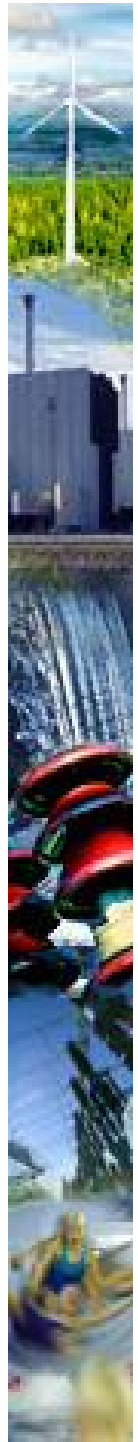


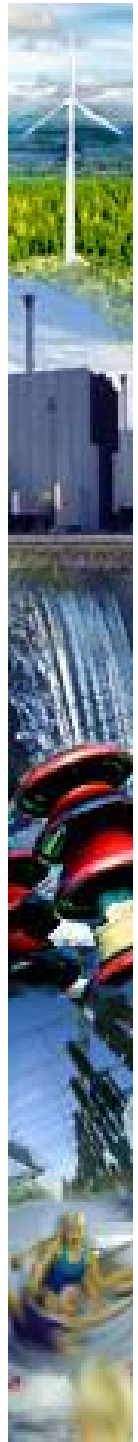
The Facts... ...about the "network"

Anders Richert
Head of Network Unit
Swedenergy
(Swedish electricity association)



Facts ...

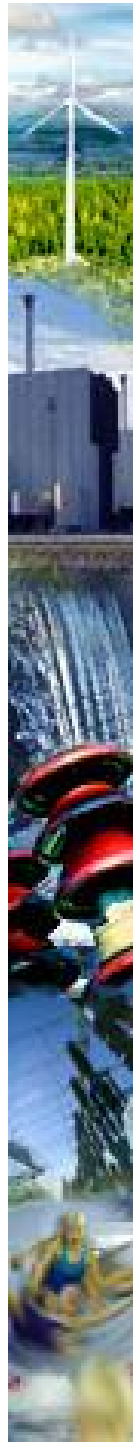
- EU has set the 20-20-20 target by 2020 through directive
- Concerning renewables the directive includes a target for the volume of renewable energy as well as a binding rule for securing capacity in the network



Facts* ...

- In Denmark ~21.3% of energy from wind
- Sweden ~1.3% (EU27 ~3.8%)
- Only five countries >5% of energy from wind (DK, ES, PT, IE, DE)

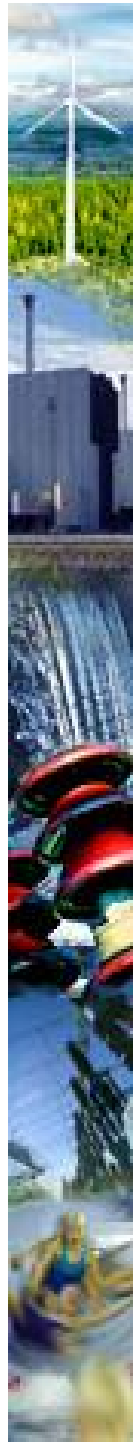
- In general there is no (network) problem for further penetration even with a structure as we have today



But we need to consider...

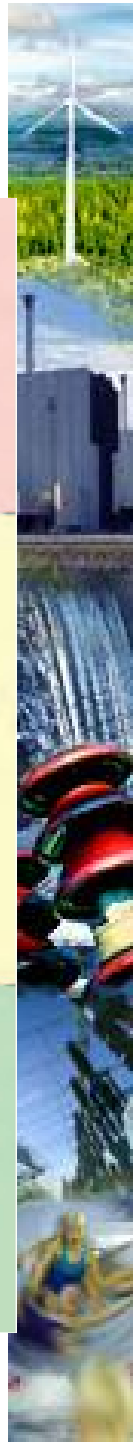
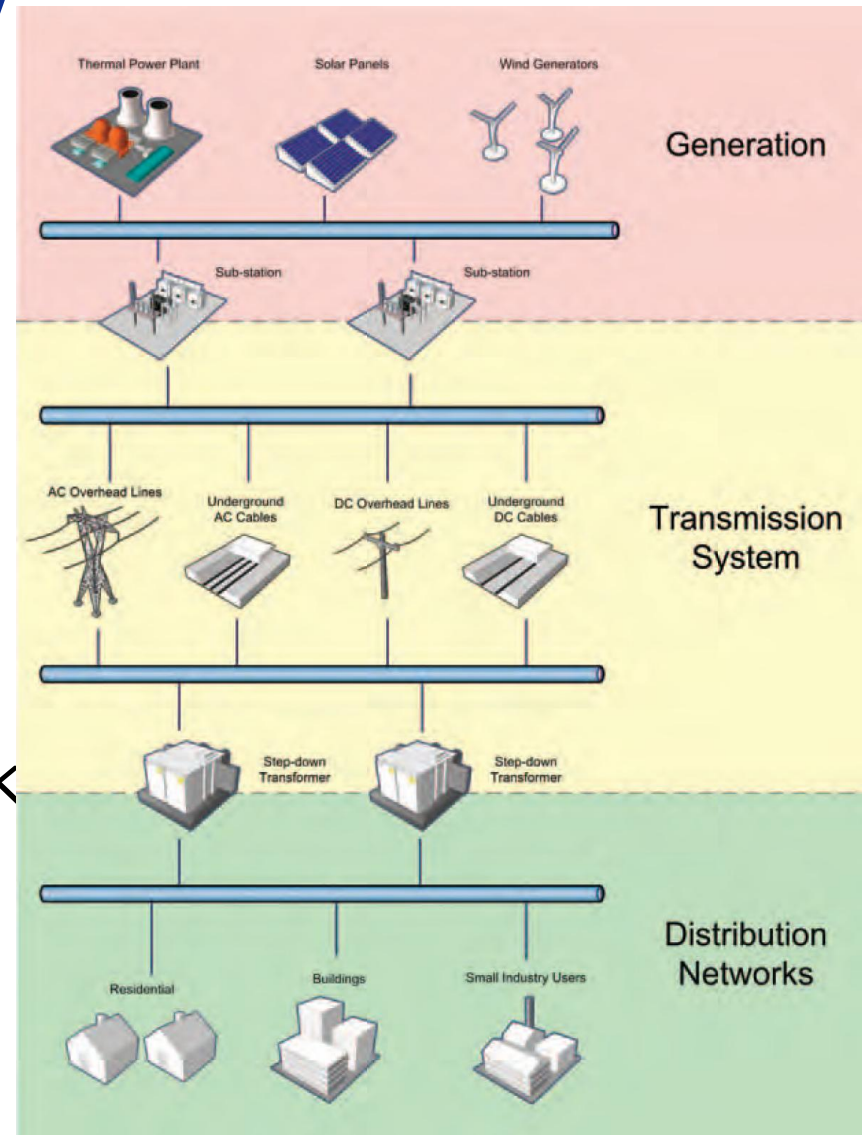
- Balancing the power variations (D & S)
 - Backup power
 - Reinforcing the network
- ... to be able to reach the goals.

These are no new issues (all generation needs this), but the "supply behavior" of windpower is different and projects are distributed and uncertain



Network of today

- Generation, mainly large units
- Transmission, transporting from generation to areas with consumption
- Distribution, the link to the consumer

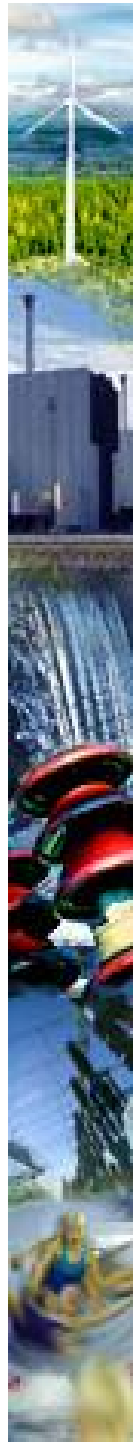


"Easy way"

- Increase balancing power
and
- Increase back-up power
and
- Reinforce the network

In the same way as the existing structure

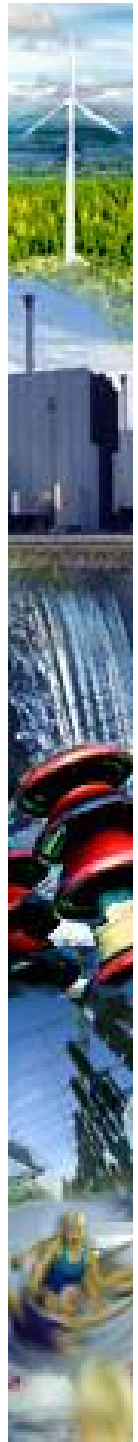
Or...



"Smarter way"

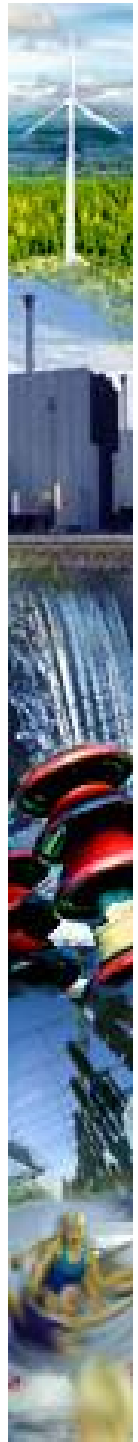
- Increase balancing power
and
- Increase back-up power
and
- Reinforce the network

...by combining new ideas – smart grid



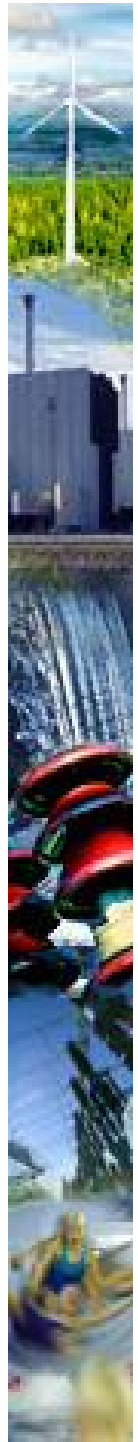
What can we do today?

- Form a vision that makes the network (and the system) prepared for the challenges. We need a combination of:
 - Flexible generating units;
 - Flexibility on the demand side;
 - Availability of interconnection capacity; and
 - More flexible (market based) rules in the power market.
- This is the concept of/vision "smart grid"



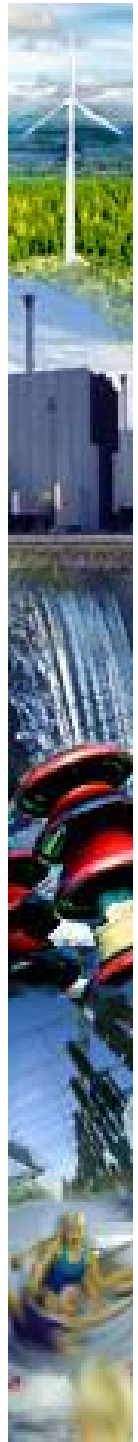
Smart Grid in EU

- The European Technology Platform SmartGrids (ETP-SG) for the European networks of 2020 and beyond (2050).
 - To develop a shared vision
 - To identify research
 - To align ongoing projects
 - To draw conclusions and recommendations for follow-up actions and implementation of the strategic research agenda and deployment plan.



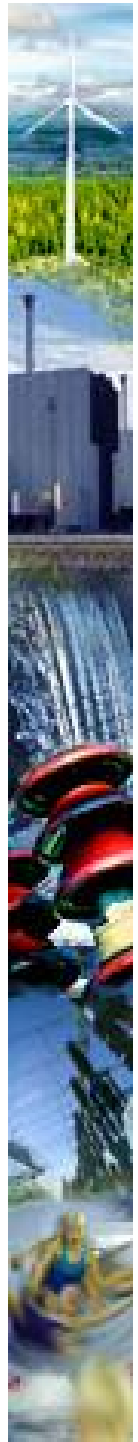
The driving forces for the Electricity Networks of the Future

- To give incentives for all the parties who seek efficiency.
- To meet the environmental, political and social demands
- To bring security, sustainability and competitiveness.
- To integrate renewable energy and distributed generation in the Electricity Networks.
- To be able to manage bottlenecks in the transmission (with market-based methods).



What can be seen already today?

- Clearer understanding windpower behaviour - in “Smart grid” terms:
 - Make use of geographical aggregation;
 - Improve control of wind plants both on local and system levels
 - Use state-of-the-art forecasting, monitoring and communication techniques.
- For the network
 - Specific grid code requirements (harmonised!) taking into account the continuing development of wind power plant capabilities.

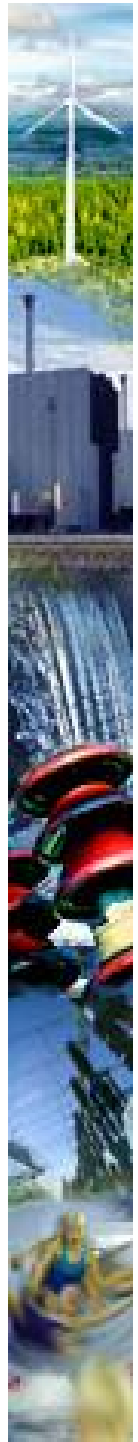


What can we do today?

Form a vision!

- The planning horizon is 5-10 years for all components (network, generation, supportsystems etc.)
- The lifetime for a windpower plant ~20y
- The lifetime for networkstructure >40y

It will be hard to do everything right but with a vision/direction we will be able to do more right than wrong and more efficient!



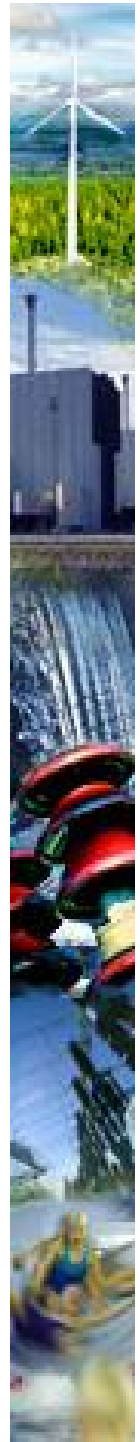
We need for the future...

- ... active consumers
- ... active generators
- ... active "products" ("electric cars", "microgeneration")
- ... active network
 - Balancing power (hydro not fossil)
 - Back-up power
 - Network
- Combining is more efficient!

More



Less

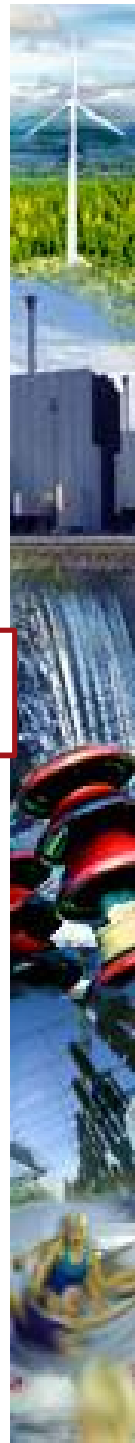


Smart Grid stakeholders

- Many stakeholder ...



..but we must work together!



Thank you

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