REKK Regional Centre for Energy Policy Research

Self-assessment and development options for the Slovenian gas market

Public consultation

Maribor, 16 May 2018

Agenda

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- Overview of Slovenian gas market characteristics & price trends
- Expected development of regional wholesale markets
- Market development options for Slovenia
- CBA with REKK's European Gas Market model
- Q&A

OVERVIEW OF SLOVENIAN GAS MARKET CHARACTERISTICS & PRICE TRENDS

Snapshot of the Slovenian gas market

- Small market dominated by industrial consumption, and significant transit activity (0.9 bcm domestic consumption and 1.3 bcm transit)
  - Little prospect for a liquid trading platform because of small volumes
- Minor role of gas in the primary energy supply (around 10% in recent years)
  - Electricity generation and space heating are dominated by other fuels/resources
- Strong interconnections with large import capacities and proximity to liquid hubs (CEGH, PSV)
  - Trading platforms within easy reach of market players
  - Infrastructure development plans for source diversification

The ACER Gas Target Model

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Market participants' needs metrics

	Threshold		
Metric	**Day-ahead product**	**Front month product**	**Forward**
1. Order book volume	≥ 2,000 MW on each bid- and offer-side	≥ 470 MW on each bid- and offer-side	≥ 120 MW on each bid- and offer-side for 17 months ahead
2. Bid-offer spread	≤ 0.4% of bid-price	≤ 0.2% of bid-price	≤ 0.7% of bid-price for 24 months ahead
3. Order book price sensitivity	≤ 0.02% price distance between average price for 120 MW and best price on each bid- and offer-side	≤ 0.1% price distance between average price for 120 MW and best price on each bid- and offer-side	≤ 0.2% price distance between average price for 120 MW and best price on each bid- and offer-side for 24 months ahead
4. Number of trades	≥ 420 trades per day	≥ 160 trades per day	≥ 8 trades per day for 22 months ahead

Are products and liquidity available such that effective management of wholesale market risk is possible?

Market health metrics

	Threshold
Metric	**Spot, prompt and forward market together**
5. Herfindahl-Hirschmann Index	≤ 2000
6. Number of supply sources	≥ 3
7. Residual Supply Index	≥ 110%
8. Market concentration for bid and offer activities	≤ 40% market share per company (or group of companies) for the best 120 MW on each bid- and offer-side
9. Market concentration for trading activities	≤ 40% market share per company (or group of companies) for the sale and purchase of gas

Is the wholesale market area competitive, resilient, and has a high degree of security of supply?

Prospects of competition

- Assessment of ‚market health' using AGTM metrics
  - High HHI (8256) >> high concentration (indicating heavy dependence on Russian sources)
  - Majority of gas demand is supplied under Russian LTC
  - Fair number of supply sources (3) >> diversity of supply sources
  - Residual Supply Index (RSI) >> unable to cover gas demand in the abscence of the largest supplier
- Taking another view: the functioning of the regional market
  - EC Decision in the Petrol/Geoplin merger case: the relevant market for wholesale gas supply is not limited to Slovenia, but includes, at least, suppliers who operate on the CEGH VTP
  - There were no barriers for either foreign suppliers to serve Slovenian wholesalers/retailers or for the latter to source gas directly at CEGH VTP
  - LTC does not result in foreclosure issues; Geoplin customers can easily switch supplier

Prospects of competition

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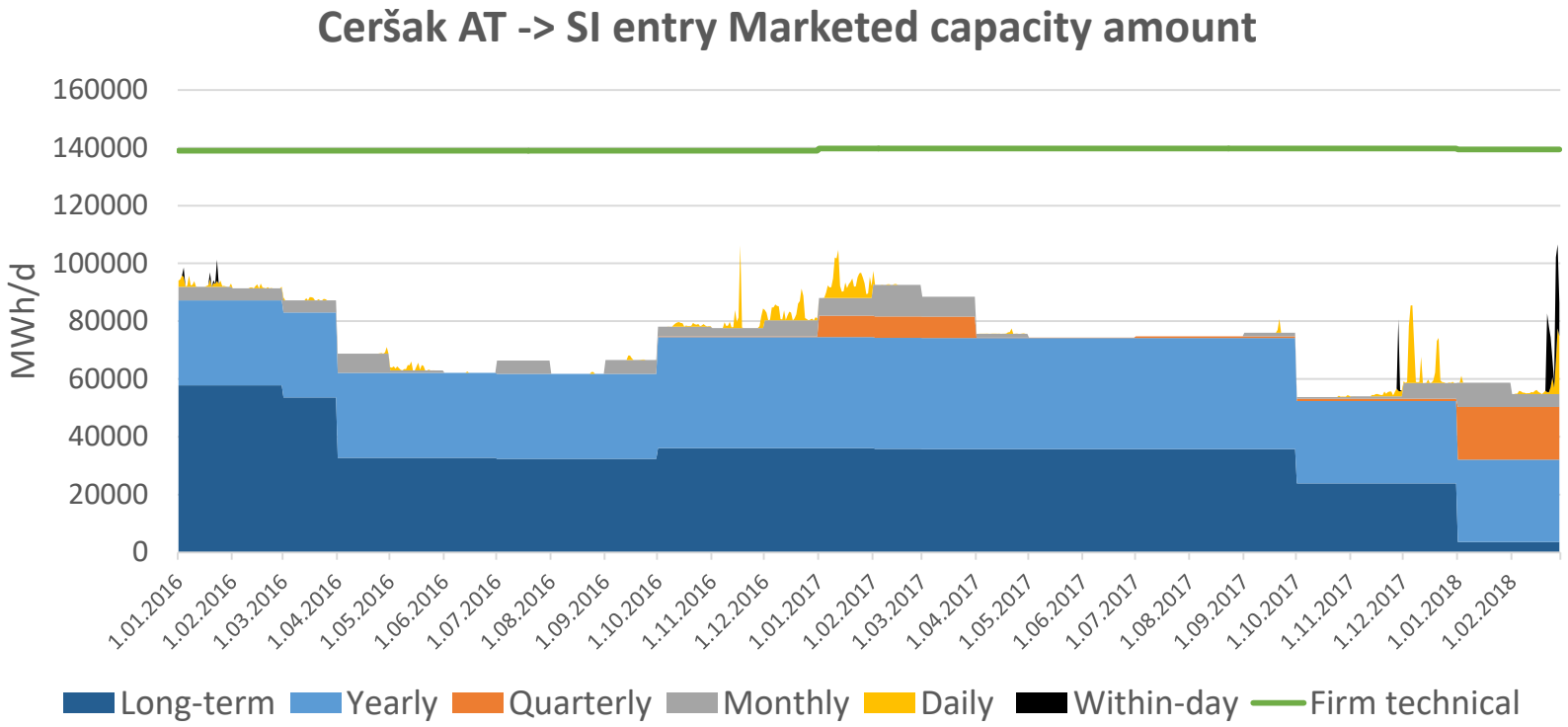
Industrial gas prices in the region (EUR/MWh)

Gas prices paid by Slovenian industrial customers have converged to regional average

Prospects of competition



Transition to more short-term bookings on the AT-SI interconnector

Prospects of competition

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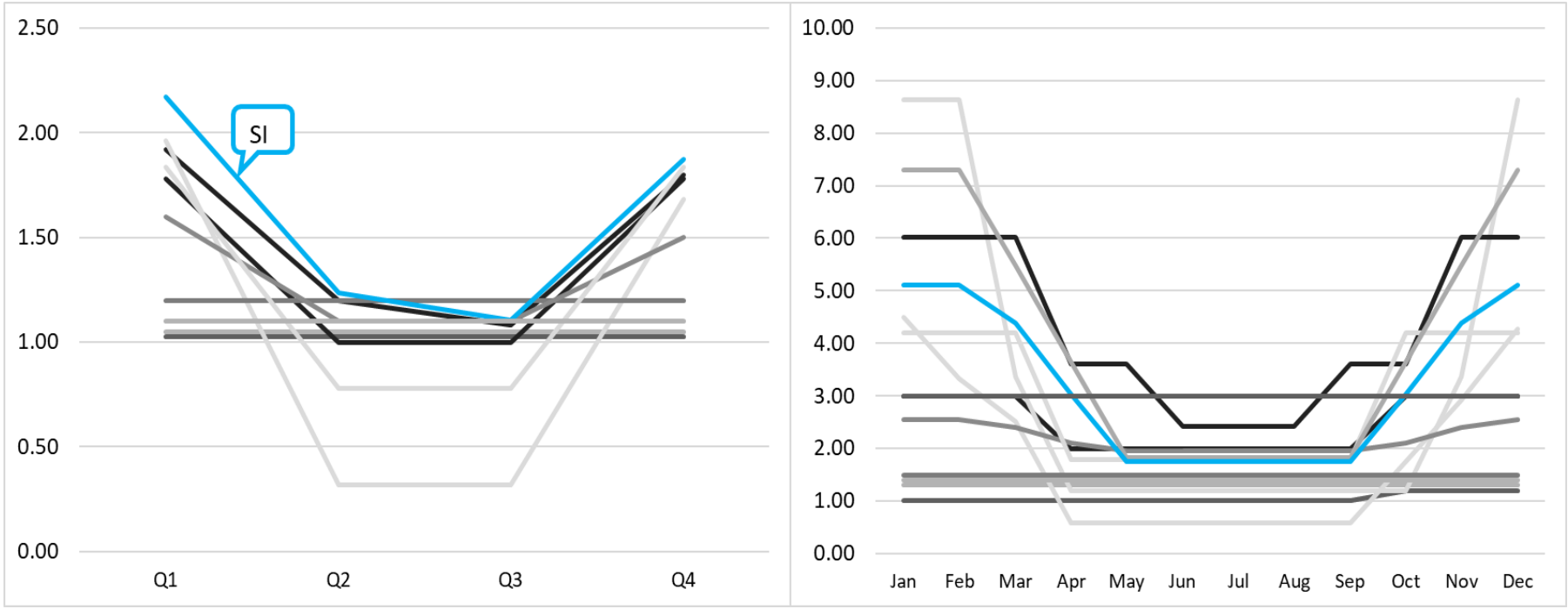
Multipliers for quarterly (left) and daily products (right) in the region



The Energy Agency will fully implement TAR NC and also lower short term tariffs after 2019

EXPECTED DEVELOPMENT OF REGIONAL WHOLESALE MARKETS

Important infrastructure projects in the region

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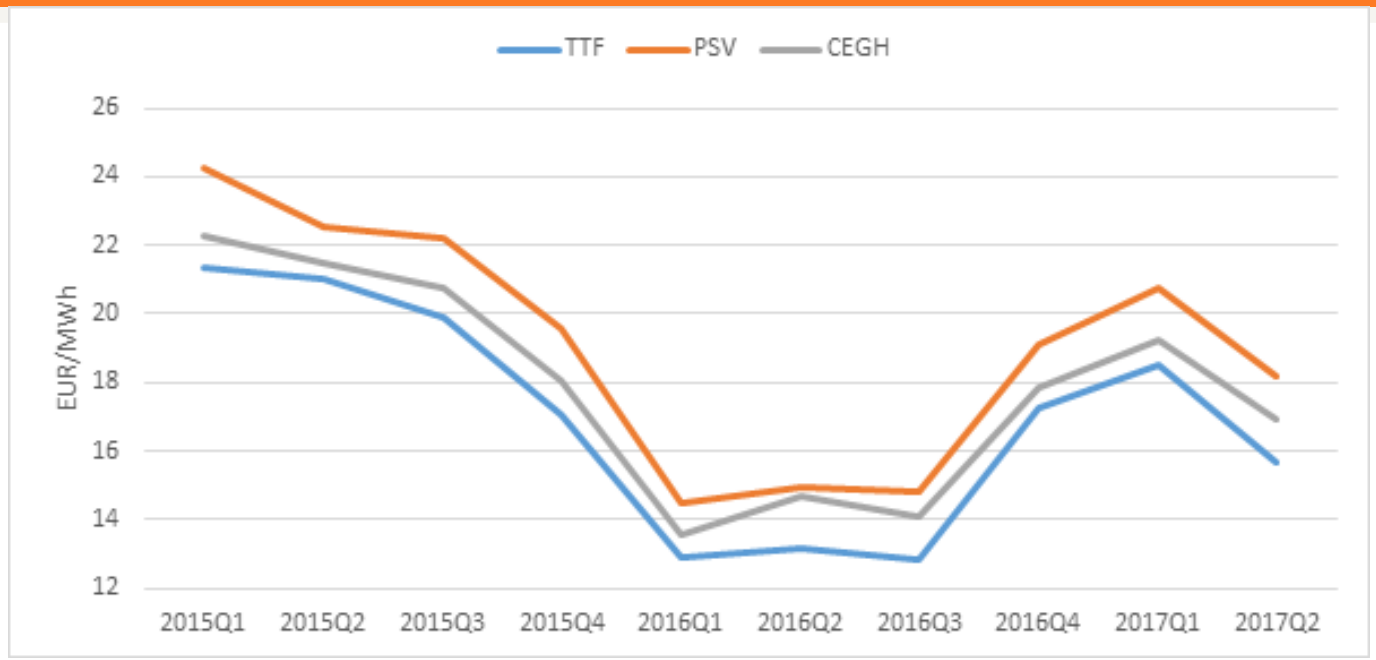
- Croatian LNG may contribute to supply source diversification and more competition
  - New deadline for submitting bids: 8 June
  - With a new Croatian LTC with Russia, the project mainly depends on Hungarian commitment
  - Property issues & environmental concerns
- Turkish Stream
  - Second string to bring Russian gas to the region may be in place by end-2019
  - Competing routes: with the IT-SI-HU project in place, Slovenia could benefit
- Black Sea gas production
  - PCI Romania-Hungary-Austria reduced to Romania-Hungary
  - Slovenia could only access this new source once the SI-HU interconnector is built
- Trans-Adriatic pipeline
  - Another diversification option for Slovenia through the currently unutilised IT-SI interconnector

The Italian „liquidity corridor”



- Controversial measure not expected to be introduced this year
- Just one example of Italy’s resolve to become a center for gravity for the regional gas market
    - Energy Strategy would phase out coal and promote gas
    - Infrastructure projects targeting both new and existing sources: two additional LNG terminals, upgrade of interconnections with North Africa, east Mediterranean project (additional 14 bcm capacity by 2025)
    - The goal is to become oversupplied: prices may decline
    - New mechanism of regas capacity auctions to attract more spot LNG

The future of long-term contracts

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- More flexible LTCs with shorter contract duration covering only „baseload" gas consumption
- Full hub indexation or „indirect spot pricing"
- Some risks related to market power issues remain
  - If minimum ToP levels are high, the national wholesaler has limited incentive to purchase gas from more competitive sources, and has limited ability to react to price movements
  - This may be a relevant concern for Slovenia with a new LTC covering more than 60% of consumption, but there is sufficient competition on a regional level
- No more destination clauses in LTCs, but long-term capacity bookings can be used to block competition
  - Russian LTC is part of the reason of AT-IT congestion
  - PRISMA auction of March 2017: Gazprom booked long-term the most important existing and new trading routes from DE to CZ and SK

DEVELOPMENT OPTIONS FOR SLOVENIA

Current regulatory framework

- Elaborated regulatory framework with clear and detailed rules (1 DIR, 1 REG, 4 FGs, 5 NCs)
  - Separate entry-exit systems (and virtual trading points)
  - Market based balancing by procuring/offering short term products on newly established trading platforms
  - Cost-reflective and non-discriminatory E/E tariffs
  - Interconnection via explicit capacity allocation (joint booking platforms & secondary capacity markets)
  - Congestion management practices to maximise capacity utilisation (oversubscription, capacity buy-back, capacity surrender, firm day ahead and long-term UIOLI)
- ACER: Regulation in force and Network Codes are insufficient to integrate markets >> additional measures are needed to deliver truly competitive markets
  - Countries/markets failing to meet AGTM metrics are recommended to take action
  - Implementation is recommended, but non-binding!

Current regulatory framework

Strengths

- First priority of the European Union is to implement and enforce current regulation
- Legally binding regulations and rules: non-compliance exposes Member States to trouble with the EU Commission

Weaknesses

- Current regulation has not much to say about how to bring liquidity into small markets
- Final Network Codes are the result of compromise between several stakeholders: they are far from being perfect

Opportunities

- Effective implementation and enforcement of current regulations has huge potential for improving markets

Threats

- Implementation may be a long journey and results are uncertain (e.g. long-term UIOLI)

Market merger & Trading region

Strengths

- Better liquidity with lower transaction costs, better price transparency and access to flexibility
- Improved market efficiency due to the abolishment of intra-zone tariffs
- Easier and less costly portfolio management due to bigger balancing zone

Weaknesses

- Slow and costly to establish (great deal of harmonization, inter-TSO compensation)
- Price signals are lost: market-based financing of incremental capacities become impossible
- „Tariff pancaking", contractual congestion are not issues for Slovenia

Opportunities

- Better competition, lower prices for Slovenia

Threats

- May result is physical congestions that need to be tackled by TSOs
- Re-dispatch would only be possible if both Austria and Italy participate
- Tariffs may increase and become less cost-reflective
- Sovereignty issues if a joint TSO is considered

Satellite market

Strengths

- Less harmonization requirement
- Improved market efficiency due to the abolishment of intra-zone tariffs

Weaknesses

- Inter-TSO compensation may become necessary

Opportunities

- Increased competition, lower prices for Slovenia

Threats

- Depends on an Italy-Austria market merger with no other source of supply for Slovenia

Market Coupling

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Strengths

- MC improves liquidity of spot markets in smaller zones and brings about price convergence
- Easier and less costly implementation (compared to market merger)
- No more risk for traders of having gas without cross-border capacity

Weaknesses

- Limited amount of day-ahead capacities restricts price convergence
- Regulated tariff for capacities limits price convergence and kills price signals indicating congestions
- MC mechanism in gas markets doesn't have long track record
- Not much improvement compared to explicit capacity allocation

Opportunities

- Multilateral market coupling can lead to price convergence within a bigger region
- Full implementation of long-term UIOLI may increase the amount of short-term capacities and the effects of MC

Threats

- TSO may lose revenues on congested borders (restricting investment)

Conclusions

- Slovenia performs poorly if measured by AGTM metrics, but
  - The proper functioning of the regional market is acknowledged by the EC
  - Stakeholders did not raise any serious barrier to trade during the consultation
  - Several regional infrastructure projects are on the table that may contribute to more diversification and competition
- Slovenia is currently much more connected to the Austrian market, but Italy may also become relevant
  - CEGH may become less liquid once Russian LTCs expire
  - Austria is more exposed to Russian dominance and market foreclosure
  - PSV is already bigger in terms of traded volumes and number of traders (although less liquid)
  - Slovenia may benefit from Italian ambitions for more diversification and liquidity
- Security of Supply considerations
  - Cross-border capacity curtailment in times of crises is prohibited by Regulation 2017/1938
  - Access to infrastructure must be maintained as far as technically and safely possible, irrespective of any market integration model
- **It was agreed based on the market assessment that no formal market integration model should be pursued for Slovenia**

CBA WITH REKK'S EUROPEAN GAS MARKET MODEL

Gas market modelling

AIM: As the Slovenian market is currently functioning well, modelling tested the most important factors that might influence the health of the Slovenian gas market

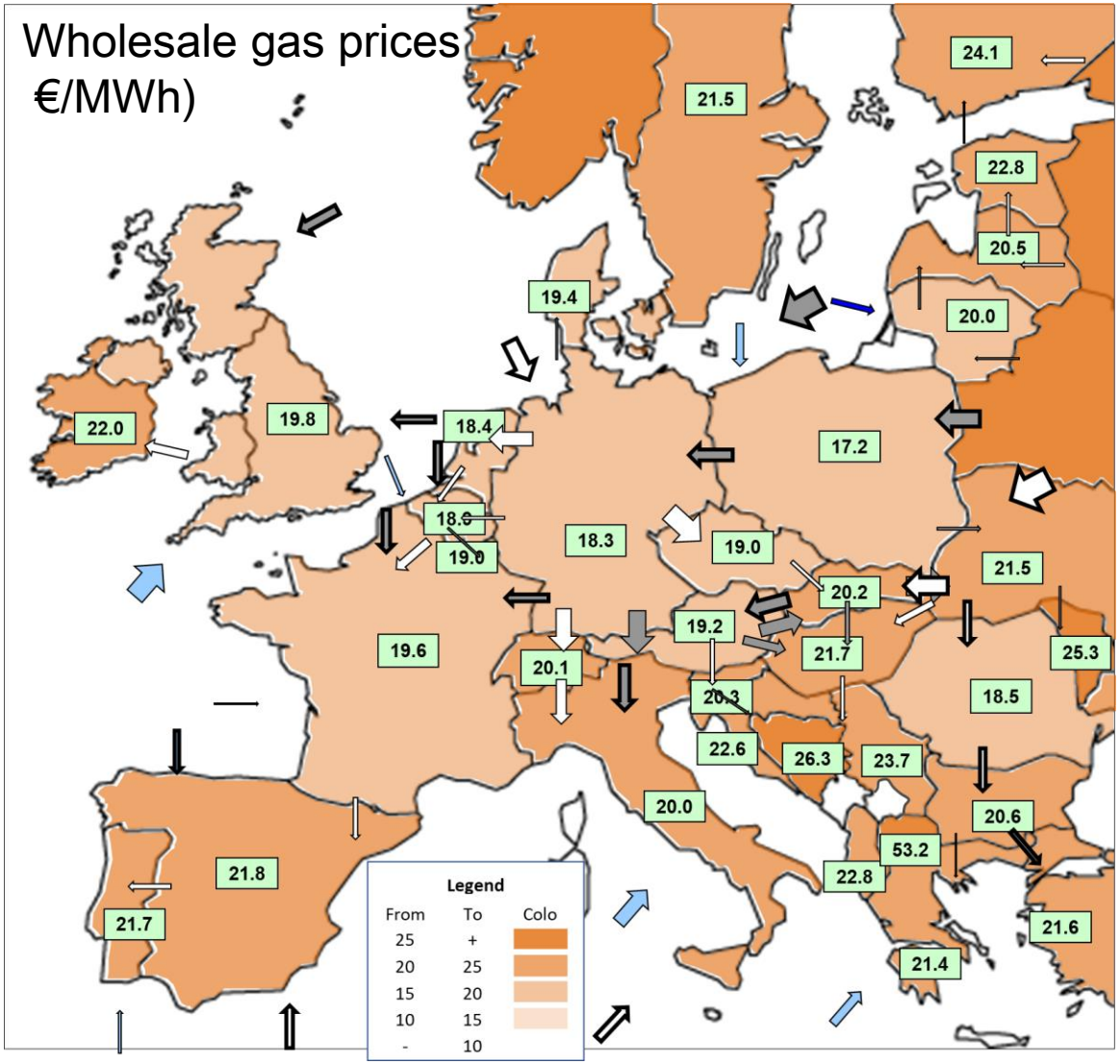
The following scenarios were modelled for the year 2021:

1. Slovenian gas demand changes
   - +/- 10%, +/-20%, +20% with higher seasonal swing
2. Non-availability of the AT-SI interconnector
3. Krk LNG terminal with the possibility of reverse flows on the SI-HR interconnector is built
4. Slovenian tariffs increase
5. SI-HU interconnector (first phase) built

+1 The impact of the trading region as proposed by the Austrian NRA in their study (IT+AT+SI+HR)

- Zero tariffs are assumed inside the trading region while entry and exit tariffs into the region are increased in order to reach similar TSO revenues

Austria is the cheapest available source for SI 2021



Pipeline	Yearly utilization
AT-SI	52%
IT-SI	0%
SI-HR	54%
SI-IT	0%

- SI price is close AT prices
- HU is more expensive and pipelines are congested from the West.
- AT-SI pipeline does not get congested even in winter

Impact of Slovenian gas demand changes is negligable

Price change compared to the reference due to demand change (€/MWh):

	+10%	-10%	+20%	-20%	+20%+higher swing
SI	0.001	-0.004	0.019	-0.005	0.185
AT	0.001	-0.004	0.019	-0.005	0.019
HR	0.001	-0.004	0.019	-0.005	0.019
HU	0.001	-0.004	0.020	-0.004	0.020
IT	0.000	0.000	0.000	0.000	0.000

- This is the only scenario when AT-.SI gets congested in one winter month

Yearly average pipeline utilization in different scenarios:

	Reference	+10%	-10%	+20%	-20%	+20%+higher swing
AT-SI	52%	55%	49%	57%	47%	57%
IT-SI	0%	0%	0%	0%	0%	0%
SI-HR	54%	54%	54%	54%	54%	54%
SI-IT	0%	0%	0%	0%	0%	0%

- demand changes affect the flows through the AT-SI interconnector, but Croatian transit remains unchanged, and the SI-IT interconnector unused

Impact of Slovenian gas demand changes

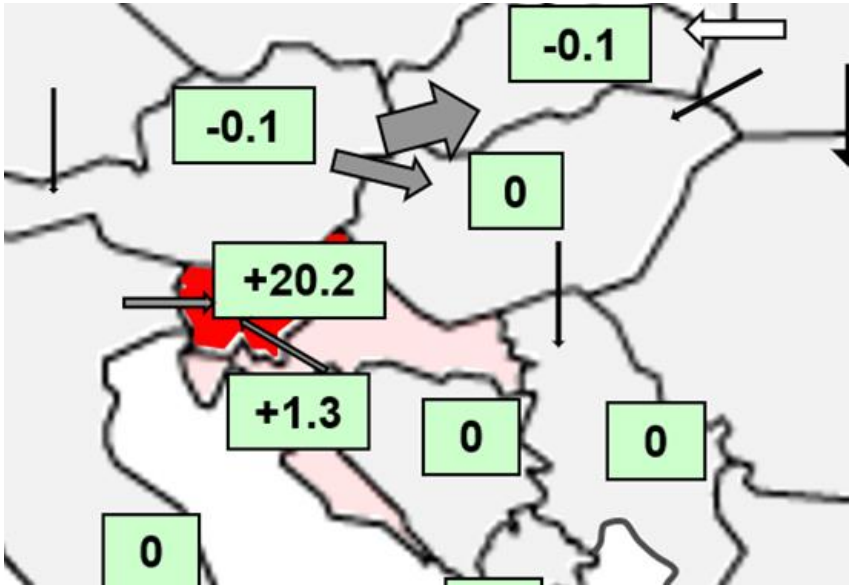
Welfare change in case of 20% demand increase and higher seasonal swing:

Welfare change m €/year	Net consumer surplus	Producer surplus	SSO operating profit	Storage arbitrage profit	Net profit of LTC buyers	TSO profit	LNG operator profit	Total Welfare
SI	124.8	0.0	0.0	0.0	0.0	6.2	0.0	131.1
AT	-1.7	0.3	0.0	0.0	1.4	1.5	0.0	1.4
HR	-0.6	0.4	0.0	0.0	0.0	0.0	0.0	-0.2
HU	-2.0	0.3	0.0	-0.2	0.7	0.1	0.0	-1.1
IT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total region	120.6	0.9	0.0	-0.2	2.1	7.8	0.0	131.1

- Total welfare in Slovenia increases by 131.1 mEUR per year, primarily due to the increase of consumers' welfare.
- The other – but smaller – part of welfare increase is the increase of TSO-profit: operational profit increase due to larger flows on interconnectors.

Impact of the non-availability of the AT-SI interconnector is huge

Price increase in January, €/MWh



- AT-SI interconnector is unavailable in January for a whole month
- it is assumed that reverse flow on the SI-HR interconnector is partly enabled: 7.75 GWh/day

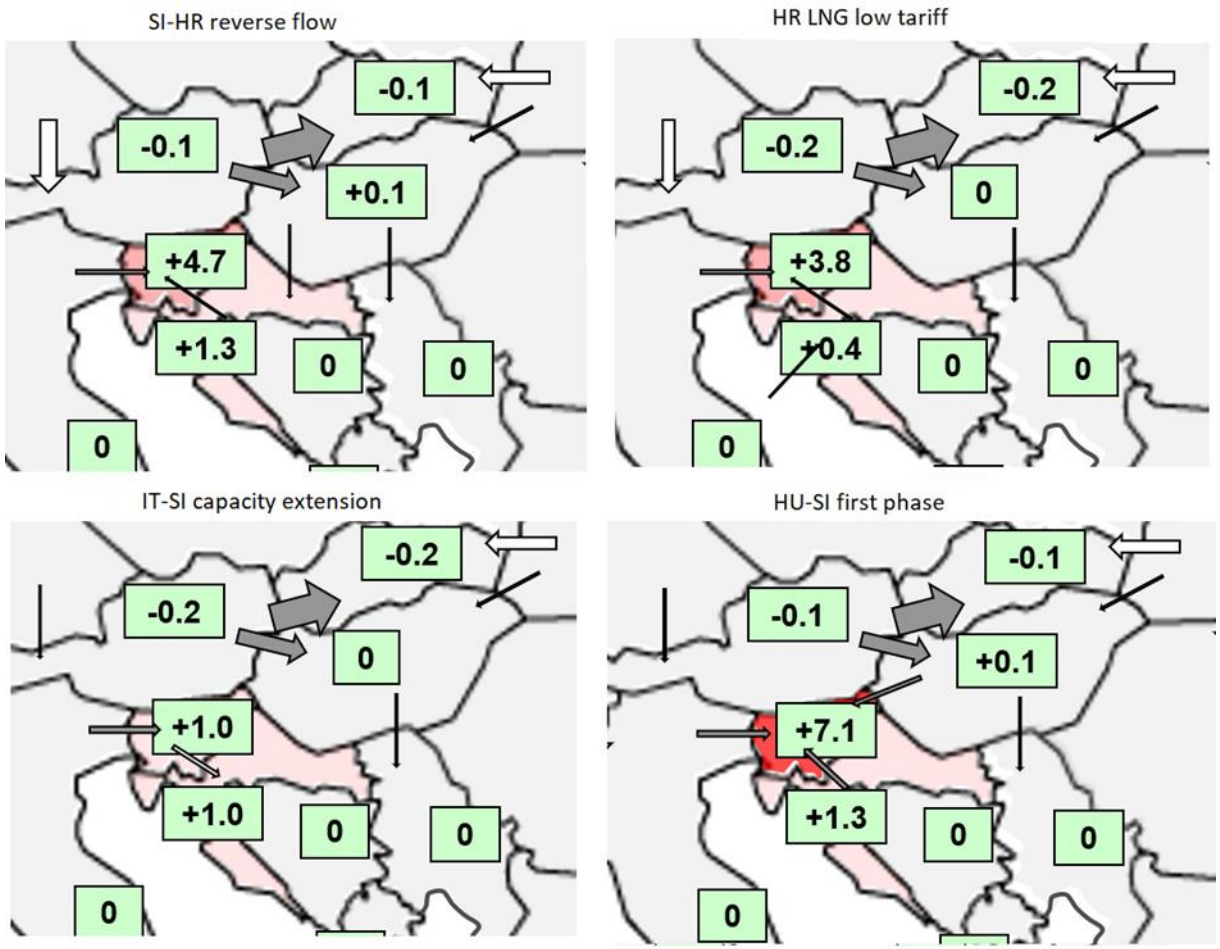
Infra	Utilization in January	
	Reference	no AT-SI
AT-SI	47%	0%
IT-SI	0%	100%
HR-SI	0%	100%
SI-HR	18%	0%
SI-IT	0%	0%

Welfare change mEUR/year	Net consumer surplus	Producer surplus	SSO operating profit	Storage arbitrage profit	Net profit of LTC buyers	TSO profit	LNG operator profit	Total Welfare
SI	**-23.7**	**0.0**	**0.0**	**0.0**	**0.0**	**10.1**	**0.0**	**-13.6**
AT	5.0	-0.6	0.0	-4.1	-1.8	1.1	0.0	-0.3
HR	-6.9	3.5	0.2	1.8	0.0	3.1	0.0	1.7
HU	-1.6	0.1	0.0	1.0	0.0	1.3	0.0	0.8
IT	4.3	-0.4	0.0	0.0	-3.8	9.5	0.0	9.6
Total region	-22.9	2.7	0.2	-1.4	-5.6	25.1	0.0	-1.9

Numerous options are available to mitigate the risk

- In order to analyze some factors which may mitigate these negative effects, the following scenarios will be examined:
  - Construction of SI-HR reverse flow (165 GWh/day is available in both direction);
  - Construction of SI-HR reverse flow and the Krk LNG terminal – assuming high (3 €/MWh) and low (1.5 €/MWh) regasification tariff;
  - Capacity enlargement on the IT-SI interconnector up to 47 GWh/day;
  - Construction of the first phase of the HU-SI bidirectional interconnector (8 GWh/day).

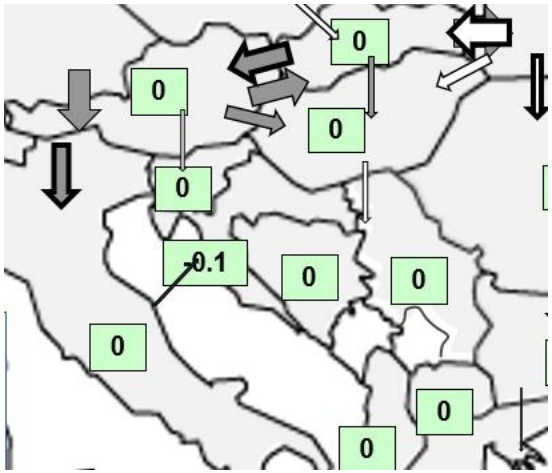
January price effect of different scenarios (€/MWh)



Impact of the Krk LNG terminal with reverse flows enabled on the SI-HR interconnector

- In case of these results 1.5 €/MWh regas fee was assumed (in case of 3 €/MWh there is no LNG import in this year)

Price change due to HR LNG, €/MWh

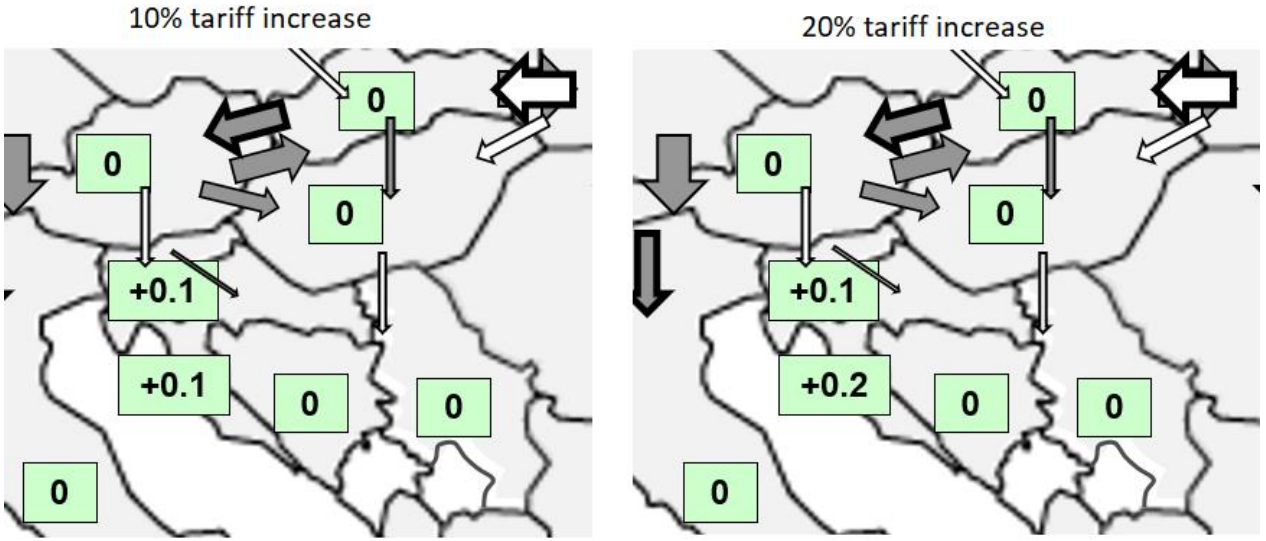


LNG terminal is used (yearly utilization is 20%),
LNG does not leave Croatia, and prices decrease only marginally even in Croatia.
Croatian transit through Slovenia decreases, which leads to lower utilization of both the AT-SI and the SI-HR interconnectors.

Welfare change m €/year	Net consumer surplus (m€)	Producer surplus (m€)	SSO operating profit (m€)	Storage arbitrage profit (m€)	Net profit of LTC buyers (m€)	TSO profit	LNG operator profit	Total Welfare
SI	0,2	0,0	0,0	0,0	0,0	-6,4	0,0	-6,2
AT	1,4	-0,2	0,0	0,0	-1,1	-11,5	0,0	-11,4
HR	3,8	-2,5	0,0	0,7	0,0	-9,4	11,2	3,9
HU	1,6	-0,2	0,0	0,1	-0,5	0,0	0,0	0,9
IT	0,0	0,0	0,0	0,0	-3,2	-5,1	0,0	-8,3
Total region	6,9	-2,9	0,0	0,8	-4,8	-32,5	11,2	-21,2

Impact of Slovenian tariff increase on prices is negligible

Price change due to tariff increase, €/MWh

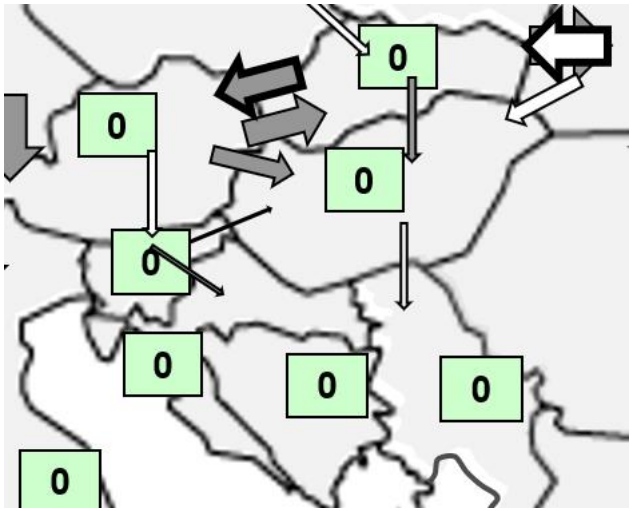


Infra	Yearly utilization		
	Refe-rence	+10%	+20%
AT-SI	52.0%	51.9%	51.9%
IT-SI	0.0%	0.0%	0.0%
SI-HR	53.6%	53.5%	53.3%
SI-IT	0.0%	0.0%	0.0%

Welfare change due to 20% tariff increase

Welfare change m €/year	Net consumer surplus (m€)	Producer surplus (m€)	SSO operating profit (m€)	Storage arbitrage profit (m€)	Net profit of LTC buyers (m€)	TSO profit	LNG operator profit	Total Welfare
SI	-0,5	0,0	0,0	0,0	0,0	1,5	0,0	1,0
AT	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
HR	-2,9	1,9	0,0	0,0	0,0	-0,1	0,0	-1,1
HU	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
IT	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Total region	-3,4	1,9	0,0	0,0	0,0	1,4	0,0	-0,1

Impact of SI-HU interconnector (first phase) is positive

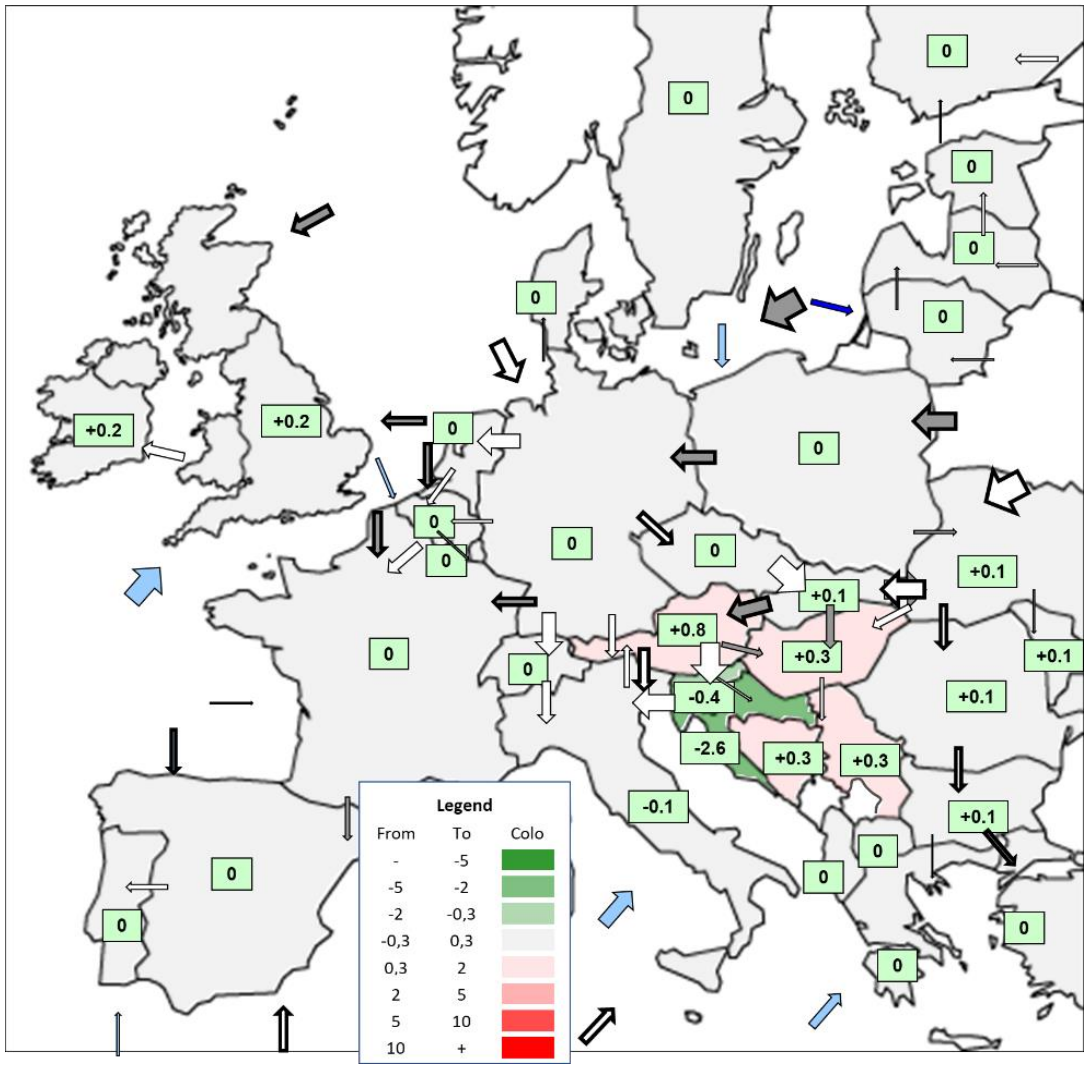


Infra	Yearly utilization reference	Yearly utilization SI-HU
AT-SI	52%	57%
IT-SI	0%	0%
SI-HR	54%	54%
SI-IT	0%	0%
SI-HU		100%
HU-SI		0%

Welfare change m €/year	Net consumer surplus	Producer surplus	SSO operating profit	Storage arbitrage profit	Net profit of LTC buyers	TSO profit	LNG operator profit	Total Welfare
SI	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0
AT	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8
HR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HU	0.0	0.0	-0.4	0.0	0.0	-0.8	0.0	-1.1
IT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total region	0.0	0.0	-0.4	0.0	0.0	2.1	0.0	1.7

Market merger scenario: AT+HR+IT+SI trading region

Price change due to tariff increase, €/MWh



- Zero tariffs are assumed inside the trading region
- Capacities inside the region are not constrained
- Entry and exit tariffs at the borders of the region are increased with the same increment in order to reach similar TSO revenues
- Necessary increment: +0.85 €/MWh (0.1% difference in total TSO revenue compared to the reference)

Market merger scenario: AT+HR+IT+SI trading region

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Yearly utilization

	Reference	Market merger
DE-AT	73%	28%
CH-IT	25%	21%
SK-AT	66%	66%
HU-HR	0%	0%
DZ-IT	60%	60%
TAP-IT	0%	0%
CZ-SK	9%	45%
DE-CZ	15%	30%
SK-HU	48%	90%
AT-DE	0%	0%
AT-SK	80%	0%
AT-HU	100%	57%
HR-HU	0%	0%
IT-CH	0%	0%

- Because of increased Italian demand and increased tariffs, there are no flows from Austria to Slovakia. Instead, Slovakia is supplied through the Czech Republic, explaining the decrease of flows on the Germany-Austria interconnector as well.
- For the same reasons, flows from Austria to Hungary decrease significantly, which are compensated through the SK-HU interconnector. This change in flow patterns result in a slight price increase in Hungary.

Welfare change m €/year	Net consumer surplus	Producer surplus	SSO operating profit	Storage arbitrage profit	Net profit of LTC buyers	TSO operational profit*	TSO auction revenues	LNG operator profit	Total Welfare
SI	4.2	0.0	0.0	0.0	-0.2	-33.8	0.0	0.0	-29.9
AT	-76.1	11.2	0.2	0.0	72.7	63.4	-24.3	0.0	47.0
HR	77.3	-49.9	0.0	0.3	0.0	-17.5	0.0	0.0	10.1
IT	47.4	-4.5	-0.1	-5.1	-35.3	-10.6	0.1	0.0	-8.0
Total	52.8	-43.2	0.1	-4.9	37.2	1.5	-24.3	0.0	19.2