

Appendix A- Supplementary Material

Appendix 1

Table 7. Pairwise comparison matrix and importance in subcriteria level.

(b) Comparison among the subcriteria under social dimension of sustainability.

	SDS1	SDS2	SDS3	SDS4	SDS5	SDS6	Importance
SDS1	1	0.5	0.25	0.5	3	2	0.12902
SDS2	2	1	2	3	3	3	0.31052
SDS3	4	0.5	1	2	3	3	0.25616
SDS4	2	0.333	0.5	1	3	2	0.15749
SDS5	0.333	0.333	0.333	0.333	1	1	0.07008
SDS6	0.5	0.333	0.333	0.5	1	1	0.07670

(c) Comparison among the subcriteria under the economic dimension of sustainability.

	ECDS1	ECDS2	ECDS3	ECDS4	ECDS5	ECDS6	Importance
ECDS1	1	2	0.333	3	3	4	0.25147
ECDS2	0.5	1	2	3	2	3	0.23740
ECDS3	3	0.5	1	2	3	3	0.25529
ECDS4	0.333	0.5	0.5	1	3	2	0.12585
ECDS5	0.333	0.333	0.333	0.333	1	1	0.06484
ECDS6	0.25	0.333	0.333	0.5	1	1	0.06512

(d) Comparison among the subcriteria under the technical dimension of sustainability.

	TDS1	TDS2	TDS3	TDS4	TDS5	TDS6	Importance
TDS1	1	0.5	3	3	3	4	0.27224
TDS2	2	1	2	3	2	3	0.28981
TDS3	0.333	0.5	1	2	3	3	0.17071
TDS4	0.333	0.5	0.5	1	3	2	0.13023
TDS5	0.333	0.333	0.333	0.333	1	1	0.06870
TDS6	0.25	0.333	0.333	0.5	1	1	0.06828

(e) Comparison among the subcriteria under the institutional dimension of sustainability.

	IDS1	IDS2	IDS3	IDS4	IDS5	Importance
IDS1	1	4	2	2	5	0.38483
IDS2	0.25	1	0.333	3	2	0.15803
IDS3	0.5	3	1	2	4	0.25906
IDS4	0.5	0.333	0.5	1	3	0.13684

IDS5	0.2	0.5	0.25	0.333	1	0.06121
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Appendix 2

Table 8. Pairwise comparison and importance in alternative level.

(b) For subcriteria share of dirty fuels in residential energy consumption.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	1	0.333	2	4	0.17244
WP	1	1	1	9	9	0.32874
BioEn	3	1	1	9	9	0.39830
Geoth	0.5	0.111	0.111	1	3	0.06542
HP	0.25	0.111	0.111	0.333	1	0.03508

(c) For subcriteria carbon intensity.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	0.333	0.25	2	3	0.15569
WP	3	1	2	3	3	0.36408
BioEn	4	0.5	1	2	3	0.27372
Geoth	0.5	0.333	0.5	1	3	0.13261
HP	0.333	0.333	0.333	0.333	1	0.07387

(d) For subcriteria emission reduction.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	1	3	5	4	0.36822
WP	1	1	2	3	3	0.28937
BioEn	0.333	0.5	1	2	3	0.16293
Geoth	0.2	0.333	0.5	1	3	0.11054
HP	0.25	0.333	0.333	0.333	1	0.06891

(e) For subcriteria need for waste disposal.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	2	2	4	3	0.36559
WP	0.5	1	2	3	3	0.25951
BioEn	0.5	0.5	1	2	3	0.18187
Geoth	0.25	0.333	0.5	1	3	0.11799

HP	0.333	0.333	0.333	0.333	1	0.07501
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(f) For subcriteria disturbance of ecological balance.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	1	3	2	0.31831
WP	0.333	1	2	3	3	0.25680
BioEn	1	0.5	1	2	3	0.21676
Geoth	0.333	0.333	0.5	1	3	0.12604
HP	0.5	0.333	0.333	0.333	1	0.08206

(g) For subcriteria consumption of clean energies in the residential sectors.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	2	3	4	4	0.40411
WP	0.5	1	2	3	3	0.25033
BioEn	0.333	0.5	1	2	3	0.16338
Geoth	0.25	0.333	0.5	1	3	0.11426
HP	0.25	0.333	0.333	0.333	1	0.06789

(h) For subcriteria income and employment criteria.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	2	5	4	0.41770
WP	0.333	1	2	3	3	0.23226
BioEn	0.5	0.5	1	2	3	0.17559
Geoth	0.2	0.333	0.5	1	3	0.10806
HP	0.25	0.333	0.333	0.333	1	0.06637

(i) For subcriteria political and social acceptance.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	4	2	3	0.39521
WP	0.333	1	2	3	3	0.23550
BioEn	0.25	0.5	1	2	3	0.15974
Geoth	0.5	0.333	0.5	1	3	0.13720
HP	0.333	0.333	0.333	0.333	1	0.07233

(j) For subcriteria impact on human health.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	2	2	5	3	0.37794
WP	0.5	1	2	3	3	0.25515
BioEn	0.5	0.5	1	2	3	0.17921
Geoth	0.2	0.333	0.5	1	3	0.11272
HP	0.333	0.333	0.333	0.333	1	0.07495

(k) For subcriteria compatibility with different policies.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	1	0.333	3	3	0.22557
WP	1	1	2	3	2	0.28894
BioEn	3	0.5	1	2	3	0.27676
Geoth	0.333	0.5	0.5	1	3	0.13719
HP	0.333	0.333	0.333	0.333	1	0.07152

(l) For subcriteria energy security.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	2	3	2	0.35675
WP	0.333	1	2	3	2	0.23171
BioEn	0.5	0.5	1	2	3	0.18795
Geoth	0.333	0.5	0.5	1	3	0.13685
HP	0.5	0.333	0.333	0.333	1	0.08673

(m) For subcriteria consumption of commercial energies.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	4	2	3	4	0.40645
WP	0.25	1	2	3	2	0.21664
BioEn	0.5	0.5	1	2	3	0.18195
Geoth	0.333	0.5	0.5	1	3	0.12906
HP	0.25	0.333	0.333	0.333	1	0.06588

(n) For subcriteria share of productive use of energy.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	1	0.333	2	2	0.18628
WP	1	1	1	3	3	0.26886
BioEn	3	1	1	3	3	0.33553
Geoth	0.5	0.333	0.333	1	3	0.12847
HP	0.5	0.333	0.333	0.333	1	0.08084

(o) For subcriteria cost factor.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	2	1	2	5	0.31456
WP	0.5	1	2	3	3	0.27402
BioEn	1	0.5	1	2	3	0.21588
Geoth	0.5	0.333	0.5	1	3	0.13192
HP	0.2	0.333	0.333	0.333	1	0.06359

(p) For subcriteria operational life.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	3	3	4	0.41431
WP	0.333	1	2	3	3	0.23401
BioEn	0.333	0.5	1	2	3	0.16395
Geoth	0.333	0.333	0.5	1	3	0.12142
HP	0.25	0.333	0.333	0.333	1	0.06629

(q) For subcriteria market maturity.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	4	2	2	3	0.36990
WP	0.25	1	2	3	3	0.23852
BioEn	0.5	0.5	1	2	3	0.18337
Geoth	0.5	0.333	0.5	1	3	0.13681
HP	0.333	0.333	0.333	0.333	1	0.07137

(r) For subcriteria national economic development*.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	3	3	3	0.40015
WP	0.333	1	2	3	3	0.23625
BioEn	0.333	0.5	1	2	3	0.16619
Geoth	0.333	0.333	0.5	1	3	0.12366
HP	0.333	0.333	0.333	0.333	1	0.07371

(s) For subcriteria share of non-renewable energies.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	2	1	2	1	0.24965
WP	0.5	1	2	3	3	0.28937
BioEn	1	0.5	1	2	2	0.20491
Geoth	0.5	0.333	0.5	1	3	0.08825
HP	1	0.333	0.5	0.333	1	0.16780

(t) For subcriteria depletion coefficient of local energy resources.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	5	2	3	4	0.41715
WP	0.2	1	2	3	3	0.22115
BioEn	0.5	0.5	1	2	3	0.17776
Geoth	0.333	0.333	0.5	1	3	0.11989
HP	0.25	0.333	0.333	0.333	1	0.06403

(u) For subcriteria overall system conversion efficiency.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	3	2	4	0.39263
WP	0.333	1	2	3	2	0.22638
BioEn	0.333	0.5	1	2	3	0.16974
Geoth	0.5	0.5	0.5	1	3	0.14493
HP	0.25	0.333	0.333	0.333	1	0.06630

(v) For subcriteria electricity supply availability.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	1	2	4	0.32532
WP	0.333	1	1	3	3	0.21860
BioEn	1	1	1	3	3	0.26187
Geoth	0.5	0.333	0.333	1	3	0.12664
HP	0.25	0.333	0.333	0.333	1	0.06756

(w) For subcriteria ease of decentralization.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	0.333	1	1	1	0.15036
WP	3	1	2	3	0.5	0.30367
BioEn	1	0.5	1	2	1	0.18338
Geoth	1	0.333	0.5	1	1	0.13218
HP	0.25	2	1	1	1	0.23039

(x) For subcriteria safety in covering peak demand.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	4	3	2	4	0.40842
WP	0.25	1	2	3	3	0.22726
BioEn	0.333	0.5	1	2	3	0.16489
Geoth	0.5	0.333	0.5	1	3	0.13515
HP	0.25	0.333	0.333	0.333	1	0.06425

(y) For subcriteria foreign direct investment.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	5	3	2	5	0.43159
WP	0.2	1	2	3	3	0.21636
BioEn	0.333	0.5	1	2	3	0.16105
Geoth	0.5	0.333	0.5	1	3	0.13231
HP	0.2	0.333	0.333	0.333	1	0.05827

(z) For subcriteria technology transfer.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	3	2	3	5	0.40020
WP	0.333	1	2	3	3	0.23972
BioEn	0.5	0.5	1	2	3	0.17876
Geoth	0.333	0.333	0.5	1	3	0.11961
HP	0.2	0.333	0.333	0.333	1	0.06168

(a₁) For subcriteria local participation.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	0.25	0.333	2	2	0.14023
WP	4	1	2	3	3	0.38968
BioEn	3	0.5	1	2	3	0.25406
Geoth	0.5	0.333	0.5	1	3	0.13668
HP	0.5	0.333	0.333	0.333	1	0.07932

(b₁) For subcriteria partnership.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	4	3	4	3	0.43346
WP	0.25	1	2	3	3	0.21827
BioEn	0.333	0.5	1	2	3	0.16110
Geoth	0.25	0.333	0.5	1	3	0.11402
HP	0.333	0.333	0.333	0.333	1	0.07312

(c₁) For subcriteria self-sufficiency.

	SP	WP	BioEn	Geoth	HP	Importance
SP	1	4	3	3	4	0.43229
WP	0.25	1	2	3	2	0.20826
BioEn	0.333	0.5	1	2	3	0.16482
Geoth	0.333	0.5	0.5	1	3	0.12875
HP	0.25	0.333	0.333	0.333	1	0.06586