

Supplementary Material

I. Case Study for Pahang

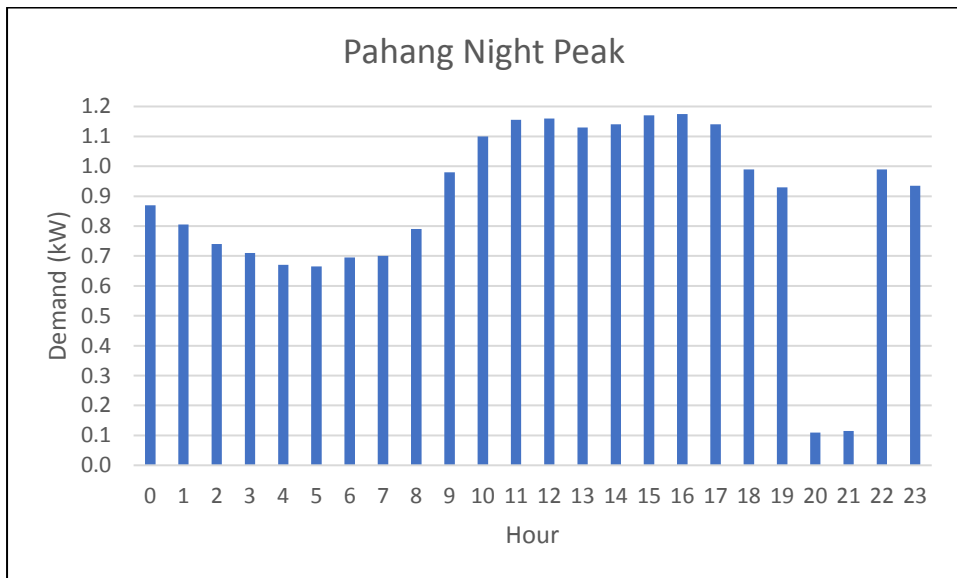
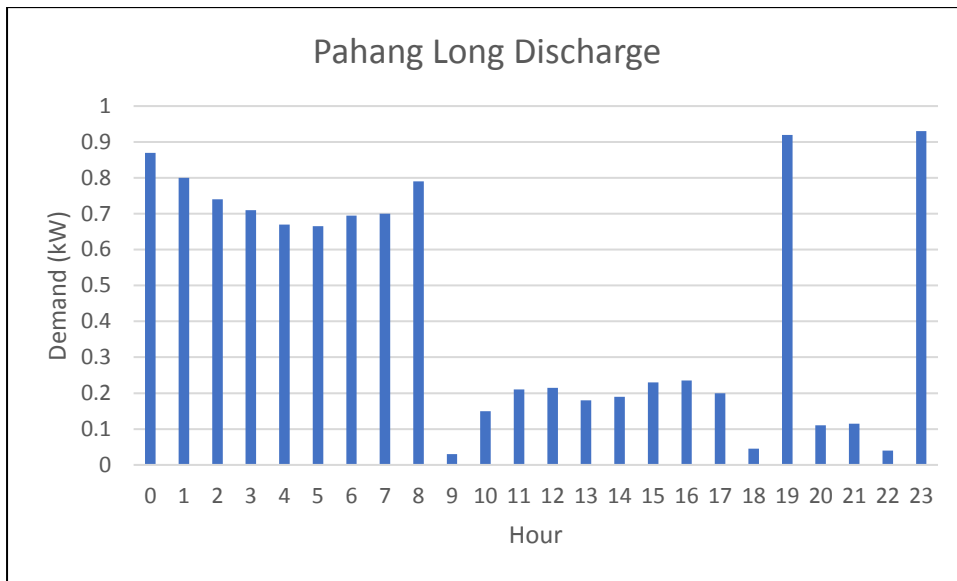
		Capital (RM)	Replacement (RM)	O&M (RM)	Salvage (RM)
1 MWh ZB	Storage	134400000	0	37351443	-10343557
	PV	329748000	0	12210054	-13535919
	Converter	36729300	13899602	0	-5653918
	System	500877300	13899602	49561497	-29533393
	NPC	534805005			
1 kWh Li-Ion	Storage	201447600	92509279	37296451	-13016771
	PV	329748000	0	12210054	-13535919
	Converter	36729300	13899602	0	-5653918
	System	567924900	106408881	49506505	-32206607
	NPC	691633678			
100 kWh Li-Ion	Storage	235200000	107893407	37324667	-15345886
	PV	329748000	0	12210054	-13535919
	Converter	36729300	13899602	0	-5653918
	System	601677300	121793008	49534720	-34535723
	NPC	738469306			

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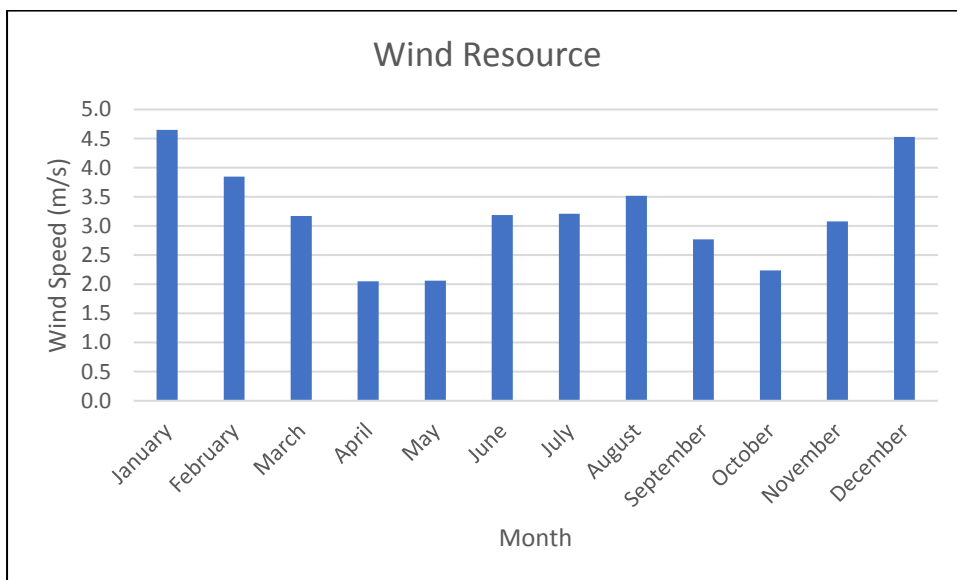
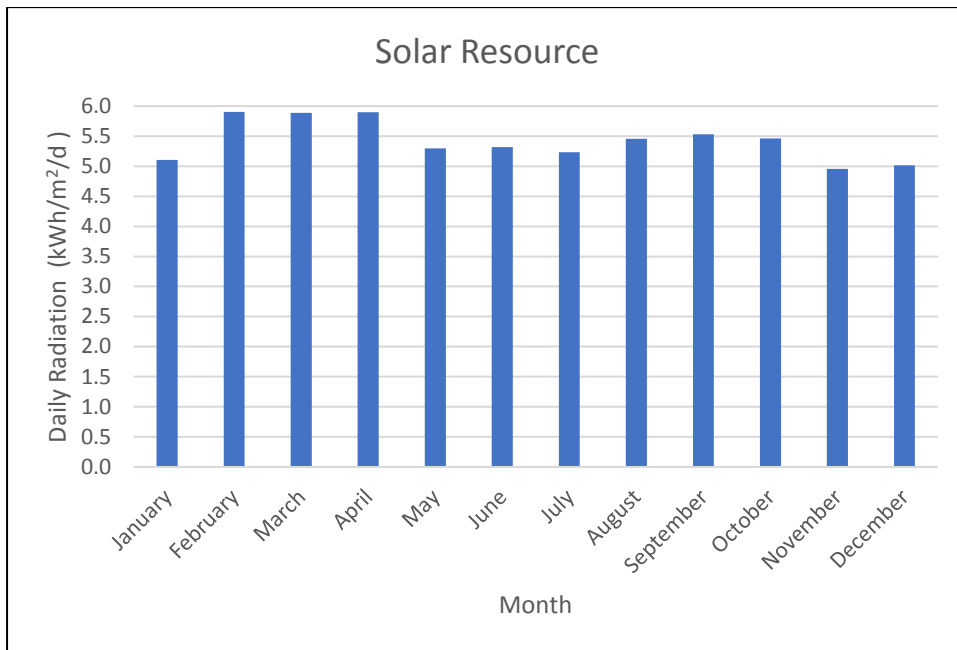
			0.05	0.1	0.2	0.3	0.45	0.5	0.6
NPC	LSS+St	LSS+St 6 MW	21	22	23	25	28	29	31
		LSS+St 10 MW	35	36	39	42	47	49	52
		LSS+St 30 MW	105	109	118	127	141	145	156
		LSS+St 50 MW	175	182	197	211	234	243	260
	St	St 6 MW	1.20	2.40	4.31	6.71	10.35	11.07	13.42
		St 10 MW	1.84	3.68	7.35	11.03	17.09	18.92	22.05
		St 30 MW	5.24	11.03	22.05	33.08	50.79	55.81	66.16
		St 50 MW	9.19	18.38	36.76	55.14	84.49	93.17	110.27
	LSS	LSS 6 MW	20	20	20	20	20	20	20
		LSS 10 MW	34	34	34	34	34	34	34
		LSS 30 MW	101	101	101	101	101	101	101
		LSS 50 MW	168	168	168	168	168	168	168

[illegible]

Demand Profile



Meteorological Data



II. Case Study for Perak

		Capital (RM)	Replacement (RM)	O&M (RM)	Salvage (RM)
1 MWh ZB	Storage	201600000	0	56027165	-15515336
	PV	596610000	0	22091537	-24490412
	Converter	66290100	25086402	0	-10204354
	System	864500100	25086402	78118702	-50210101
	NPC	917495102			

1 kWh Li-Ion	Storage	302171400	140143284	55944676	-17779570
	PV	596610000	0	22091537	-24490412
	Converter	66290100	25086402	0	-10204354
	System	965071500	165229686	78036213	-52474336
	NPC	1155863063			

100 kWh Li-Ion	Storage	352520000	163386990	55942566	-20884466
	PV	596610000	0	22091537	-24490412
	Converter	66290100	25086402	0	-10204354
	System	1015420100	188473392	78034103	-55579232
	NPC	1226348362			

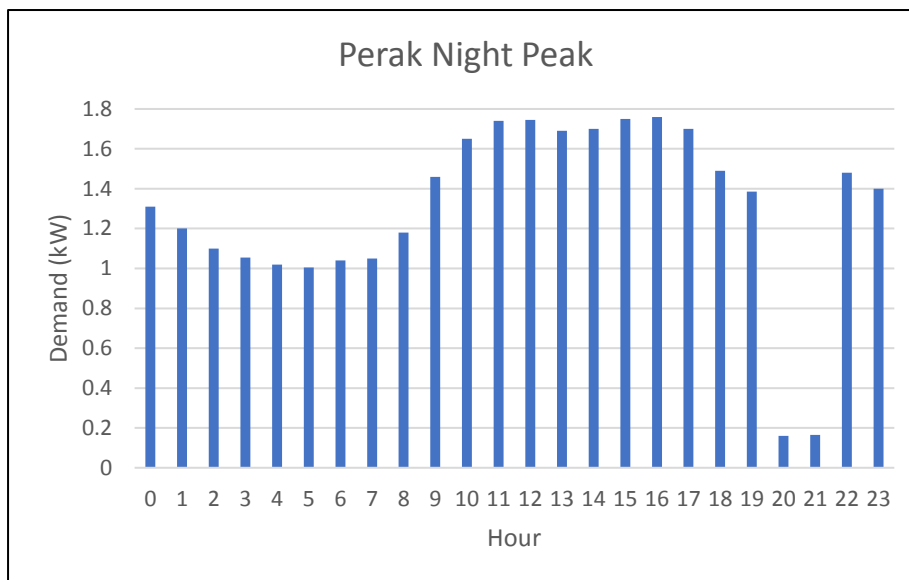
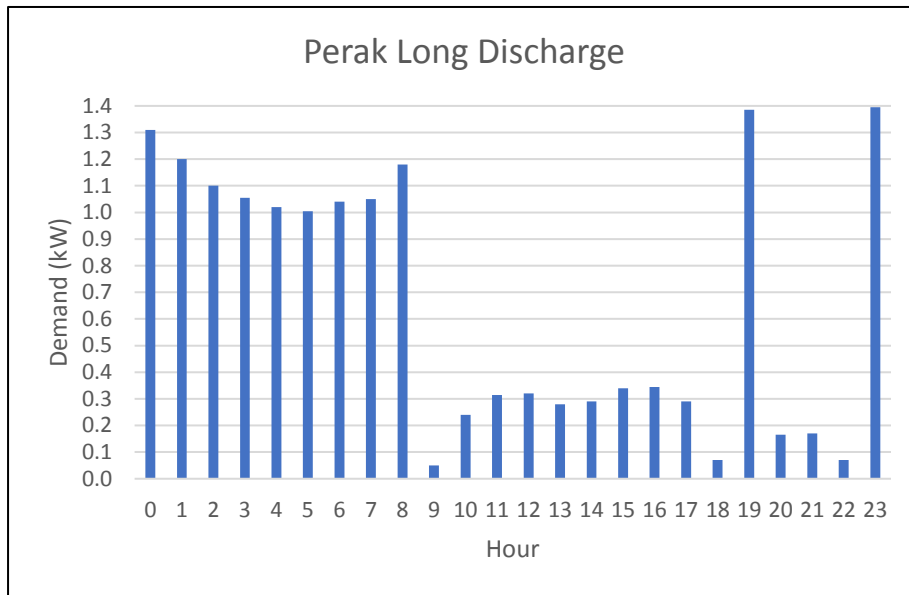
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			0.05	0.1	0.2	0.3	0.39	0.5	0.6
NPC	LSS+St	LSS+St 6 MW	21	22	23	25	27	29	31
		LSS+St 10 MW	35	36	39	42	45	48	52
		LSS+St 30 MW	105	109	118	127	134	145	156
		LSS+St 50 MW	175	182	197	211	224	241	260
	St	St 6 MW	1	2	4	7	9	11	13
		St 10 MW	2	4	7	11	14	18	22
		St 30 MW	6	11	22	33	43	55	66
		St 50 MW	9	18	37	55	72	92	110
	LSS	LSS 6 MW	20	20	20	20	20	20	20
		LSS 10 MW	34	34	34	34	34	34	34
		LSS 30 MW	101	101	101	101	101	101	101
		LSS 50 MW	168	168	168	168	168	168	168

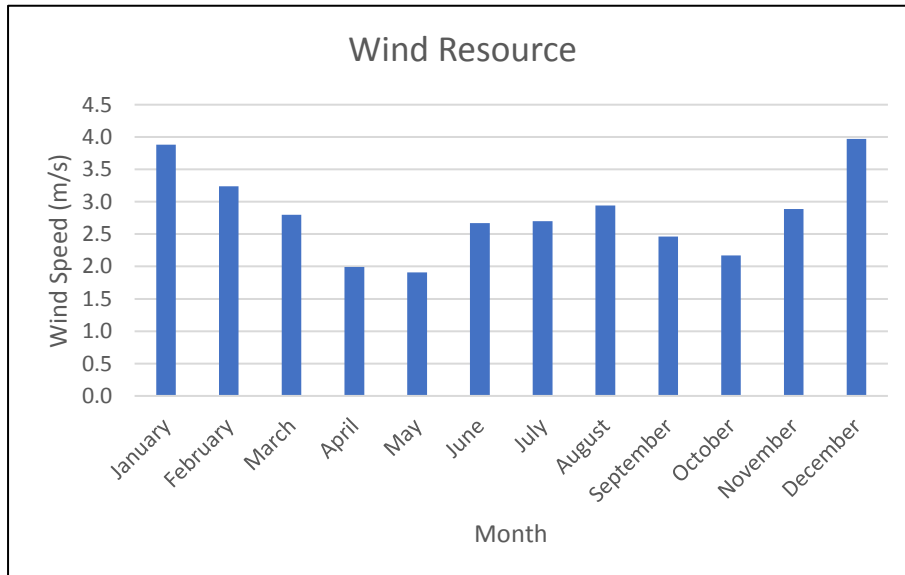
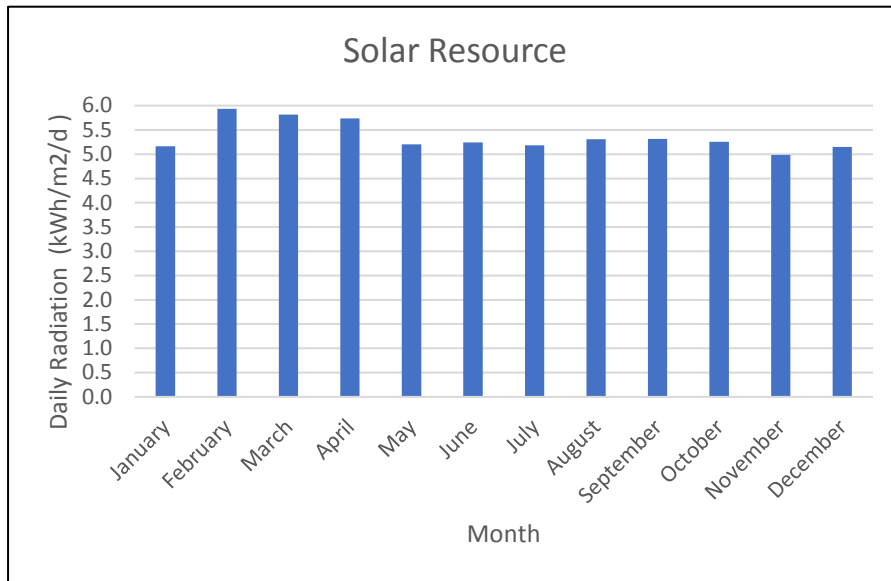
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Demand Profile



Meteorological Data



Cost of Component/Balance of System (BOS)

Components	List of Costing	
Solar PV Module	Capital Cost	RM 3000/kWh (USD 727/kWh)
	Replacement Cost	RM 3000/kWh (USD 727/kWh)
	O&M Cost	RM 10.00/kWh (USD 2.42/year)
Converter	Capital Cost	RM 300.00/kW (USD 72.70/kW)
	Replacement Cost	RM 300.00/kW (USD 72.70/kW)
	O&M Cost	RM 0.00/year (USD 0.00/year)
Surrette 4KS 21P	Capital Cost	RM 4,500/unit (USD 1090.50/ unit)
	Replacement Cost	RM 4,500/unit (USD 1090.50/unit)
	O&M Cost	RM 150.00/year (USD 36.35/year)
Generic 1kWh Lead Acid	Capital Cost	RM 300/unit (USD 72.70/kW)
	Replacement Cost	RM 300/unit (USD 72.70/kW)
	O&M Cost	RM 10.00/year (USD 2.42/year)
Generic 1kWh Li-Ion	Capital Cost	RM 600/unit (USD 145.4/unit)
	Replacement Cost	RM 600/unit (USD 145.4/unit)
	O&M Cost	RM 10.00/year (USD 2.42/year)
Generic 100kWh Li-Ion	Capital Cost	RM 70,000/unit (USD 16,963.33/unit)
	Replacement Cost	RM 70,000/unit (USD 16,963.33/unit)
	O&M Cost	RM 1,000.00/year (USD 242.33/year)
Generic 1MWh Li-Ion	Capital Cost	RM 700,000/unit (USD 169,633.33/unit)
	Replacement Cost	RM 700,000/unit (USD 169,633.33/unit)
	O&M Cost	RM 10,000.00/year (USD 2423.33/year)
Generic Vanadium Flow	Capital Cost	RM 5,000/unit (USD 1,211.67/unit)
	Replacement Cost	RM 1,000/unit (USD 242.33/unit)
	Operation & Maintenance Cost	RM 100.00/year (USD 24.23/year)
Generic 1MWh Zinc Bromide Flow Battery	Capital Cost	RM 400,000/unit (USD 96,933.33/unit)
	Replacement Cost	RM 400,000/unit (USD 96,933.33/unit)
	O&M Cost	RM 10,000.00/year (USD 2423.33/year)
280kW – 1MWh Primus Power Energy Pod	Capital Cost	RM 2,000,000/unit (USD 484,666.67/unit)
	Replacement Cost	RM 2,000,000/unit (USD 484,666.67/unit)
	O&M Cost	RM 50,000.00/year (USD 12,116.67/year)
Redflow ZBM2	Capital Cost	RM 8,000/unit (USD 1,938.67/unit)
	Replacement Cost	RM 8,000/unit (USD 1,938.67/unit)
	O&M Cost	RM 0.00/year (USD 0.00/year)
Generic 245kWh Pumped Hydro	Capital Cost	RM 22,000/unit (5,331.33/unit)
	Replacement Cost	RM 500/unit (USD 121.17/unit)
	O&M Cost	RM 2,000.00/year (USD 484.67/year)
Diesel Generator Set	Capital Cost	RM 500.00/kW (USD 121.17/kW)
	Replacement Cost	RM 500.00/kW (USD 121.17/kW)
	O&M Cost	RM 0.03/operation hour (USD 0.00727/o.h.)
	Fuel Price	RM 1.00/Litre (USD 0.2423/Litre)

Homer Energy. (2018). HOMER Pro. Accessed: August 12, 2020. [Online]. Available: <https://www.homerenergy.com/products/pro/index.html>