Supplementary materials

A. Criteria weighting

Tables SA.1-SA.12 are related to the weighting of indicators in section 5.1 of the article.

Table SA.1. The average of experts' opinions comparing the best criterion to all criteria of the general dimension

Expert group	The best criterion	Economic			Social			Environmental		
1	Economic	1	1	1	2.5	3	3.5	3.5	4	4.5
2		1	1	1	2.5	3	3.5	2.5	3	3.5
3		1	1	1	0.67	1	1.5	1.5	2	2.5

Table SA.2. The average of experts' opinions comparing the worst criterion to all criteria of the general dimension

	The worst criterion: Environmental		
Expert / Criterion	1	2	3
Economic	2.5	3	3.5
	1.5	2	2.5
	1.5	2	2.5
Social	1	1	1
	1	1	1
	1	1	1
Environmental	1	1	1
	1	1	1
	1.5	2	2.5

Table SA.3. Weight and inconsistency rate of general criteria

Environmental	Social	Economic	Criterion
0.20897	0.24176	0.54925	**Weight**
$CR = 0.032435$			

Table SA.4. The average of experts' opinions comparing the best criterion to all criteria of the economic dimension

Expert group	Best	Investment cost			National Internal Rate of Return (IRR)			Reducing casualties and road accidents		
1	Investment cost	1	1	1	0.67	1	1.5	1	2	2.5
2		1	1	1	0.67	1	1.5	2.5	3	3.5
3		1	1	1	1	1	1	2.5	3	3.5

Expert group	Best	Strengthening the country's international status and transit			Internal rate of return (IRR) from the perspective of the private sector			Fuel consumption saving		
1	Investment cost	1	2	2.5	2.5	3	3.5	1	2	2.5
2		2.5	3	3.5	2.5	3	3.5	2.5	3	3.5
3		2.5	3	3.5	3.5	4	4.5	2.5	3	3.5

Expert group	Best	The amount of traffic (ton-kilometer)		
1	Investment cost	1	2	2.5
2		1	2	2.5
3		1	2	2.5

Table SA.5. The average of experts' opinions comparing the worst criterion to all criteria of the economic dimension

	The worst: Internal rate of return (IRR) from the perspective of the private sector		
Expert / Criterion	**1**	**2**	**3**
Investment cost	2.5	3	3.5
	2.5	3	3.5
	3.5	4	4.5
National Internal Rate of Return (IRR)	1	2	2.5
	2.5	3	3.5
	3.5	4	4.5
Reducing casualties and road accidents	1	1	1
	1	2	2.5
	0.67	1	1.5
Strengthening the country's international status and transit	1	2	2.5
	1	2	2.5
	1	2	2.5
Internal rate of return (IRR) from the perspective of the private sector	1	1	1
	1	1	1
	1	1	1
Fuel consumption saving	0.67	1	1.5
	1	2	2.5
	1	1	1
	1	2	2.5

The amount of traffic	1	2	2.5
	1	2	2.5

Table SA.6. Weight and inconsistency rate of economic criteria

Criterion	Investment cost	National Internal Rate of Return (IRR)	Reducing casualties and road accidents	Strengthening the country's international status and transit	Internal rate of return (IRR) from the perspective of the private sector	Fuel consumption saving	The amount of traffic ton-) (kilometer
Weight	0.26295	0.22775	0.09613	0.10106	0.07169	0.10075	0.13967
$\boldsymbol{CR = 0.003542}$							

Table SA.7. The average of experts' opinions comparing the best criterion to all criteria of social dimension

Expert group	**Best**	Creating social justice and removing deprivation			Providing employment, especially in deprived areas			The possibility of developing the plan to cover other regions of the country		
1	Creating social justice and removing deprivation	1	1	1	1	2	2.5	1	1	1
2		1	1	1	2.5	3	3.5	1	2	2.5
3		1	1	1	1	2	2.5	1	2	2.5
Expert group	**Best**	Facilitating people's rail travel			Improving the correlation between the economic and social centers of the country					
1	Creating social justice and removing deprivation	1	1	1	1	1	1			
2		0.67	1	1.5	0.67	1	1.5			
3		0.67	1	1.5	1	1	1			

Table SA.8. The average of experts' opinions comparing the worst criterion to all criteria of social dimension

	Worth: Providing employment, especially in deprived areas		
Expert / Criterion	**1**	**2**	**3**
Creating social justice and removing deprivation	1	2	2.5
	2.5	3	3.5
	1	2	2.5
Providing employment, especially in deprived areas	1	1	1
	1	1	1
	1	1	1
	0.67	1	1.5

The possibility of developing the plan to cover other regions of the country	0.67	1	1.5
	1	2	2.5
Facilitating people's rail travel	1	2	2.5
	0.67	1	1.5
	1	2	2.5
Improving the correlation between the economic and social centers of the country	1	2	2.5
	1	2	2.5
	1	2	2.5

Table SA.9. Weight and inconsistency rate of social criteria

Criterion	Creating social justice and removing deprivation	Providing employment, especially in deprived areas	The possibility of developing the plan to cover other regions of the country	Facilitating people's rail travel	Improving the correlation between the economic and social centers of the country
Weight	0.28659	0.12064	0.18764	0.19397	0.21115
$\boldsymbol{CR = 0.006541}$					

Table SA.10. The average of experts' opinions comparing the best criterion to all criteria of environmental dimension

Expert group	**Best**	Reducing environmental pollutants			Less effect on environmental change and destruction			Creating pollution in the implementation of the project		
1	Less effect on environmental change and destruction	1	2	2.5	1	1	1	1	2	2.5
2		1	1	1	1	1	1	1	1	1
3		0.67	1	1.5	1	1	1	1	2	2.5

Table SA.11. The average of experts' opinions comparing the worst criterion to all criteria of environmental dimension

	Worth: Creating pollution in the implementation of the project		
Expert / **Criterion**	**1**	**2**	**3**
Reducing environmental pollutants	1	1	1
	0.67	1	1.5
	1	1	1
	1	2	2.5
	1	2	2.5

Less effect on environmental change and destruction	0.67	1	1.5
Creating pollution in the implementation of the project	1	1	1
	1	1	1
	1	1	1

Table SA.12. Weight and inconsistency rate of environmental criteria

Criterion	Reducing environmental pollutants	Less effect on environmental change and destruction	Creating pollution in the implementation of the project
Weight	0.31120	0.43389	0.25492
$\boldsymbol{CR = 0.003547}$			

B. Stochastic VIKOR results in cost changes scenario

Tables SB.1-SB.5 are related to section 5.2.1 of the article.

Table SB.1. Values of the normalized matrix of stochastic VIKOR decision making in the scenario of cost changes

	S1-1	S1-2	S1-3	S1-1	S1-2	S1-3	S1-1	S1-2	S1-3
	C1			C2			C3		
P1	0.091240	0.091240	0.091240	0.104690	0.106276	0.108042	0.066035	0.066035	0.066035
P2	0.257428	0.257428	0.257428	0.133954	0.145532	0.158392	0.041877	0.041877	0.041877
P3	0.048868	0.048868	0.048868	0.069120	0.064148	0.058546	0.073925	0.073925	0.073925
P4	0.087369	0.087369	0.087369	0.143650	0.152492	0.162582	0.100670	0.100670	0.100670
P5	0.145616	0.145616	0.145616	0.121666	0.125497	0.129866	0.049062	0.049062	0.049062
P6	0.052422	0.052422	0.052422	0.068050	0.062164	0.055664	0.067129	0.067129	0.067129
P7	0.035075	0.035075	0.035075	-0.004977	-0.020110	-0.036699	0.021511	0.021511	0.021511
P8	0.062952	0.062952	0.062952	0.103542	0.107973	0.112640	0.109402	0.109402	0.109402
P9	0.161977	0.161977	0.161977	0.078913	0.076660	0.073952	0.027835	0.027835	0.027835
P10	0.039388	0.039388	0.039388	0.064248	0.059606	0.054186	0.082206	0.082206	0.082206
P11	0.017667	0.017667	0.017667	0.117146	0.119762	0.122830	0.360348	0.360348	0.360348
	C4			C5			C6		
P1	0.200557	0.200056	0.200557	0.000000	0.000000	0.000000	0.066035	0.066035	0.066035
P2	0.050139	0.050014	0.050139	0.000000	0.000000	0.000000	0.041877	0.041877	0.041877
P3	0.061281	0.061128	0.061281	0.000000	0.000000	0.000000	0.073925	0.073925	0.073925

P4	0.200557	0.200056	0.200557	0.000000	0.000000	0.000000	0.100670	0.100670	0.100670
P5	0.008357	0.010836	0.008357	0.000000	0.000000	0.000000	0.049062	0.049062	0.049062
P6	0.006685	0.006669	0.006685	0.000000	0.000000	0.000000	0.067129	0.067129	0.067129
P7	0.100279	0.100028	0.100279	0.000000	0.000000	0.000000	0.021511	0.021511	0.021511
P8	0.094708	0.094471	0.094708	0.000000	0.000000	0.000000	0.109402	0.109402	0.109402
P9	0.004457	0.004446	0.004457	0.000000	0.000000	0.000000	0.027835	0.027835	0.027835
P10	0.200557	0.200056	0.200557	0.000000	0.000000	0.000000	0.082206	0.082206	0.082206
P11	0.072423	0.072242	0.072423	0.000000	0.000000	0.000000	0.360348	0.360348	0.360348
	C7			C8			C9		
P1	0.023857	0.023857	0.023857	0.016667	0.016667	0.016667	0.036179	0.036179	0.036179
P2	0.028322	0.028322	0.028322	0.083333	0.083333	0.083333	0.057887	0.057887	0.057887
P3	0.073406	0.073406	0.073406	0.100000	0.100000	0.100000	0.100189	0.100189	0.100189
P4	0.136648	0.136648	0.136648	0.166667	0.166667	0.166667	0.135367	0.135367	0.135367
P5	0.017966	0.017966	0.017966	0.050000	0.050000	0.050000	0.037404	0.037404	0.037404
P6	0.050025	0.050025	0.050025	0.066667	0.066667	0.066667	0.076812	0.076812	0.076812
P7	0.025919	0.025919	0.025919	0.066667	0.066667	0.066667	0.122454	0.122454	0.122454
P8	0.060900	0.060900	0.060900	0.083333	0.083333	0.083333	0.049872	0.049872	0.049872
P9	0.020427	0.020427	0.020427	0.066667	0.066667	0.066667	0.071691	0.071691	0.071691
P10	0.171282	0.171282	0.171282	0.166667	0.166667	0.166667	0.200378	0.200378	0.200378
P11	0.391247	0.391247	0.391247	0.133333	0.133333	0.133333	0.111767	0.111767	0.111767
	C10			C11			C12		
P1	0.122807	0.122807	0.122807	0.021243	0.021243	0.021243	0.081967	0.081967	0.081967
P2	0.105263	0.105263	0.105263	0.093469	0.093469	0.093469	0.081967	0.081967	0.081967
P3	0.140351	0.140351	0.140351	0.102946	0.102946	0.102946	0.131148	0.131148	0.131148
P4	0.105263	0.105263	0.105263	0.114254	0.114254	0.114254	0.131148	0.131148	0.131148
P5	0.070175	0.070175	0.070175	0.008236	0.008236	0.008236	0.065574	0.065574	0.065574
P6	0.105263	0.105263	0.105263	0.140938	0.140938	0.140938	0.098361	0.098361	0.098361
P7	0.070175	0.070175	0.070175	0.062912	0.062912	0.062912	0.081967	0.081967	0.081967
P8	0.035088	0.035088	0.035088	0.073206	0.073206	0.073206	0.065574	0.065574	0.065574
P9	0.035088	0.035088	0.035088	0.034201	0.034201	0.034201	0.032787	0.032787	0.032787
P10	0.122807	0.122807	0.122807	0.213246	0.213246	0.213246	0.114754	0.114754	0.114754
P11	0.087719	0.087719	0.087719	0.135350	0.135350	0.135350	0.114754	0.114754	0.114754
	C13			C14			C15		
P1	0.066035	0.066035	0.066035	0.016667	0.016667	0.016667	0.035088	0.035088	0.035088

P2	0.041877	0.041877	0.041877	0.100000	0.100000	0.100000	0.087719	0.087719	0.087719
P3	0.073925	0.073925	0.073925	0.100000	0.100000	0.100000	0.087719	0.087719	0.087719
P4	0.100670	0.100670	0.100670	0.150000	0.150000	0.150000	0.157895	0.157895	0.157895
P5	0.049062	0.049062	0.049062	0.083333	0.083333	0.083333	0.087719	0.087719	0.087719
P6	0.067129	0.067129	0.067129	0.083333	0.083333	0.083333	0.087719	0.087719	0.087719
P7	0.021511	0.021511	0.021511	0.083333	0.083333	0.083333	0.070175	0.070175	0.070175
P8	0.109402	0.109402	0.109402	0.066667	0.066667	0.066667	0.087719	0.087719	0.087719
P9	0.027835	0.027835	0.027835	0.083333	0.083333	0.083333	0.070175	0.070175	0.070175
P10	0.082206	0.082206	0.082206	0.150000	0.150000	0.150000	0.140351	0.140351	0.140351
P11	0.360348	0.360348	0.360348	0.083333	0.083333	0.083333	0.087719	0.087719	0.087719

Table SB.2. Values of the weighted normalization matrix of stochastic VIKOR decision making in the scenario of cost changes

	S1-1	S1-2	S1-3	S1-1	S1-2	S1-3	S1-1	S1-2	S1-3
	C1			C2			C3		
P1	0.001977	0.006589	0.004612	0.001964	0.006647	0.004730	0.000523	0.001743	0.001220
P2	0.005577	0.018590	0.013013	0.002513	0.009102	0.006935	0.000332	0.001106	0.000774
P3	0.001059	0.003529	0.002470	0.001297	0.004012	0.002563	0.000585	0.001952	0.001366
P4	0.001893	0.006309	0.004417	0.002695	0.009538	0.007118	0.000797	0.002658	0.001860
P5	0.003155	0.010516	0.007361	0.002283	0.007849	0.005686	0.000389	0.001295	0.000907
P6	0.001136	0.003786	0.002650	0.001277	0.003888	0.002437	0.000532	0.001772	0.001241
P7	0.000760	0.002533	0.001773	-0.000093	-0.001258	-0.001607	0.000170	0.000568	0.000398
P8	0.001364	0.004546	0.003182	0.001943	0.006753	0.004932	0.000866	0.002888	0.002022
P9	0.003509	0.011697	0.008188	0.001481	0.004795	0.003238	0.000220	0.000735	0.000514
P10	0.000853	0.002844	0.001991	0.001206	0.003728	0.002372	0.000651	0.002170	0.001519
P11	0.000383	0.001276	0.000893	0.002198	0.007491	0.005378	0.002854	0.009513	0.006659
	C4			C5			C6		
P1	0.001670	0.005553	0.003897	0.000000	0.000000	0.000000	0.000548	0.001827	0.001279
P2	0.000417	0.001388	0.000974	0.000000	0.000000	0.000000	0.000348	0.001159	0.000811
P3	0.000510	0.001697	0.001191	0.000000	0.000000	0.000000	0.000614	0.002046	0.001432
P4	0.001670	0.005553	0.003897	0.000000	0.000000	0.000000	0.000836	0.002786	0.001950
P5	0.000070	0.000301	0.000162	0.000000	0.000000	0.000000	0.000407	0.001358	0.000950
P6	0.000056	0.000185	0.000130	0.000000	0.000000	0.000000	0.000557	0.001857	0.001300
P7	0.000835	0.002776	0.001948	0.000000	0.000000	0.000000	0.000179	0.000595	0.000417

P8	0.000789	0.002622	0.001840	0.000000	0.000000	0.000000	0.000908	0.003027	0.002119
P9	0.000037	0.000123	0.000087	0.000000	0.000000	0.000000	0.000231	0.000770	0.000539
P10	0.001670	0.005553	0.003897	0.000000	0.000000	0.000000	0.000682	0.002275	0.001592
P11	0.000603	0.002005	0.001407	0.000000	0.000000	0.000000	0.002991	0.009971	0.006980
	C7			C8			C9		
P1	0.000275	0.000915	0.000641	0.000173	0.000577	0.000404	0.000158	0.000528	0.000369
P2	0.000326	0.001086	0.000760	0.000866	0.002887	0.002021	0.000253	0.000844	0.000591
P3	0.000845	0.002816	0.001971	0.001039	0.003465	0.002425	0.000438	0.001461	0.001023
P4	0.001572	0.005241	0.003669	0.001732	0.005774	0.004042	0.000592	0.001974	0.001382
P5	0.000207	0.000689	0.000482	0.000520	0.001732	0.001213	0.000164	0.000546	0.000382
P6	0.000576	0.001919	0.001343	0.000693	0.002310	0.001617	0.000336	0.001120	0.000784
P7	0.000298	0.000994	0.000696	0.000693	0.002310	0.001617	0.000536	0.001786	0.001250
P8	0.000701	0.002336	0.001635	0.000866	0.002887	0.002021	0.000218	0.000727	0.000509
P9	0.000235	0.000783	0.000548	0.000693	0.002310	0.001617	0.000314	0.001046	0.000732
P10	0.001971	0.006570	0.004599	0.001732	0.005774	0.004042	0.000877	0.002923	0.002046
P11	0.004502	0.015006	0.010504	0.001386	0.004619	0.003234	0.000489	0.001630	0.001141
	C10			C11			C12		
P1	0.000836	0.002785	0.001950	0.000149	0.000498	0.000349	0.000628	0.002092	0.001465
P2	0.000716	0.002387	0.001671	0.000657	0.002191	0.001534	0.000628	0.002092	0.001465
P3	0.000955	0.003183	0.002228	0.000724	0.002414	0.001690	0.001004	0.003348	0.002343
P4	0.000716	0.002387	0.001671	0.000804	0.002679	0.001875	0.001004	0.003348	0.002343
P5	0.000477	0.001592	0.001114	0.000058	0.000193	0.000135	0.000502	0.001674	0.001172
P6	0.000716	0.002387	0.001671	0.000991	0.003304	0.002313	0.000753	0.002511	0.001757
P7	0.000477	0.001592	0.001114	0.000442	0.001475	0.001032	0.000628	0.002092	0.001465
P8	0.000239	0.000796	0.000557	0.000515	0.001716	0.001201	0.000502	0.001674	0.001172
P9	0.000239	0.000796	0.000557	0.000241	0.000802	0.000561	0.000251	0.000837	0.000586
P10	0.000836	0.002785	0.001950	0.001500	0.005000	0.003500	0.000879	0.002929	0.002050
P11	0.000597	0.001989	0.001393	0.000952	0.003173	0.002221	0.000879	0.002929	0.002050
	C13			C14			C15		
P1	0.000644	0.002147	0.001503	0.000227	0.000756	0.000529	0.001342	0.004472	0.003131
P2	0.000408	0.001362	0.000953	0.001360	0.004534	0.003173	0.003354	0.011181	0.007826
P3	0.000721	0.002404	0.001683	0.001360	0.004534	0.003173	0.003354	0.011181	0.007826
P4	0.000982	0.003273	0.002291	0.002040	0.006800	0.004760	0.006038	0.020125	0.014088
P5	0.000479	0.001595	0.001117	0.001133	0.003778	0.002645	0.003354	0.011181	0.007826

P6	0.000655	0.002183	0.001528	0.001133	0.003778	0.002645	0.003354	0.011181	0.007826
P7	0.000210	0.000699	0.000490	0.001133	0.003778	0.002645	0.002683	0.008945	0.006261
P8	0.001067	0.003557	0.002490	0.000907	0.003022	0.002116	0.003354	0.011181	0.007826
P9	0.000272	0.000905	0.000634	0.001133	0.003778	0.002645	0.002683	0.008945	0.006261
P10	0.000802	0.002673	0.001871	0.002040	0.006800	0.004760	0.005367	0.017889	0.012522
P11	0.003515	0.011717	0.008202	0.001133	0.003778	0.002645	0.003354	0.011181	0.007826

Table SB.3. f+ and f- values in the cost change scenario

	S1-1	S1-2	S1-3	S1-1	S1-2	S1-3	S1-1	S1-2	S1-3
	C1			C2			C3		
f^+	0.005577	0.018590	0.013013	0.002695	0.009538	0.007118	0.002854	0.009513	0.006659
f^-	0.000383	0.001276	0.000893	-0.000093	-0.001258	-0.001607	0.000170	0.000568	0.000398
	C4			C5			C6		
f^+	0.001670	0.005553	0.003897	0.000000	0.000000	0.000000	0.002991	0.009971	0.006980
f^-	0.000037	0.000123	0.000087	0.000000	0.000000	0.000000	0.000179	0.000595	0.000417
	C7			C8			C9		
f^+	0.004502	0.015006	0.010504	0.001732	0.005774	0.004042	0.000877	0.002923	0.002046
f^-	0.000207	0.000689	0.000482	0.000173	0.000577	0.000404	0.000158	0.000528	0.000369
	C10			C11			C12		
f^+	0.000955	0.003183	0.002228	0.001500	0.005000	0.003500	0.001004	0.003348	0.002343
f^-	0.000239	0.000796	0.000557	0.000058	0.000193	0.000135	0.000251	0.000837	0.000586
	C13			C14			C15		
f^+	0.003515	0.011717	0.008202	0.002040	0.006800	0.004760	0.006038	0.020125	0.014088
f^-	0.000210	0.000699	0.000490	0.000227	0.000756	0.000529	0.001342	0.004472	0.003131

Table SB.4. Utility values of plans in the scenario of cost changes

	Ljs			SSj
P1	10.937	10.952	10.963	10.95367
P2	9.079	9.062	9.048	9.059603
P3	8.773	8.794	8.810	8.796632
P4	4.903	4.903	4.903	4.902601
P5	11.434	11.433	11.458	11.44181
P6	10.249	10.271	10.287	10.27323
P7	11.638	11.640	11.641	11.64007
P8	10.472	10.470	10.469	10.4702
P9	12.309	12.313	12.318	12.31422
P10	5.363	5.378	5.391	5.380227
P11	5.167	5.194	5.214	5.197128

Table SB.5. The regret values of the plans in the scenario of cost changes

	Tjs			Rj
P1	1	1	1	1
P2	0.972255132	0.972255132	0.972255132	0.972255
P3	0.869866191	0.869866191	0.869866191	0.869866
P4	0.766377996	0.766377996	0.766377996	0.766378
P5	1	1	1	1
P6	0.988636364	0.988636364	0.988636364	0.988636
P7	1	1	1	1
P8	1	1	1	1
P9	1	1	1	1
P10	0.909404659	0.909404659	0.909404659	0.909405
P11	1	1	1	1

C. Stochastic VIKOR results in demand changes scenario

Tables SC.1-SC.5 are related to section 5.2.2 of the article.

Table SC.1. Values of the normalized matrix of stochastic VIKOR decision making in the scenario of demand changes

	S2-1	S2-2	S2-3	S2-1	S2-2	S2-3	S2-1	S2-2	S2-3
	C1			C2			C3		
P1	0.090288	0.090288	0.090288	0.109375	0.108042	0.104849	0.063989	0.063989	0.063989
P2	0.254743	0.254743	0.254743	0.164653	0.158392	0.136571	0.040580	0.040580	0.040580
P3	0.054282	0.054282	0.054282	0.055681	0.058546	0.068048	0.082116	0.082116	0.082116
P4	0.086458	0.086458	0.086458	0.167748	0.162582	0.145538	0.119755	0.119755	0.119755
P5	0.144097	0.144097	0.144097	0.132566	0.129866	0.122326	0.047542	0.047542	0.047542
P6	0.051875	0.051875	0.051875	0.052469	0.055664	0.066729	0.065048	0.065048	0.065048
P7	0.039216	0.039216	0.039216	-0.045772	-0.036699	-0.007982	0.019149	0.019149	0.019149
P8	0.062295	0.062295	0.062295	0.115378	0.112640	0.104349	0.106011	0.106011	0.106011
P9	0.160287	0.160287	0.160287	0.071850	0.073952	0.078712	0.026972	0.026972	0.026972
P10	0.038977	0.038977	0.038977	0.050972	0.054186	0.063431	0.079658	0.079658	0.079658
P11	0.017482	0.017482	0.017482	0.125080	0.122830	0.117427	0.349180	0.349180	0.349180
	C4			C5			C6		

P1	0.194106	0.195461	0.195461	0.094505	0.096525	0.102423	0.065264	0.065264	0.065264
P2	0.048526	0.048865	0.048865	0.093587	0.090009	0.085370	0.041388	0.041388	0.041388
P3	0.061034	0.061460	0.061460	0.094198	0.095378	0.099417	0.075134	0.075134	0.075134
P4	0.212914	0.214401	0.214401	0.060077	0.053982	0.022949	0.108904	0.108904	0.108904
P5	0.015020	0.008144	0.008144	0.100410	0.102518	0.112738	0.048489	0.048489	0.048489
P6	0.006470	0.006515	0.006515	0.098717	0.100953	0.110457	0.066344	0.066344	0.066344
P7	0.101755	0.102465	0.102465	0.102605	0.105257	0.118658	0.021460	0.021460	0.021460
P8	0.091661	0.092301	0.092301	0.091587	0.093301	0.096567	0.108124	0.108124	0.108124
P9	0.004313	0.004344	0.004344	0.107383	0.106944	0.118058	0.027510	0.027510	0.027510
P10	0.194106	0.195461	0.195461	0.077967	0.075668	0.062205	0.081245	0.081245	0.081245
P11	0.070094	0.070583	0.070583	0.078965	0.079465	0.071158	0.356138	0.356138	0.356138
	C7			C8			C9		
P1	0.088751	0.088751	0.088751	0.016667	0.016667	0.016667	0.036179	0.036179	0.036179
P2	0.105362	0.105362	0.105362	0.083333	0.083333	0.083333	0.057887	0.057887	0.057887
P3	0.273080	0.273080	0.273080	0.100000	0.100000	0.100000	0.100189	0.100189	0.100189
P4	0.508346	0.508346	0.508346	0.166667	0.166667	0.166667	0.135367	0.135367	0.135367
P5	0.000596	0.000596	0.000596	0.050000	0.050000	0.050000	0.037404	0.037404	0.037404
P6	0.001659	0.001659	0.001659	0.066667	0.066667	0.066667	0.076812	0.076812	0.076812
P7	0.000859	0.000859	0.000859	0.066667	0.066667	0.066667	0.122454	0.122454	0.122454
P8	0.002019	0.002019	0.002019	0.083333	0.083333	0.083333	0.049872	0.049872	0.049872
P9	0.000677	0.000677	0.000677	0.066667	0.066667	0.066667	0.071691	0.071691	0.071691
P10	0.005679	0.005679	0.005679	0.166667	0.166667	0.166667	0.200378	0.200378	0.200378
P11	0.012972	0.012972	0.012972	0.133333	0.133333	0.133333	0.111767	0.111767	0.111767
	C10			C11			C12		
P1	0.122807	0.122807	0.122807	0.021243	0.021243	0.021243	0.081967	0.081967	0.081967
P2	0.105263	0.105263	0.105263	0.093469	0.093469	0.093469	0.081967	0.081967	0.081967
P3	0.140351	0.140351	0.140351	0.102946	0.102946	0.102946	0.131148	0.131148	0.131148
P4	0.105263	0.105263	0.105263	0.114254	0.114254	0.114254	0.131148	0.131148	0.131148
P5	0.070175	0.070175	0.070175	0.008236	0.008236	0.008236	0.065574	0.065574	0.065574
P6	0.105263	0.105263	0.105263	0.140938	0.140938	0.140938	0.098361	0.098361	0.098361
P7	0.070175	0.070175	0.070175	0.062912	0.062912	0.062912	0.081967	0.081967	0.081967
P8	0.035088	0.035088	0.035088	0.073206	0.073206	0.073206	0.065574	0.065574	0.065574
P9	0.035088	0.035088	0.035088	0.034201	0.034201	0.034201	0.032787	0.032787	0.032787
P10	0.122807	0.122807	0.122807	0.213246	0.213246	0.213246	0.114754	0.114754	0.114754

P11	0.087719	0.087719	0.087719	0.135350	0.135350	0.135350	0.114754	0.114754	0.114754
	C13			C14			C15		
P1	0.065377	0.065377	0.065377	0.016667	0.016667	0.016667	0.035088	0.035088	0.035088
P2	0.041460	0.041460	0.041460	0.100000	0.100000	0.100000	0.087719	0.087719	0.087719
P3	0.075573	0.075573	0.075573	0.100000	0.100000	0.100000	0.087719	0.087719	0.087719
P4	0.107243	0.107243	0.107243	0.150000	0.150000	0.150000	0.157895	0.157895	0.157895
P5	0.048574	0.048574	0.048574	0.083333	0.083333	0.083333	0.087719	0.087719	0.087719
P6	0.066460	0.066460	0.066460	0.083333	0.083333	0.083333	0.087719	0.087719	0.087719
P7	0.021296	0.021296	0.021296	0.083333	0.083333	0.083333	0.070175	0.070175	0.070175
P8	0.108312	0.108312	0.108312	0.066667	0.066667	0.066667	0.087719	0.087719	0.087719
P9	0.027558	0.027558	0.027558	0.083333	0.083333	0.083333	0.070175	0.070175	0.070175
P10	0.081387	0.081387	0.081387	0.150000	0.150000	0.150000	0.140351	0.140351	0.140351
P11	0.356759	0.356759	0.356759	0.083333	0.083333	0.083333	0.087719	0.087719	0.087719

Table SC.2. Values of the weighted normalization matrix of stochastic VIKOR decision making in the scenario of demand changes

	S2-1	S2-2	S2-3	S2-1	S2-2	S2-3	S2-1	S2-2	S2-3
	C1			C2			C3		
P1	0.003260	0.006520	0.003260	0.003420	0.006757	0.003279	0.000845	0.001689	0.000845
P2	0.009198	0.018396	0.009198	0.005149	0.009907	0.004271	0.000536	0.001071	0.000536
P3	0.001960	0.003920	0.001960	0.001741	0.003662	0.002128	0.001084	0.002168	0.001084
P4	0.003122	0.006244	0.003122	0.005246	0.010169	0.004551	0.001581	0.003162	0.001581
P5	0.005203	0.010406	0.005203	0.004146	0.008122	0.003825	0.000628	0.001255	0.000628
P6	0.001873	0.003746	0.001873	0.001641	0.003482	0.002087	0.000859	0.001717	0.000859
P7	0.001416	0.002832	0.001416	-0.001431	-0.002295	-0.000250	0.000253	0.000506	0.000253
P8	0.002249	0.004499	0.002249	0.003608	0.007045	0.003263	0.001399	0.002799	0.001399
P9	0.005788	0.011575	0.005788	0.002247	0.004625	0.002462	0.000356	0.000712	0.000356
P10	0.001407	0.002815	0.001407	0.001594	0.003389	0.001984	0.001051	0.002103	0.001051
P11	0.000631	0.001262	0.000631	0.003912	0.007682	0.003672	0.004609	0.009218	0.004609
	C4			C5			C6		
P1	0.002694	0.005425	0.002713	0.000930	0.001901	0.001008	0.000903	0.001806	0.000903
P2	0.000673	0.001356	0.000678	0.000921	0.001772	0.000840	0.000573	0.001145	0.000573
P3	0.000847	0.001706	0.000853	0.000927	0.001878	0.000979	0.001039	0.002079	0.001039
P4	0.002955	0.005951	0.002975	0.000591	0.001063	0.000226	0.001507	0.003013	0.001507
P5	0.000208	0.000226	0.000113	0.000989	0.002019	0.001110	0.000671	0.001342	0.000671

P6	0.000090	0.000181	0.000090	0.000972	0.001988	0.001087	0.000918	0.001836	0.000918
P7	0.001412	0.002844	0.001422	0.001010	0.002073	0.001168	0.000297	0.000594	0.000297
P8	0.001272	0.002562	0.001281	0.000902	0.001837	0.000951	0.001496	0.002992	0.001496
P9	0.000060	0.000121	0.000060	0.001057	0.002106	0.001162	0.000381	0.000761	0.000381
P10	0.002694	0.005425	0.002713	0.000768	0.001490	0.000612	0.001124	0.002248	0.001124
P11	0.000973	0.001959	0.000980	0.000777	0.001565	0.000701	0.004927	0.009854	0.004927
	C7			C8			C9		
P1	0.001702	0.003404	0.001702	0.000289	0.000577	0.000289	0.000264	0.000528	0.000264
P2	0.002021	0.004041	0.002021	0.001444	0.002887	0.001444	0.000422	0.000844	0.000422
P3	0.005237	0.010474	0.005237	0.001732	0.003465	0.001732	0.000731	0.001461	0.000731
P4	0.009749	0.019498	0.009749	0.002887	0.005774	0.002887	0.000987	0.001974	0.000987
P5	0.000011	0.000023	0.000011	0.000866	0.001732	0.000866	0.000273	0.000546	0.000273
P6	0.000032	0.000064	0.000032	0.001155	0.002310	0.001155	0.000560	0.001120	0.000560
P7	0.000016	0.000033	0.000016	0.001155	0.002310	0.001155	0.000893	0.001786	0.000893
P8	0.000039	0.000077	0.000039	0.001444	0.002887	0.001444	0.000364	0.000727	0.000364
P9	0.000013	0.000026	0.000013	0.001155	0.002310	0.001155	0.000523	0.001046	0.000523
P10	0.000109	0.000218	0.000109	0.002887	0.005774	0.002887	0.001461	0.002923	0.001461
P11	0.000249	0.000498	0.000249	0.002310	0.004619	0.002310	0.000815	0.001630	0.000815
	C10			C11			C12		
P1	0.001393	0.002785	0.001393	0.000249	0.000498	0.000249	0.001046	0.002092	0.001046
P2	0.001194	0.002387	0.001194	0.001096	0.002191	0.001096	0.001046	0.002092	0.001046
P3	0.001592	0.003183	0.001592	0.001207	0.002414	0.001207	0.001674	0.003348	0.001674
P4	0.001194	0.002387	0.001194	0.001339	0.002679	0.001339	0.001674	0.003348	0.001674
P5	0.000796	0.001592	0.000796	0.000097	0.000193	0.000097	0.000837	0.001674	0.000837
P6	0.001194	0.002387	0.001194	0.001652	0.003304	0.001652	0.001255	0.002511	0.001255
P7	0.000796	0.001592	0.000796	0.000737	0.001475	0.000737	0.001046	0.002092	0.001046
P8	0.000398	0.000796	0.000398	0.000858	0.001716	0.000858	0.000837	0.001674	0.000837
P9	0.000398	0.000796	0.000398	0.000401	0.000802	0.000401	0.000418	0.000837	0.000418
P10	0.001393	0.002785	0.001393	0.002500	0.005000	0.002500	0.001465	0.002929	0.001465
P11	0.000995	0.001989	0.000995	0.001587	0.003173	0.001587	0.001465	0.002929	0.001465
	C13			C14			C15		
P1	0.001063	0.002126	0.001063	0.000378	0.000756	0.000378	0.002236	0.004472	0.002236
P2	0.000674	0.001348	0.000674	0.002267	0.004534	0.002267	0.005590	0.011181	0.005590
P3	0.001229	0.002457	0.001229	0.002267	0.004534	0.002267	0.005590	0.011181	0.005590

P4	0.001744	0.003487	0.001744	0.003400	0.006800	0.003400	0.010063	0.020125	0.010063
P5	0.000790	0.001579	0.000790	0.001889	0.003778	0.001889	0.005590	0.011181	0.005590
P6	0.001080	0.002161	0.001080	0.001889	0.003778	0.001889	0.005590	0.011181	0.005590
P7	0.000346	0.000692	0.000346	0.001889	0.003778	0.001889	0.004472	0.008945	0.004472
P8	0.001761	0.003522	0.001761	0.001511	0.003022	0.001511	0.005590	0.011181	0.005590
P9	0.000448	0.000896	0.000448	0.001889	0.003778	0.001889	0.004472	0.008945	0.004472
P10	0.001323	0.002646	0.001323	0.003400	0.006800	0.003400	0.008945	0.017889	0.008945
P11	0.005800	0.011600	0.005800	0.001889	0.003778	0.001889	0.005590	0.011181	0.005590

Table SC.3. f+ and f- values in the demand change scenario

	S2-1	S2-2	S2-3	S2-1	S2-2	S2-3	S2-1	S2-2	S2-3
	C1			C2			C3		
f^+	0.009198	0.018396	0.009198	0.005246	0.010169	0.004551	0.004609	0.009218	0.004609
f^-	0.000631	0.001262	0.000631	-0.001431	-0.002295	-0.000250	0.000253	0.000506	0.000253
	C4			C5			C6		
f^+	0.002955	0.005951	0.002975	0.001057	0.002106	0.001168	0.004927	0.009854	0.004927
f^-	0.000060	0.000121	0.000060	0.000591	0.001063	0.000226	0.000297	0.000594	0.000297
	C7			C8			C9		
f^+	0.009749	0.019498	0.009749	0.002887	0.005774	0.002887	0.001461	0.002923	0.001461
f^-	0.000011	0.000023	0.000011	0.000289	0.000577	0.000289	0.000264	0.000528	0.000264
	C10			C11			C12		
f^+	0.001592	0.003183	0.001592	0.002500	0.005000	0.002500	0.001674	0.003348	0.001674
f^-	0.000398	0.000796	0.000398	0.000097	0.000193	0.000097	0.000418	0.000837	0.000418
	C13			C14			C15		
f^+	0.005800	0.011600	0.005800	0.003400	0.006800	0.003400	0.010063	0.020125	0.010063
f^-	0.000346	0.000692	0.000346	0.000378	0.000756	0.000378	0.002236	0.004472	0.002236

Table SC.4. Utility values of plans in the scenario of demand changes

	Ljs			SSj
P1	10.360	10.285	10.249	10.29503
P2	8.491	8.525	8.591	8.532971
P3	7.866	7.803	7.768	7.810002
P4	5.099	5.099	5.099	5.099094
P5	10.654	10.623	10.588	10.62211
P6	9.668	9.594	9.544	9.600151
P7	10.797	10.728	10.696	10.73743
P8	10.206	10.135	10.126	10.15009
P9	11.325	11.320	11.317	11.32057
P10	6.093	6.059	6.049	6.065232
P11	6.341	6.259	6.220	6.269373

Table SC.5. The regret values of the plans in the scenario of demand changes

	Tjs			Rj
P1	1	1	1	1
P2	0.940456316	0.940456316	0.940456316	0.940456
P3	0.84489932	0.84489932	0.84489932	0.844899
P4	1	1	1	1
P5	1	1	1	1
P6	0.997906474	0.997906474	0.997906474	0.997906
P7	1	1	1	1
P8	1	1	1	1
P9	1	1	1	1
P10	0.989988288	0.989988288	0.989988288	0.989988
P11	1	1	1	1