Draft Results of the PECI/PMI 2020 Assessment

Gas and Oil Infrastructure Projects

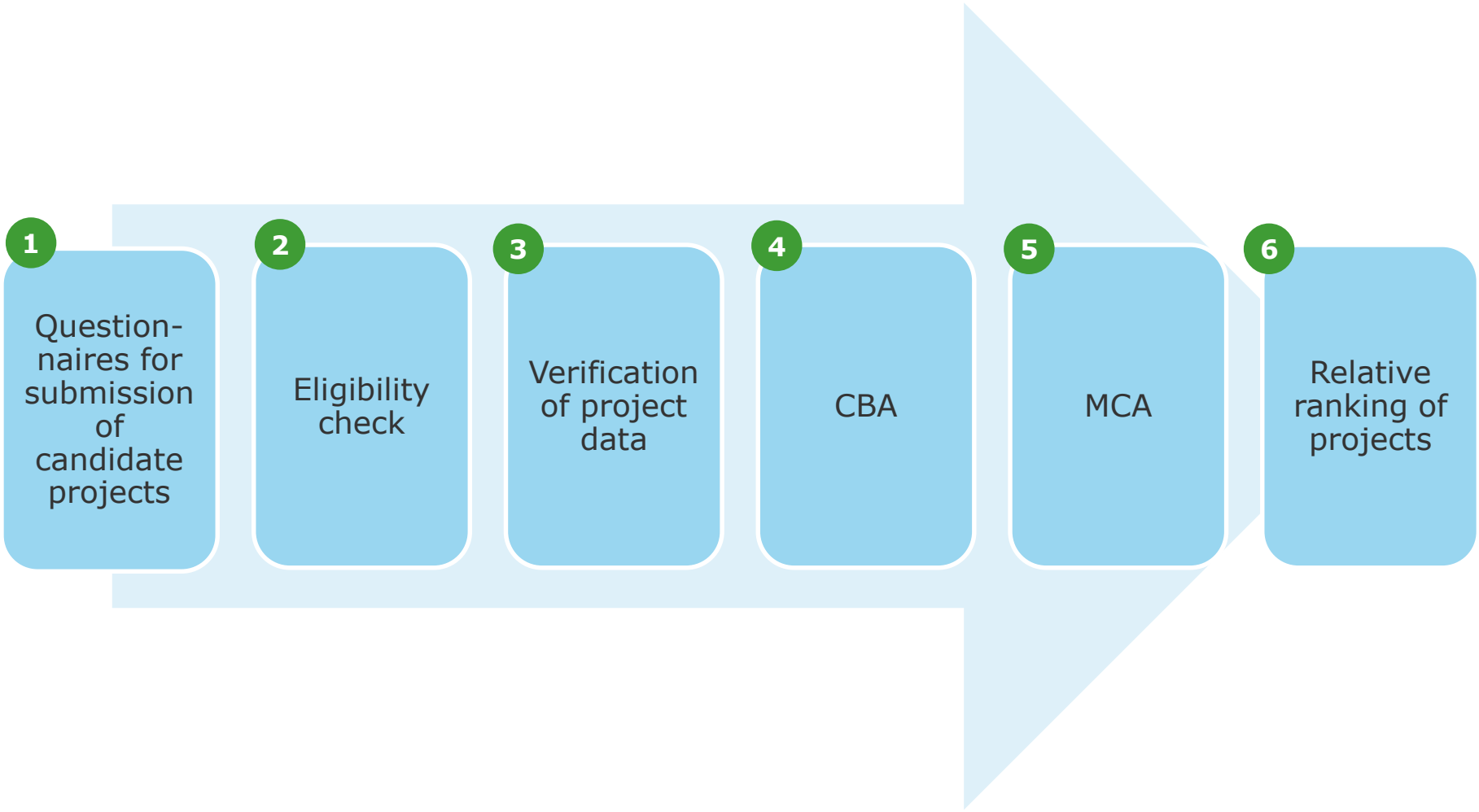
3rd PECI/PMI Gas & Oil Group meeting

27.05.2020

Agenda

1. Overview of Assessment Methodology
2. Reference scenario for CBA modelling
3. Results of cost-benefit analysis and sensitivities
4. Results of multicriteria assessment and relative ranking

Steps of the Project Assessment



Summary of project submissions

	Elec-tricity trans-mission	Elec-tricity storage	Gas trans-mission	Gas storage	LNG	Smart grid	Oil	Total
Number of projects submitted	6	0	19	1	0	0	3	29
Number of assessed projects	6	0	18	0	0	0	2	26
Submitted investment cost (million €)	2879	-	7908	75	-	-	416	11278

Two gas transmission projects were not jointly submitted: RS-ME and RS-BA, AL storage had data quality issues; 1 oil project did not meet infrastructure criteria

Summary of Gas Projects – map I.

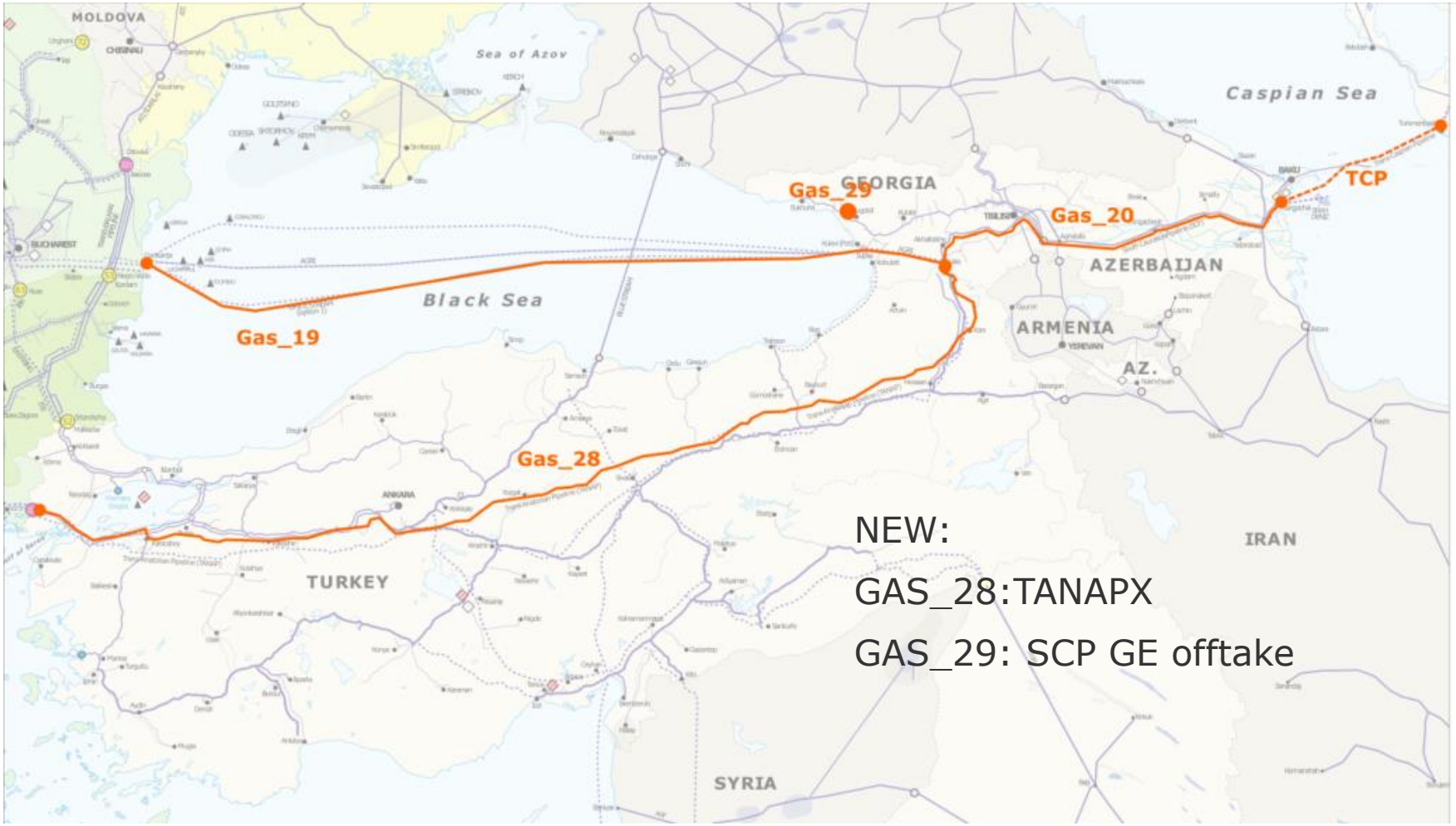
New projects:

GAS_26: MK-KO*

GAS_27: RO-UA;

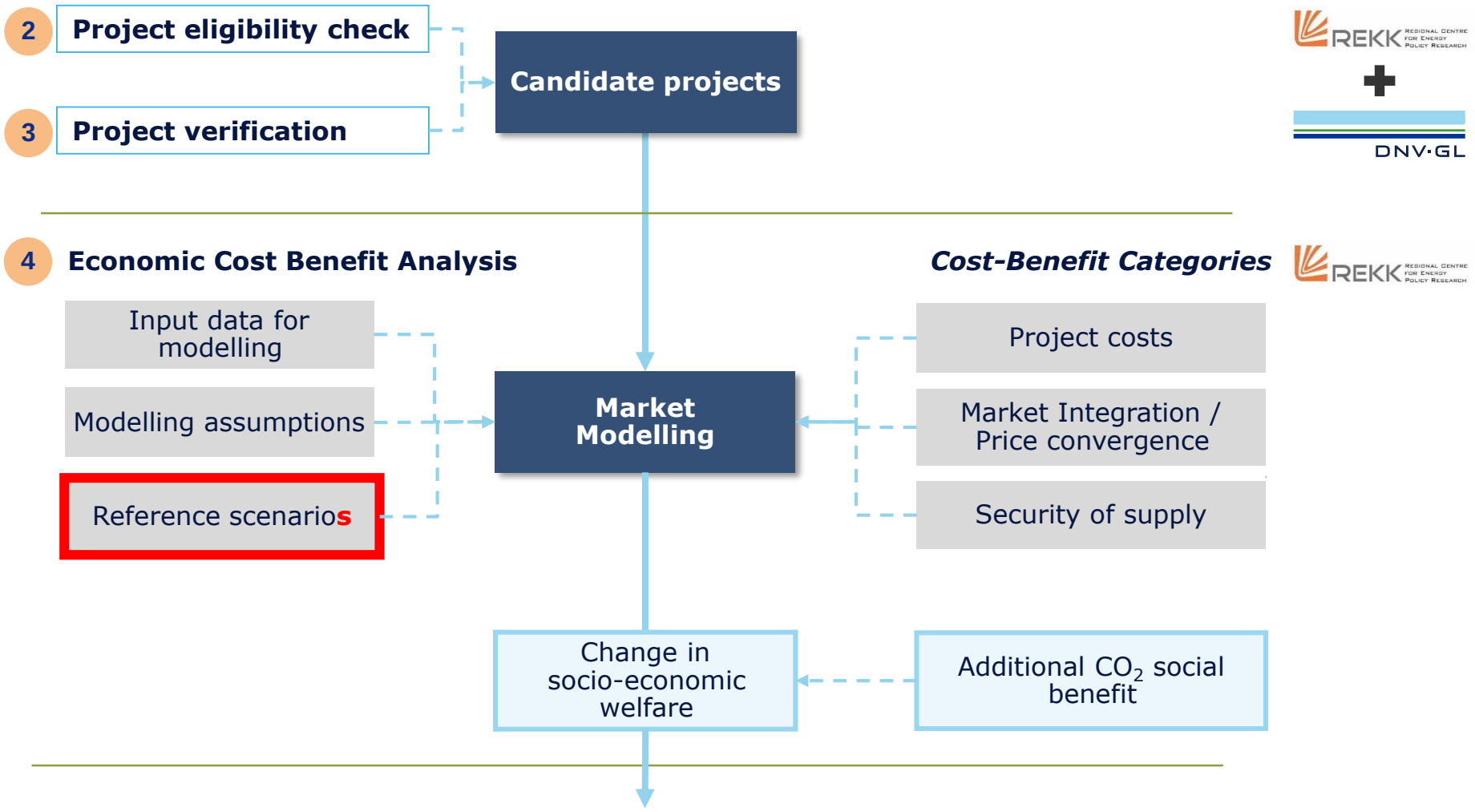
Resubmitted projects are labelled with the 2018 submission codes

Summary of Gas Projects – map II.



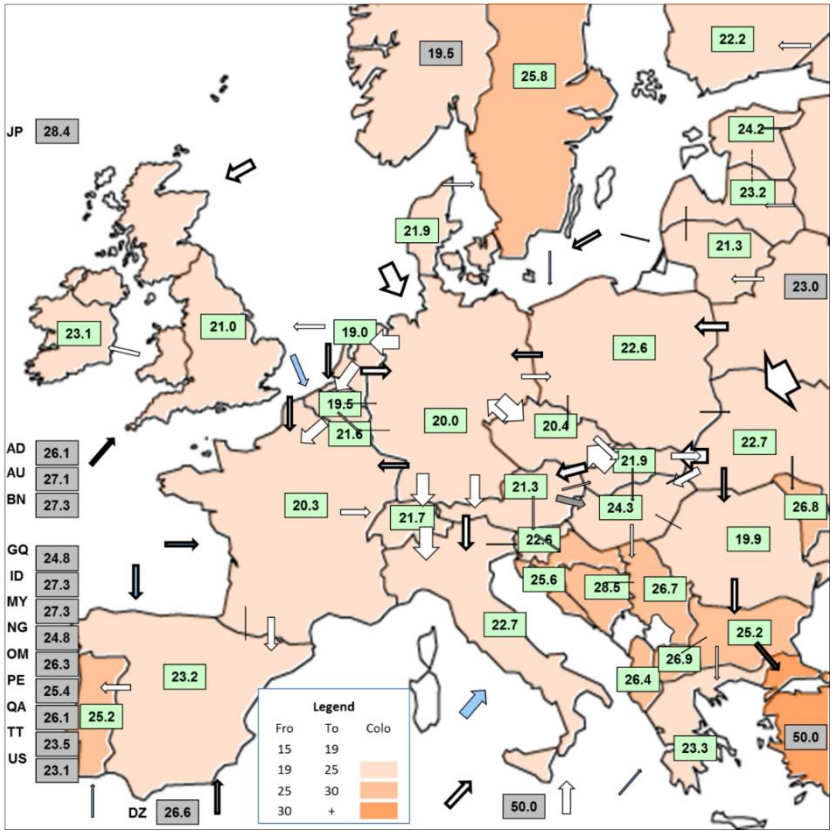
Summary of Oil Projects – map

Conceptual framework for the assessment (I)



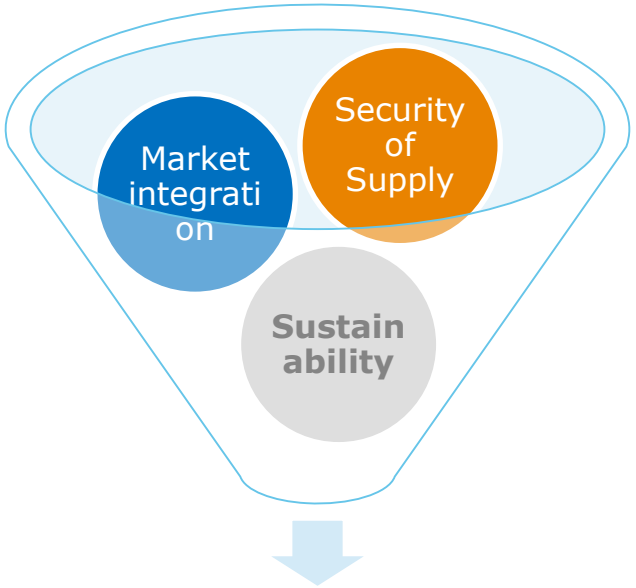
CBA Modelling with EGMM

- Not only EnC CPS, but whole Europe is modelled (Georgia and Armenia also included)
- Competitive prices by countries; price modelled for each 12 months
- Modelled welfare components: Total welfare change for Market Integration and Security of Supply = CS + PS+ TSO + LTC holder + SSO + LSO
  - CS: Consumer surplus change in the countries of the area of analysis compared to reference
  - PS: Producer surplus change in the countries of the area of analysis
  - TSO, SSO, LSO: Change in profit
  - Change in LTC contract holder's profit
  - Investment cost: verified investment cost
- CO2 effect calculated as a change of CO2 emission due to change in gas demand (gas replacing more polluting fuels)



CBA modelling with EGMM

- Modelled years: 2020, 2025, 2030, 2035, 2040, 2045, 2050
- PINT modelling: put-in one at a time
- Incremental approach: WITHOUT project reference compared to WITH PROJECT
- Each project is modelled in a normal scenario and in a supply disruption scenario
- Assessment period:25 years
- Social discount rate 4%



Monetized benefits

Cost of investment < 95% × Total ΔSW in normal scenario +5%× Total ΔSW in SOS scenario + Δ CO_2 emission value

CBA measures the merit of the project + ELIGIBILITY

- Calculated socio-economic benefits shall outweigh the costs otherwise the project does not meet the GENERAL eligibility criteria of adopted Regulation 347/2013
- Shall be calculated for the Energy Community (= EU27+9 Contracting Parties)

B/C>1.1 

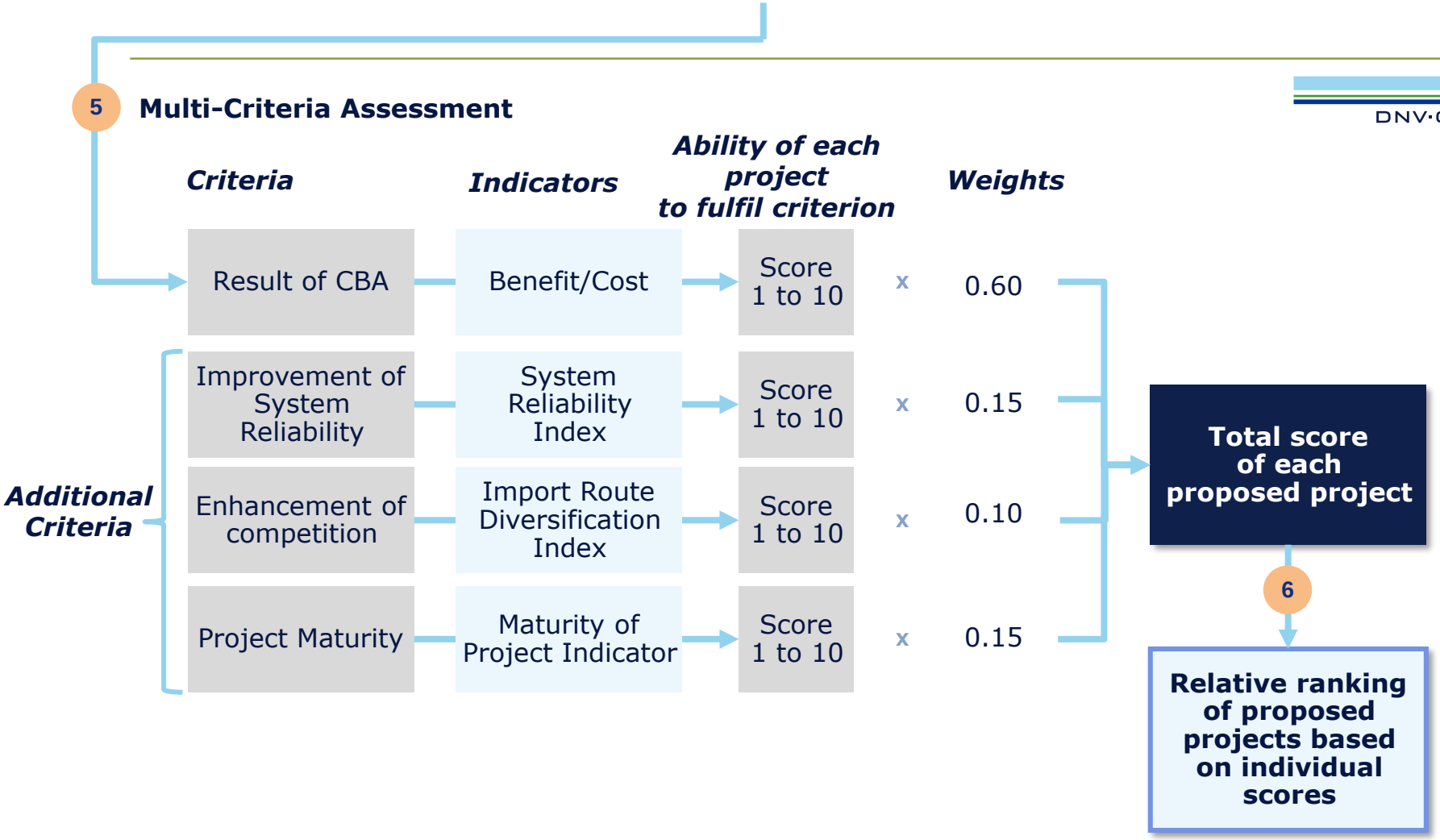
B/C<0.9 

- if 0.9<=B/C<=1.1 **sensitivity results** and **other indicators** shall guide the decision)

Ranking is based on the B/C (Benefit/Cost ratio) of the projects.

The region applied is the **Energy Community**, but other regions are calculated to orient the decision making.

Conceptual framework for the assessment (II)



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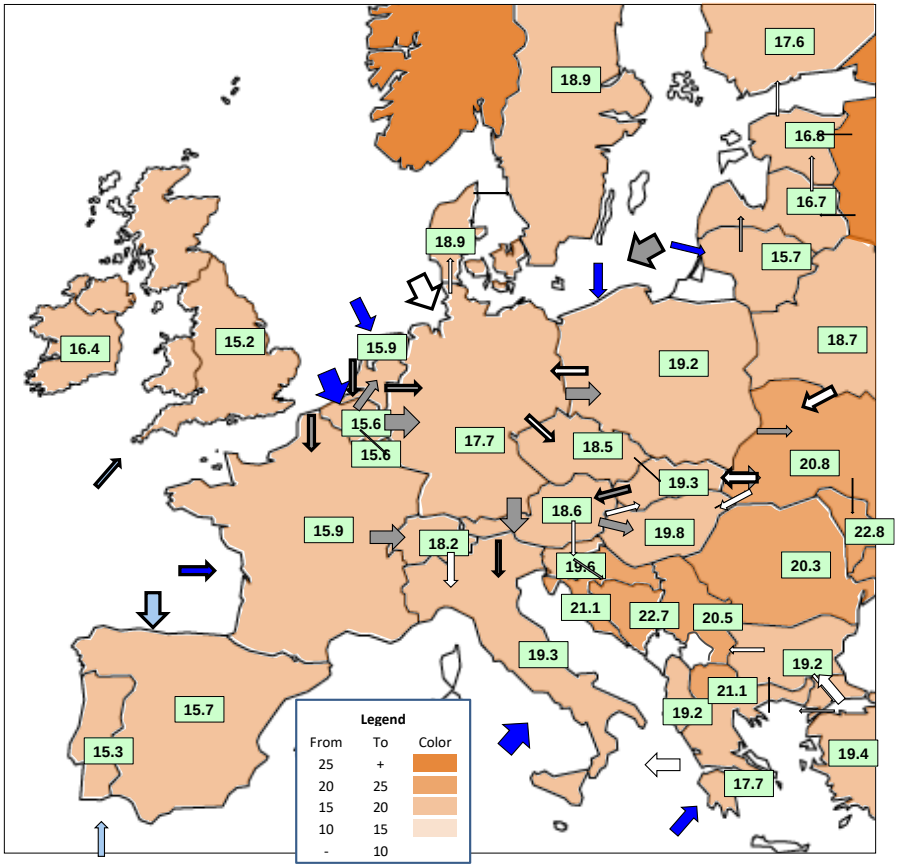
Scenario description

- Two main scenarios:
  1) BAU: Overall higher gas demand consumption forecast
  2) Green: Larger fallback in gas demand especially after 2040
- Demand and production for the EU Member States is based (i) for BAU on ENTSOs National Trends; (ii) for Green: based on PRIMES EUCO 3235.5

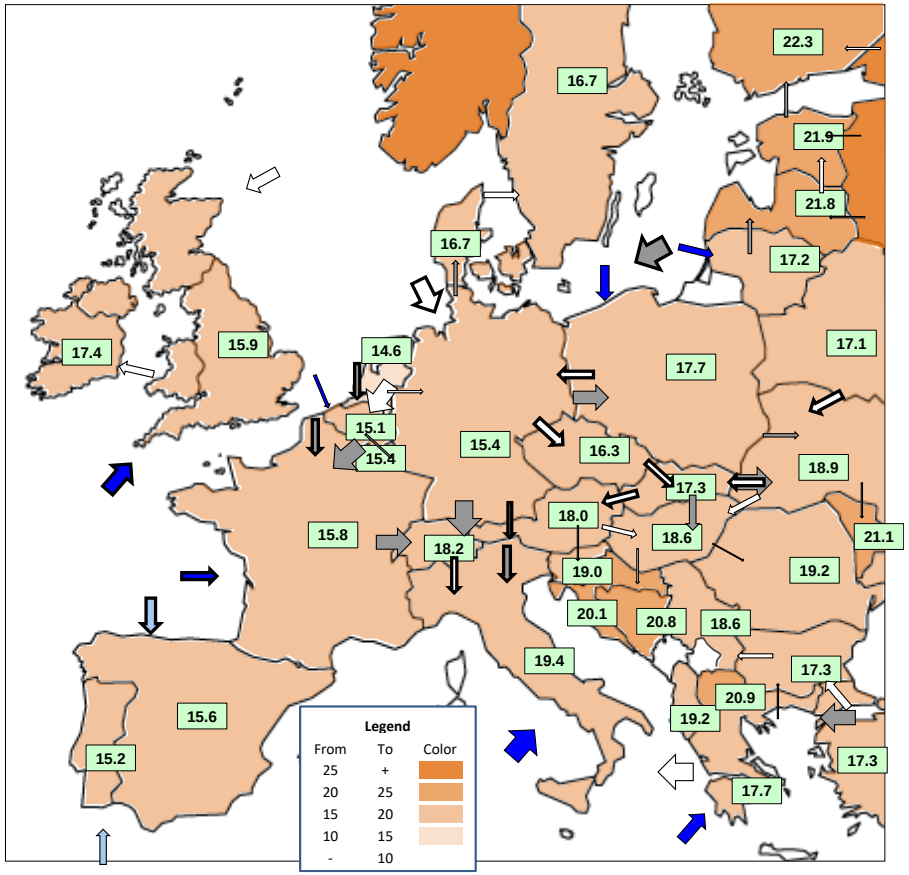
  For the Contracting Parties the gas demand and production data source is the submission of the Groups in the framework of this project for both scenarios
- Infrastructure assumption is the same for both scenarios: Current capacities (based on ENTSOG's latest capacity map) + FID projects as their construction is indicated in TYNDP 2020 + other capacities under construction (NS2, TS2, BG-SR-HU)
- Trade assumptions are the same for both scenarios:
  - LTC assumption : route of RU LTCs shifts from UA to alternative routes (NS2 and TR2) by 2025 – UA is used for additional flexibility if needed; price of LTC gas is calibrated to 2019 historical data
  - RU delivers gas via NS and UA to DE and via UA to AT, via TS to TR on a short term basis

2020 BAU and Green baseline scenarios (without project) , €/MWh

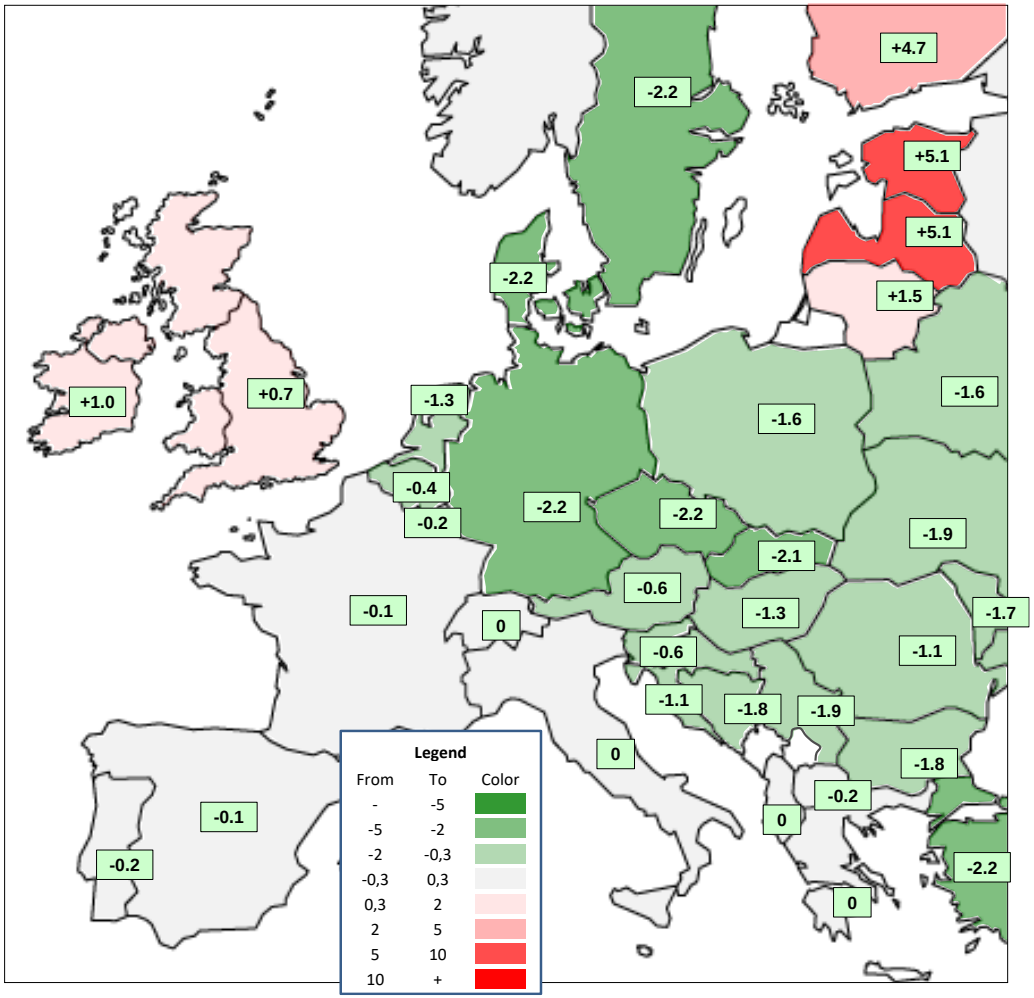
BAU



Green



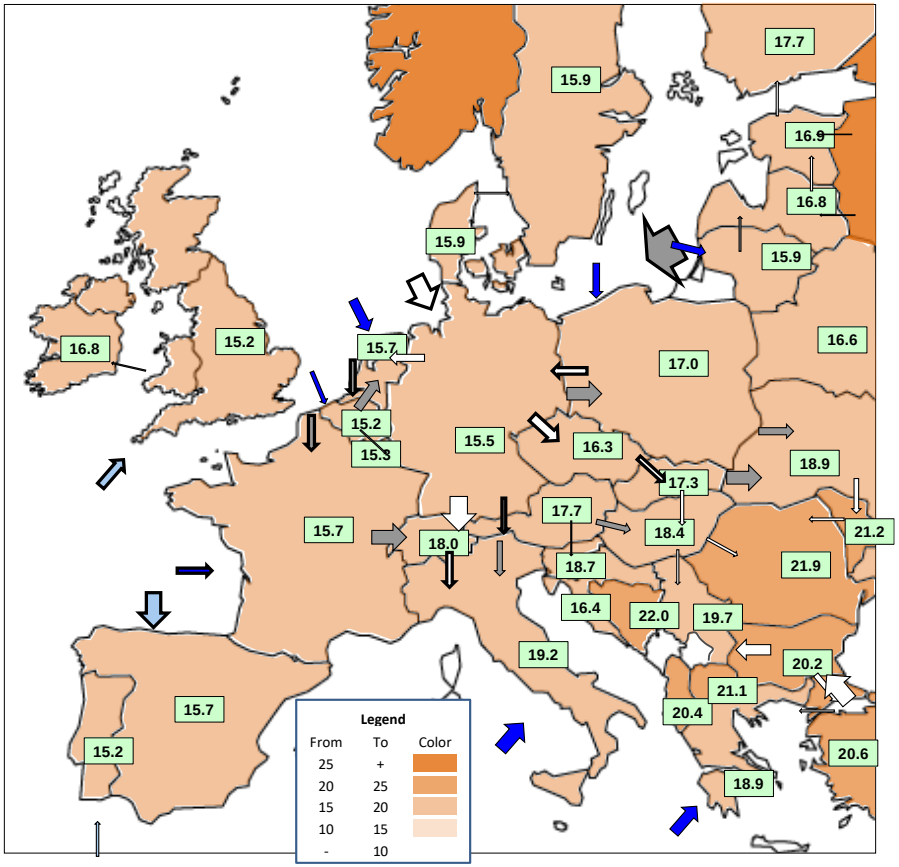
Difference of 2020 Green and BAU scenarios without project , €/MWh



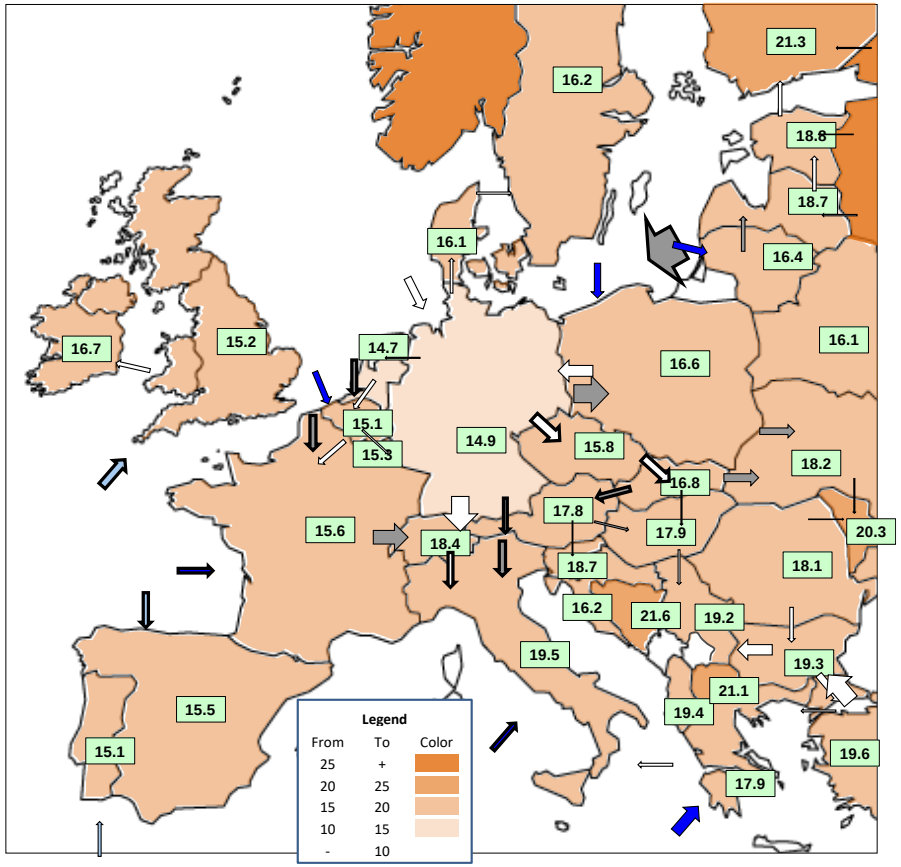
Green means cheaper Green scenario; red means more expensive Green scenario compared to BAU

2030 BAU and Green baseline scenarios without project , €/MWh

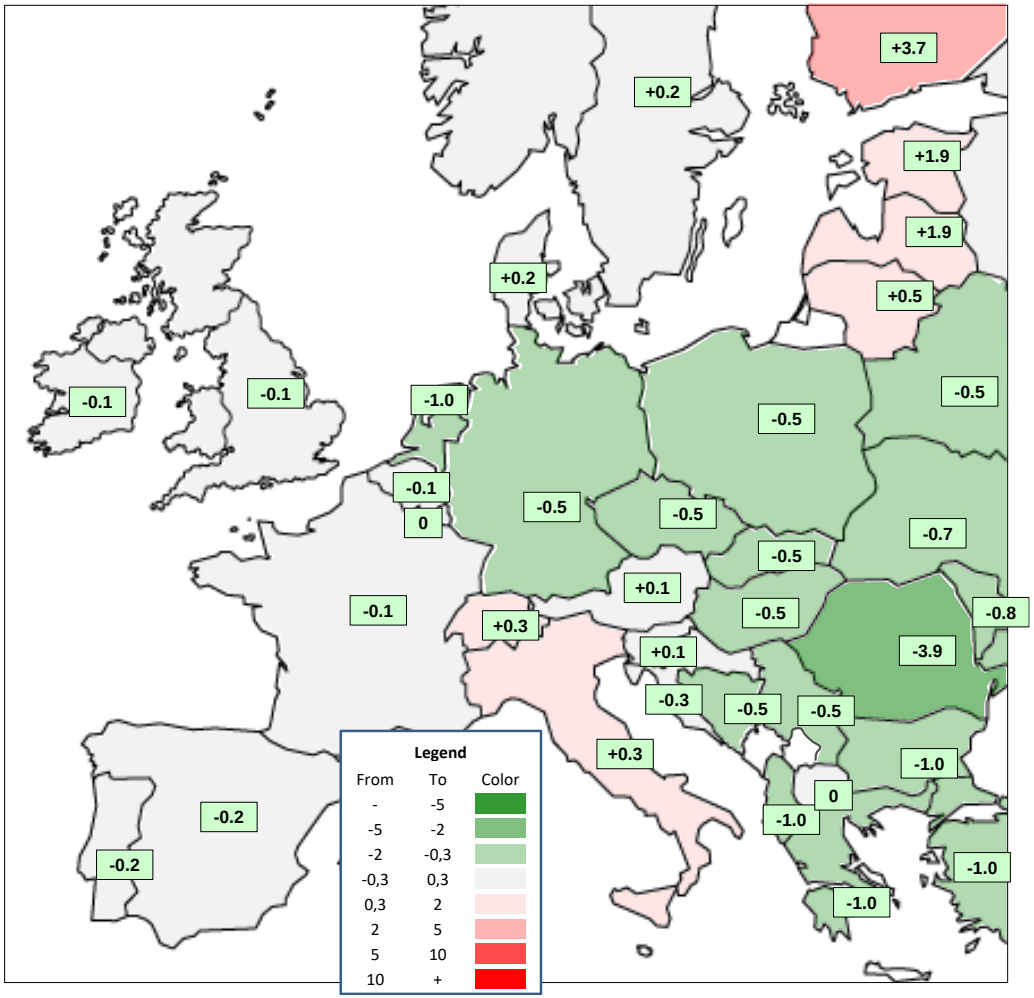
BAU



Green



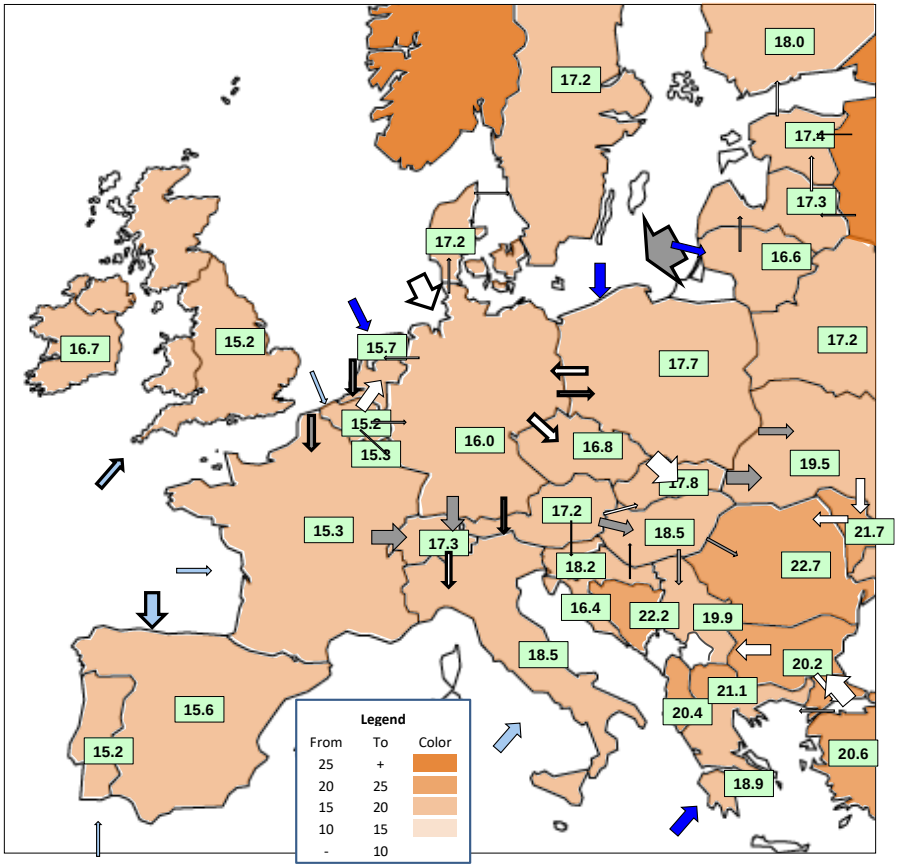
Difference of 2030 Green and BAU scenarios without project , €/MWh



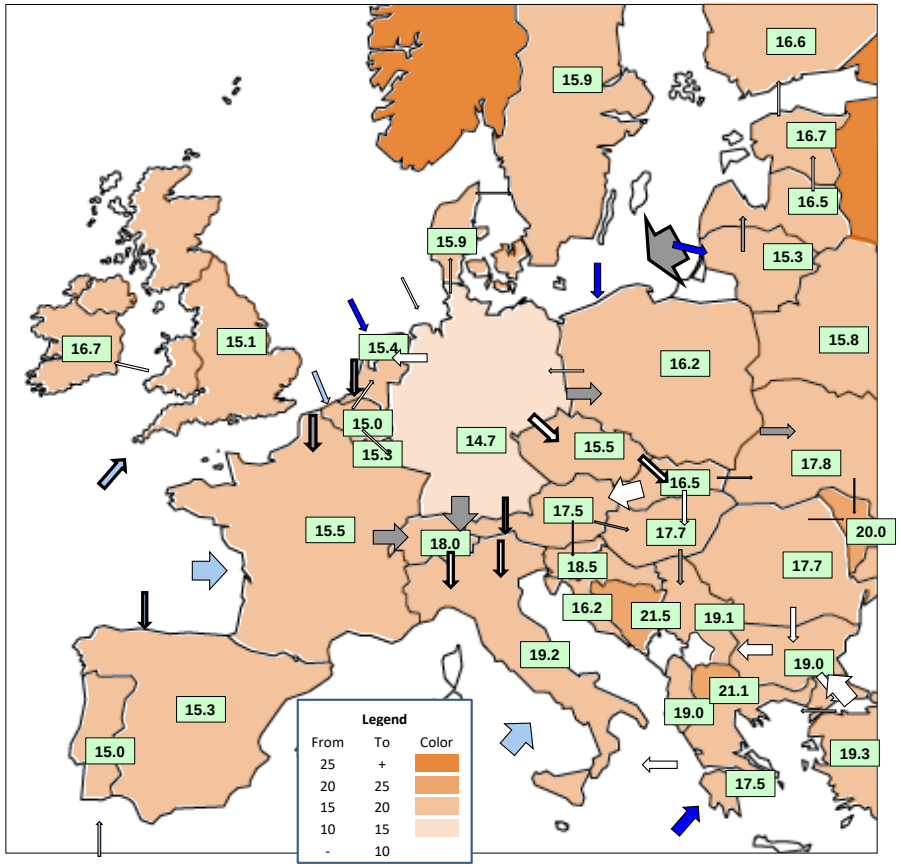
Green means cheaper Green scenario; red means more expensive Green scenario compared to BAU

2040 BAU and Green scenarios without project , €/MWh

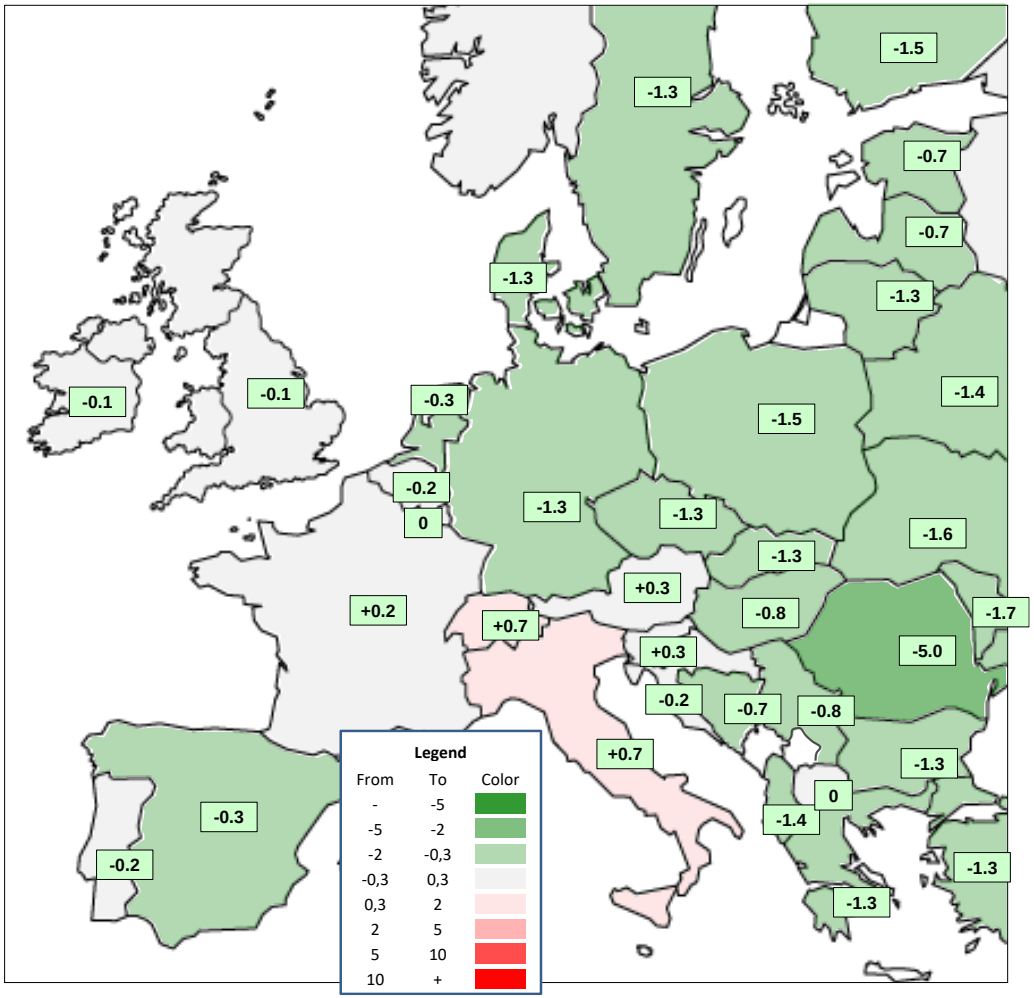
BAU



Green



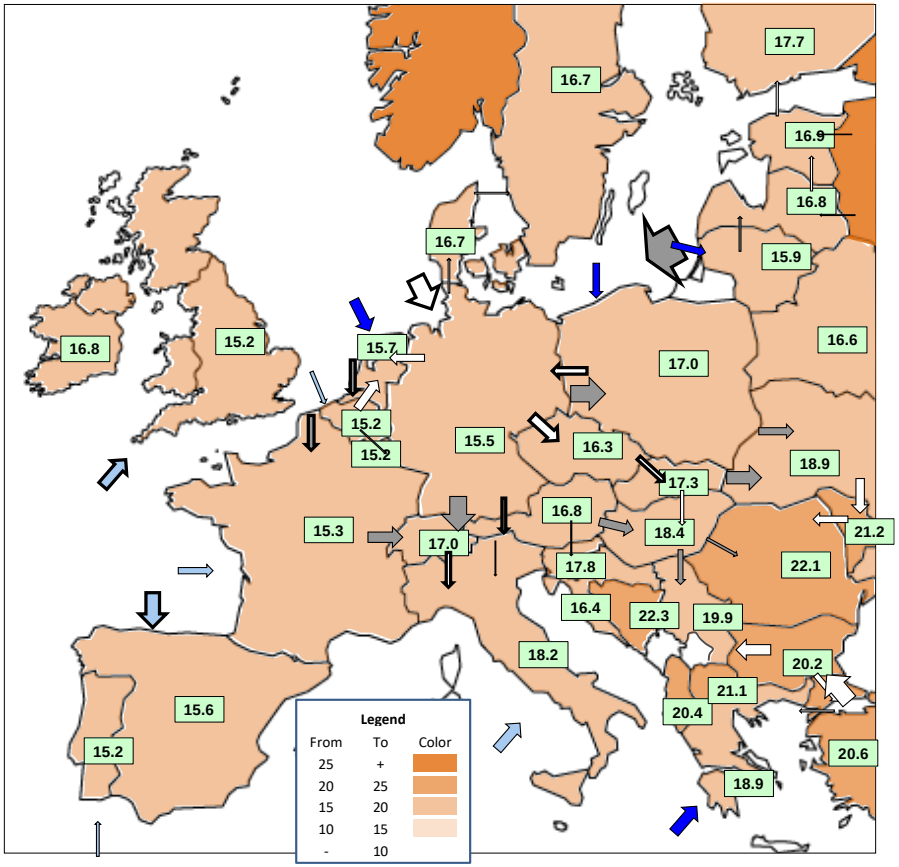
Difference of 2040 Green and BAU scenarios without project , €/MWh



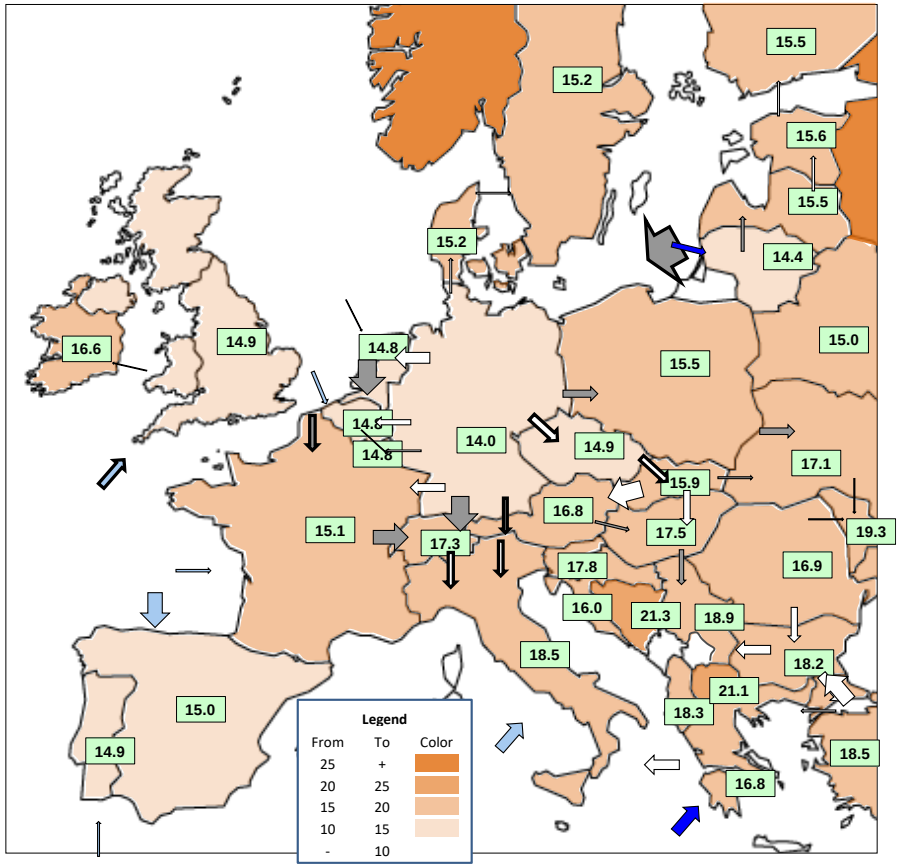
Green means cheaper Green scenario; red means more expensive Green scenario compared to BAU

2050 BAU and Green scenarios without project , €/MWh

BAU



Green

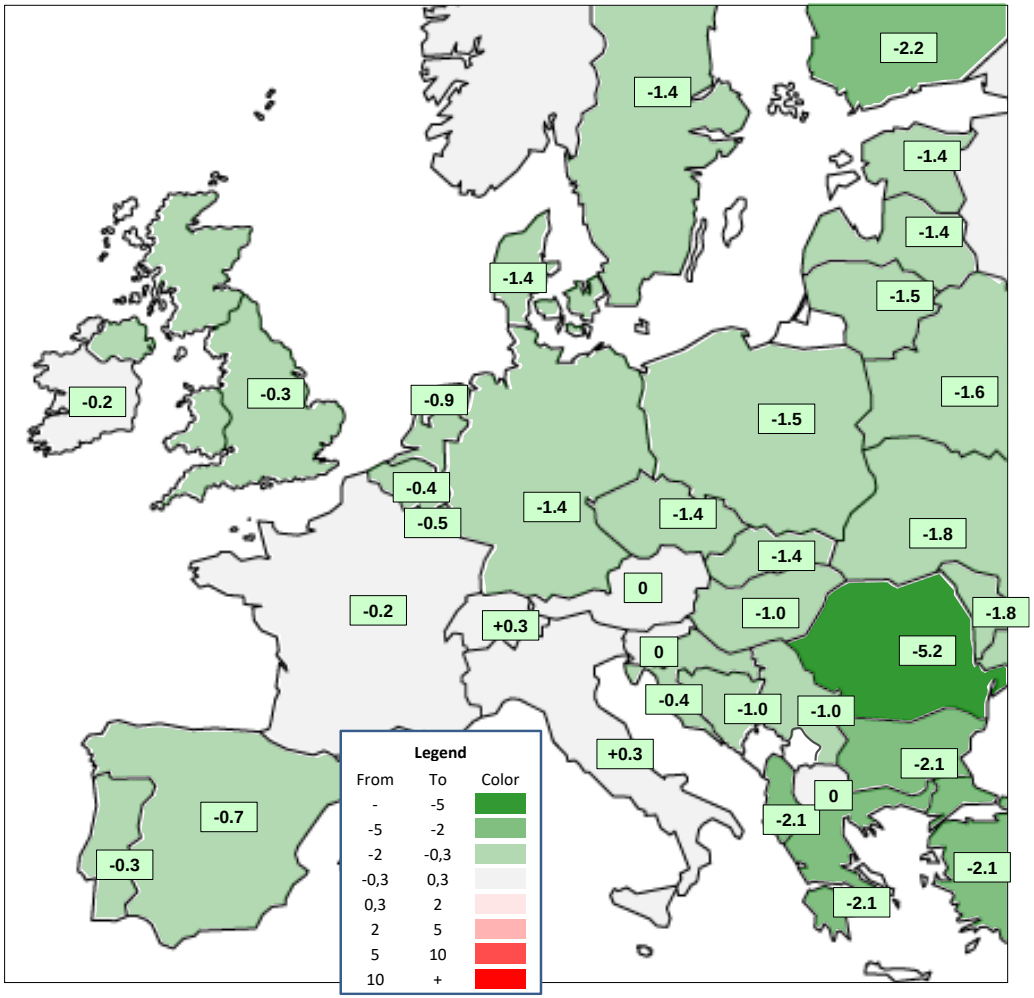


Difference of 2050 Green and BAU scenarios without project, €/MWh

RO production:

TYNDP: 94.8 TWH/yr (2020) 25.5 TWh/yr (2050)

PRIMES: 126 TWh/Yr in 2020 to 150 TWh/yr in 2050



Green means cheaper Green scenario; red means more expensive Green scenario compared to BAU

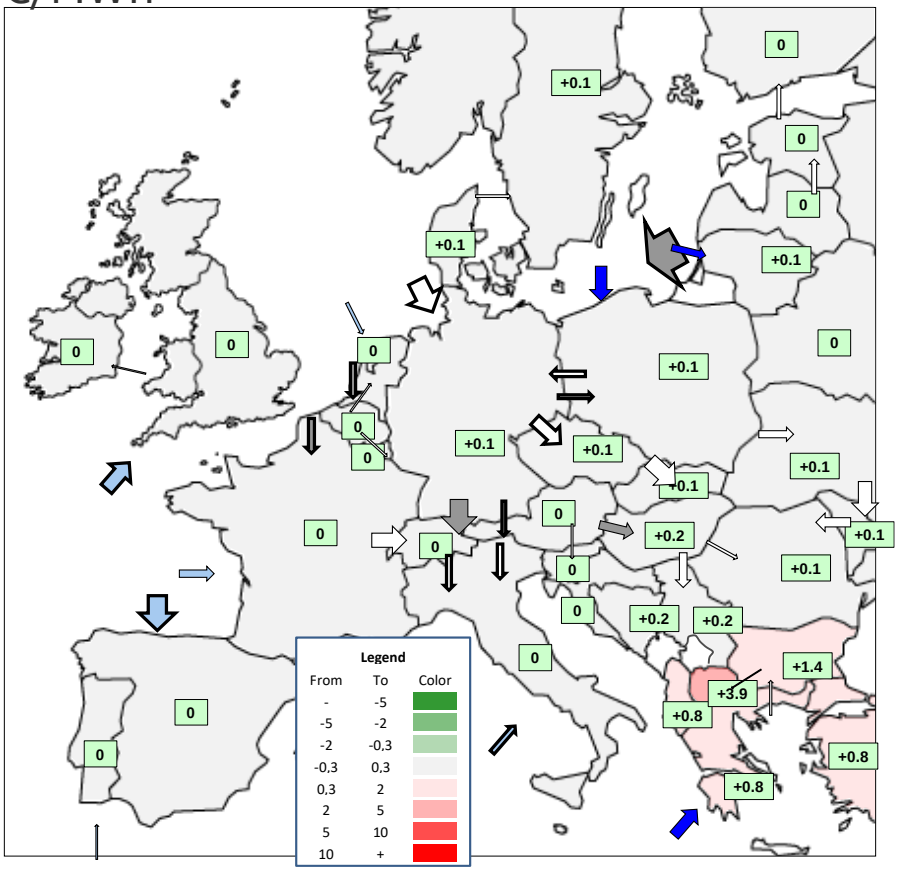
Security of supply modelling

- SOS is modelled as a January one month demand disruption on the largest import infrastructure to the assessed region, that is Turkish Stream.
- It is assumed that the Trans Balkan pipeline is in operation, therefore RU can use that for transmission purposes.
- As in normal scenarios as well, the TAP pipeline has physical reverse flow capacities and can ship gas from IT to AL and GR if necessary

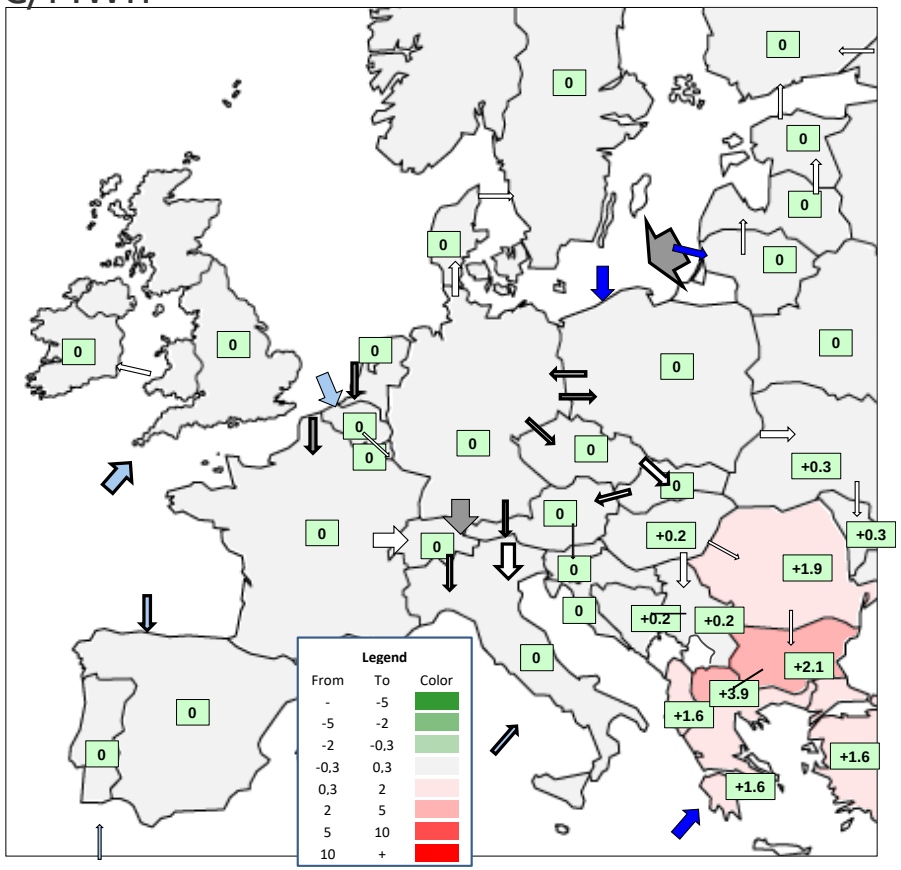
- Welfare change is measured as the difference of the without project and with the project scenario
- Security of supply results are part of the CBA: 5% weight is assigned to the welfare change achieved in SOS run. (Total welfare change = 95%welfare change in normal runs + 5% welfare change in SOS)

2030 January SOS effects (BAU and Green)

BAU, Wholesale gas price change €/MWh

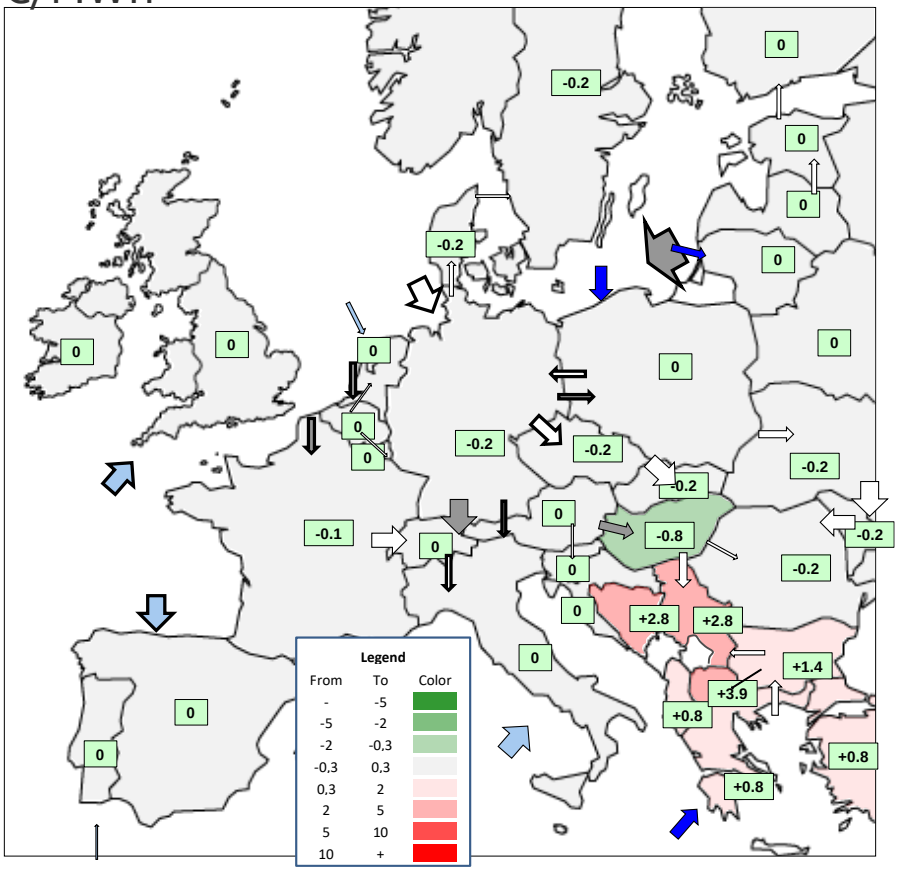


Green, Wholesale gas price change €/MWh

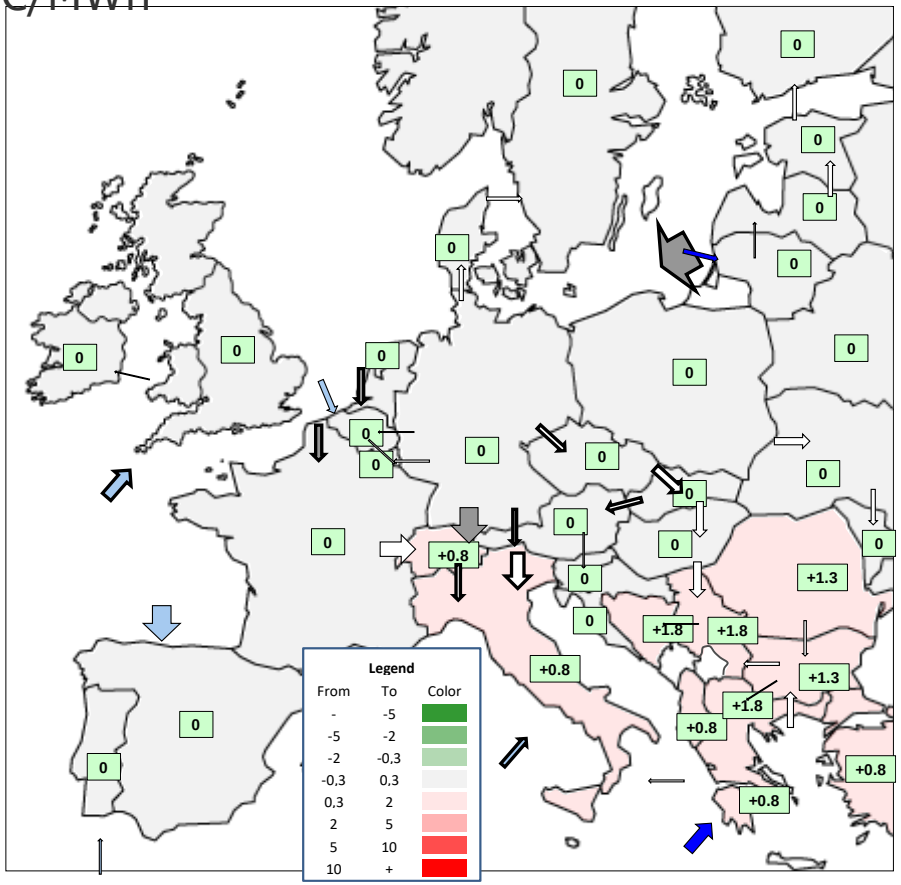


2050 January SOS effects (BAU and Green)

BAU, Wholesale gas price change €/MWh



Green, Wholesale gas price change €/MWh



Notes on the modelling – technicalities and assumptions

- **Newly gasified countries** have no gas demand in the baseline, hence for them the total consumer benefit will be assigned to the project – they are therefore not comparable to projects in existing gas markets and for that reason not shown in a joint ranking with all other projects (KO*,ME, AL) AL also belongs to the gasification group despite that AL has some demand in the baseline that could be served by TAP.
- Some countries have projected demand growth that can only be met by building new interconnectors. These demand growth assumptions will be modelled as **project specific demand**. (BA, MK)
- **Tariffs** are the same for all assessed projects: on entry IP points (0.65 €/MWh) and exit IP (0.58€/MWh), based on average entry and exit fees applied in the Contracting Parties and their EU neighbours. Therefore in some cases new projects might attract flows from existing (more expensive) points of the same TSO system, resulting in losses of operation revenues for the respective TSO. The operation revenues of the TSOs are not part of the welfare maximization, but are accounted for in the total welfare change. It can therefore happen, that a total welfare change due to a project is negative.

Notes on the modelling – technicalities and assumptions

- Less „ending isolation" projects than in 2018: Please note, that it has significant impact on certain projects' benefits that
  - in our 2020 baseline **MD is not isolated** any more, as former PMI RO-MD and first phase of the Trans Balkan reverse flow are already part of the baseline.
  - In the 2025 reference **Serbia is not isolated** any more as BG-RS-HU corridor is already under construction and is part of the 2025 baseline.
- Differences in the **production assumptions** in Romania (BAU assumes sharp decline, GREEN assumes moderate growth) has significant impact on certain projects that connect to the RO market.

Project code – and project dependencies

Proj Code	Short desctiprion	Infrastructure assumption	Project specific demand
GAS_01	Northern BA-HR		BA
GAS_02	Western BA-HR		BA
GAS_03	Southern BA-HR		BA
GAS_03a	Southern BA-HR	IAP is in the reference	BA
GAS_04b	GR-MK		MK
GAS_08	RO-RS		
GAS_09	BG-RS		
GAS_10	HR-RS		
GAS_10a	HR-RS Phase 2		
GAS_11	RS-MK		MK
GAS_13	ALKOGAP	IAP is in the reference	AL
GAS_16	IAP	Clustered with:TAPX, TAP-IAP	AL, ME
GAS_19	White Stream	Clustered with: TCP, SCPFX	
GAS_22	SCPFX		
GAS_25	TransBalcan bidirectional		
GAS_26	MK-KO*		MK, KO*
GAS_27	RO-UA		
GAS_28	TANAPX	SCPFX, TAPX	
GAS_29	SCP GE offtake		

Dependencies and clusters

Dependent projects:

- GAS_3a (Bosnia South) and GAS_13 ALKOGAP.
- For these projects we assume that IAP (clustered with TAPX and connection of IAP to TAP in Albania) are already build. So the baseline (without project) infrastructure setup for these projects differ from the reference.

Clustered projects:

- GAS_16 (IAP) was modelled with a connection point to TAPX. Therefore TAPX and TAP-IAP are added to the submitted IAP project - as agreed with the promoter in the Second Group Meeting. No CAPEX has been assigned to these additions.
- GAS_19 (White Stream) has been modelled as a corridor with TCP and SCPFX. No CAPEX has been assigned to TCP.
- GAS_28 (TANAPX) has been modelled as a corridor of SCPFX, TANAPX and TAPX. No additional CAPEX has been assigned to TAPX.

Key project data

Project Code	Project name	From A	To B	Technical capacity	Transmission tariff	Transmission tariff	Commissioning year	Cost in country A	Cost in country B
				GWh/day	Exit (EUR/MWh)	Entry (EUR/ MWh)		Million € discounted (2020)	Million € discounted (2020)
GAS_01	Northern HR-BA	HR	BA	162	0.65	0.58	2026	9	85
GAS_01	Northern BA-HR	BA	HR	42	0.65	0.58	2026	0	0
GAS_02	Western HR-BA	HR	BA	81	0.65	0.58	2027	16	33
GAS_03	Southern HR-BA	HR	BA	81	0.65	0.58	2024	16	100
GAS_03	Southern BA-HR	BA	HR	42	0.65	0.58	2024	0	0
GAS_03a	Southern HR-BA	HR	BA	81	0.65	0.58	2025	16	100
GAS_03a	Southern BA-HR	BA	HR	42	0.65	0.58	2025	0	0
GAS_03a	IAP AL-ME	AL	ME	136.5	0.65	0.58	2025	0	0
GAS_03a	IAP ME-AL	ME	AL	136.5	0.65	0.58	2025	0	0
GAS_03a	IAP ME-HR	ME	HR	116.6	0.65	0.58	2025	118	299
GAS_03a	IAP HR-ME	HR	ME	116.6	0.65	0.58	2025	0	0
GAS_03a	TAP-IAP	GR	AL	162	0.65	0.58	2025	0	169
GAS_03a	TAPX TR-GR	TR	GR	350	0.65	0.58	2025	0	0
GAS_03a	TAPX GR-IT	GR	IT	188	0.65	0.58	2025	0	0
GAS_04b	GR-MK	GR	MK	76.5	0.65	0.58	2023	51	52
GAS_04b	MK-GR	MK	GR	76.5	0.65	0.58	2023	0	0
GAS_08	Serbia-Romania	RS	RO	35.04	0.65	0.58	2021	9.5	53.76
GAS_08	Romania-Serbia	RO	RS	46.51	0.65	0.58	2021	0	0
GAS_09	Bulgaria -Serbia	BG	RS	39.44	0.65	0.58	2022	81	82.95
GAS_09	Serbia-Bulgaria	RS	BG	3.2	0.65	0.58	2022	0	0
GAS_10	Serbia-Croatia	RS	HR	32.8	0.65	0.58	2025	9	20
GAS_10	Croatia-Serbia	HR	RS	42.11	0.65	0.58	2025	0	0
GAS_10a	Serbia-Croatia Phase 2	RS	HR	32.8	0.65	0.58	2028	60	95.6
GAS_10a	Croatia-Serbia Phase 2	HR	RS	185.66	0.65	0.58	2028	0	0

Key project data

Project Code	Project name	From A	To B	Technical capacity	Transmission tariff	Transmission tariff	Commissioning year	Cost in country A	Cost in country B
				GWh/day	Exit (EUR/MWh)	Entry (EUR/ MWh)		Million € discounted (2020)	Million € discounted (2020)
GAS_11	Serbia - North Macedonia	RS	MK	10.4	0.65	0.58	2023	9	14
GAS_11	North Macedonia - Serbia	MK	RS	42.35	0.65	0.58	2023	0	0
GAS_13	ALKOGAP AL-KO*	AL	KO*	63.7	0.65	0.58	2027	152	61.5
GAS_13	ALKOGAP KO*-AL	KO*	AL	63.7	0.65	0.58	2027	0	0
GAS_13	IAP AL-ME	AL	ME	136.5	0.65	0.58	2027	0	0
GAS_13	IAP ME-AL	ME	AL	136.5	0.65	0.58	2027	0	0
GAS_13	IAP ME-HR	ME	HR	116.6	0.65	0.58	2027	118	299
GAS_13	IAP HR-ME	HR	ME	116.6	0.65	0.58	2027	0	0
GAS_13	TAP-IAP	GR	AL	162	0.65	0.58	2027	0	169
GAS_13	TAPX TR-GR	TR	GR	350	0.65	0.58	2025	0	0
GAS_13	TAPX GR-IT	GR	IT	188	0.65	0.58	2025	0	0
GAS_16	IAP AL-ME	AL	ME	136.5	0.65	0.58	2025	0	0
GAS_16	IAP ME-AL	ME	AL	136.5	0.65	0.58	2025	0	0
GAS_16	IAP ME-HR	ME	HR	116.6	0.65	0.58	2025	118	299
GAS_16	IAP HR-ME	HR	ME	116.6	0.65	0.58	2025	0	0
GAS_16	TAP-IAP	GR	AL	162	0.65	0.58	2025	0	169
GAS_16	TAPX TR-GR	TR	GR	350	0.65	0.58	2025	0	0
GAS_16	TAPX GR-IT	GR	IT	188	0.65	0.58	2025	0	0
GAS_19	White Stream GE-RO	GE	RO	500	0.65	0.58	2024	2053	2053
GAS_19	White Stream RO-GE	RO	GE	500	0.65	0.58	2024	0	0
GAS_19	White Stream AZ-GE	AZ	GE	150	0.65	0.58	2024	1048	0
GAS_19	White Stream TM-AZ	TM	GE	980	0.65	0.58	2024	0	0

Key project data

Project Code	Project name	From A	To B	Technical capacity	Transmission tariff	Transmission tariff	Commissioning year	Cost in country A	Cost in country B
				GWh/day	Exit (EUR/MWh)	Entry (EUR/ MWh)		Million € discounted (2020)	Million € discounted (2020)
GAS_22	SCPFX AZ-GE	AZ	GE	151	0.65	0.58	2024	1048	0
GAS_22	SCPFX GE-TR	GE	TR	151	0.65	0.58	2024	0	0
GAS_25	Trans-Balcan RF MD-UA	MD	UA	58.1	0.65	0.58	2021	7	7.2
GAS_25	Trans-Balcan RF RO-MD	RO	MD	58.1	0.65	0.58	2021	0	0
GAS_26	North Macedonia-Kosovo* MK-KO*	MK	KO*	42.35	0.65	0.58	2024	12	60
GAS_26	North Macedonia-Kosovo* KO*-MK	KO*	MK	42.35	0.65	0.58	2024	0	0
GAS_27	Interconnector Romania - Ukraine RO-UA	RO	UA	58.1	0.65	0.58	2025	125	36.8
GAS_27	Interconnector Romania - Ukraine UA-RO	UA	RO	58.1	0.65	0.58	2025	0	0
GAS_28	TANAPX GE-TR	GE	TR	286	0.65	0.58	2025	0	750
GAS_28	TANAPX TR-GR	TR	GR	286	0.65	0.58	2025	0	0
GAS_28	SCPFX AZ-GE	AZ	GE	151	0.65	0.58	2025	1048	0
GAS_28	SCPFX GE-TR	GE	TR	151	0.65	0.58	2025	0	0
GAS_28	TAPX TR-GR	TR	GR	350	0.65	0.58	2025	0	0
GAS_28	TAPX GR-IT	GR	IT	188	0.65	0.58	2025	0	0
GAS_29	SCP GE Offtake IT GE	IT	GE	28.5	0.10	0.10	2023	0	8
GAS_29	SCP GE Offtake GE IT	GE	IT	28.5	0.10	0.10	2023	0	0

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4. Results of multicriteria assessment and relative ranking

Gas PINT BAU EnC (EU27+CP)

		Cons. MEUR	Prod. MEUR	Infra OP MEUR	Infra auc MEUR	Trader (LTC+ stor) MEUR	Total MEUR	CO2 MEUR	Inv. Cost MEUR	NPV MEUR	B/C	COMMENT
GAS_01	Northern BA-HR	1882	7	-6	-44	111	1950	164	94	2020	22	Project specific demand
GAS_02	Western BA-HR	1922	3	-5	-43	102	1978	171	49	2100	44	Project specific demand
GAS_03	Southern BA-HR	1760	15	-10	-43	131	1853	149	116	1886	17	Project specific demand
GAS_03a	Southern BA-HR + IAP	2526	8	19	99	-45	2607	193	116	2683	24	DIFFERENT BASELINE! Project specific demand
GAS_04b	GR-MK	1773	101	71	47	495	2487	217	103	2601	26	Project specific demand
GAS_08	RO-RS	588	-383	-437	-136	176	-192	11	63	-244	-3	Flow in RS-RO direction
GAS_09	BG-RS	0	0	0	-3	3	0	0	164	-164	0	Competing project is under construction((BG-SR-HU)
GAS_10	HR-RS	30	-29	160	232	-39	354	7	29	332	12	
GAS_10a	HR-RS P2	400	-172	307	358	-268	626	28	156	498	4	
GAS_11	RS-MK	2061	19	131	20	156	2386	209	23	2573	115	Project specific demand
GAS_13	ALKOGAP + IAP	4426	13	213	164	97	4913	595	214	5294	26	DIFFERENT BASELINE! GASIFICATION- benefits overestimated
GAS_16	IAP	11981	102	198	373	388	13042	1110	586	13566	24	GASIFICATION.benefits overestimated
GAS_19	White Stream	10219	-2424	-1909	967	-5101	1753	344	4105	-2009	1	Benefits can not outweigh high costs
GAS_22	SCPFX	5413	-164	390	2398	-4891	3145	201	1048	2298	3	
GAS_25	TB Bi	-322	205	-31	-15	148	-15	-6	14	-36	-2	
GAS_26	MK-KO*	1739	15	133	1607	81	3576	316	72	3820	54	GASIFICATION – benefits overestimated
GAS_27	RO-UA	543	-302	-376	236	-26	74	14	162	-74	1	Used in UA-RO direction
GAS_28	TANAPX	5562	-220	162	2602	-5068	3038	207	1798	1446	2	
GAS_29	SCP GE offtake	3763	-6	152	23	-3707	225	153	8	370	47	

Gas PINT Green EnC (EU27+CP)

		Cons. MEUR	Prod. MEUR	Infra OP MEUR	Infra auc MEUR	Trader (LTC) MEUR	Total MEUR	CO2 MEUR	Inv. Cost MEUR	NPV MEUR	B/C	COMMENT
GAS_01	Northern BA-HR	1620	-1	-32	-64	110	1634	152	94	1692	19	Project specific demand
GAS_02	Western BA-HR	1687	-6	-29	-74	121	1700	160	49	1811	38	Project specific demand
GAS_03	Southern BA-HR	1472	8	-36	6	40	1490	133	116	1507	14	Project specific demand
GAS_03a	Southern BA-HR + IAP	1608	-13	-11	159	-157	1586	143	116	1613	15	DIFFERENT BASELINE! Project specific demand
GAS_04b	GR-MK	2024	102	143	171	95	2535	219	103	2651	27	Project specific demand
GAS_08	RO-RS	-714	654	-24	303	-81	138	-18	63	57	2	Flow in RS-RO direction
GAS_09	BG-RS	0	0	0	266	-266	0	0	164	-164	0	Competing project is under construction((BG-SR-HU)
GAS_10	HR-RS	43	-122	101	51	202	275	9	29	255	10	
GAS_10a	HR-RS P2	1230	-869	253	238	-173	677	58	156	580	5	
GAS_11	RS-MK	2109	16	129	654	-513	2394	212	23	2584	116	Project specific demand
GAS_13	ALKOGAP + IAP	4410	19	288	273	-32	4959	594	214	5339	26	DIFFERENT BASELINE! GASIFICATION- benefits overestimated
GAS_16	IAP	11940	285	1	491	213	12930	1107	586	13451	24	GASIFICATION.benefits overestimated
GAS_19	White Stream	6077	-645	353	2249	-5244	2790	222	4105	-1094	1	Benefits can not outweigh high costs
GAS_22	SCPFX	5984	-495	369	2161	-5192	2828	219	1048	1999	3	
GAS_25	TB Bi	-215	682	-302	-76	-191	-103	-12	14	-129	-8	
GAS_26	MK-KO*	1746	48	141	2012	-363	3584	317	72	3829	54	GASIFICATION – benefits overestimated
GAS_27	RO-UA	82	297	-154	-261	-64	-101	-7	162	-270	-1	Used in UA-RO direction
GAS_28	TANAPX	6283	-322	-630	1798	-5278	1851	218	1798	272	1	
GAS_29	SCP GE offtake	3277	50	206	490	-3762	261	135	8	388	49	

Notes on the results

- GAS 01, GAS 02, GAS 03, GAS 03a: All three projects aim to connect BA to HR, and allow for increased gas consumption in BA. The gas increase had to be modelled as a project specific demand due to the structure of the BA transmission grid and the limited capacity of the current single entry point from RS. The welfare gains are similar for all project, therefore the level of investment cost matters especially for the B/C. The lowest investment cost and the highest B/C among these projects is with GAS_02 Western BA-HR. GAS_03 Southern BA-HR has a high positive NPV and a high B/C result even without connecting to the IAP. With IAP the project is only slightly better. In the Green scenario results have similar pattern however they are lower.
- GAS04b Interconnector Greece North Macedonia: This project provides new source of gas and a second entry point to North Macedonia. As the current infrastructure is not sufficient to serve the future estimated demand, a project specific demand growth was used. Due to the substantial demand growth in MK this project serves the MK consumers.

Notes on the results

- GAS_08 Serbia-Romania: The project performs good in the Green scenario, when additional Romanian production growth is assumed, and the gas is delivered from RO to RS. In the BAU scenario Romania is not self-sufficient anymore, therefore the pipeline is used in reverse mode (RS to RO). In BAU it does not provide sufficient benefits on ENC level to outweigh the cost (eg. losses of other TSOs due to redirecting flows from existing pipelines) This project has very low investment costs, and is positive for both hosting countries, so it could be implemented bilaterally.
- GAS_09 Serbia-Bulgaria: This project does not attract any flows, as there is already a larger pipeline (BG-RS-HU) under construction connecting the same markets (and hence it is in the reference). Therefore the RS market is not isolated any more without the GAS_09, as the BG-RS-HU already provides a second entry point besides the existing HU-RS.
- GAS_10 and GAS_10a Croatia-Serbia: this pipeline has two phases, both perform well in both scenarios, and especially the first phase with smaller investment cost has a high B/C.

Notes on the results

- GAS_11 RS-MK: This project provides new source of gas and a second entry point to North Macedonia. As the current infrastructure is not sufficient to serve the future estimated demand, a project specific demand growth was used. Due to the substantial demand growth in MK this project serves the MK consumers.
- GAS_13 ALKOGAP: This project is depending on IAP, hence was modelled with IAP in the baseline. Most benefits are related to gasification of Kosovo*. NOTE: all project specific demand growth is attributed to IAP and not split between ALKOGAP and IAP, as we had no data for that.
- GAS_16 IAP: Most of the benefits of these projects are the huge consumer welfare related to gasification of ME and AL. Benefits are overestimated, due to limits of sector specific modelling of gasification. Results in the green scenario call for a CBCA to compensate HR for the losses on the investment.
- GAS_19 White Stream: the project costs are too high and can not be outweighed by the benefits generated.

Notes on the results

- GAS_22 SCPFX performs well in both scenarios.
- GAS_25 Reverse flow on Trans-Balkan is a second phase of a project. The first phase was put into operation in 2019. Please note that besides the first phase of the same project we also have the former PMI project RO-MD already in the baseline. Therefore this project has less impact than in the 2018 evaluation. Results are mixed for this project: in the BAU scenario there is only limited flow from RO to MD and no flow from MD to UA. In the green scenario there are flows from RO (new additional production) and these new flows are using the Trans-balkan reverse flow pipeline instead of the RO-MD (Iasi Ungheni), which has higher tariffs. The UA TSO would see similar shift in flows from the PL, SK and HU entry points to the MD entry - and a related revenue loss. All in all the new capacities are not really needed according to modelling, both UA and MD has existing capacites to serve demand. Bilaterally the project can be implemented as costs are very limited, and the TSO revenue losses can be compensated by tariff setting of the hosting countries.

Notes on the results

- GAS_26 MK-KO* Main benefits are attributed to gasification benefits in KO*. The project is competing with GAS_13 (ALKOGAP) in this respect. The project would need an enabler to bring more gas to MK (GAS_04b GR-MK or GAS_11 RS-MK) before connecting KO*. Note: Gasification benefits are overestimated in sectoral modelling.
- GAS_27 RO-UA: In the BAU scenario the project would be used in the UA-RO direction as RO is short on gas in this scenario. The project could be implemented on a bilateral basis as it is beneficial on the hosting countries level only. In the Green scenario the project is redirecting flows form the existing interconnectors (SK-UA PL-UA) as cheap RO production would flow to UA. Consumer benefits in UA are modest compared to reduction in consumer surplus change in RO. TSO operation revenue change can is driving the results.
- GAS_28 Southern Gas Corridor extension (Cluster: SCPFX-TANAPX-TAPX): The cluster is modestly positive
- GAS_29 SCP GE Offtake: New entry point to GE is allowing TPA and SWAP possibilities to traders, who have LTC gas in SCP, mainly in IT and GR. The competition is reducing prices in GE, resulting in the highest B/C for this project in gasified countries

Regional sensitivity - NPV

		BAU				Green			
		EnC	Reg	Host	CP	EnC	Reg	Host	CP
GAS_01	Northern BA-HR	2020	2038	2194	1949	1692	1703	1896	1646
GAS_02	Western BA-HR	2100	2119	2272	2039	1811	1822	2011	1772
GAS_03	Southern BA-HR	1886	1902	2062	1820	1507	1518	1715	1468
GAS_03a	Southern BA-HR + IAP	2683	2698	2864	2591	1613	1613	1790	1544
GAS_04b	GR-MK	2601	2374	2601	2591	2651	2486	2529	2549
GAS_08	RO-RS	-244	16	354	-133	57	24	176	43
GAS_09	BG-RS	-164	-164	-164	-91	-164	-164	-164	-89
GAS_10	HR-RS	332	323	514	145	255	270	481	107
GAS_10a	HR-RS Phase 2	498	514	891	324	580	786	1043	394
GAS_11	RS-MK	2573	2574	2495	2492	2584	2581	2517	2517
GAS_13	ALKOGAP + IAP	5294	5173	5164	5185	5339	5277	5133	5192
GAS_16	IAP	13566	13419	13473	13524	13451	13327	13448	13544
GAS_19	White Stream	-2009	-1212	996	69	-1094	-1001	-1649	500
GAS_22	SCPFX	2298	1944	1537	1622	1999	2098	1444	1505
GAS_25	TB Bi	-36	-52	-54	-42	-129	11	53	-52
GAS_26	MK-KO*	3820	3820	3012	2992	3829	3825	2970	2963
GAS_27	RO-UA	-74	-92	373	-296	-270	-103	-34	-16
GAS_28	TANAPX	1446	1285	1214	802	272	590	857	766
GAS_29	SCP GE offtake	370	229	259	256	388	253	220	189

Regional Sensitivity – B/C

		BAU				Green			
		EnC	Reg	Host	CP	EnC	Reg	Host	CP
GAS_01	Northern BA-HR	22.5	22.7	24.3	23.9	19.0	19.1	21.2	20.4
GAS_02	Western BA-HR	43.9	44.2	47.4	62.8	38.0	38.2	42.0	54.7
GAS_03	Southern BA-HR	17.3	17.4	18.8	19.2	14.0	14.1	15.8	15.7
GAS_03a	Southern BA-HR + IAP	24.1	24.3	25.7	26.9	14.9	14.9	16.4	16.4
GAS_04b	GR-MK	26.2	24.0	26.2	50.8	26.6	25.0	25.5	50.0
GAS_08	RO-RS	-2.9	1.2	6.6	-13.0	1.9	1.4	3.8	5.5
GAS_09	BG-RS	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1
GAS_10	HR-RS	12.4	12.1	18.7	17.1	9.8	10.3	17.6	12.9
GAS_10a	HR-RS Phase 2	4.2	4.3	6.7	6.4	4.7	6.1	7.7	7.6
GAS_11	RS-MK	115.3	115.4	111.9	111.8	115.8	115.7	112.9	112.9
GAS_13	ALKOGAP + IAP	25.8	25.2	25.2	25.3	26.0	25.7	25.0	25.3
GAS_16	IAP	24.2	23.9	24.0	48.1	24.0	23.7	23.9	48.2
GAS_19	White Stream	0.5	0.7	1.2	1.0	0.7	0.8	0.6	1.2
GAS_22	SCPFX	3.2	2.9	2.5	2.5	2.9	3.0	2.4	2.4
GAS_25	TB Bi	-1.5	-2.6	-2.8	-2.0	-8.1	1.8	4.8	-2.7
GAS_26	MK-KO*	54.1	54.1	42.8	42.6	54.2	54.1	42.3	42.1
GAS_27	RO-UA	0.5	0.4	3.3	-7.0	-0.7	0.4	0.8	0.6
GAS_28	TANAPX	1.8	1.7	1.7	1.4	1.2	1.3	1.5	1.4
GAS_29	SCP GE offtake	46.6	29.3	33.0	32.6	48.9	32.2	28.2	24.4

Robustness check

INFRA	As the section connecting the Turkish Stream pipelines via **Bulgaria and Serbia to Hungary** is not in place yet (under construction) but is part of the baseline by 2025, this sensitivity takes the BG-RS-HU pipeline out of the baseline – as if it would not happen
DEMAND	The submitted demand path for the Contracting parties assumes a very optimistic development for gas markets related to gasification of entire countries or regions (Albania, Montenegro, Kosovo*, North Macedonia and Bosnia and Herzegovina). Sensitivity was carried out assuming that **in the newly gasified countries/regions only 50% of the assumed demand increase will materialize**.
LNG	**High Global LNG supply** assumes an oversupplied global LNG market where 1500 TWh LNG reaches Europe **Low LNG supply** assumes that Asian demand centers absorb a huge part of the spot LNG available on the global market leaving about 600 TWh/yr LNG for Europe
TOOT	Instead of putting one infrastructure in a time (PINT), we include all projects and take- one-out-at a time (TOOT).

Sensitivity analysis, NPV EnC (EU27+CP)

		Reference BAU refB	Reference Green refG	No southern route infraB	No southern route infraG	Low gasification demand B	Low gasification demand G	High LNG supply HLNGB	High LNG supply HLNGG	Low LNG supply LLNGB	Low LNG supply LLNGG	TOOTB	TOOTG
GAS_01	Northern BA-HR	2020	1692	2137	1595	998	833	2065	1736	1847	1577	2097	1796
GAS_02	Western BA-HR	2100	1811	2242	1718	1060	914	2145	1856	1926	1696	2086	1827
GAS_03	Southern BA-HR	1886	1507	1953	1402	920	731	1932	1548	1720	1395	2008	1652
GAS_03a	Southern BA-HR (+ IAP)	2683	1613	2784	1487	949	792	2733	1633	2457	1500		
GAS_04b	GR-MK	2601	2651	2652	2613	1269	1306	2693	2558	2523	2334	2747	2753
GAS_08	RO-RS	-244	57	142	-70	-244	57	-230	29	-613	-94	92	61
GAS_09	BG-RS	-164	-164	-411	-164	-164	-164	-164	-164	-164	-161	164	164
GAS_10	HR-RS	332	255	348	-171	332	255	421	268	-28	-27	118	136
GAS_10a	HR-RS Phase 2	498	580	346	38	498	580	740	599	-155	-153	24	113
GAS_11	RS-MK	2573	2584	2642	2661	1279	1286	2569	2599	2692	2551	2569	2670
GAS_13	ALKOGAP (+ IAP)	5294	5339	5288	5332	-60	-68	5312	5335	5020	4970	10491	10434
GAS_16	IAP	13566	13451	13620	13482	6497	6336	13689	13619	12650	12968	3057	3280
GAS_19	White Stream	-2009	-1094	-2220	-1410	-2009	-1094	-2145	-1397	-1457	-91	3040	2891
GAS_22	SCPFX	2298	1999	2031	1663	2298	1999	2247	1667	3075	2800	-813	-98
GAS_25	TransBalkan bidirectional	-36	-129	-26	-105	-36	-129	-46	-108	-25	-202	82	61
GAS_26	MK-KO*	3820	3829	4475	4594	2207	2213	3830	3835	3808	3819	4113	4146
GAS_27	RO-UA	-74	-270	-83	-224	-74	-270	-90	-288	-52	347	191	220
GAS_28	TANAPX	1446	272	1187	87	1446	272	1404	207	2225	1936	750	769
GAS_29	SCP GE offtake	370	388	394	416	370	388	425	345	137	663	169	51

Sensitivity analysis, B/C EnC (EU27+CP)

		Reference BAU refB	Reference Green refG	No southern route infraB	No southern route infraG	Low gasification demand B	Low gasification demand G	High LNG supply HLNGB	High LNG supply HLNGG	Low LNG supply LLNGB	Low LNG supply LLNGG	TOOTB	TOOTG
GAS_01	Northern BA-HR	22.5	19.0	23.7	18.0	11.6	9.9	23.0	19.5	20.7	17.8	-21.3	-18.1
GAS_02	Western BA-HR	43.9	38.0	46.8	36.1	22.6	19.7	44.8	38.9	40.3	35.6	-41.6	-36.3
GAS_03	Southern BA-HR	17.3	14.0	17.8	13.1	8.9	7.3	17.7	14.3	15.8	13.0	-16.3	-13.2
GAS_03a	Southern BA-HR (+ IAP)	24.1	14.9	25.0	13.8	9.2	7.8	24.6	15.1	22.2	13.9		
GAS_04b	GR-MK	26.2	26.6	26.6	26.3	13.3	13.6	27.0	25.7	25.4	23.6	-25.6	-25.6
GAS_08	RO-RS	-2.9	1.9	3.2	-0.1	-2.9	1.9	-2.6	1.5	-8.7	-0.5	-0.5	0.0
GAS_09	BG-RS	0.0	0.0	-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GAS_10	HR-RS	12.4	9.8	13.0	-4.9	12.4	9.8	15.5	10.3	0.0	0.1	-3.1	-3.7
GAS_10a	HR-RS Phase 2	4.2	4.7	3.2	1.2	4.2	4.7	5.8	4.9	0.0	0.0	0.8	0.1
GAS_11	RS-MK	115.3	115.8	118.4	119.3	57.9	58.1	115.2	116.5	120.6	114.4	-113.2	-117.7
GAS_13	ALKOGAP (+ IAP)	25.8	26.0	25.8	26.0	0.7	0.7	25.9	26.0	24.5	24.3	-48.1	-47.8
GAS_16	IAP	24.2	24.0	24.2	24.0	12.1	11.8	24.4	24.2	22.6	23.1	-4.2	-4.6
GAS_19	White Stream	0.5	0.7	0.5	0.7	0.5	0.7	0.5	0.7	0.6	1.0	0.3	0.3
GAS_22	SCPFX	3.2	2.9	2.9	2.6	3.2	2.9	3.1	2.6	3.9	3.7	1.8	1.1
GAS_25	TransBalkan bidirectional	-1.5	-8.1	-0.9	-6.4	-1.5	-8.1	-2.3	-6.6	-0.8	-13.2	-4.8	-3.3
GAS_26	MK-KO*	54.1	54.2	63.2	64.8	31.7	31.7	54.2	54.3	53.9	54.0	-56.1	-56.6
GAS_27	RO-UA	0.5	-0.7	0.5	-0.4	0.5	-0.7	0.4	-0.8	0.7	3.1	-0.2	-0.4
GAS_28	TANAPX	1.8	1.2	1.7	1.0	1.8	1.2	1.8	1.1	2.2	2.1	0.0	0.0
GAS_29	SCP GE offtake	46.6	48.9	49.7	52.3	46.6	48.9	53.5	43.5	18.0	82.9	-19.8	-5.3

Notes on the sensitivity results – PINT: ROBUST results

- Drastic demand growth cut (by 50%) in the demand sensitivity does have a huge impact on project results, but most projects still stay positive.
  (ALKOGAP is the only exception)
- Low LNG supply would negatively impact the HR-RS interconnector and positively the RO-UA interconnector and White Stream. The rest is unimpacted.
- Infrastructure sensitivity results for the BAU are close the 2018 PECI assessment results, as the reference that time did not include Turk Stream +BG-RS-HU.

Notes on sensitivity results - TOOT

- Please note, that the region has too many competing plans, therefore the **TOOT modelling shows that none of them - except for the SCPFX project - would be missed on Energy Community level if all others were implemented**. The competing pairs can be identified by the changes in utilization of the TOOT modelling results, but it is also intuitive:
  - GAS_01 & GAS_02 & GAS_03 connect the same countries, and target the same demand growth in Bosnia.
  - GAS_4a GR-MK is competing with GAS_ 11 RS-MK for the North Macedonian market.
  - GAS_08 Romania Serbia is competing with GAS_19 White Stream for the Romanian market in BAU (without RO production increase)
  - GAS_13 (ALKOGAP) with GAS_26 MK-KO* for the gasification of Kosovo*.
- **TOOT results for the region**: Results on CP level put together a set of projects that provide positive results as a group for the region and are not competitive:
  - In BAU these are: GAS_08 (RO-RS) +GAS_10 (HR-RS) + GAS_22 (SCPFX) + GAS_25 (Trans Balkan) + GAS_29 (SCP GE Offtake)
  - In GREEN: GAS_22 SCPFX + GAS_29 SCP GE Offtake

Agenda

1. Overview of Assessment Methodology
2. Reference scenario for CBA modelling
3. Results of cost-benefit analysis and sensitivities
4. Results of multicriteria assessment and relative ranking

Gas MCA Results – BAU Scenario

Projects in developed gas markets

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weigthted Scores of Indicators				Total Score
		Benefit-Cost Ratio (B/C ratio)	System Reliability Index (SRI)	Import Route Diversification (IRD)	Implementation Progress Indicator (IPI)	B/C ratio	SRI	IRD	IPI	B/C ratio (60%)	SRI (15%)	IRD (10%)	IPI (15%)	
GAS_08	RS-RO	-2.86	0.38	0.28	2.00	0.00	3.28	6.66	2.00	0.00	0.49	0.67	0.30	**1.46**
GAS_09	BG-RS	0.00	0.29	0.20	4.00	0.00	2.73	5.64	4.00	0.00	0.41	0.56	0.60	**1.57**
GAS_10	RS-HR	12.44	0.59	0.29	5.00	8.00	4.52	6.73	5.00	4.80	0.68	0.67	0.75	**6.90**
GAS_10a	RS-HR	4.20	1.17	0.36	5.00	3.15	8.00	7.53	5.00	1.89	1.20	0.75	0.75	**4.59**
GAS_19	GE-RO	0.51	10.51	0.56	1.00	0.00	10.00	10.00	1.00	0.00	1.50	1.00	0.15	**2.65**
GAS_22	AZ-GE	3.19	0.00	-0.01	3.00	2.56	1.00	3.10	3.00	1.53	0.15	0.31	0.45	**2.44**
GAS_25	MD-UA	-1.51	0.77	0.08	2.00	0.00	5.61	4.20	2.00	0.00	0.84	0.42	0.30	**1.56**
GAS_27	RO-UA	0.55	0.02	0.00	1.00	0.00	1.13	3.27	1.00	0.00	0.17	0.33	0.15	**0.65**
GAS_28	GE-TR	1.80	0.88	-0.18	2.00	1.74	6.29	1.00	2.00	1.04	0.94	0.10	0.30	**2.39**
GAS_29	SCP GE offtake	46.63	0.18	0.02	1.00	10.00	2.08	3.41	1.00	6.00	0.31	0.34	0.15	**6.80**

outliers (next one gets 8 points)

Gas MCA Results – GREEN Scenario

Projects in developed gas markets

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weigthted Scores of Indicators				Total Score
		Benefit-Cost Ratio (B/C ratio)	System Reliability Index (SRI)	Import Route Diversification (IRD)	Implementation Progress Indicator (IPI)	B/C ratio	SRI	IRD	IPI	B/C ratio (60%)	SRI (15%)	IRD (10%)	IPI (15%)	
GAS_08	RS-RO	1.90	0.36	0.28	2.00	1.90	3.04	6.66	2.00	1.14	0.46	0.67	0.30	**2.56**
GAS_09	BG-RS	0.00	0.29	0.20	4.00	0.00	2.62	5.64	4.00	0.00	0.39	0.56	0.60	**1.56**
GAS_10	RS-HR	9.78	0.56	0.29	5.00	8.00	4.17	6.73	5.00	4.80	0.62	0.67	0.75	**6.85**
GAS_10a	RS-HR	4.73	1.23	0.36	5.00	4.09	8.00	7.53	5.00	2.45	1.20	0.75	0.75	**5.16**
GAS_19	GE-RO	0.73	12.89	0.56	1.00	0.00	10.00	10.00	1.00	0.00	1.50	1.00	0.15	**2.65**
GAS_22	AZ-GE	2.91	0.00	-0.01	3.00	2.68	1.00	3.10	3.00	1.61	0.15	0.31	0.45	**2.52**
GAS_25	MD-UA	-8.09	0.77	0.08	2.00	0.00	5.36	4.20	2.00	0.00	0.80	0.42	0.30	**1.52**
GAS_27	RO-UA	-0.67	0.02	0.00	1.00	0.00	1.14	3.27	1.00	0.00	0.17	0.33	0.15	**0.65**
GAS_28	GE-TR	1.15	0.41	-0.18	2.00	1.32	3.34	1.00	2.00	0.79	0.50	0.10	0.30	**1.69**
GAS_29	SCP GE offtake	48.89	0.22	0.02	1.00	10.00	2.28	3.41	1.00	6.00	0.34	0.34	0.15	**6.83**

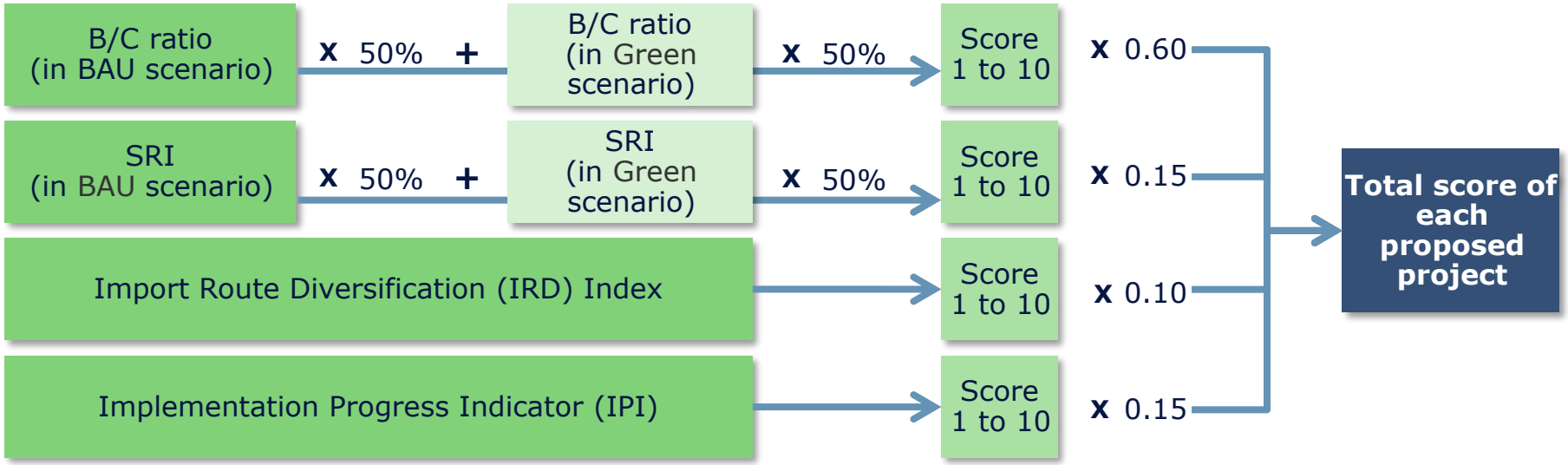
outliers (next one gets 8 points)

Combined Scenario Results – Scoring and Ranking

Application of BAU and ENTSO-E NTS scenario has an impact on CBA results (B/C ratio) and system reliability (System Reliability Index)

- B/C ratio of a project in both scenarios is weighted 50%
- SRI is calculated for both scenarios for each country where the project is located, whereas change of indicator is weighted 50%
- Scoring is then done on the weighted values

Impact on competition (IRD) of alternative scenarios cannot be estimated without strong assumptions (therefore not done), project implementation is not assumed to change with scenarios



Gas MCA Results – Combined for Both Scenarios

Projects in developed gas markets

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weigthted Scores of Indicators				Total Score
		Benefit-Cost Ratio (B/C ratio)	System Reliability Index (SRI)	Import Route Diversification (IRD)	Implementation Progress Indicator (IPI)	B/C ratio	SRI	IRD	IPI	B/C ratio (60%)	SRI (15%)	IRD (10%)	IPI (15%)	
GAS_08	RS-RO	-0.48	0.37	0.28	2.00	0.00	3.16	6.66	2.00	0.00	0.47	0.67	0.30	**1.44**
GAS_09	BG-RS	0.00	0.29	0.20	4.00	0.00	2.67	5.64	4.00	0.00	0.40	0.56	0.60	**1.56**
GAS_10	RS-HR	11.11	0.57	0.29	5.00	8.00	4.34	6.73	5.00	4.80	0.65	0.67	0.75	**6.87**
GAS_10a	RS-HR	4.47	1.20	0.36	5.00	3.57	8.00	7.53	5.00	2.14	1.20	0.75	0.75	**4.84**
GAS_19	GE-RO	0.62	11.70	0.56	1.00	0.00	10.00	10.00	1.00	0.00	1.50	1.00	0.15	**2.65**
GAS_22	AZ-GE	3.05	0.00	-0.01	3.00	2.62	1.00	3.10	3.00	1.57	0.15	0.31	0.45	**2.48**
GAS_25	MD-UA	-4.80	0.77	0.08	2.00	0.00	5.48	4.20	2.00	0.00	0.82	0.42	0.30	**1.54**
GAS_27	RO-UA	-0.06	0.02	0.00	1.00	0.00	1.13	3.27	1.00	0.00	0.17	0.33	0.15	**0.65**
GAS_28	GE-TR	1.48	0.65	-0.18	2.00	1.57	4.77	1.00	2.00	0.94	0.72	0.10	0.30	**2.06**
GAS_29	SCP GE offtake	47.76	0.20	0.02	1.00	10.00	2.18	3.41	1.00	6.00	0.33	0.34	0.15	**6.82**

outliers (next one gets 8 points)

Gas MCA Results – BAU Scenario

Projects in countries with further gasification

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weigthted Scores of Indicators				Total Score
		Benefit -Cost Ratio (B/C ratio)	System Reliability Index (SRI)	Import Route Diversification (IRD)	Implementation Progress Indicator (IPI)	B/C ratio	SRI	IRD	IPI	B/C ratio (60%)	SRI (15%)	IRD (10%)	IPI (15%)	
GAS_01	HR-BA	22.49	2.36	0.26	-8.00	1.99	5.44	3.42	-8.00	1.20	0.82	0.34	-1.20	**1.15**
GAS_02	HR-BA	43.86	1.77	0.30	-8.00	6.06	4.33	3.81	-8.00	3.64	0.65	0.38	-1.20	**3.47**
GAS_03	HR-BA	17.26	2.66	0.42	5.00	1.00	6.00	4.93	5.00	0.60	0.90	0.49	0.75	**2.74**
GAS_03a	HR-BA	24.13	2.56	0.34	5.00	2.31	5.81	4.22	5.00	1.38	0.87	0.42	0.75	**3.43**
GAS_04b	MK-GR	26.15	2.32	0.40	4.00	2.69	5.37	4.73	4.00	1.61	0.80	0.47	0.60	**3.49**
GAS_11	RS-MK	115.34	0.97	0.67	-9.00	10.00	2.82	7.35	-9.00	6.00	0.42	0.73	-1.35	**5.81**
GAS_13	AL-KO*	25.79	4.00	0.13	-7.00	2.62	8.00	2.19	-7.00	1.57	1.20	0.22	-1.05	**1.94**
GAS_16	AL-ME	24.15	20.00	0.95	5.00	2.31	10.00	10.00	5.00	1.39	1.50	1.00	0.75	**4.64**
GAS_26	MK-KO*	54.06	0.00	0.00	2.00	8.00	1.00	1.00	2.00	4.80	0.15	0.10	0.30	**5.35**

outliers (next one gets 8 and 6 points respectively)

Gas MCA Results – GREEN Scenario

Projects in countries with further gasification

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weigthted Scores of Indicators				Total Score
		Benefit -Cost Ratio (B/C ratio)	System Reliability Index (SRI)	Import Route Diversification (IRD)	Implementation Progress Indicator (IPI)	B/C ratio	SRI	IRD	IPI	B/C ratio (60%)	SRI (15%)	IRD (10%)	IPI (15%)	
GAS_01	HR-BA	19.00	2.31	0.26	-8.00	1.87	5.47	3.42	-8.00	1.12	0.82	0.34	-1.20	**1.09**
GAS_02	HR-BA	37.96	1.77	0.30	-8.00	5.18	4.44	3.81	-8.00	3.11	0.67	0.38	-1.20	**2.95**
GAS_03	HR-BA	13.99	2.58	0.42	5.00	1.00	6.00	4.93	5.00	0.60	0.90	0.49	0.75	**2.74**
GAS_03a	HR-BA	14.90	2.49	0.34	5.00	1.16	5.82	4.22	5.00	0.70	0.87	0.42	0.75	**2.74**
GAS_04b	MK-GR	26.63	1.77	0.40	4.00	3.20	4.42	4.73	4.00	1.92	0.66	0.47	0.60	**3.66**
GAS_11	RS-MK	115.82	0.99	0.67	-9.00	10.00	2.91	7.35	-9.00	6.00	0.44	0.73	-1.35	**5.82**
GAS_13	AL-KO*	26.00	4.00	0.13	-7.00	3.09	8.00	2.19	-7.00	1.85	1.20	0.22	-1.05	**2.22**
GAS_16	AL-ME	23.95	19.83	0.95	5.00	2.74	10.00	10.00	5.00	1.64	1.50	1.00	0.75	**4.89**
GAS_26	MK-KO*	54.18	0.00	0.00	2.00	8.00	1.00	1.00	2.00	4.80	0.15	0.10	0.30	**5.35**

outliers (next one gets 8 and 6 points respectively)

Gas MCA Results – Combined for Both Scenarios

Projects in countries with further gasification

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weigthted Scores of Indicators				Total Score
		Benefit -Cost Ratio (B/C ratio)	System Reliability Index (SRI)	Import Route Diversification (IRD)	Implementation Progress Indicator (IPI)	B/C ratio	SRI	IRD	IPI	B/C ratio (60%)	SRI (15%)	IRD (10%)	IPI (15%)	
GAS_01	HR-BA	20.74	2.33	0.26	-8.00	1.93	5.46	3.42	-8.00	1.16	0.82	0.34	-1.20	**1.12**
GAS_02	HR-BA	40.91	1.77	0.30	-8.00	5.60	4.39	3.81	-8.00	3.36	0.66	0.38	-1.20	**3.20**
GAS_03	HR-BA	15.63	2.62	0.42	5.00	1.00	6.00	4.93	5.00	0.60	1.20	0.49	0.75	**3.04**
GAS_03a	HR-BA	19.52	2.52	0.34	5.00	1.71	5.82	4.22	5.00	1.02	0.87	0.42	0.75	**3.07**
GAS_04b	MK-GR	26.39	2.04	0.40	4.00	2.96	4.90	4.73	4.00	1.77	0.74	0.47	0.60	**3.58**
GAS_11	RS-MK	115.58	0.98	0.67	-9.00	10.00	2.87	7.35	-9.00	6.00	0.43	0.73	-1.35	**5.82**
GAS_13	AL-KO*	25.89	4.00	0.13	-7.00	2.87	8.00	2.19	-7.00	1.72	1.20	0.22	-1.05	**2.09**
GAS_16	AL-ME	24.05	19.88	0.95	5.00	2.53	10.00	10.00	5.00	1.52	1.50	1.00	0.75	**4.77**
GAS_26	MK-KO*	54.12	0.00	0.00	2.00	8.00	1.00	1.00	2.00	4.80	0.15	0.10	0.30	**5.35**

outliers (next one gets 8 and 6 points respectively)

Projects with a negative NPV or B/C Ratio below 1 (based on both Scenarios)

Projects with a significantly negative NPV or B/C ratio below 1 – i.e. indicating that its benefits do not outweigh its cost – would not comply with the eligibility criterion of Regulation 347/2013 as adopted by the Ministerial Council for the Energy Community and are therefore not included in the relative ranking

Project Code	Project Name
GAS_19	Whitestream
GAS_09	Gas Interconnector Bulgaria Serbia
GAS_25	Trans-Balkan Bi-directional Flow
GAS_08	Gas Interconnector Serbia Romania
GAS_27	Interconnector Romania - Ukraine

Relative Ranking of Gas Projects (based on both Scenarios)

Projects in developed gas markets

Rank	Project Code	Project Name
1	GAS_10	Gas Interconnector Serbia-Croatia
2	GAS_29	SCP Georgian Offtake Expansion for EU LNG Swap
3	GAS_10a	Gas Interconnector Serbia-Croatia Phase 2
4	GAS_22	SCPFX
5	GAS_28	TANAPX

Positive NPVs

B/C Ratio above 1

Relative Ranking of Gas Projects (based on both Scenarios)

Projects in countries with further gasification

Rank	Project Code	Project Name
1	GAS_11	Gas Interconnector Serbia – North Macedonia
2	GAS_26	Gas Interconnection North Macedonia – Kosovo*
3	GAS_16	Ionian Adriatic Pipeline (IAP)
4	GAS_04b	Gas Interconnector Greece – North Macedonia
5	GAS_02	Interconnection Pipeline BiH-HR (Licka Jesenica-Trzac-Bosanska Krupa)
6	GAS_03a	Interconnector BiH-HR (Zagvozd-Posusje-Travnik)
7	GAS_03	Interconnector BiH-HR (Zagvozd-Posusje-Travnik)
8	GAS_13	Albania Kosovo* Gas Pipeline (ALKOGAP)
9	GAS_01	Interconnection Pipeline BiH-HR (Slobodnica-Brod-Zenica)

Positive NPVs

B/C Ratio above 1

Oil Assessment - Results and Ranking

PECI / PMI Projects

Project Code	Project Name	Countries	Eligibility for PECI or PMI status?	Costs and benefits	Security of supply	Environmental risk mitigation	Interoperability	Project maturity	Rank
OIL_01	Brody – Adamowo oil pipeline	UA, PL	Eligible for PECI status	As the project already holds the status of PCI and PECI it was already shown that benefits outweigh costs	Improved security of supply by diversification of oil supply routes and sources and reverse flow possibilities	Avoiding shipping risks and emissions	High level of interoperability	Mature	**1**
OIL_02	Transportation of different crudes of oil via Southern Druzhba pipeline	GE, UA, AT, HU, CZ, SK	Eligible for PMI status	Costs indicated in the documentation are very low compared to this, large benefits are foreseen	Improved security of supply through supply source diversification and increased supply stability	Avoiding shipping risks and emissions	Interoperability is assured	Preparatory	**2**

Thank you!

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