

Online Resource 2: Workshop methods

Workshop 1 (online)

Goals: Providing context to technologies developed for reducing ammonia emissions, gaining stakeholder feedback and insight, developing systematic lens on context.

Methods:

To introduce the topic, a technology developer presented new technologies in ammonia emissions. Stakeholders (researchers, advisors, permit bureaus, people from research farms) were given space to ask questions about these developments. This allowed us to see how stakeholders related to technology developers and to study the relations between stakeholders and technologies developed to reduce ammonia emissions.

Following this, we formed two break-out groups to discuss technological developments in ammonia emissions. A SWOT-analysis was used to discuss the various aspects of technology developments among stakeholders and technology developers. After these discussions, a systematic overview of ammonia emissions was provided (including both human and non-human actors). This overview was used to discuss the network of actors around ammonia emissions between stakeholders and technology developers.

A final plenary discussion was used to discuss the themes discussed in each group and to conclude the workshop.

Workshop 2 (in person)

Goals: Discussing scenarios for the future of ammonia emissions and of technologies in ammonia emission reduction, gaining stakeholder feedback and insight.

Methods:

A timeline of past developments in ammonia emissions was used as an ice-breaker for the participants of the workshops. This timeline mainly focused on regulatory developments in ammonia emissions and was developed by the participants.

Following the ice-breakers, stakeholders were asked to name drivers of change in livestock farming, related to ammonia emissions. Drivers of change were identified by participants and discussed. Based on these drivers of change, participants were asked to provide 2-4 assumptions for how these drivers of change might develop over the next ten years, ranging from positive to negative scenarios of change. This process allowed us to identify the positions of stakeholders and their perceptions on ammonia emissions and ammonia emission reduction.