

Supplementary Materials

Table S1. Cost Structures and the Country of Origins Model: (a) Biomass; (b) Solar PV; (c) Hydro.

(a) Biomass

Breakdown	GTAP Sector	HS-6 Cat.	Import Origin	Levelized Cost [10 ⁻³ USD/kWh]
Boiler, Gasifier, Pyrolysis System	41	841911	(Total)	20.24
			Italy	7.02
			UK	4.93
			China	3.97
			Japan	2.25
			USA	2.07
Generator, Gas Engine, Steam Turbine	41	850239	(Total)	14.27
			China	6.42
			Singapore	4.52
			Japan	1.43
			Germany	0.96
			USA	0.94
Fuel Preparation, Handling and Storage	41	842890	(Total)	7.60
			China	2.79
			Singapore	1.47
			Japan	1.14
			Germany	0.92
			Italy	0.67
			USA	0.61
Meter, Protection, Pollution, Others	41	853530	(Total)	7.26
			Singapore	2.01
			India	1.83
			South Korea	0.67
			China	0.55
			Italy	1.64
			UK	0.55
Grid Connection	46	-	(Domestic)	6.27
Installation	46	-	(Domestic)	21.35
Pre-construction	46	-	(Domestic)	4.35
O&M Cost	54	-	(Domestic)	5.63
Fuel Cost	13	-	(Domestic)	14.39
Total				101

(b) Solar PV

Breakdown	GTAP Sector	HS-6 Cat.	Import Origin	Levelized Cost [10 ⁻³ USD/kWh]
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				Small [< 100 kW]	Med. [100 kW – 1 MW]	Large [> 1 MW]
PV Module	40	854140	(Total)	85.01	77.41	55.88
			Singapore	46.32	42.18	30.45
			China	10.43	9.50	6.86
			Germany	13.63	12.41	8.96
			Taiwan	9.46	8.62	6.22
			South Korea	5.17	4.71	3.40
Inverter	41	850440	(Total)	27.89	22.05	14.12
			China	13.87	10.97	7.02
			Singapore	8.52	6.73	4.31
			Hong Kong	3.30	2.61	1.67
			USA	2.20	1.74	1.11
Mounting Structure / Roof Mounting	37	761090	(Total)	10.10	16.72	18.95
			China	8.73	14.46	16.38
			Taiwan	0.55	0.92	1.04
			USA	0.82	1.35	1.53
Energy Meter	41	902830	(Total)	1.48	1.01	0.30
			China	0.76	0.52	0.15
			India	0.29	0.20	0.06
			Singapore	0.17	0.12	0.03
			Hong Kong	0.16	0.11	0.03
			USA	0.10	0.07	0.02
Electrical Protection System	41	853530	(Total)	5.66	5.19	2.17
			Singapore	1.57	1.44	0.60
			India	1.43	1.31	0.55
			South Korea	0.52	0.48	0.20
			China	0.43	0.39	0.16
			Italy	1.28	1.18	0.49
			UK	0.43	0.40	0.17
Balance of System	41	854411	(Total)	4.58	4.31	7.40
			China	2.11	1.98	3.40
			Singapore	0.88	0.83	1.42
			Japan	0.71	0.67	1.15
			USA	0.88	0.83	1.42
Grid Connection Costs	46	-	(Domestic)	3.56	8.12	15.37
Transport and Freight Insurance	53	-	(Domestic)	6.53	1.01	1.03
Design, Engineering, Project Management	54	-	(Domestic)	9.89	4.74	1.48
Installation	46	-	(Domestic)	36.99	17.76	6.65
Civil Works	46	-	(Domestic)	1.98	2.20	1.77
Land Acquisition and Development	54	-	(Domestic)	0.00	0.05	2.81

Consulting Services, Licenses, Permits	56	-	(Domestic)	4.55	8.46	19.95
O&M Cost	54	-	(Domestic)	2.20	0.85	2.25
Total				200	170	150

(c) Hydro

Breakdown	GTAP Sector	HS-6 Cat.	Import Origin	Levelized Cost [10 ⁻³ USD/kWh]
Conveyance System	35	730449	(Total)	2.87
			Japan	0.71
			Singapore	0.69
			China	0.44
			Italy	0.37
			Spain	0.25
			Germany	0.22
			UK	0.17
Turbine and Generator	41	841012	(Total)	2.26
			Belgium	0.97
			Austria	0.78
			Germany	0.52
Power House	34	681091	(Total)	0.33
			China	0.25
			Brunei	0.06
			Singapore	0.02
Electrical Protection System	41	853530	(Total)	0.03
			Singapore	0.01
			India	0.01
			Italy	0.01
Headworks	34	252390	(Total)	0.22
			China	0.10
			Singapore	0.06
			Japan	0.01
			USA	0.05
Others	37	731829	(Total)	1.04
			China	0.29
			Singapore	0.26
			Japan	0.23
			Taiwan	0.12
			France	0.07
			USA	0.08
Grid Connection		-	(Domestic)	3.12
Transport and others Installation		-	(Domestic)	0.06
Civil works				5.28
Pre-construction		-	(Domestic)	11.16
O&M Cost	54	-	(Domestic)	1.99
Total				29

Table S2. SHDB product models: (a) Biomass; (b) Solar PV; (c) Hydro.

(a) Biomass

GTAP Sector		Country	Cost
No.	Description		[10 ⁻³ USD2002/kWh]
13	Forestry	Malaysia	10.79
41	Machinery and equipment nec	China	10.29
		Singapore	6.00
		Japan	3.62
		Germany	1.41
		Italy	6.99
		USA	2.71
		India	1.37
		South	
		Korea	0.50
		UK	4.11
46	Construction	Malaysia	23.97
54	Business services nec	Malaysia	4.22

(b) Solar PV

GTAP Sector		Country	Cost [10 ⁻³ USD2002/kWh]		
No.	Description		Small [< 100 kW]	Med. [100 kW– 1 MW]	Large [> 1 MW]
37	Metal products	China	6.55	10.84	12.28
		Taiwan	0.41	0.69	0.78
		USA	0.61	1.01	1.15
40	Electronic equipment	Singapore	34.72	31.62	22.82
		China	7.82	7.12	5.14
		Germany	10.21	9.30	6.71
		Taiwan	7.09	6.46	4.66
		South			
		Korea	3.88	3.53	2.55
41	Machinery and equipment nec	Singapore	8.35	6.83	4.77
		India	1.29	1.13	0.45
		South			
		Korea	0.39	0.36	0.15
		China	12.87	10.39	8.05
		Italy	0.96	0.88	0.37
		UK	0.32	0.30	0.12
		Japan	0.54	0.50	0.87
		USA	2.38	1.98	1.92
		Hong Kong	2.59	2.03	1.28
46	Construction	Malaysia	31.88	21.05	17.83
53	Insurance	Malaysia	4.89	0.76	0.78
54	Business services nec	Malaysia	9.06	4.23	4.90
56	Public Administration, Defense, Education, Health	Malaysia	3.41	6.34	14.95

(c) Hydro

GTAP Sector		Country	Cost [10 ⁻³ USD2002/kWh]
No.	Description		
34	Mineral products nec	China	0.26
		Singapore	0.06
		Japan	0.01
		USA	0.04
		Brunei	0.05
35	Ferrous metals	Japan	0.54
		Singapore	0.52
		China	0.33
		Italy	0.28
		Spain	0.19
		Germany	0.17
		UK	0.13
37	Metal products	China	0.21
		Singapore	0.19
		Japan	0.17
		Taiwan	0.09
		France	0.05
		USA	0.06
41	Machinery and equipment nec	Belgium	0.73
		Austria	0.58
		Germany	0.39
		Singapore	0.01
		India	0.01
		Italy	0.01
46	Construction	Malaysia	16.20
54	Business services nec	Malaysia	0.46