TYNDP 2014 – Regional Focus
Challenges for Grid Development in CCS Region

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Convener Regional Group
Continental Central South

Regional Group CCS Stakeholder Workshop
Rome, March 20th 2014

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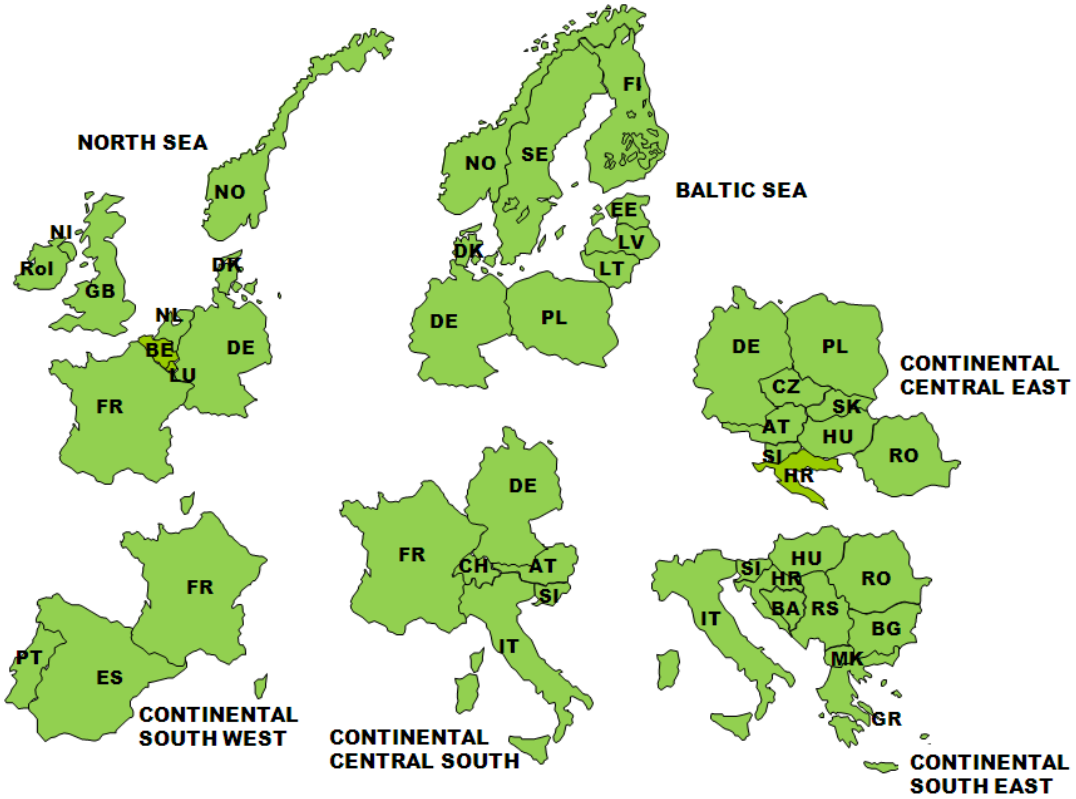
Reliable Sustainable Connected

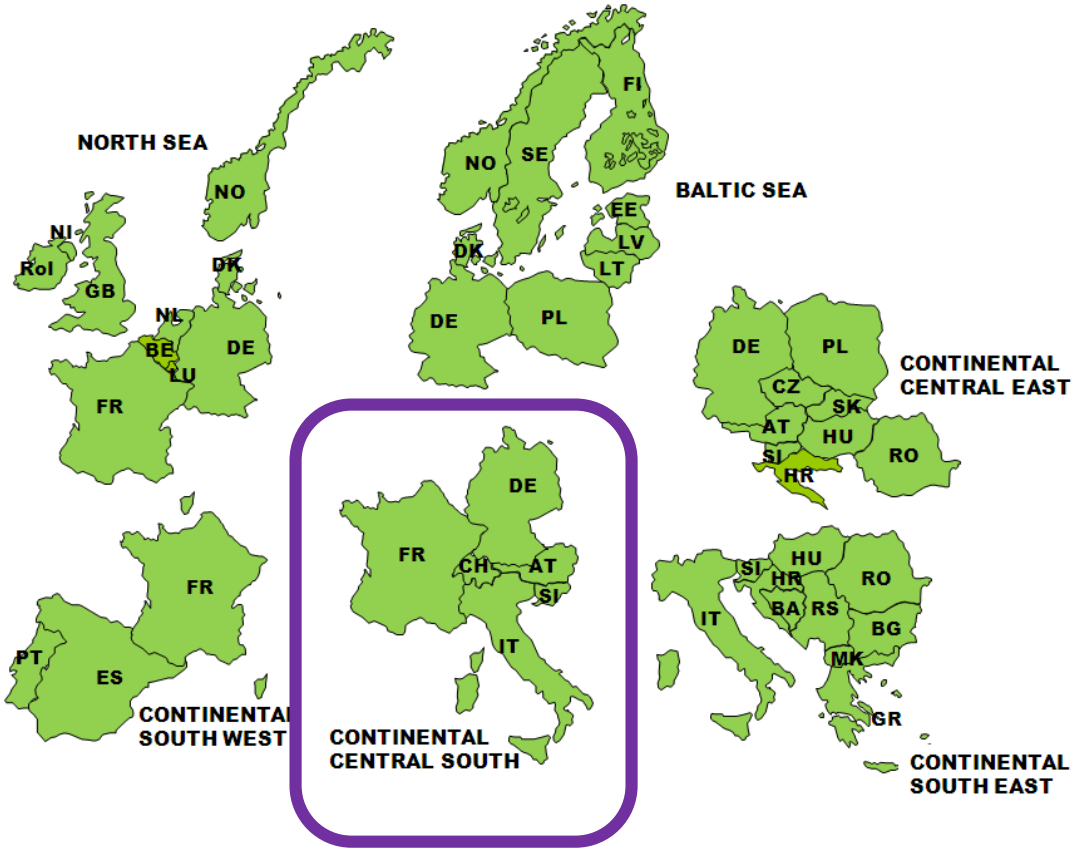
Specifics of the Region Continental Central South

What/Where is the RG Continental Central South?



Specifics of the Region Continental Central South

Where is Continental Central South?



Specifics of the Region Continental Central South

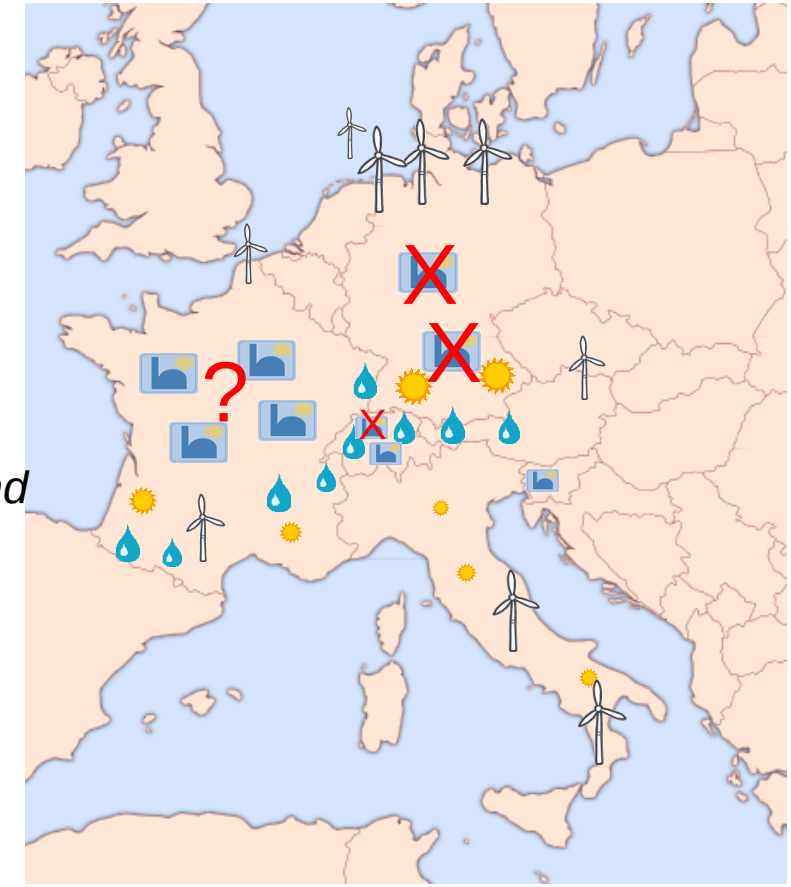
Who is the RG Continental Central South?

- *9 TSOs out of 6 Countries*
  - ✓ *AT: APG, VÜN*
  - ✓ *CH: Swissgrid*
  - ✓ *DE: Amprion, TenneT TSO, TransnetBW*
  - ✓ *FR: RTE*
  - ✓ *IT: Terna*
  - ✓ *SI: ELES*

Specifics of the Region Continental Central South

TODAY: What is currently at Stake in the Region?

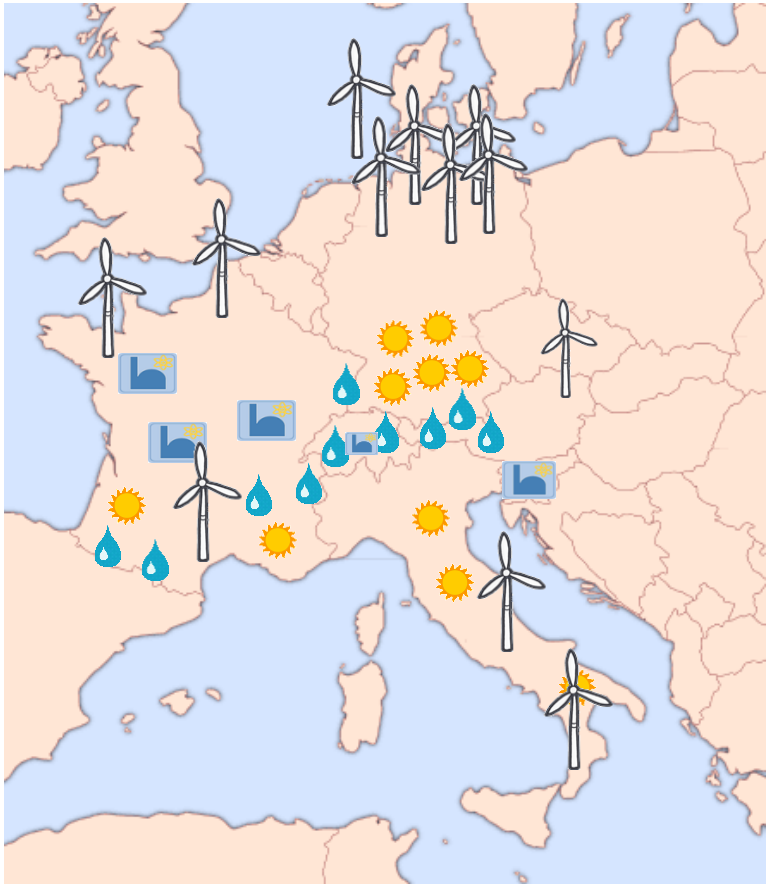
- *Central position in Europe*
- *Strong interaction/interrelation within the region and with neighbours*
- *"Energiewende" is already on-going*
- *RES development concentrated at the corners of the region (DE, FR and IT)*
- *Alpine hydro pump storage generation in the centre*
- *Nuclear phase out in Germany and Switzerland decided; discussions in FR*



What is at Stake in the Region in the 2030 Scenarios?

Vision 1: Regional issues/specifics

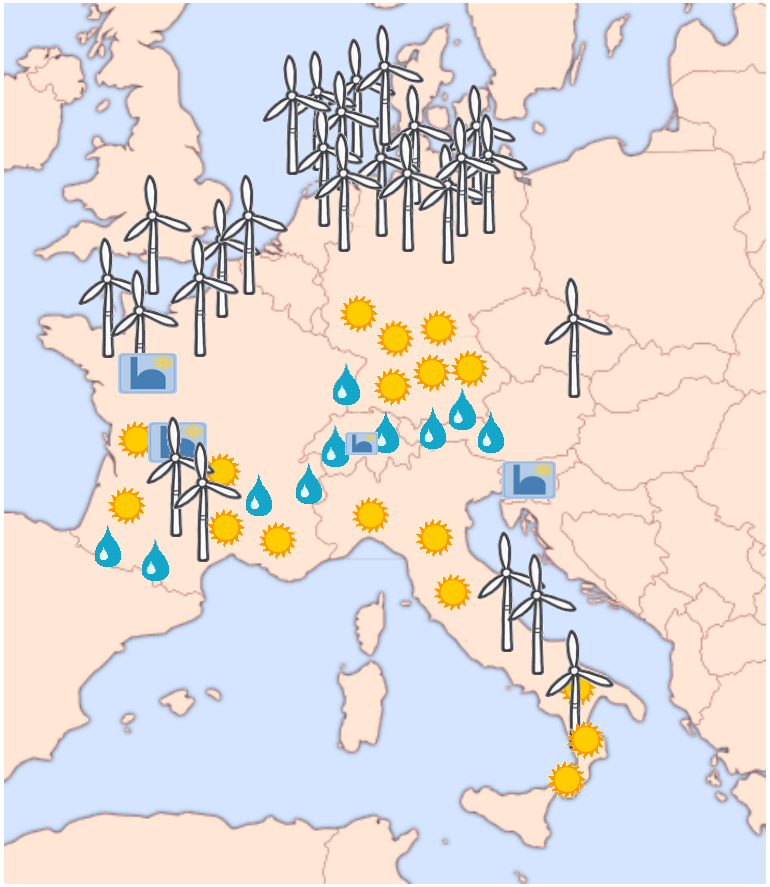
- *Central position in Europe*
- *Strong interaction/interrelation within the region and with neighbours*
- *"Energiewende"* ***proceeds – but "rel. slow"***
- *RES development* ***keeps*** *concentrated at the corners of the region (DE, FR and IT)*
- *Alpine hydro pump storage generation in the centre* ***is increased***
- *Nuclear phase out in Germany* ***realized***
- ***Some decrease of nuclear generation in France and Switzerland***
- ***FR and DE have less energy available for export to IT***
- ***Low load growth***



What is at Stake in the Region in this 2030 Scenario?

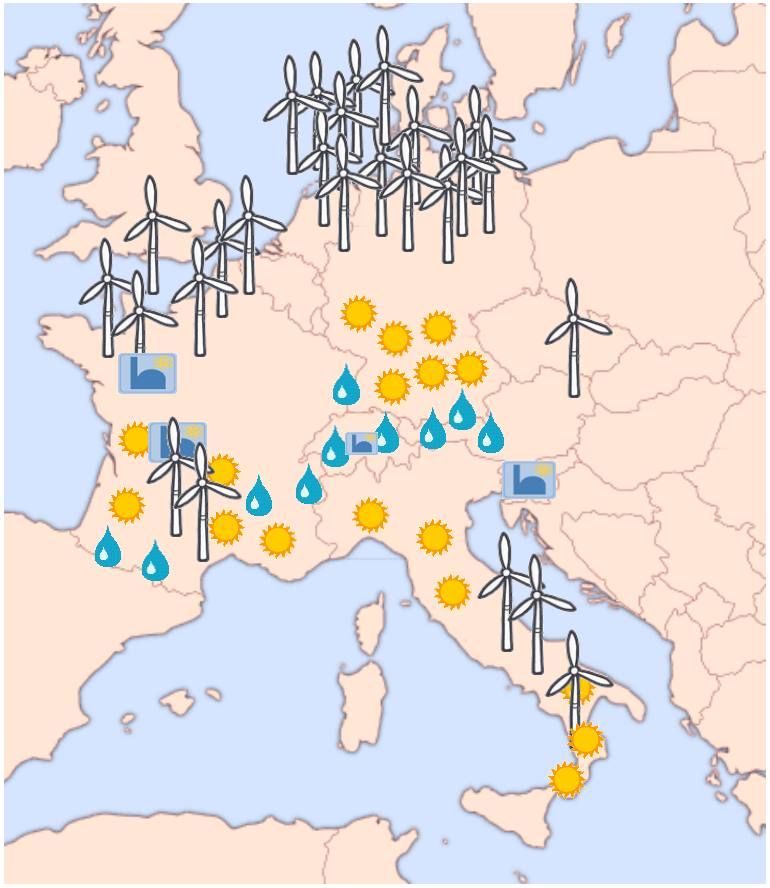
Vision 4: Regional issues/specifics

- *Central position in Europe*
- *Strong interaction/interrelation within the region and with neighbours*
- *"Energiewende"* ***in full progress***
- ***Massive*** *RES development concentrated at the corners of the region (DE, FR and IT)* ***- on trajectory to EU 2050 targets***
- *Alpine hydro pump storage generation in the centre* ***is further increased***
- *Nuclear phase out in Germany* ***realized***
- ***Stronger decrease of nuclear generation in France (and Switzerland)***
- ***FR and DE have less energy available for export to IT***
- ***Higher load growth***



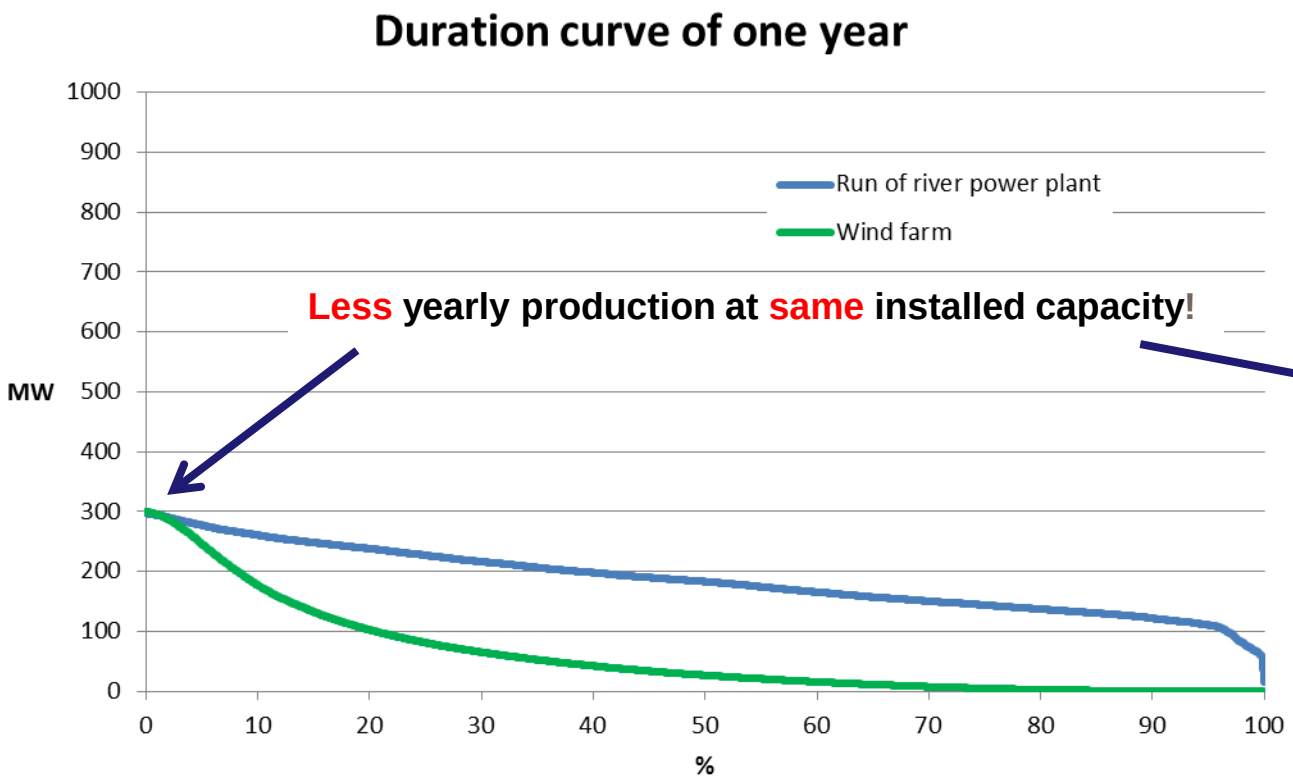
Consequences of installed RES capacity

- **Regional divergence**
  of generation and demand
  - Wide area energy flows necessary
  - New “renewables“ are more large scale power plants
- **Divergence in time**
  of generation and demand
  - Necessity of additional transport capacity and storages!
  - Challenge for the overall system!
- **Divergence Power vs. Energy**

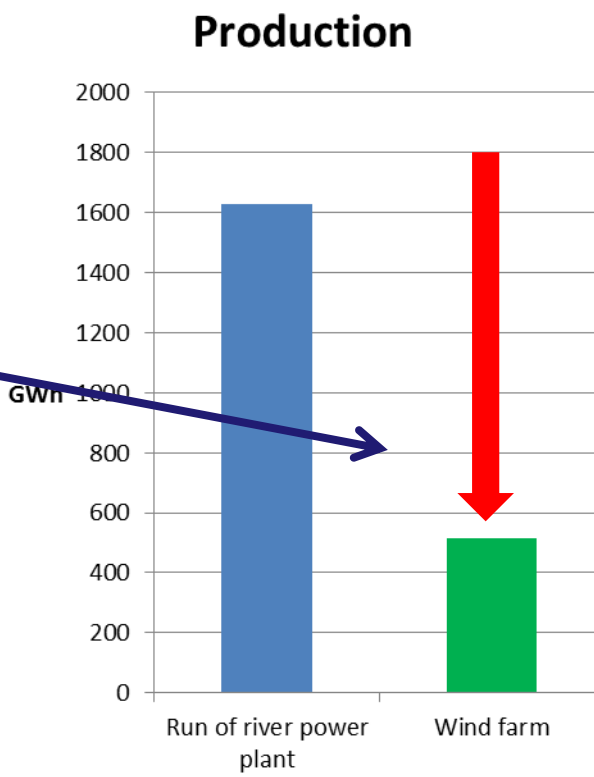


Power vs. Energy

Wind Farm – Run of River Power Plant



Less yearly production at same installed capacity!



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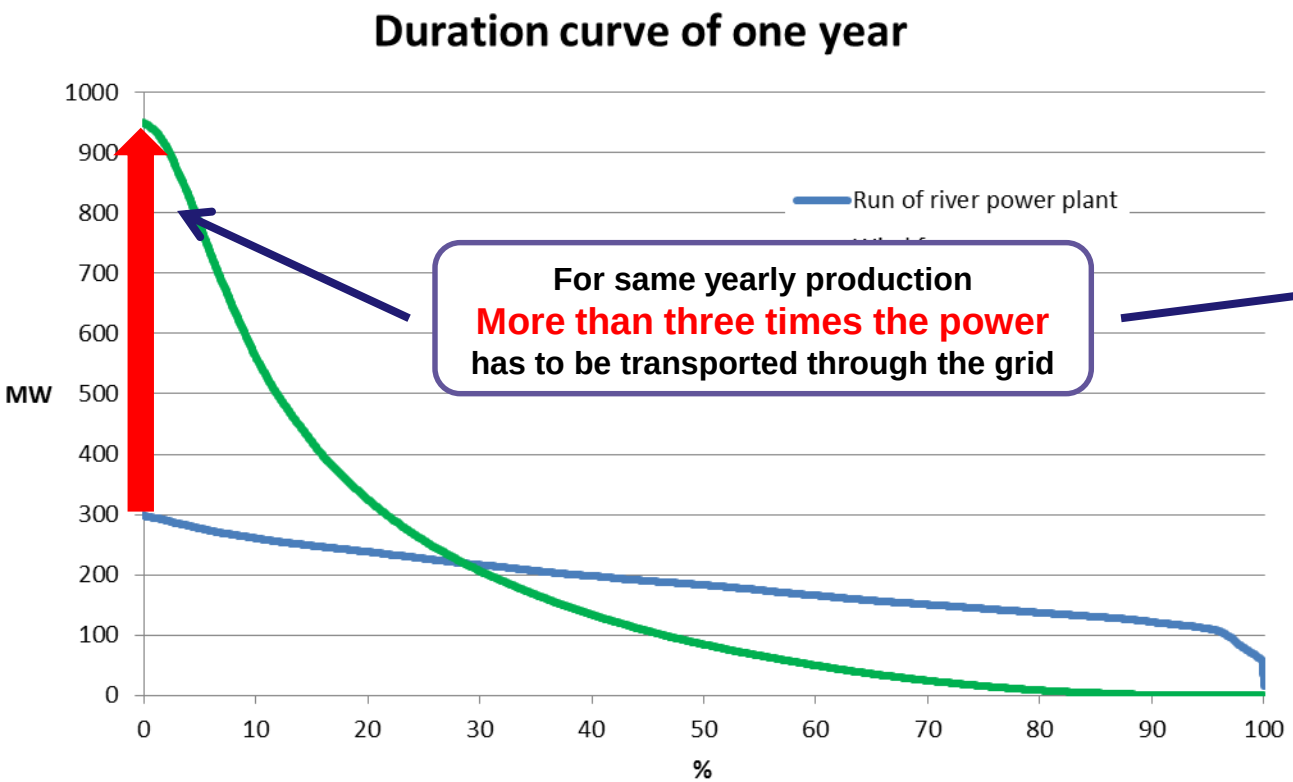

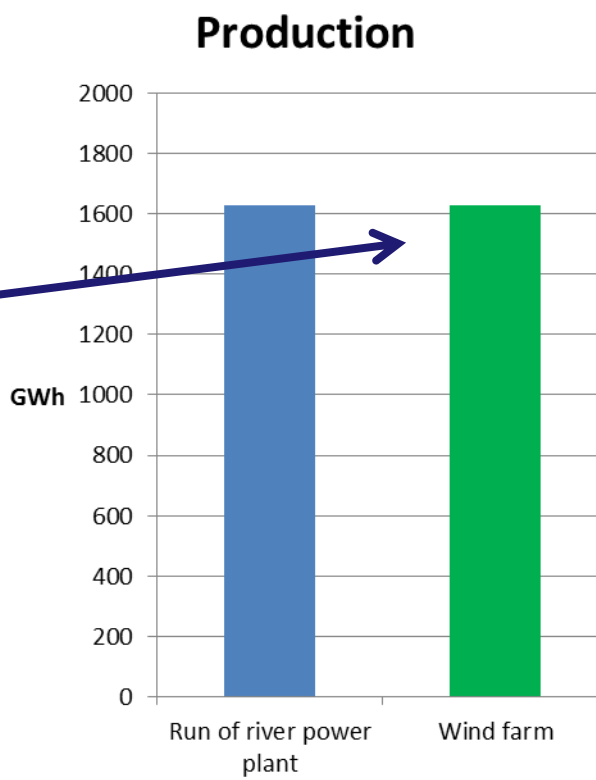

More than three times the installed capacity for the same energy!

! Transmission capacities have to be provided for the POWER produced !

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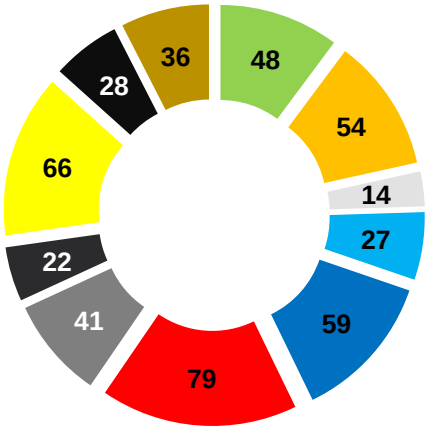
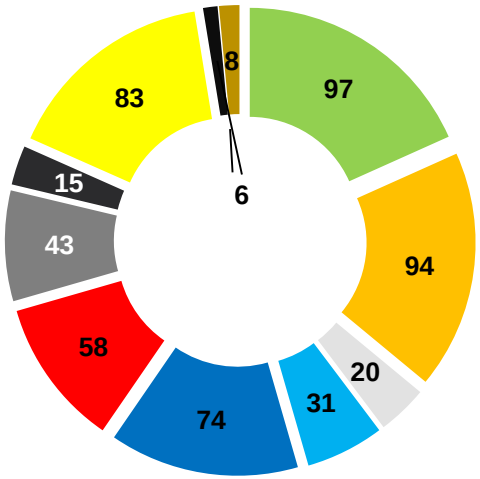
RG CCS Installed Capacities in Vision 1 and Vision 4

2012 [GW]



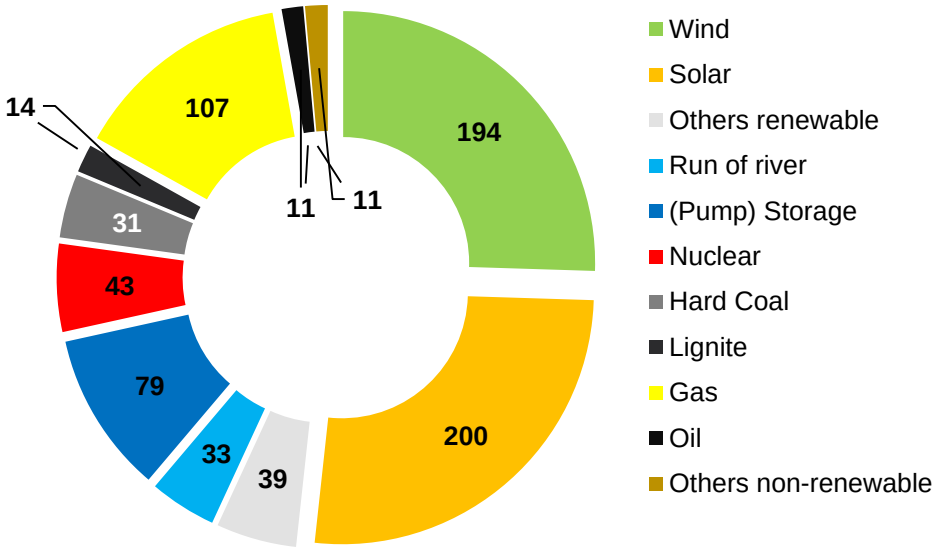
Total 472 GW

Vision 1 2030 [GW]



Total 528 GW

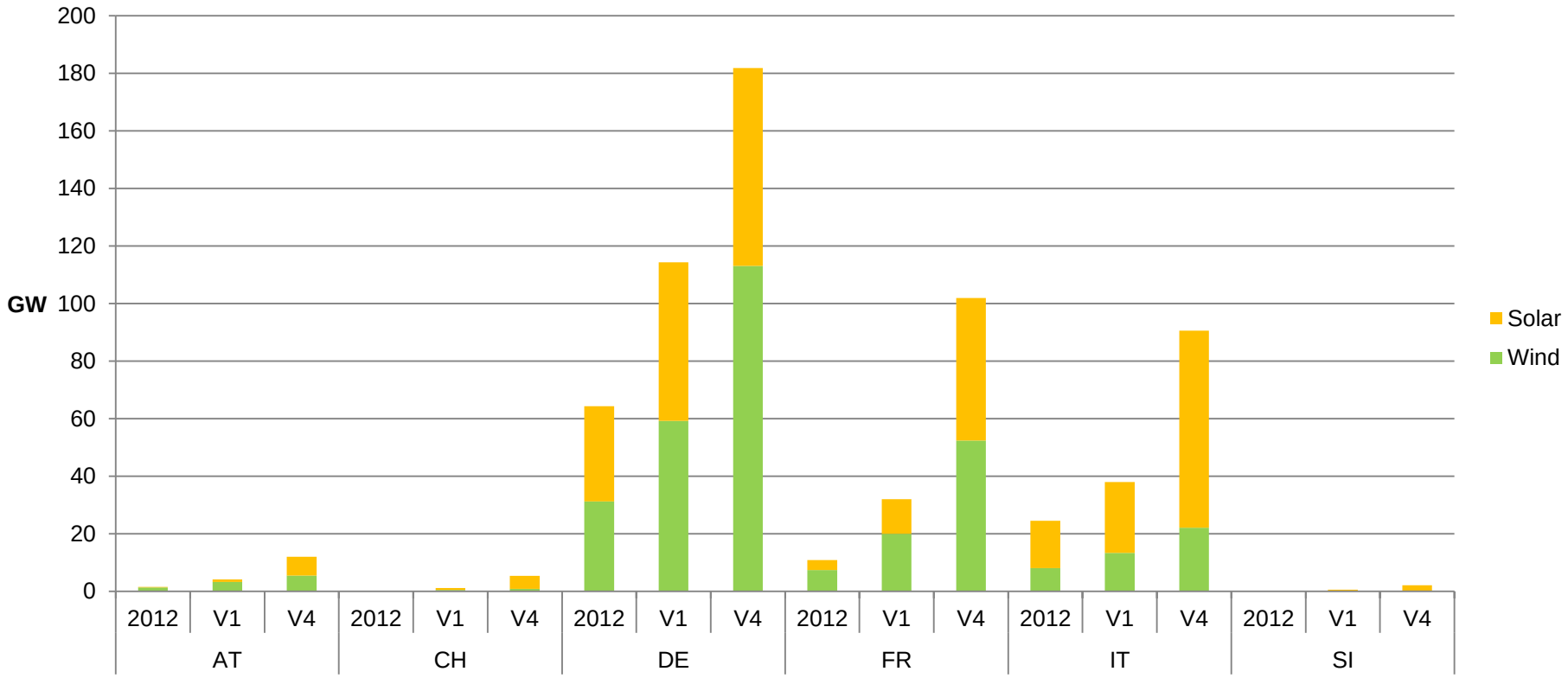
Vision 4 2030 [GW]



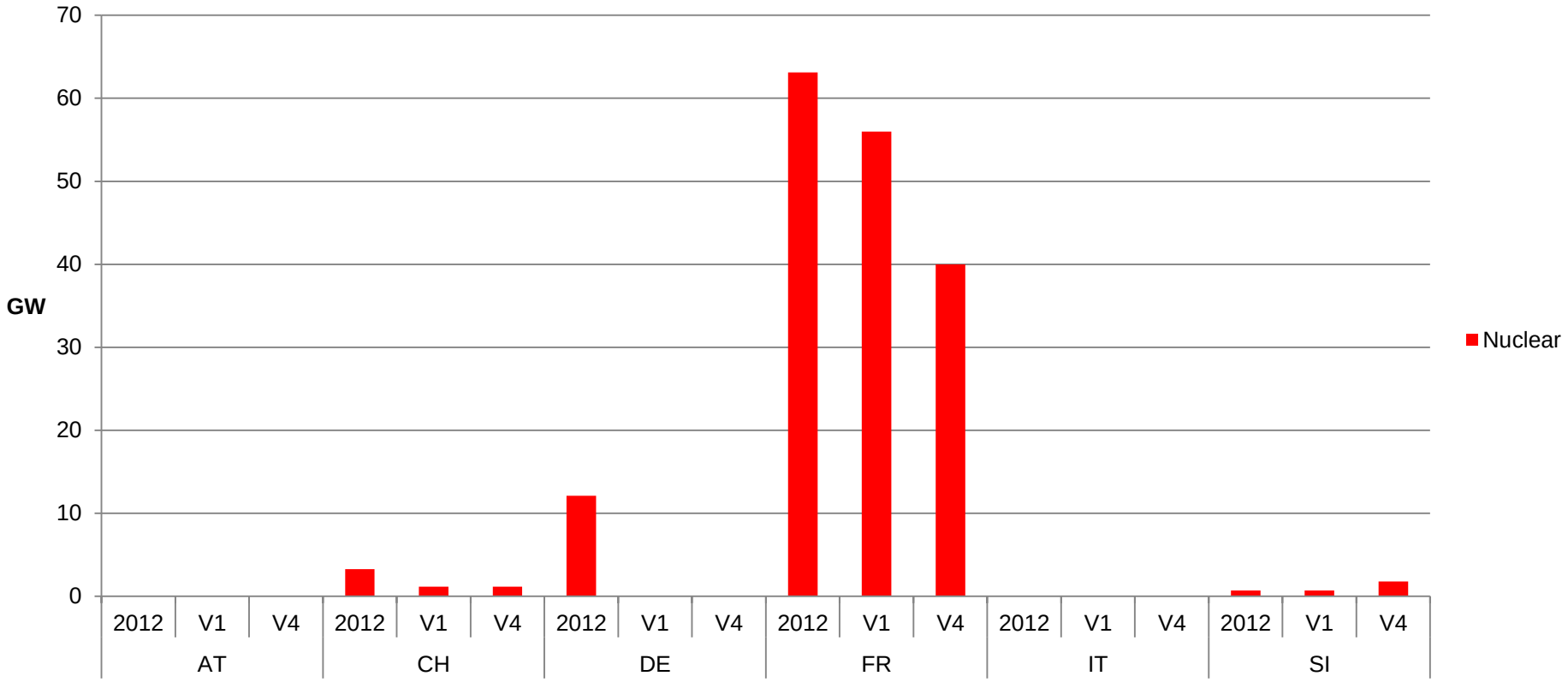
Total 769 GW

Wind and PV:	**+ 89 GW, + ~100%**	**+ 292 GW, RES nearly triples**
Nuclear phase out:	**- 20 GW, -19 %**	**- 36 GW, - 45 %**
Storage capacity:	**+15 GW, + 25 %**	**+ 20 GW, +34 %**

Development of Wind and Solar at National Level



Develoment of Nuclear Capacities at National Level



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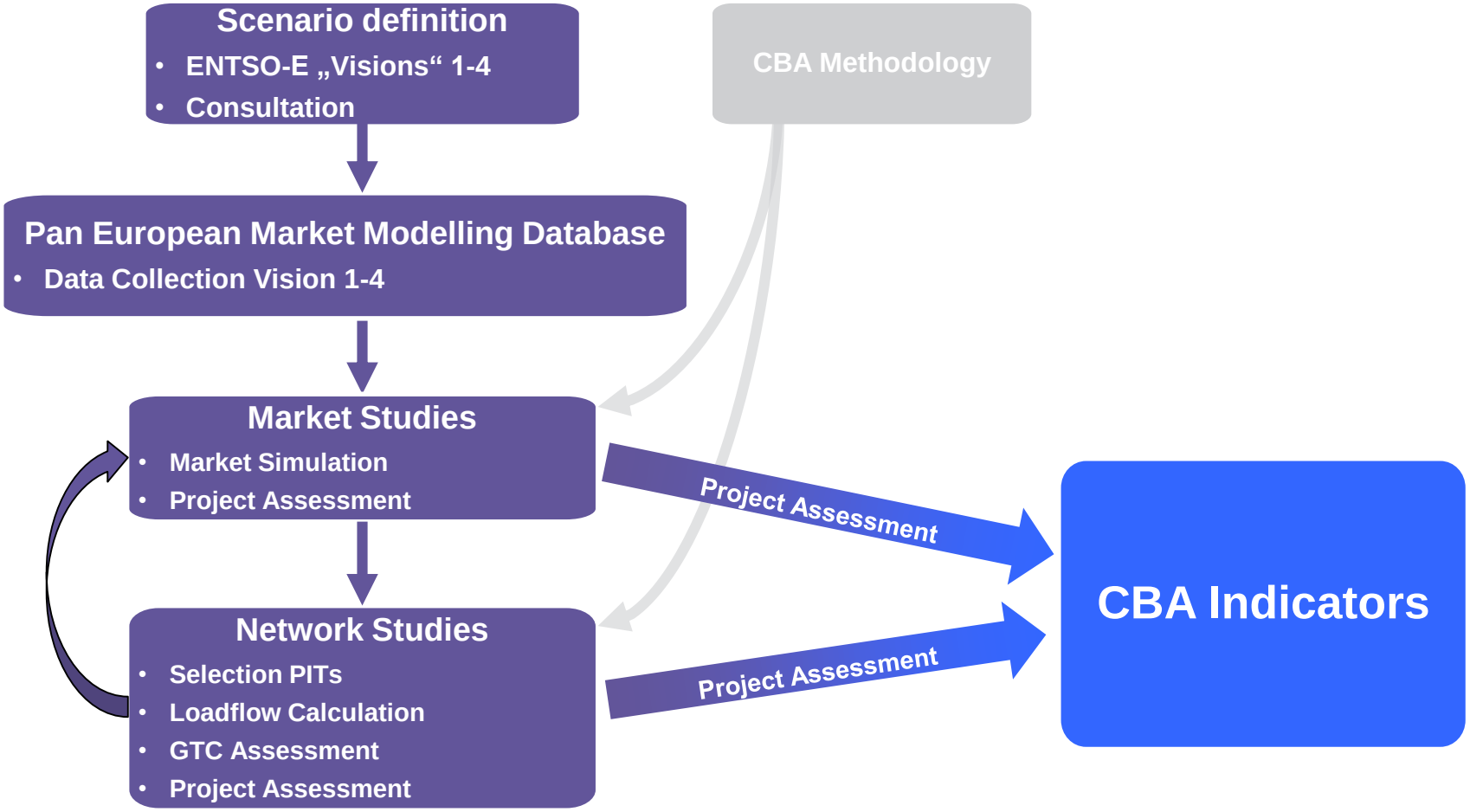
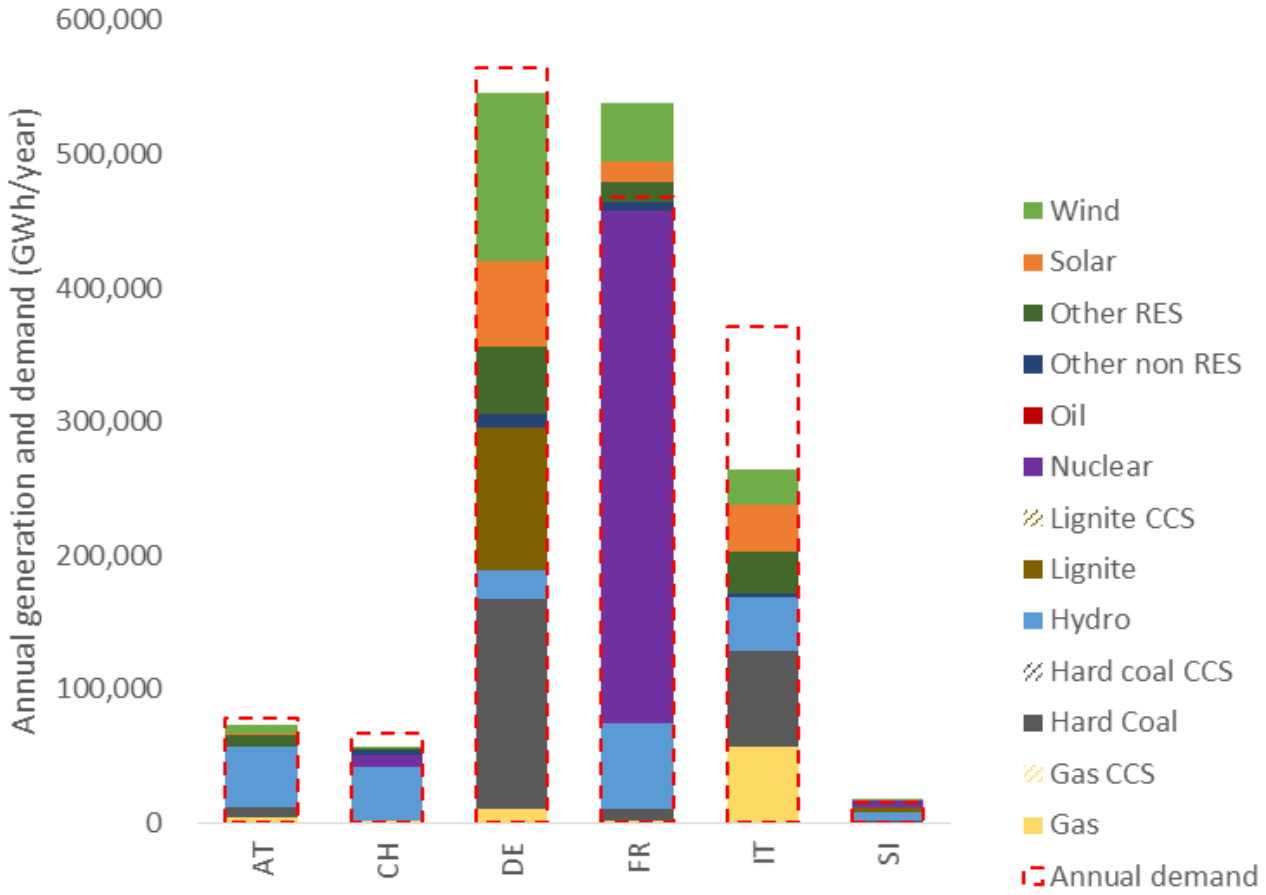
General Methodology



Preliminary Market Results for Vision 1 (TWh)



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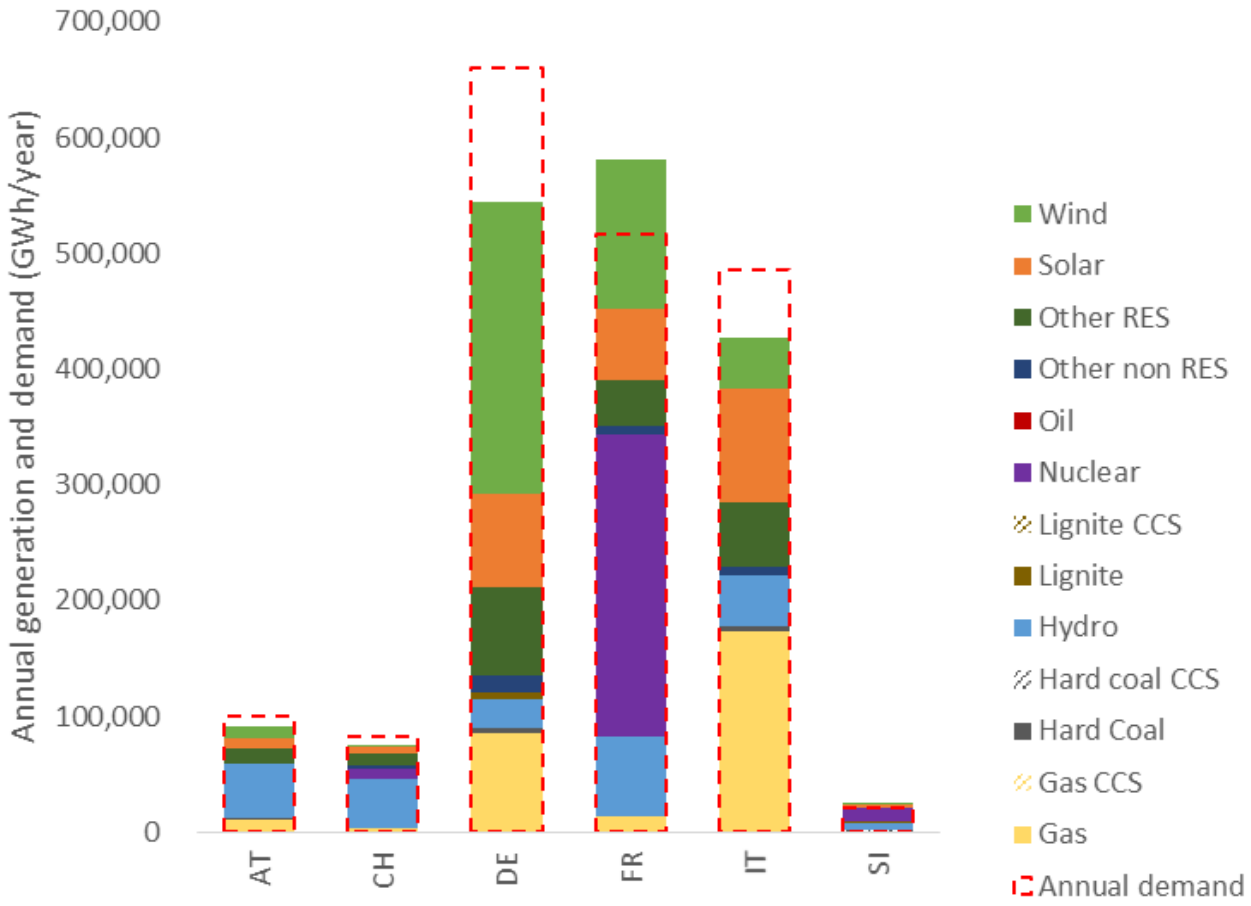
Preliminary Market Results for Vision 4 (TWh)



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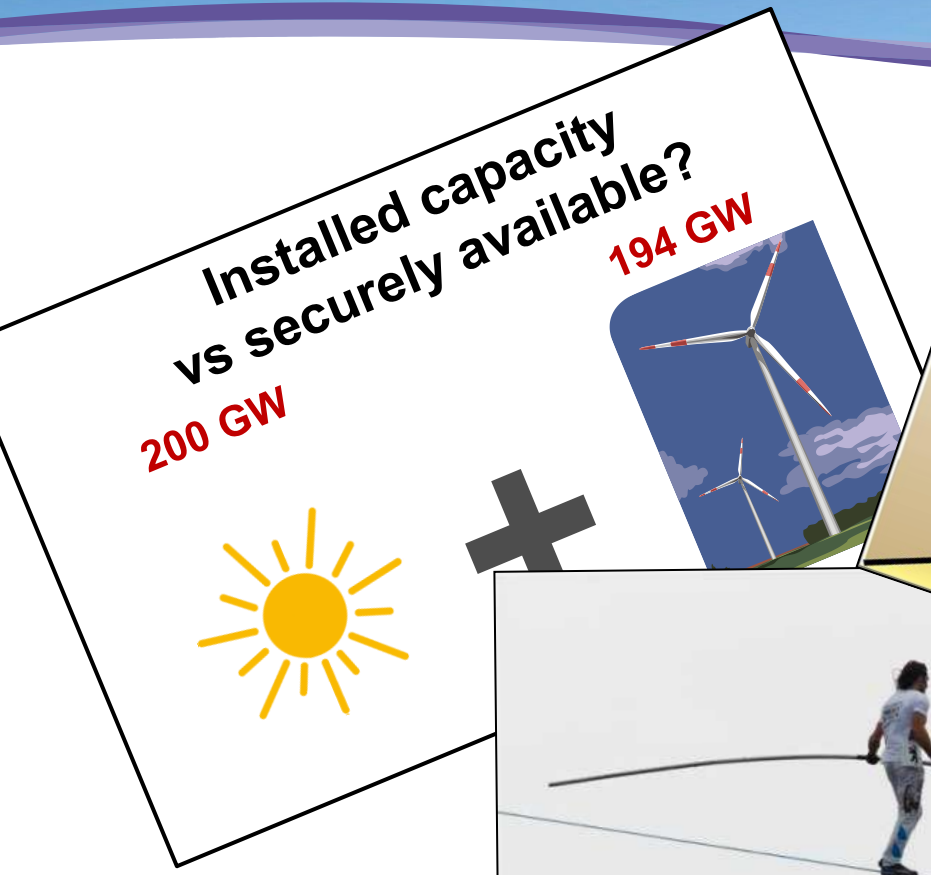
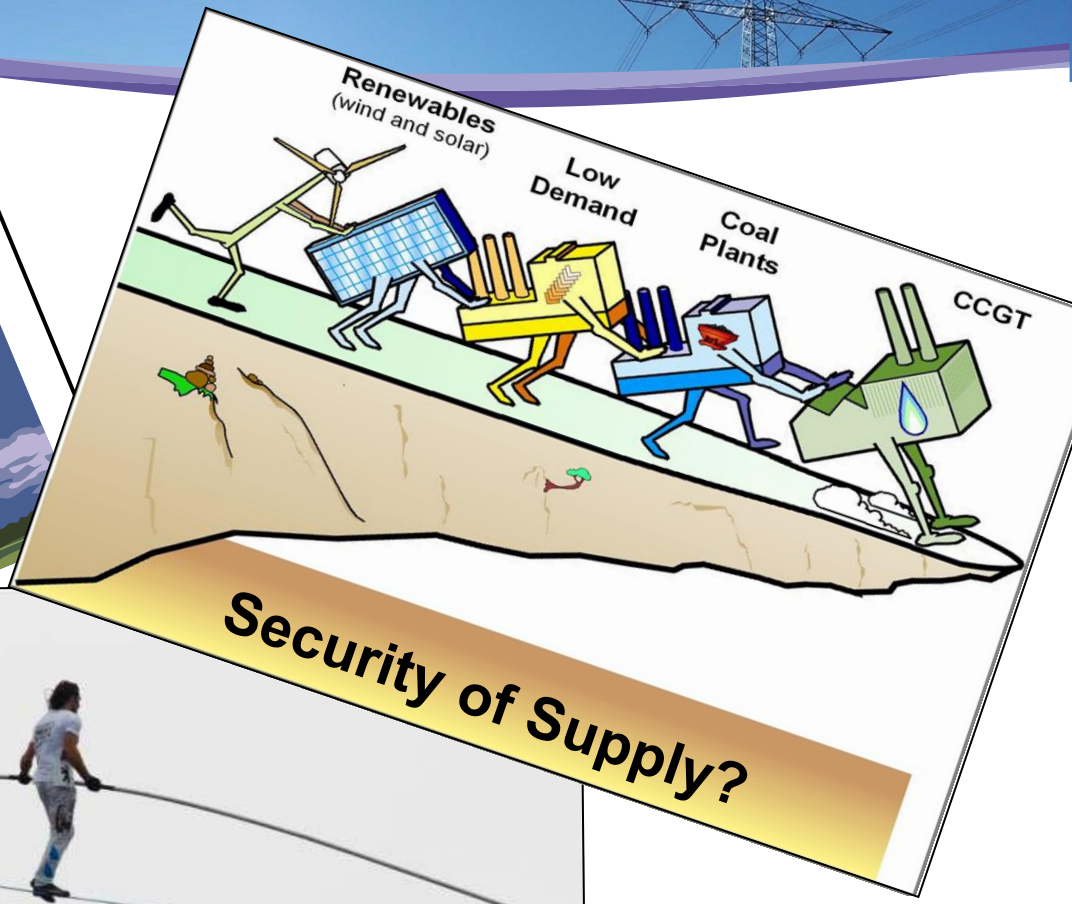
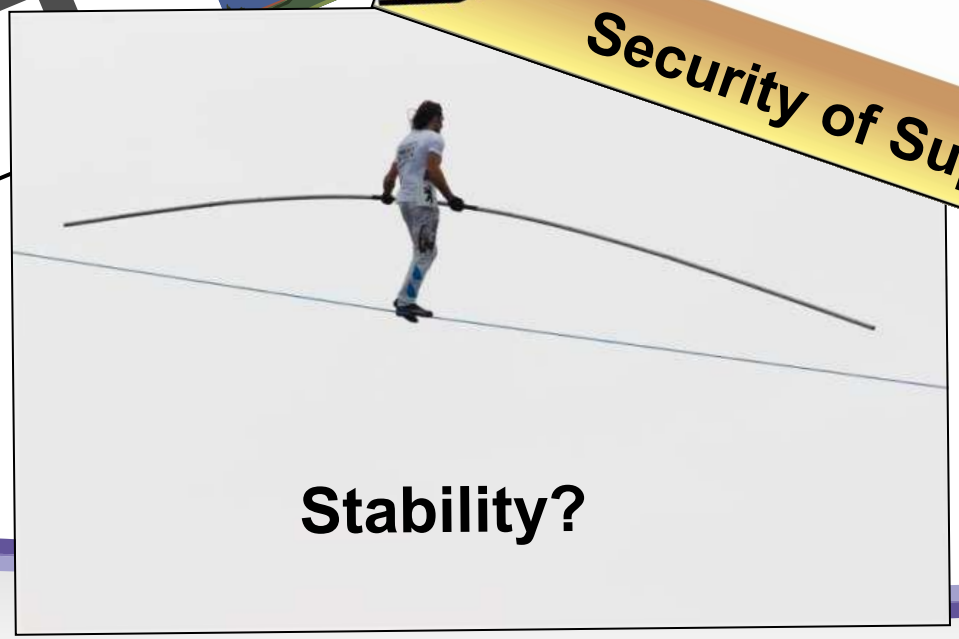
Additional Challenges to be Mastered







Conclusions

- **Massive RES-Development at the corners of the region is on-going and accompanied fundamental changes for the electricity system**

- **High, volatile and wide area power flows are the consequence in the Region**

- **Adequate and reliable transmission network is a crucial prerequisite for achieving the EU energy policy goals and to cope with the forthcoming challenges**

- **Time is a crucial factor:**
  From Planning to "making projects happen" the support of all stakeholders is vital → public acceptance is a key factor

Thank you for your attention!

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