Supplementary Material: Appendix I

Table I1. Weights of Criteria in Scenario 2's Experiments

Second Scenario	Experiment 1	Experiment 2	Experiment 3
Operating Cost Savings (Electricity & Fuel)	0.290	0.290	0.100
Energy Consumption	**0.310**	0.240	0.050
Lifecycle Cost Savings (With initial costs) (20 years)	0.210	0.210	**0.850**
Carbon Emissions	0.190	0.260	-

Table I2. SIR Flows Using SAW and TOPSIS Procedures for Scenario 2's Experiments

Procedure		Alt.	Experiment 1				Experiment 2				Experiment 3			
			S-Flow	*I*-Flow	*n*-Flow	*r*-Flow	*S*-Flow	*I*-Flow	*n*-Flow	*r*-Flow	*S*-Flow	*I*-Flow	*n*-Flow	*r*-Flow
SAW		A1	2.000	2.000	0	0.500	2.000	2.000	0	0.500	2.010	2.010	0	0.5
		A2	1.991	2.009	-0.018	0.498	2.005	1.995	0.010	0.501	1.103	2.918	-1.815	0.274
		A3	2.017	1.983	0.034	0.504	1.990	2.010	-0.020	0.498	3.826	0.195	3.631	0.952
		A4	2.009	1.991	0.018	0.502	1.995	2.005	-0.010	0.499	2.918	1.103	1.815	0.726
		A5	1.983	2.017	-0.034	0.496	2.010	1.990	0.020	0.503	0.195	3.826	-3.631	0.048
TOPSIS	ƛ=1	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.498	0.502	-0.004	0.498	0.501	0.499	0.002	0.501	0.274	0.726	-0.452	0.274
		A3	0.504	0.496	0.008	0.504	0.498	0.503	-0.005	0.498	0.952	0.048	0.904	0.952
		A4	0.502	0.498	0.004	0.502	0.499	0.501	-0.002	0.499	0.726	0.274	0.452	0.726
		A5	0.496	0.504	-0.008	0.496	0.503	0.498	0.005	0.502	0.048	0.952	-0.904	0.048
	ƛ=2	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.253	0.747	-0.494	0.253
		A3	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.946	0.054	0.892	0.946
		A4	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.747	0.253	0.494	0.747
		A5	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.054	0.946	-0.892	0.054
	ƛ=10	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.513	0.487	0.026	0.513	0.487	0.513	-0.026	0.487	0.250	0.750	-0.500	0.250
		A3	0.487	0.513	-0.026	0.487	0.513	0.487	0.026	0.513	0.946	0.054	0.892	0.946
		A4	0.487	0.513	-0.026	0.487	0.513	0.487	0.026	0.513	0.750	0.250	0.500	0.750
		A5	0.513	0.487	0.026	0.513	0.487	0.513	-0.026	0.487	0.054	0.946	-0.892	0.054

Table I3. Alternatives Rank for Scenario 2's Experiments

Procedure		Experiment 1	Experiment 2	Experiment 3
SAW		A3 → A4 → A1 → A2 → A5	A5 → A2 → A1 → A4 → A3	A3 → A4→ A1 → A2 → A5
TOPSIS	λ=1	A3 → A4 → A1 → A2 → A5	A5 → A2 → A1 → A4 → A3	A3 → A4→ A1 → A2 → A5
	λ=2	Incomparable	Incomparable	A3 → A4→ A1 → A2 → A5
	λ=10	A2 → A5 → A1 → A3 → A4	A3 → A4→ A1 → A2 → A5	A3 → A4→ A1 → A2 → A5

Table I4. Weights of Criteria in Scenario 3's Experiments

Third Scenario	Experiment 1	Experiment 2
Operating Cost Savings (Electricity & Fuel)	0.280	0.280
Energy Consumption	**0.330**	0.240
Lifecycle Cost Savings (With initial costs) (20 years)	0.210	0.210
Carbon Emissions	0.180	**0.270**

Table I5. SIR Flows Using SAW and TOPSIS Procedures for Scenario 3's Experiments

Procedure		Alt.	Experiment 1				Experiment 2			
			S-Flow	I-Flow	n-Flow	r-Flow	S-Flow	I-Flow	n-Flow	r-Flow
SAW		A1	2.000	2.000	0	0.500	2.000	2.000	0	0.500
		A2	2.034	1.966	0.068	0.509	2.006	1.994	0.012	0.502
		A3	1.931	2.069	-0.138	0.483	1.987	2.013	-0.026	0.497
		A4	1.966	2.034	-0.068	0.492	1.994	2.006	-0.012	0.499
		A5	2.069	1.931	0.138	0.517	2.013	1.987	0.026	0.503
TOPSIS	λ=1	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.509	0.492	0.017	0.508	0.502	0.499	0.003	0.501
		A3	0.483	0.517	-0.034	0.483	0.497	0.503	-0.006	0.497
		A4	0.492	0.509	-0.017	0.492	0.499	0.502	-0.003	0.499
		A5	0.517	0.483	0.034	0.517	0.503	0.497	0.006	0.503
	λ=2	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.52	0.48	0.04	0.52	0.501	0.499	0.002	0.501
		A3	0.475	0.525	-0.05	0.475	0.499	0.501	-0.002	0.499
		A4	0.48	0.52	-0.04	0.48	0.499	0.501	-0.002	0.499
		A5	0.525	0.475	0.05	0.525	0.501	0.499	0.002	0.501
	λ=10	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.546	0.454	0.092	0.546	0.490	0.510	-0.02	0.490
		A3	0.454	0.546	-0.092	0.454	0.511	0.489	0.022	0.511
		A4	0.454	0.546	-0.092	0.454	0.510	0.490	0.020	0.510
		A5	0.546	0.454	0.092	0.546	0.489	0.511	-0.022	0.489

Table I6. Alternatives Rank for Scenario 3's Experiments

Procedure		Experiment 1	Experiment 2
SAW		A5 → A2 → A1 → A4 → A3	A5 → A2 → A1 → A4 → A3
TOPSIS	λ=1	A5 → A2 → A1 → A4 → A3	A5 → A2 → A1 → A4 → A3
	λ=2	A5 → A2 → A1 → A4 → A3	A5 → A2 → A1 → A4 → A3
	λ=10	A2 → A5 → A1 → A3 → A4	A2 → A5 → A1 → A3 → A4

Table I7. Weights of Criteria in Scenario 4's Experiments

Fourth Scenario	Experiment 1	Experiment 2
Operating Cost Savings (Electricity & Fuel)	0.280	0.100
Energy Consumption	**0.280**	**0.440**
Lifecycle Cost Savings (With initial costs) (20 years)	0.210	**0.390**
Carbon Emissions	**0.230**	0.070

Table I8. SIR flows using SAW and TOPSIS procedures for Scenario 4's Experiments

Procedure		Alt.	Experiment 1				Experiment 2			
			S-Flow	I-Flow	n-Flow	r-Flow	S-Flow	I-Flow	n-Flow	r-Flow
SAW		A1	2.000	2.000	0	0.500	2.000	2.000	0	0.500
		A2	2.015	1.985	0.03	0.504	2.009	1.991	0.018	0.502
		A3	1.969	2.031	-0.062	0.492	1.982	2.018	-0.036	0.496
		A4	1.985	2.015	-0.03	0.496	1.991	2.009	-0.018	0.498
		A5	2.031	1.969	0.062	0.508	2.018	1.982	0.036	0.505
TOPSIS	ƛ=1	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.504	0.496	0.008	0.504	0.502	0.498	0.004	0.502
		A3	0.492	0.508	-0.016	0.492	0.496	0.505	-0.009	0.496
		A4	0.496	0.504	-0.008	0.496	0.498	0.502	-0.004	0.498
		A5	0.508	0.492	0.016	0.508	0.505	0.496	0.009	0.504
	ƛ=2	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.505	0.495	0.010	0.505	0.517	0.483	0.034	0.517
		A3	0.493	0.507	-0.014	0.493	0.479	0.521	-0.042	0.479
		A4	0.495	0.505	-0.010	0.495	0.483	0.517	-0.034	0.483
		A5	0.507	0.493	0.014	0.507	0.521	0.479	0.042	0.521
	ƛ=10	A1	0.500	0.500	0	0.500	0.500	0.500	0	0.500
		A2	0.502	0.498	0.004	0.502	0.526	0.474	0.052	0.526
		A3	0.498	0.502	-0.004	0.498	0.474	0.526	-0.052	0.474
		A4	0.498	0.502	-0.004	0.498	0.474	0.526	-0.052	0.474
		A5	0.502	0.498	0.004	0.502	0.526	0.474	0.052	0.526

Table I9. Alternatives Rank for Scenario 4's Experiments

Procedure		Experiment 1	Experiment 2
SAW		A5 → A2 → A1 → A4 → A3	A5 → A2 → A1 → A4 → A3
TOPSIS	ƛ=1	A5 → A2 → A1 → A4 → A3	A5 → A2 → A1 → A4 → A3
	ƛ=2	A5 → A2 → A1 → A4 → A3	A5 → A2 → A1 → A4 → A3
	ƛ=10	A2 → A5 → A1 → A3 → A4	A2 → A5 → A1 → A3 → A4