

## **Supplementary File (Online Resource)**

### **Evaluation of Sustainable Hydrogen Production Technologies by Fuzzy AHP Analysis with Bootstrapping**

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This supplementary file presents the questionnaire surveys filled in by the subject matter experts (SMEs), which include the pairwise comparisons conducted by each SME using linguistic variables. At the beginning of each questionnaire, an explanation is provided outlining the objectives of the survey. Following this, each SME is requested to supply their personal information. Subsequently, detailed instructions, along with an illustrative example, are given to guide participants on how to complete the questionnaire. Finally, each SME is asked to perform the pairwise comparisons.

The following sections of this supplementary file contain:

1. Main body of the questionnaire
2. Responses from each SME regarding the pairwise comparisons.

# 1. Main body of the questionnaire

## Survey

### **Prioritize Hydrogen Production Technologies in Egypt using Fuzzy Analytic Hierarchy Process (FAHP) Considering Sustainability Criteria**

Dear Sir/ madam

Greetings,

This survey aims to prioritize and evaluating the utilization of the proposed hydrogen production technologies in Egypt as critical step towards the development of Egypt's hydrogen economy strategy. The researcher adopted main four sustainability criteria, economic, social, environmental, and technical. Each should include two of sub-criteria for better evaluation.

**Note:** the information will be used only for scientific research activity.

#### **Part (1) personal information**

|                                                                                                    |                 |                          |                  |                          |                    |
|----------------------------------------------------------------------------------------------------|-----------------|--------------------------|------------------|--------------------------|--------------------|
| Please mark ( <input type="radio"/> ) in front of the correct option: <u>use by copy and paste</u> |                 |                          |                  |                          |                    |
| <b>Gender</b>                                                                                      |                 |                          |                  |                          |                    |
| <input type="checkbox"/>                                                                           | Male            | <input type="checkbox"/> | Female           | <input type="checkbox"/> |                    |
| <b>Degree</b>                                                                                      |                 |                          |                  |                          |                    |
| <input type="checkbox"/>                                                                           | Bachelor degree | <input type="checkbox"/> | Master           | <input type="checkbox"/> | Doctoral           |
| <b>Experience</b>                                                                                  |                 |                          |                  |                          |                    |
| <input type="checkbox"/>                                                                           | Less 7 years    | <input type="checkbox"/> | Between 7 and 15 | <input type="checkbox"/> | More 15            |
| <b>Sector</b>                                                                                      |                 |                          |                  |                          |                    |
| <input type="checkbox"/>                                                                           | Government      | <input type="checkbox"/> | Private          | <input type="checkbox"/> | International org. |
| Name                                                                                               |                 |                          |                  |                          |                    |
| Organization                                                                                       |                 |                          |                  |                          |                    |
| Title                                                                                              |                 |                          |                  |                          |                    |
| Remarks                                                                                            |                 |                          |                  |                          |                    |

Thank you for your efforts and commitment please send it directly to [ikshanh@live.com](mailto:ikshanh@live.com).

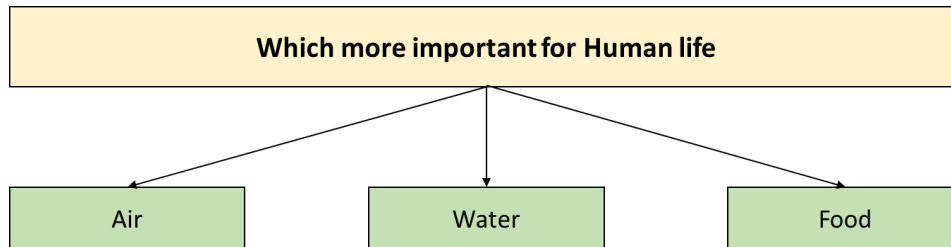
Sincerely yours

**Ibrahim Kshanh**

**National graduate institute for policy studies, Japan**

### Fuzzy Analytic Hierarchy Process Model: Example

Which is more important for Human life?



| EXAMPLE | Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Criteria |
|---------|----------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------|
|         |          | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |          |
| 1       | Air      |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Water    |
| 2       | Food     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | Air      |
| 3       | Food     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | Water    |

**In the previous example;**

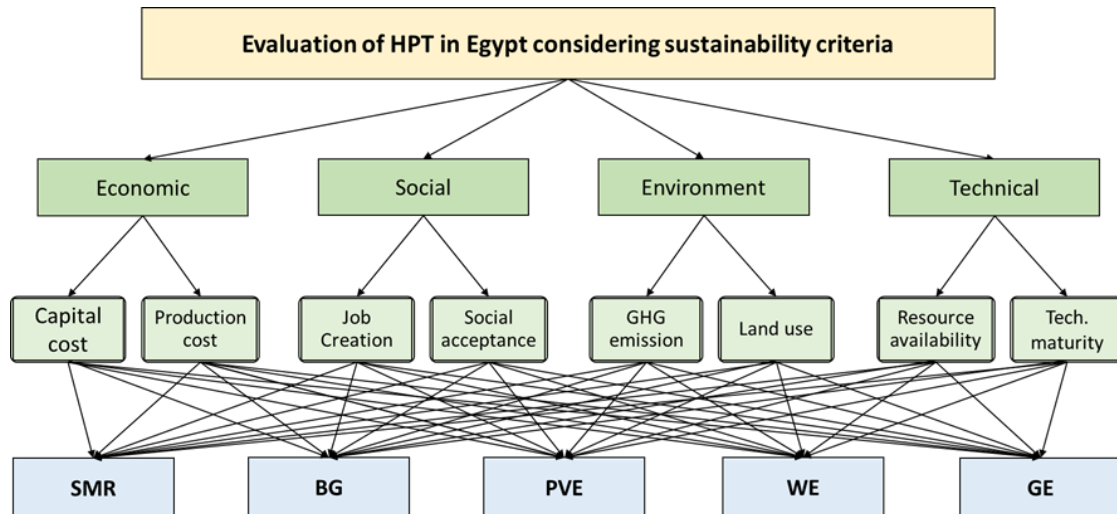
- 1) It means that (Air) has **very strong** importance relative to (water)
- 2) It means that (Air) has **strong to very strong** importance relative to (Food)
- 3) It means that (Food) has **equal** importance relative to (water)

**Please use the same technique for filling the following questionnaire regarding the prioritization of hydrogen production technologies in Egypt as following.**

1. Steam Methane Reforming (SMR)
2. Biomass Gasification (BG)
3. PV-Electrolysis (PVE)
4. Wind-Electrolysis (WE)
5. Grid-Electrolysis (GE)

**FAHP model:**  
**Prioritization of hydrogen production technologies in Egypt**

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## 2. Responses from each SME regarding the pairwise comparisons

### Pairwise Comparison: SME1

#### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |

#### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | BG                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | PVE                    |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | WE                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | GE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | PVE                    |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  | WE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                | GE                     |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | WE                     |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  | GE                     |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  | GE                     |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      | GE                     |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                        | GE                     |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | PVE                    |
| BG                                     |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | GE                     |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        | GE                     |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                      | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | GE      |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | GE      |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   | X               |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       | X                  |                        | PVE                              |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               |                    | X               |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               | X                     |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              | X                 |                 |                    |               |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       |               |                    | X               |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        | X                  |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    | X               |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   | X                      |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | GE                               |

## Pairwise Comparison: SME2

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                |                        | GE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  |                        | GE      |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      | GE                     |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                        | GE                     |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| BG                               |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |

## Pairwise Comparison: SME3

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      | GE                     |
| PVE                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                        | GE                     |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                        | GE      |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | GE      |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        |                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      |                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      |                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        |                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                        |                        | WE      |
| PVE                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| WE                                     |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | GE      |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |

## Pairwise Comparison SME4

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | GE                               |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | GE                               |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |

## Pairwise Comparison: SME5

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | BG                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | PVE                    |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | WE                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | GE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  | PVE                    |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  | WE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | GE                     |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | WE                     |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  | GE                     |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                  | GE                     |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      | GE                     |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                        | GE                     |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| BG                               |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                      | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | GE      |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |

## Pairwise Comparison SME6

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| <i>Sustainability Criteria</i> | <i>Preference Degree</i> |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | <i>Sustainability Criteria</i> |
|--------------------------------|--------------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|--------------------------------|
|                                | <i>Extreme</i>           | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                |
| Economic                       |                          |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Social                         |
| Economic                       |                          | X                      |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Environment                    |
| Economic                       |                          |                        |                    | X                     |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Technical                      |
| Social                         |                          |                        | X                  |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Environment                    |
| Social                         |                          | X                      |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Technical                      |
| Environment                    |                          |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       | X                  |                        | Technical                      |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| <i>Sustainability Sub-Criteria</i> | <i>Preference Degree</i> |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | <i>Sustainability Sub-Criteria</i> |
|------------------------------------|--------------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|------------------------------------|
|                                    | <i>Extreme</i>           | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                    |
| Capital cost                       |                          | X                      |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Prod. cost                         |
| Job creation                       |                          |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Social accept.                     |
| GHG emission                       |                          |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | Land use                           |
| Resource Av.                       |                          |                        | X                  |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Tech maturity                      |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme | Extreme |
| SMR                                    |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | BG      |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | PVE     |
| SMR                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      |                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      |                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        |                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| PVE                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| WE                                     |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  |                        | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | GE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  |                        | GE      |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                  | BG                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | PVE                    |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | WE                     |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  | PVE                    |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | WE                     |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  | WE                     |
| PVE                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |
| WE                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    | X                 |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    | X                 |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | PVE     |
| SMR                                    | X                 |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| SMR                                    | X                 |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |

## Pairwise Comparison: SME7

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | GE                               |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |

## Pairwise Comparison: SME8

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                        | GE                     |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        | GE                     |
| PVE                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        | GE                     |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |

## Pairwise Comparison: SME9

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                | X                 |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                | X                 |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | PVE     |
| SMR                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| SMR                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                        |                        | PVE     |
| BG                                     |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| BG                                     |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| PVE                                    |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | GE      |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  |                        | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  |                        | GE      |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                  |                        | GE      |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        |                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                        |                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                        |                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | GE      |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                        | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        |                    |                       |               |                    | X               |                   |              |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | GE                               |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 | X                 |              |                   |                 |                    |               |                       |                    |                        | GE                               |

## Pairwise Comparison: SME10

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | BG                     |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | PVE                    |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | WE                     |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | PVE                    |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  | WE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | GE                     |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                                  | WE                     |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | GE                     |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen<br>Production<br>Technologies |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                        | Extreme |
| SMR                                    |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | BG      |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | PVE     |
| SMR                                    |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | WE      |
| SMR                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                        | WE      |
| PVE                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |
| WE                                     |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                        | GE      |

## Pairwise Comparison: SME11

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        | GE                               |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                  |                        | GE      |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       | X                 |          |                    |        |                       |             |                        |                                  | GE      |

## Pairwise Comparison: SME12

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        | PVE                    |
| SMR                                    |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | GE                     |
| PVE                                    |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | GE                     |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | GE      |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  |                        | GE      |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                |                        | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| PVE                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        |                        | GE      |
| BG                                     |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | PVE     |
| BG                                     |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| BG                                     |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                                        |                        | WE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | GE      |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | GE      |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       |               | X                  |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              | X                 |                 |                    |               |                       |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              | X                 |                 |                    |               |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   | X            |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | X             |                       |                    |                        | GE                               |

## Pairwise Comparison: SME13

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | GE                               |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                      |                                  | GE      |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |

## Pairwise Comparison: SME14

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   |                        | x           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        | x           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             | x                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       |        | x                  |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        | x           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          | x                 |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          | x                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | GE                               |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | x     |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | x     |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | x                  |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | x                  |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | x                  |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | x                     |             |                        | GE                               |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | x     |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          | x                 |       |                   |          |                    |        |                       |             |                        | GE                               |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          | x                 |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | GE                               |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | x     |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | x           |                        | PVE                              |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | x           |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | x     |                   |          |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        |                    | x        |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        | x           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |
| WE                               |                   |                        | x           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | GE                               |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  |
| SMR                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | BG                               |
| SMR                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| SMR                              |                   |                        |             |                       | x      |                    |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | x        |                    |        |                       |             |                        | GE                               |
| BG                               |                   |                        |             |                       |        | x                  |          |                   |       |                   |          |                    |        |                       |             |                        | PVE                              |
| BG                               |                   |                        |             |                       |        | x                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | GE                               |
| PVE                              |                   |                        |             |                       |        | x                  |          |                   |       |                   |          |                    |        |                       |             |                        | WE                               |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | GE                               |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | x      |                       |             |                        | GE                               |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   | x            |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | x             |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   | x            |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   | x            |                   |                 |                    |               |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | x             |                       |                    |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   | x            |                   |                 |                    |               |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   | x            |                   |                 |                    |               |                       |                    |                        | GE                               |
| PVE                              |                   |                        |                    |                       | x             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       | X             |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | x             |                       |                    |                        | GE                               |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | Hydrogen Production Technologies |
|----------------------------------|-------------------|------------------------|--------------------|-----------------------|---------------|--------------------|-----------------|-------------------|--------------|-------------------|-----------------|--------------------|---------------|-----------------------|--------------------|------------------------|----------------------------------|
|                                  | <i>Extreme</i>    | very strong to extreme | <i>Very Strong</i> | strong to very strong | <i>Strong</i> | Moderate to strong | <i>Moderate</i> | equal to moderate | <i>Equal</i> | equal to moderate | <i>Moderate</i> | Moderate to strong | <i>Strong</i> | strong to very strong | <i>Very Strong</i> | very strong to extreme |                                  |
| SMR                              |                   |                        | x                  |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | BG                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 | x                 |              |                   |                 |                    |               |                       |                    |                        | PVE                              |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   | x            |                   |                 |                    |               |                       |                    |                        | WE                               |
| SMR                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   | x               |                    |               |                       |                    |                        | GE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       | x                  |                        | PVE                              |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | x             |                       |                    |                        | WE                               |
| BG                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   |                 |                    | x             |                       |                    |                        | GE                               |
| PVE                              |                   |                        | x                  |                       |               |                    |                 |                   |              |                   |                 |                    |               |                       |                    |                        | WE                               |
| PVE                              |                   |                        |                    |                       |               |                    |                 |                   |              |                   | x               |                    |               |                       |                    |                        | GE                               |
| WE                               |                   |                        |                    |                       |               |                    |                 |                   |              |                   | x               |                    |               |                       |                    |                        | GE                               |

## Pairwise Comparison: SME15

### 1) Prioritize sustainable development dimensions with respect to goal [ Egypt Case ]

| Sustainability Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Criteria |             |
|-------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-------------------------|-------------|
|                         | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                         | Extreme     |
| Economic                |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Social      |
| Economic                |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Economic                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                         | Technical   |
| Social                  |                   |                        |             |                       |        |                    |          | X                 |       |                   |          |                    |        |                       |             |                        |                         | Environment |
| Social                  |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                         | Technical   |
| Environment             |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                         | Technical   |

### 2) Prioritize sub-criteria with respect to [ Sustainability main criteria ]

| Sustainability Sub-Criteria | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Sustainability Sub-Criteria |                |
|-----------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|-----------------------------|----------------|
|                             | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                             | Extreme        |
| Capital cost                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Prod. cost     |
| Job creation                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Social accept. |
| GHG emission                |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                             | Land use       |
| Resource Av.                |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                             | Tech maturity  |

### 3) Prioritize hydrogen production technologies in Egypt with respect to [ Capital Cost ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme |
| SMR                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | BG                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  | PVE                    |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  | WE                     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | GE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | PVE                    |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                  | WE                     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                | GE                     |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  | WE                     |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                  | GE                     |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  | GE                     |

### 4) Prioritize hydrogen production technologies in Egypt with respect to [ Production Cost ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme |
| SMR                                    |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        | BG                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | PVE                    |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | GE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | PVE                    |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | WE                     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | GE                     |
| PVE                                    |                   |                        |             |                       |        | X                  |          |                   |       |                   |          |                    |        |                       |             |                                        | WE                     |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        | GE                     |
| WE                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                                        | GE                     |

### 5) Prioritize hydrogen production technologies in Egypt with respect to [ Job creation ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen Production Technologies |                        |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------|------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                  | very strong to extreme | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                                  |                        | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                  |                        | PVE     |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                                  |                        | GE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | PVE     |
| BG                               |                   | X                      |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| BG                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | WE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |
| WE                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                  |                        | GE      |

### 6) Prioritize hydrogen production technologies in Egypt with respect to [ Social acceptance ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | X                                | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             | X                     |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | GE      |

### 7) Prioritize hydrogen production technologies in Egypt with respect to [ GHG Emission ]

| Hydrogen<br>Production<br>Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | Hydrogen<br>Production<br>Technologies |                        |         |
|----------------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|----------------------------------------|------------------------|---------|
|                                        | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong |                                        | very strong to extreme | Extreme |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        |                        | BG      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      |                        | PVE     |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             | X                                      |                        | WE      |
| SMR                                    |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | GE      |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                                        |                        | PVE     |
| BG                                     |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                                        |                        | WE      |
| BG                                     |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| PVE                                    |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                                        |                        | WE      |
| PVE                                    |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |
| WE                                     |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                                        |                        | GE      |

### 8) Prioritize hydrogen production technologies in Egypt with respect to [ Land use ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          | X                  |        |                       |             |                        |                                  | GE      |

### 9) Prioritize hydrogen production technologies in Egypt with respect to [ Resource availability ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        | X                     |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       | X           |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    | X        |                   |       |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       | X      |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | GE      |

### 10) Prioritize hydrogen production technologies in Egypt with respect to [ Technology Maturity ]

| Hydrogen Production Technologies | Preference Degree |                        |             |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        | Hydrogen Production Technologies |         |
|----------------------------------|-------------------|------------------------|-------------|-----------------------|--------|--------------------|----------|-------------------|-------|-------------------|----------|--------------------|--------|-----------------------|-------------|------------------------|----------------------------------|---------|
|                                  | Extreme           | very strong to extreme | Very Strong | strong to very strong | Strong | Moderate to strong | Moderate | equal to moderate | Equal | equal to moderate | Moderate | Moderate to strong | Strong | strong to very strong | Very Strong | very strong to extreme |                                  | Extreme |
| SMR                              |                   |                        | X           |                       |        |                    |          |                   |       |                   |          |                    |        |                       |             |                        |                                  | BG      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | PVE     |
| SMR                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| SMR                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | PVE     |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | WE      |
| BG                               |                   |                        |             |                       |        |                    |          |                   |       |                   |          |                    | X      |                       |             |                        |                                  | GE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   | X     |                   |          |                    |        |                       |             |                        |                                  | WE      |
| PVE                              |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |
| WE                               |                   |                        |             |                       |        |                    |          |                   |       |                   | X        |                    |        |                       |             |                        |                                  | GE      |