A Multi-Criteria Framework Supporting Sustainability Assessment Considering SDG 7 Targets

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Decision matrix with data for evaluated countries.

Table 1: Decision matrix with criteria performance values for 2020.

Country	Symbol	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}
Austria	AT	3.33	2.92	749	9.79	36.545	10.283	78.204	34.995	58.324	1.5	83.7
Belgium	BE	3.8	2.88	687	6.77	13	11.035	25.122	8.447	78.055	4.1	85.6
Bulgaria	BG	2.48	1.38	344	2.47	23.319	9.101	23.586	37.178	37.882	27.5	97.1
Croatia	HR	1.92	1.6	563	5.7	31.023	6.593	53.816	36.928	53.589	5.7	86.6
Cyprus	CY	2.47	1.76	409	8.28	16.879	7.401	12.041	37.117	93.077	20.9	95
Czechia	CZ	3.5	2.29	668	4.61	17.303	9.383	14.81	23.535	38.898	2.2	73.7
Denmark	DK	2.63	2.26	741	17.07	31.648	9.574	65.323	51.073	44.856	3	63.2
Estonia	EE	3.24	2.09	711	4.18	30.069	12.165	28.293	58.834	10.524	2.7	79.8
Finland	FI	5.39	4.21	957	6.15	43.802	13.438	39.564	57.622	42.024	1.8	69.7
France	FR	3.09	1.93	575	9.24	19.109	9.207	24.819	23.369	44.463	6.5	79.5
Germany	DE	3.16	2.42	697	9.97	19.312	9.918	44.696	14.807	63.672	9	86.5
Greece	EL	1.84	1.34	401	7.7	21.749	5.341	35.856	31.941	81.784	16.7	74.9
Hungary	HU	2.45	1.85	612	4.73	13.85	11.571	11.904	17.72	56.628	4.2	77.3
Iceland	IS	15.83	8.08	1316	2.19	83.725	11.959	102.709	80.505	12.156	1	44.8
Ireland	IE	2.69	2.24	627	22.61	16.16	10.187	39.055	6.264	71.302	4.2	79.5
Italy	IT	2.23	1.73	516	10.28	20.359	10.736	38.081	19.949	73.454	11.1	82.2
Latvia	LV	2.24	2.03	587	5.06	42.132	6.733	53.357	57.094	45.481	6	83.8
Lithuania	LT	2.23	1.9	513	5.02	26.773	5.511	20.166	50.35	74.909	23.1	102.6
Luxembourg	LU	6.25	6.04	786	13.09	11.699	12.581	13.887	12.614	92.458	3.6	92.3
Malta	MT	1.44	1.05	204	3.57	10.714	10.586	9.489	23.027	97.56	7.2	58.8
Netherlands	NL	3.35	2.61	534	8.36	13.999	12.631	26.407	8.053	68.068	2.4	92.4
Norway	NO	4.65	3.42	824	12.82	77.358	28.69	113.802	36.126	-623.059	0.8	87.9
Poland	PL	2.55	1.87	557	4.72	16.102	6.575	16.237	22.144	42.76	3.2	84.2
Portugal	PT	1.9	1.46	293	7.97	33.982	9.701	58.033	41.546	65.261	17.5	78.7
Romania	RO	1.61	1.22	416	5.27	24.478	8.54	43.374	25.327	28.201	10	85.4
Slovakia	SK	2.78	1.89	503	5.04	17.345	9.259	23.066	19.427	56.301	5.7	77.7
Slovenia	SI	2.92	2.09	510	6.44	25	10.911	35.095	32.141	45.801	2.8	89.8
Spain	ES	2.22	1.56	307	8.96	21.22	9.528	42.944	17.966	67.89	10.9	79.7
Sweden	SE	4.04	2.99	695	9.22	60.124	31.854	74.495	66.381	33.511	2.7	68.2
United Kingdom	UK	2.61	2.01	571	11.88	12.336	8.856	34.769	7.837	34.829	5.4	81.8

Results of MCDA evaluation of analysed countries.

Table 2: Results of MCDA evaluation of countries.

Country	Score			Rank		
	TOPSIS	ARAS	CODAS	TOPSIS	ARAS	CODAS
AT	0.4691	0.4152	3.3560	6	6	6
BE	0.3720	0.2760	-1.4730	18	17	16
BG	0.1466	0.1136	-9.1427	30	30	30
HR	0.3826	0.3016	-1.0871	13	13	13
CY	0.1990	0.1588	-7.3829	29	28	29
CZ	0.4047	0.3058	-0.2478	11	12	11
DK	0.5208	0.4764	5.8136	4	4	4
EE	0.4416	0.3718	1.7187	8	7	8
FI	0.5072	0.4741	5.4887	5	5	5
FR	0.3732	0.2923	-1.4815	17	14	17
DE	0.3514	0.2872	-2.0504	22	15	22
EL	0.2823	0.2236	-4.3875	27	27	27
HU	0.3736	0.2673	-1.5713	16	21	18
IS	0.6380	0.7385	15.9272	1	1	1
IE	0.4433	0.3609	2.1147	7	8	7
IT	0.3313	0.2676	-2.7136	23	20	23
LV	0.4154	0.3487	0.1104	9	9	10
LT	0.2042	0.1543	-7.3459	28	29	28
LU	0.4130	0.3422	0.4326	10	10	9
MT	0.3672	0.2371	-2.0086	20	26	21
NL	0.3800	0.2739	-1.2408	14	18	14
NO	0.6376	0.6704	13.1534	2	2	2
PL	0.3689	0.2543	-1.7866	19	23	19
PT	0.3109	0.2688	-2.9916	26	19	24
RO	0.3203	0.2440	-3.3669	25	25	26
SK	0.3613	0.2635	-2.0064	21	22	20
SI	0.3956	0.3067	-0.6794	12	11	12
ES	0.3259	0.2521	-3.1190	24	24	25
SE	0.5765	0.5719	9.2656	3	3	3
UK	0.3794	0.2863	-1.2980	15	16	15

Results of PROMETHEE II with using different preference functions.

Table 3: PROMETHEE II rankings with using different preference functions.

	Usual	U-shape	V-shape	Level	Linear	Gaussian
AT	6	6	6	6	6	6
BE	18	15	17	17	17	17
BG	27	30	30	30	30	30
HR	19	16	15	13	11	12
CY	30	29	29	28	28	28
CZ	8	11	11	11	12	11
DK	5	5	5	4	4	4
EE	7	7	7	7	10	9
FI	4	4	4	5	5	5
FR	14	18	13	14	14	13
DE	13	14	16	16	15	16
EL	26	25	27	27	27	27
HU	21	20	19	20	19	19
IS	1	2	1	1	1	1
IE	11	8	9	8	9	8
IT	20	21	20	21	18	18
LV	10	10	10	10	8	10
LT	28	28	28	29	29	29
LU	12	9	8	9	7	7
MT	29	27	26	25	22	24
NL	15	19	18	18	21	20
NO	3	1	2	2	2	2
PL	25	24	24	24	23	23
PT	17	12	21	19	24	22
RO	23	26	25	26	26	26
SK	22	23	22	22	20	21
SI	9	13	12	12	16	15
ES	24	22	23	23	25	25
SE	2	3	3	3	3	3
UK	16	17	14	15	13	14