

ENTSO-E's Workshop with Stakeholders on TYNDP 2014

Continental Central East Regional Investment Plan 2014

Main results and messages

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Reliable Sustainable Connected

Key messages from CCE RgIP 2014

- Significant change in generation portfolio will continue to drive the grid development
 - ✓ connection of new generation, mainly from RES: 54% share of the total installed capacity in the CCE region and 30% share of the total installed capacity in the ENTSO-E area
 - ✓ an increase in nuclear capacities is noticeable in some CCE countries: CZ, HU, RO, SK and PL
- Through market studies a development of market capacities was revealed across region where an increase of peak market exchange program/NTCs was noticed in several borders 
HU-RO, HU-HR, CZ-DE, CZ-AT and DE-PL.
- The bulk power flows in the studies are mainly directed from the North to South and West to East of the region.

Key messages from CCE RgIP 2014

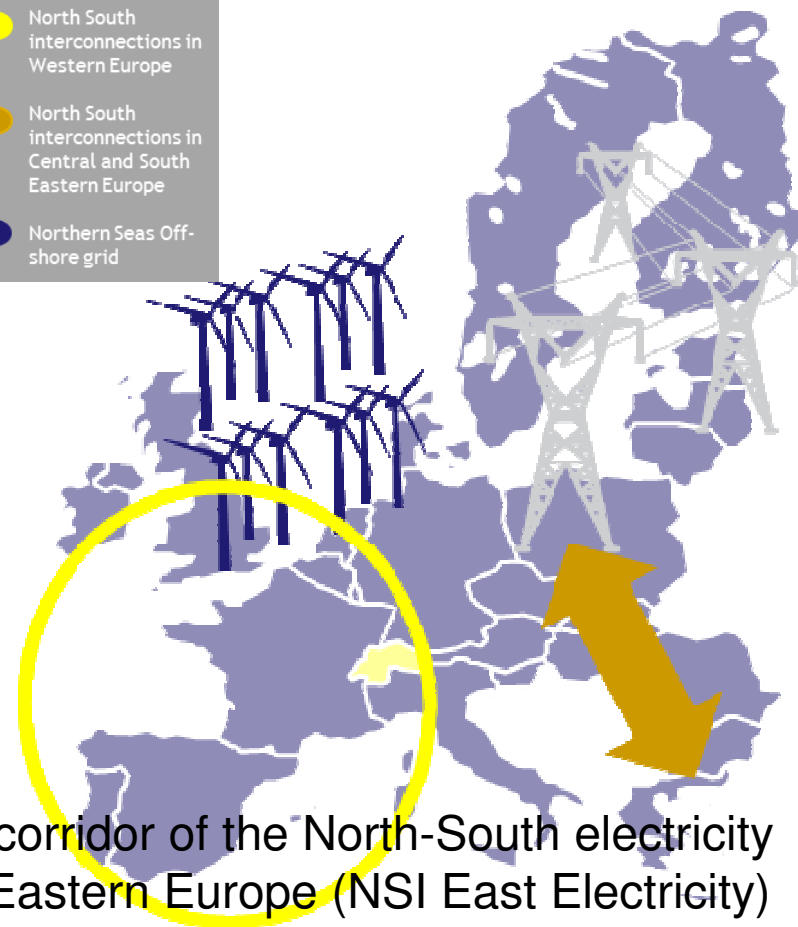
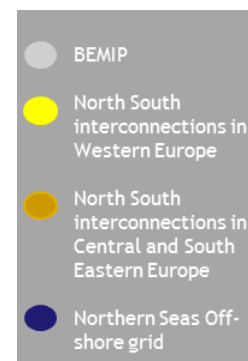
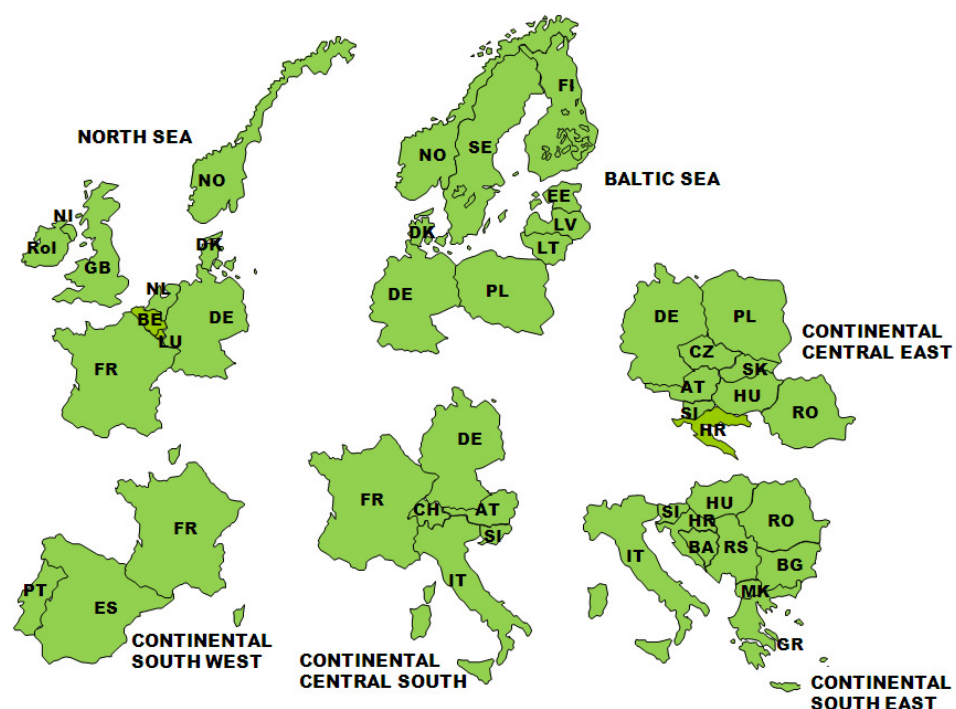


- A Need for new transmission investments:
 - ✓ 13 boundaries were identified implying 34 projects of pan-European significance (174 investments)
 - ✓ 60 % of projects of Pan-European significance help integrate RES
 - ✓ 28000 km of projects of Pan-European significance with an investment cost of about 50€ bn.
 - ✓ 142 investments of Regional significance.
- Slow permit granting and lengthy procedures and public non-acceptance of OHL remains to be an obstacle.
- Transit flows continue to be among problems in the region which trigger short- and medium- term measures

Content

1. CCE RG Structure
2. Main drivers and areas of interest in CCE region
3. Installed capacities & electricity production in 4 visions
4. Regional particularities
5. Main flow trends
6. Regional bottlenecks and needs
7. Result of CBA (indicators)
8. Project portfolio
9. Investment cost as a challenge

TYNDP and EC regional Groups



Countries forming part of the European priority corridor of the North-South electricity interconnections in Central Eastern and South Eastern Europe (NSI East Electricity)

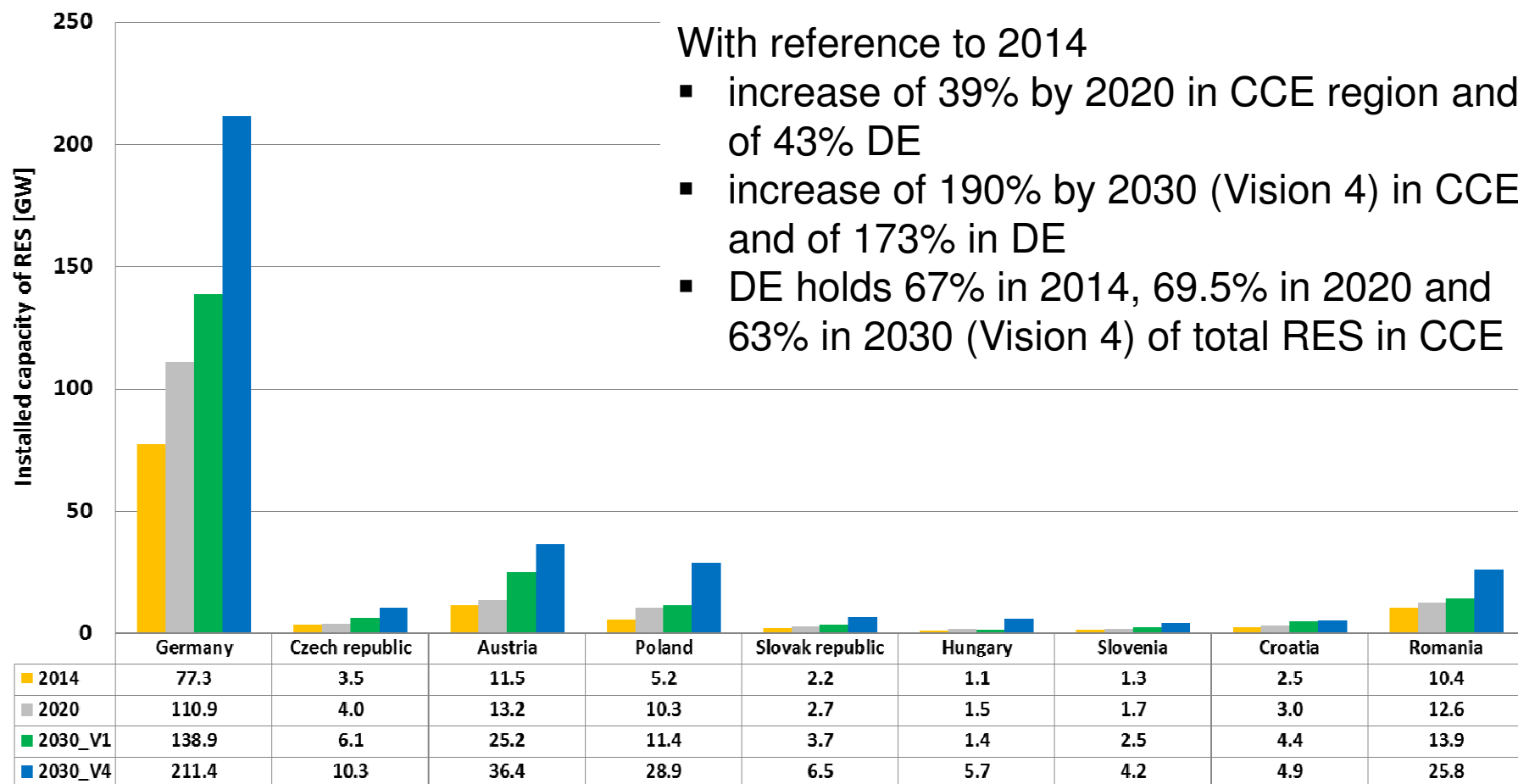
Continental Central East Regional Group



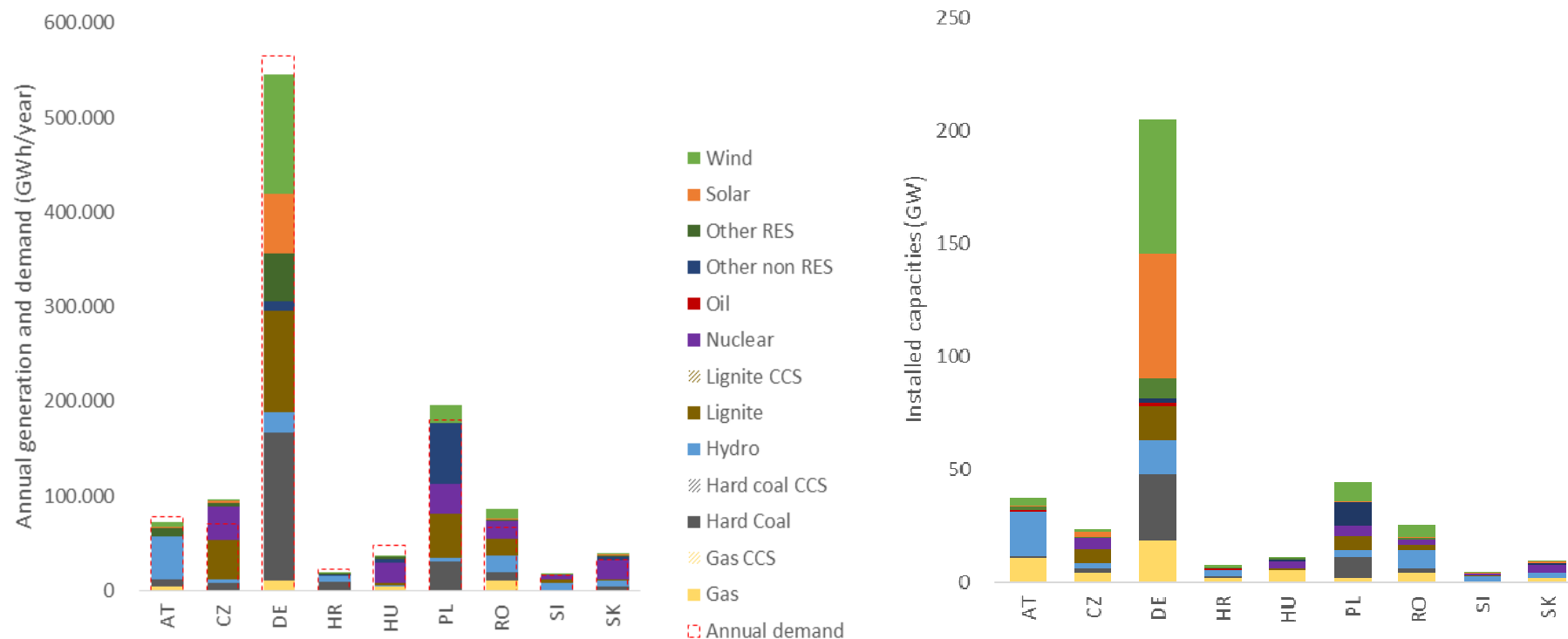
9 Members states
10 TSOs



RES progress in CCE region

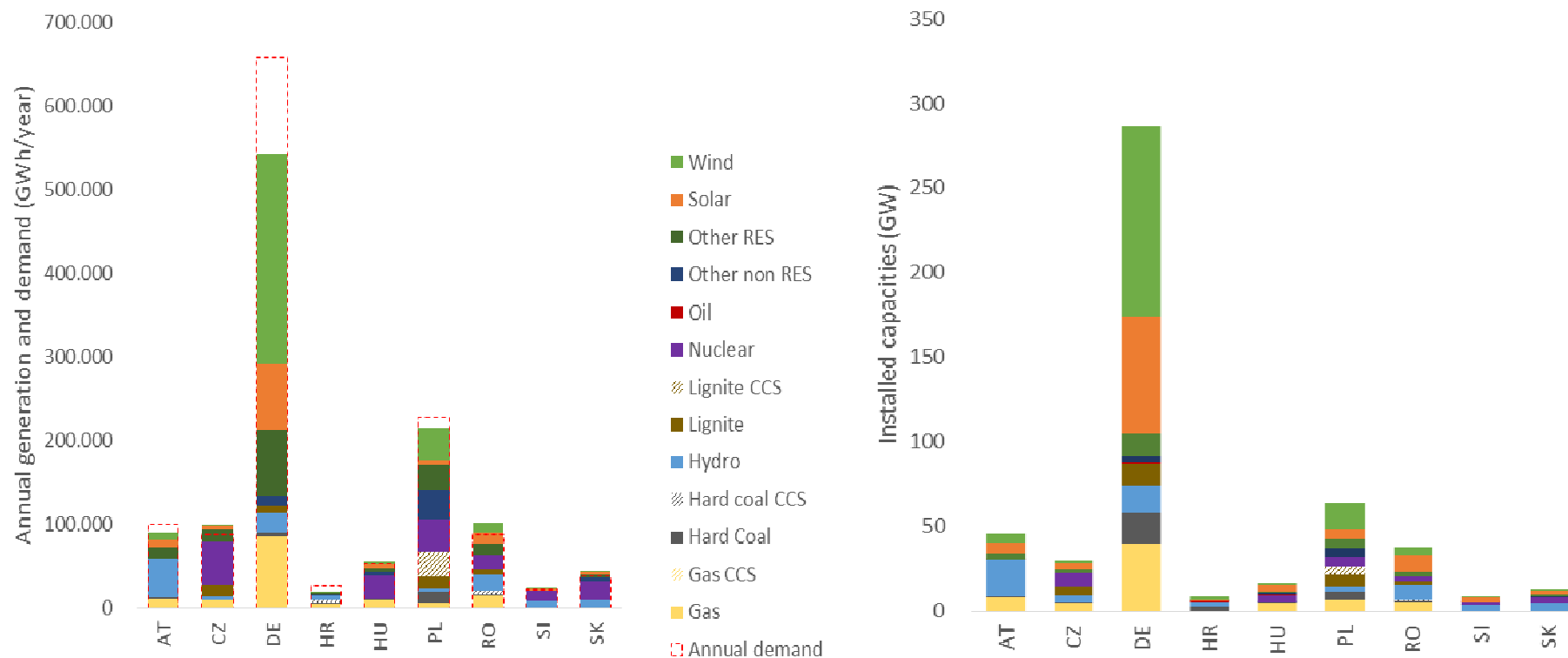


RG CCE installed capacity, generation and demand on V1



- CCE RG behaves as a net exporter of nearly 32 TWh/year
- 34% of total regional annual generation is from RES; with a share of 50% from DE
- Main exporters: CZ, RO and PL; Importers of > 5TWh: DE and HU

RG CCE installed capacity, generation and demand on V4



- CCE RG behaves as a net importer of nearly 104 TWh/year
- 56% of total regional annual generation is from RES; with a share of 49% from DE
- Main exporters: RO, CZ, and SL; Importers of > 5TWh: DE, PL and HR

1. Ongoing change of generation pattern in DE

shut down of conventional plants near areas with high demand and increase of RES in areas with low demand)

2. A need for more capacities: DE-PL and SK-HU

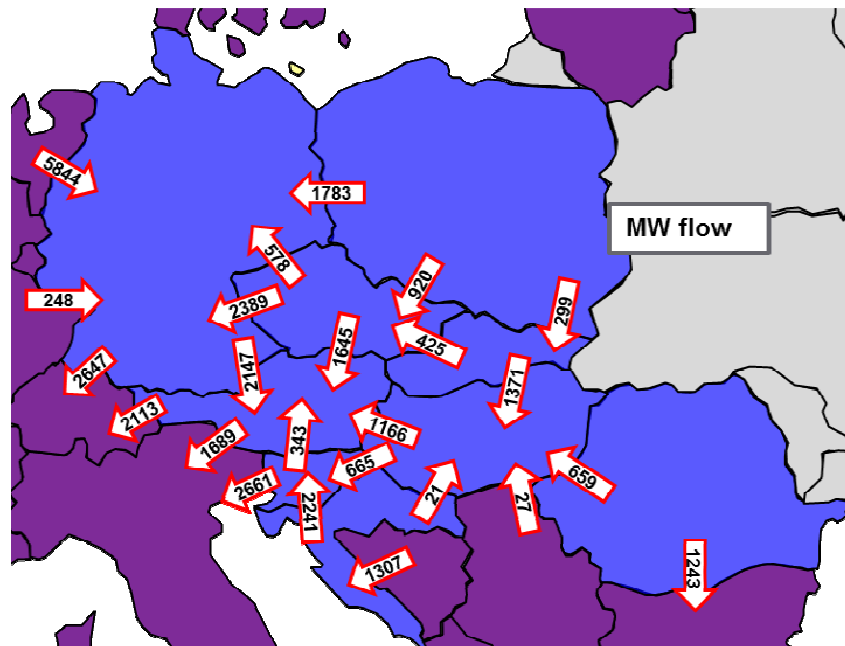
Increase in Market exchange revealed: HU-RO, HU-HR, CZ-DE and CZ-AT

3. Besides DE an increase in RES is revealed in other countries PL, RO and AT

4. Power flow control on DE-PL and DE-CZ borders

Illustration of network power-flows

Vision 1 – low wind



Vision 1 – North to South flows

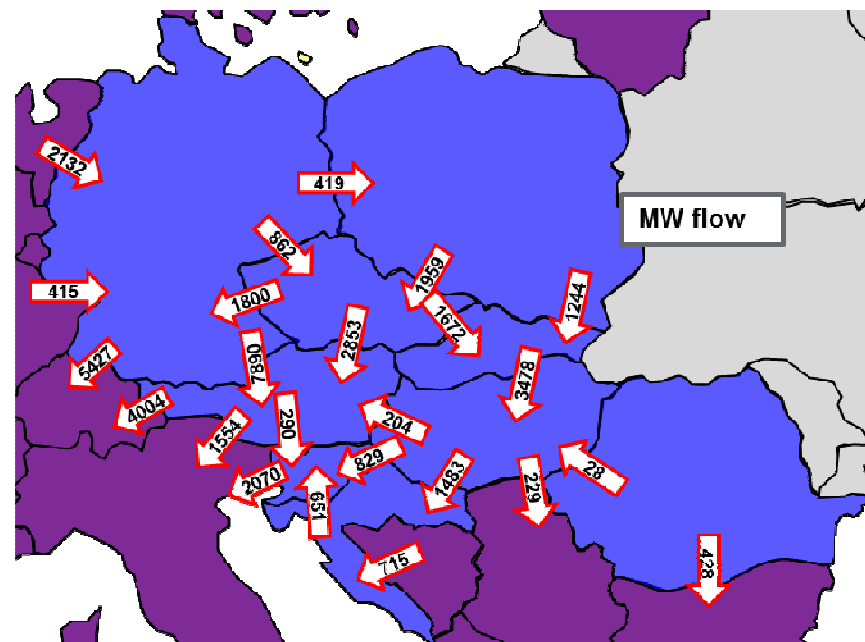
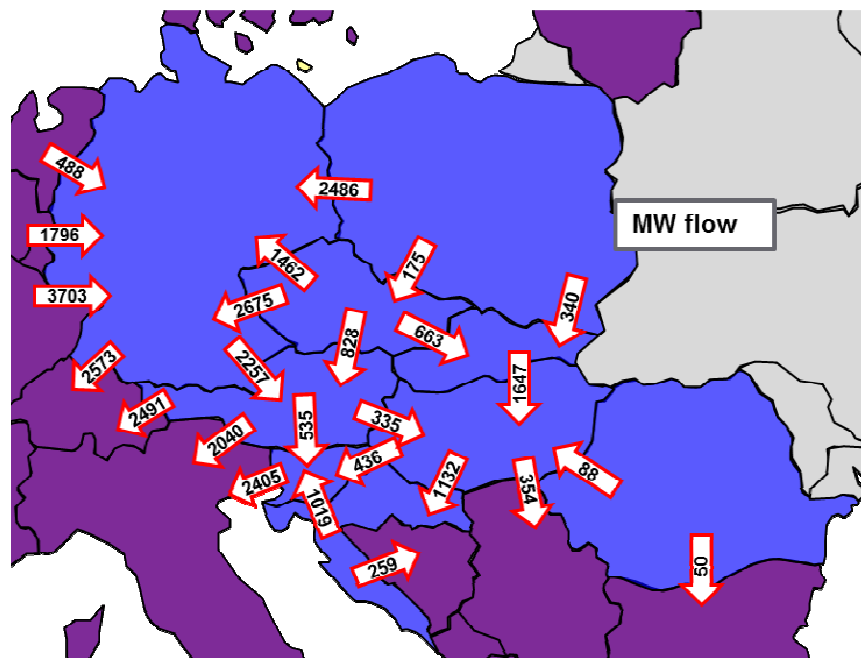
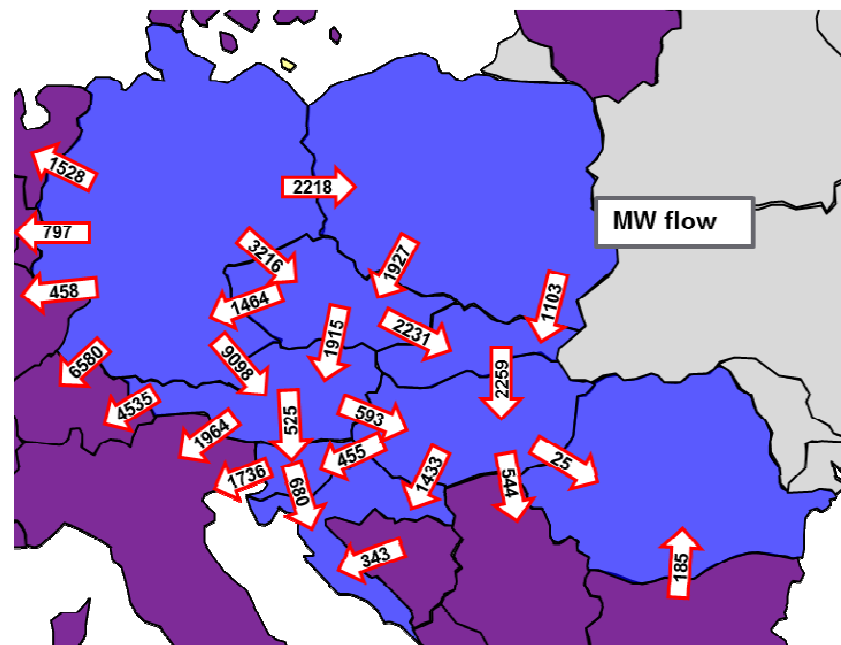


Illustration of network power-flows

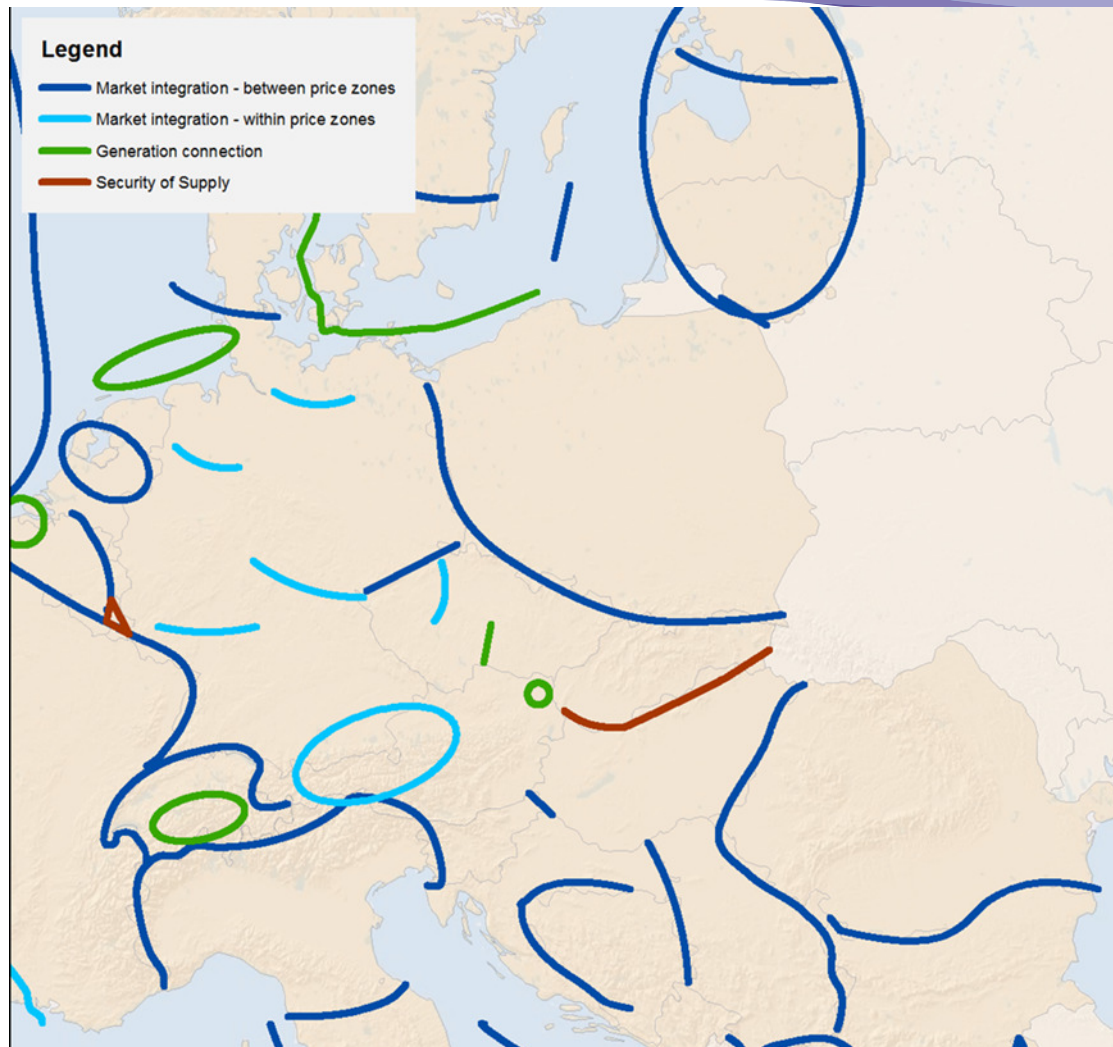
Vision 4 – low RES



Vision 4 – high import of Southern Europe (wind)



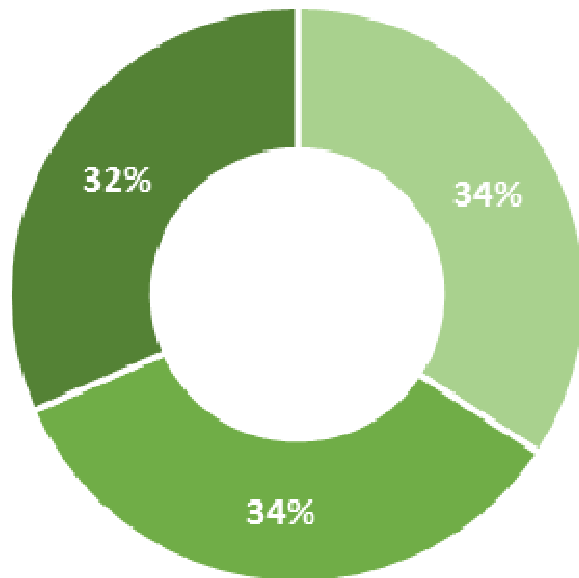
Main Regional bottlenecks



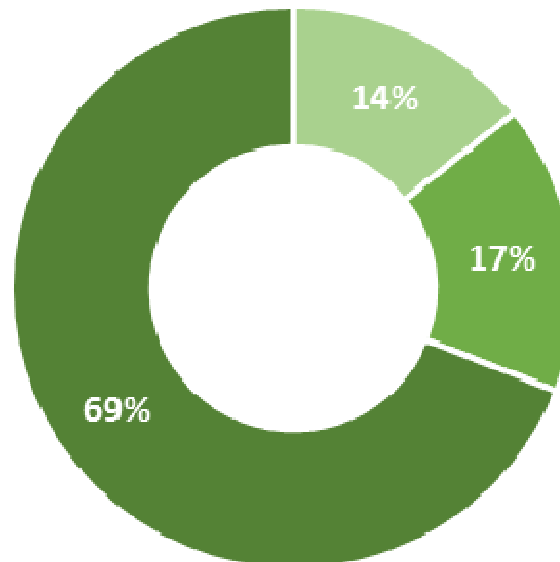
1. *Security of supply on Slovakia – Hungary border*
2. *Integration of RES generation, and market integration in Germany*
3. *Market integration and security of supply on Polish synchronous border*
4. *Additional needs on borders AT-DE, HU-SI, HU-RO, DE-CZ to support market integration*
5. *Additional generation connection requirements in CZ, AT*

RG Continental Central East – CBA (SE) indicator

Vision 1



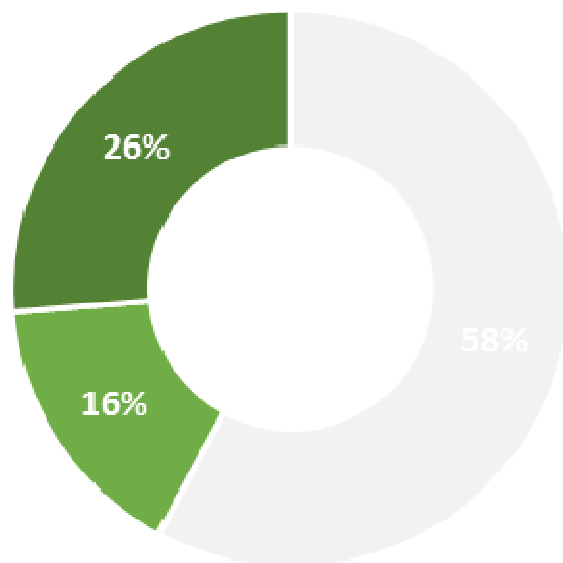
Vision 4



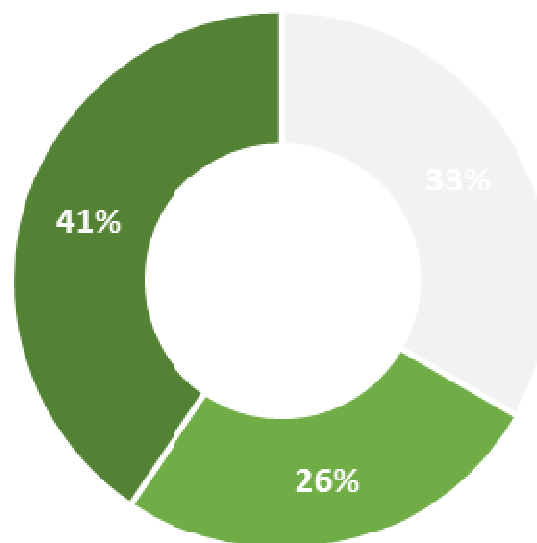
- <30 Meuros
- 30-100 Meuros
- >100 Meuros

RG Continental Central East – CBA (RES) indicator

Vision 1



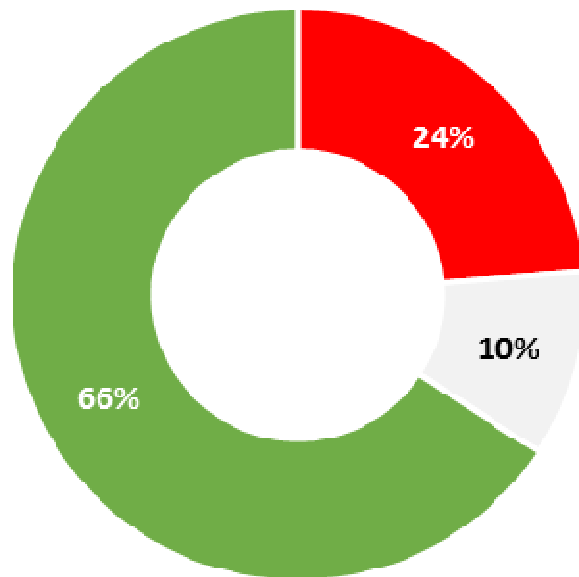
Vision 4



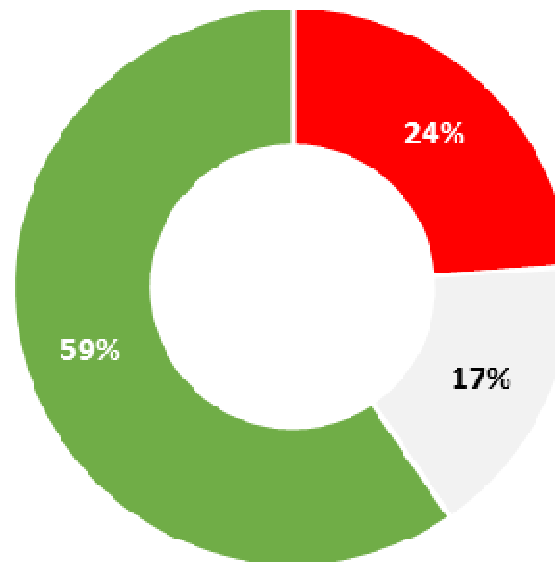
- Neutral effect (<100 MW or <50 GWh)
- 100 - 500 MW or 50 - 300 GWh
- >500 MW or >300 GWh

RG Continental Central East – CBA (Losses) indicator

Vision 1



Vision 4



- Increase losses
- Neutral
- Decrease losses

RG Continental Central East – CBA (CO₂) indicator

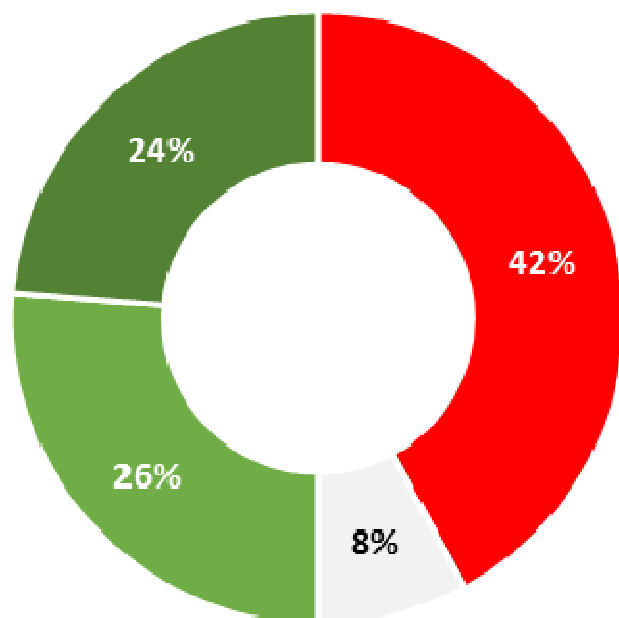
■ Increase the CO₂ emissions by 100kT/year or more

■ Neutral or increase CO₂ emissions by less than 100kT/year

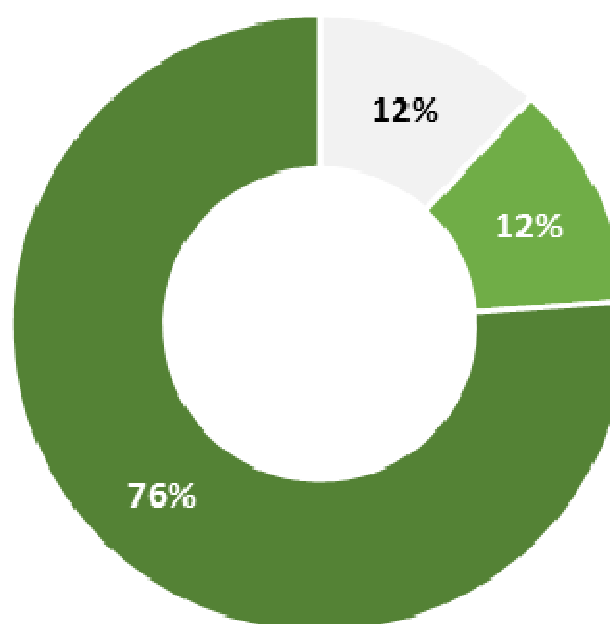
Decrease the CO₂ emissions by less than 500kT/year

Decrease the CO₂ emissions by 500kT/year or more

Vision 1



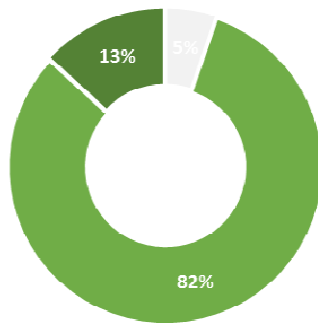
Vision 4



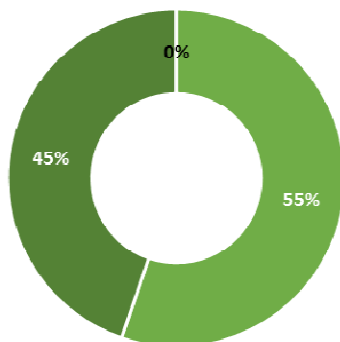
RG Continental Central East – CBA (Technical resilience and flexibility) indicators

Vision 1

Technical resilience indicator

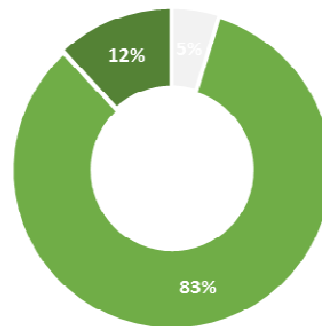


Flexibility indicator

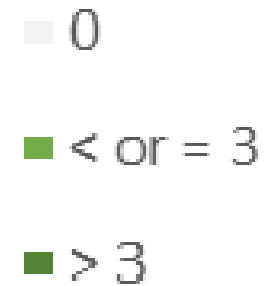
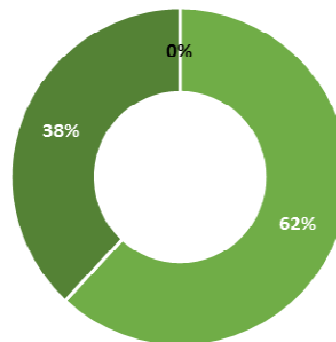


Vision 4

Technical resilience indicator



Flexibility indicator







Investment costs



AT	2.4
CZ	1.2
DE	34.8-54.2
HR	0.2
HU	0.1
PL	1.3
RO	0.6
SI	1.5
SK	0.3
Total	42.4-61.8

- ✓ *The integration of more RES, especially the costly offshore production*
- ✓ *The interconnection of different regions via long distance cables (e.g. German corridors)*
- ✓ *The use of cutting edge technologies (e.g. HVDC VSC) mainly to enable more power to be shifted over a longer distance*

Conclusions

- A Need for new transmission investments:
 - ✓ Additional 5000 km explored compare to previous TYNDP (increase in 22%)
 - ✓ Market integration together with RES integration revealed a need for new or reinforced interconnections:
 - Within RG CCE: PL-DE, SK-HU, HU-SI, AT-DE, CZ-DE
 - Outside RG CCE: PL-SE, DE-SE, DE-NO, DE-CH, AT-IT, HR-BIH, RO-RS, RO-MD, RO-TU, PL-LT
 - ✓ Lengthy permitting procedures and financing of projects continues to be challenging tasks for TSOs
 - ✓ National implementation of EU targets for next decades will provide a framework to decrease uncertainty for system development to support power grid optimization and cost-efficiency

Thank you very much for you attention

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RG CCE ENTSO-E

