

Scenarios for the development of the (North) European power system

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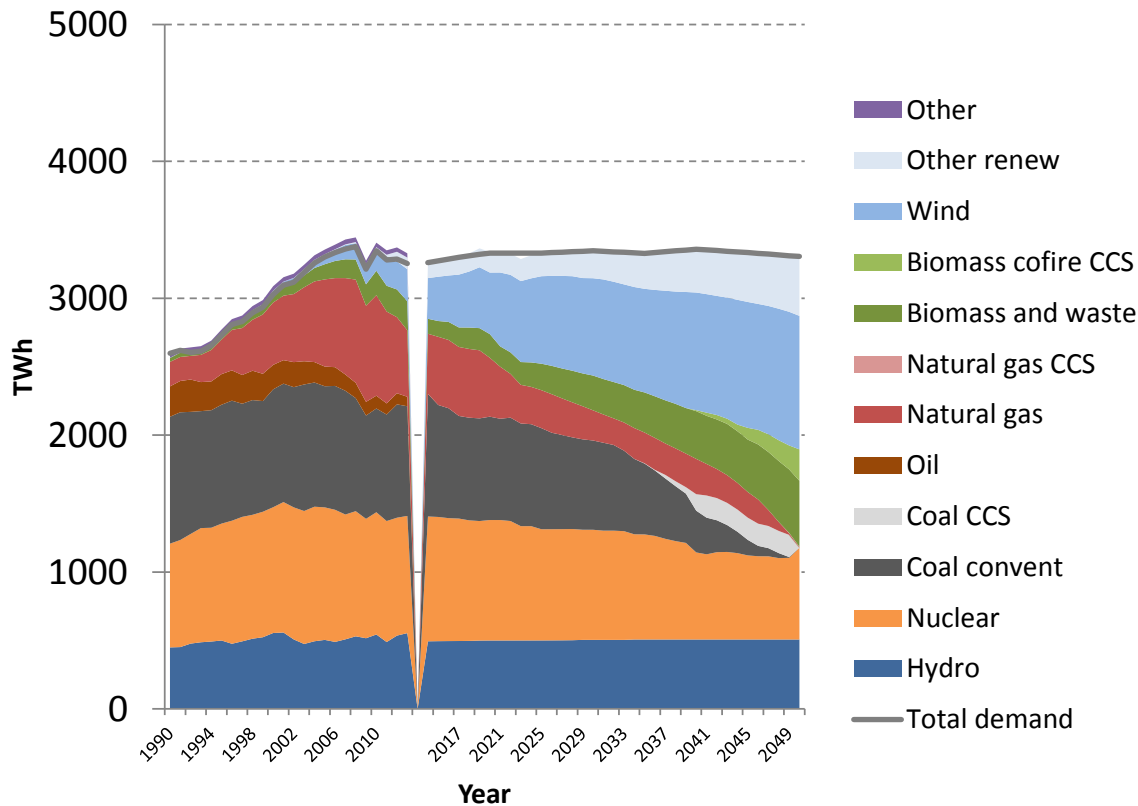
Stockholm, 3rd of March

Important considerations for the development of the European electricity system that define our scenarios

- ❑ EU 2020 energy and climate package, the 2030 policy framework and the 2050 roadmap (-40% GHG, 27% RES and +27% energy efficiency)
 - Significant effort for the electricity system (towards zero emissions by 2050?)
- ❑ Policy setup (focusing on GHG, on RES or on several policy objectives simultaneously)
- ❑ Technological development and availability
 - Renewables
 - CCS
 - Nuclear power
 - Efficiency measures, increased electrification
- ❑ Economic growth, international fuel markets
- ❑ Common EU effort or regional targets
- ❑ Increased integration through new interconnectors
- ❑

European electricity-generation scenario, "Go for all targets"

Today (2013): 33% RES, 42% fossil and 25% nuclear



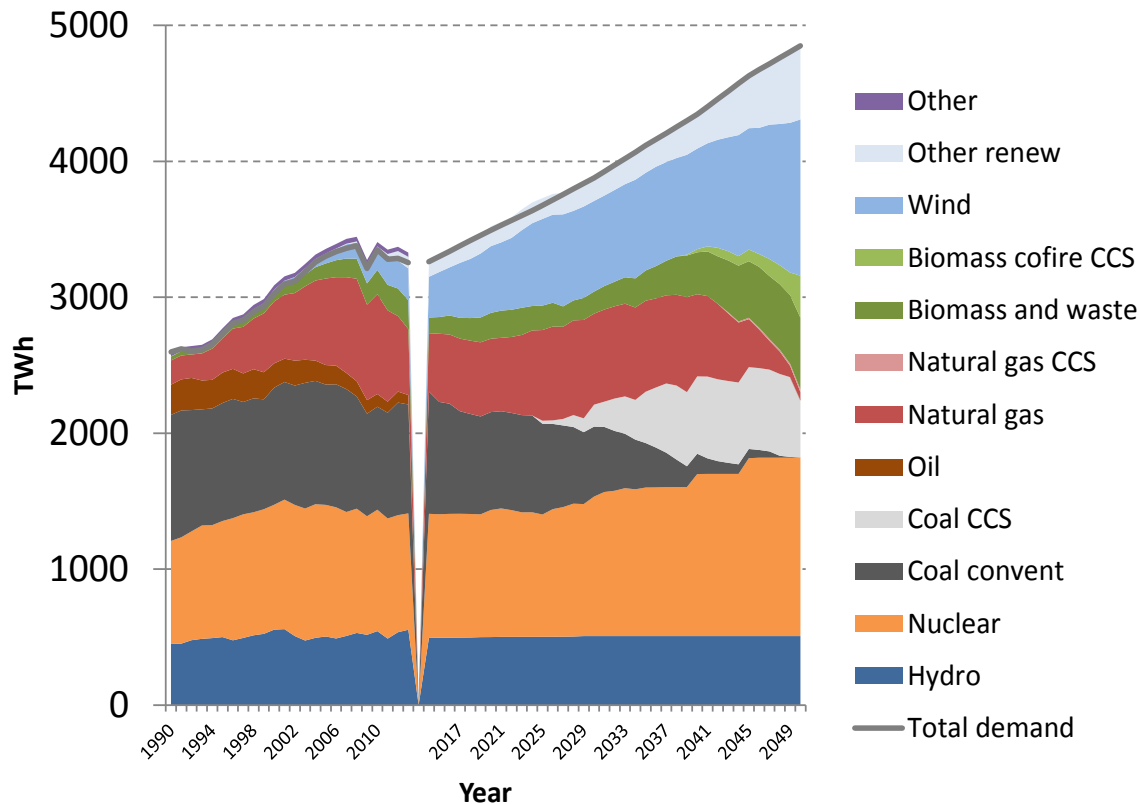
- Targets for RES, CO₂-red and end-use efficiency by 2030/2050
- RES-E share: 33% 2013, 40% 2020, 50% 2030
- National efforts
- All options available
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→ Low ETS and wholesale electricity prices until 2030

EU-27, NO and CH

European electricity-generation scenario, "Go for climate"

Today (2013): 33% RES, 42% fossil and 25% nuclear



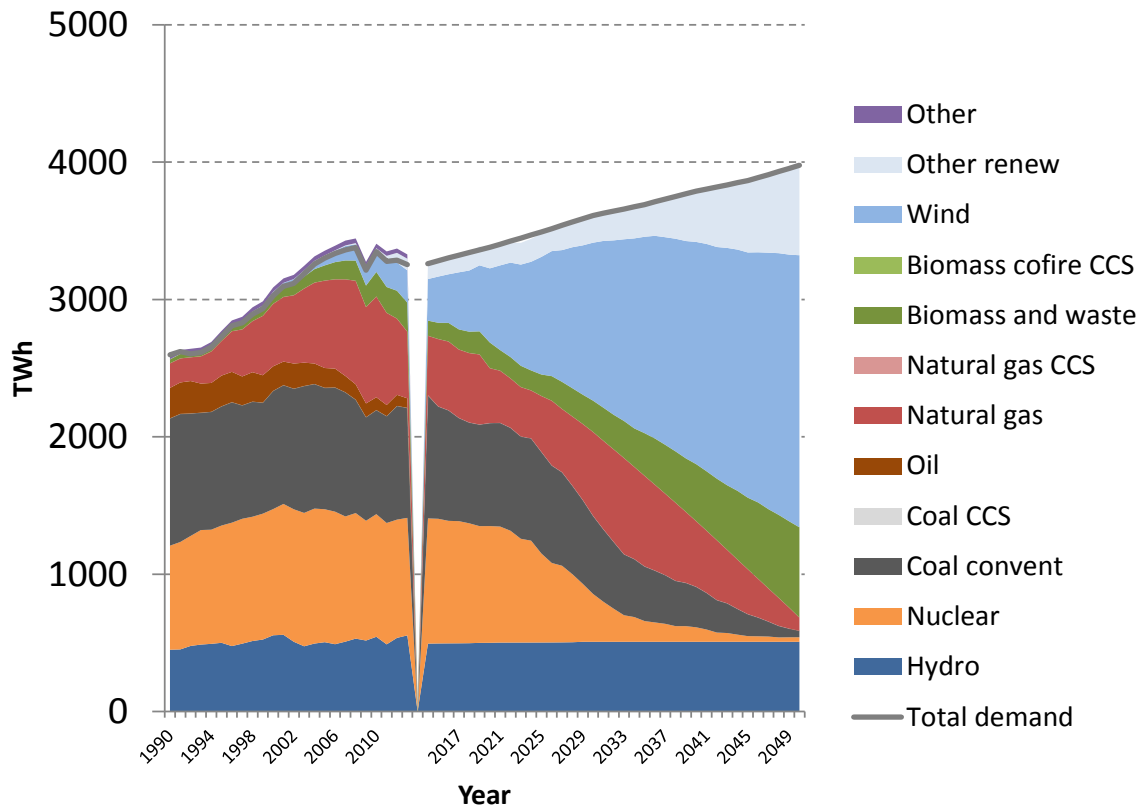
- One overarching CO₂-reduction goal post 2020, -95% by 2050
- Common EU effort
- All technologies optional
- CCS available
- Increased electrification
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→ Increasing ETS and wholesale electricity prices after 2020

EU-27, NO and CH

European electricity-generation scenario, "Go for green"

Today (2013): 33% RES, 42% fossil and 25% nuclear



- Very ambitious targets for RES, ~90% by 2050
- Common European RES effort
- CO₂-reduction target, -95%
- Rapid nuclear phase-out (45-50 yrs instead of 60 yrs)

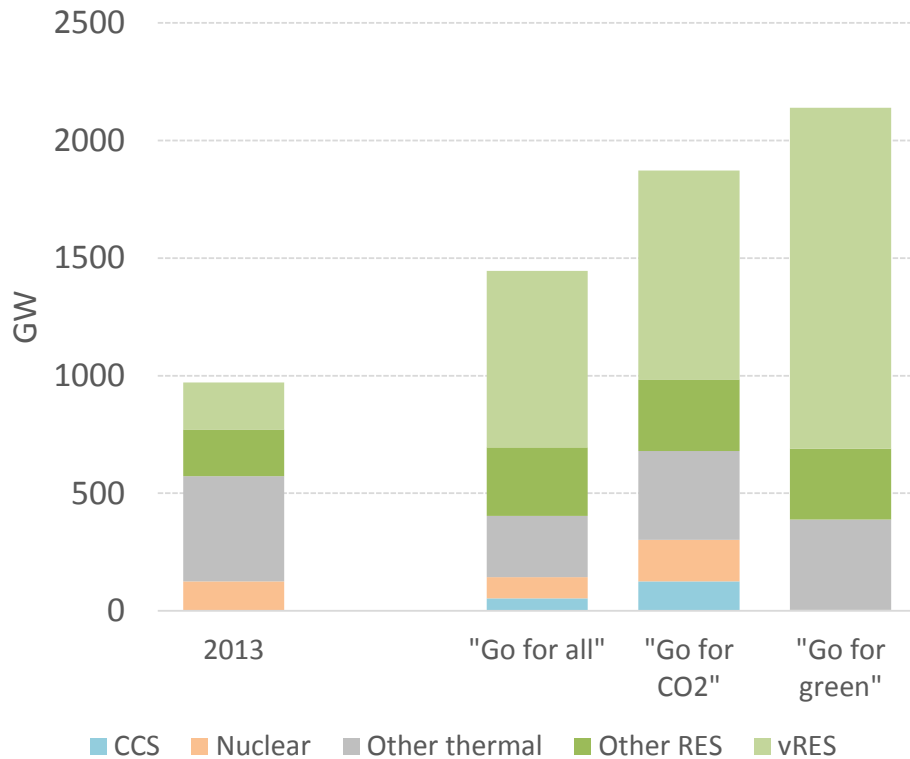
-> Almost 50% wind in 2050
(similar to the EWEA vision)

→ Increasing subsidy levels for RES-E and low wholesale electricity prices

EU-27, NO and CH

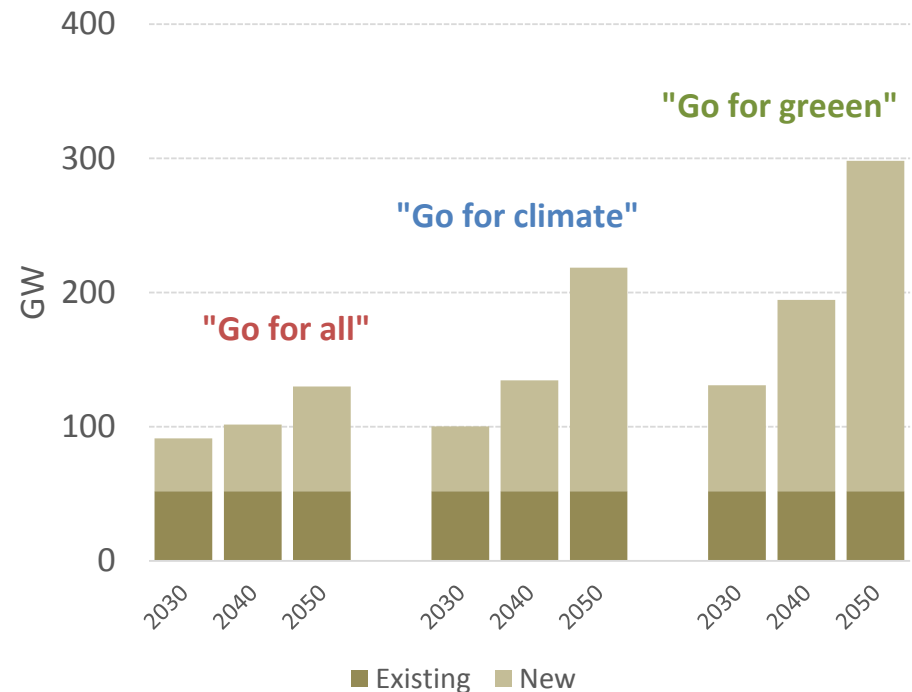
The importance of capacity

The estimated production increase of 0-40% will require 50%-100% more generation capacity by 2050



1500-2200 GW corresponds to the estimates made in EC, Roadmap 2011

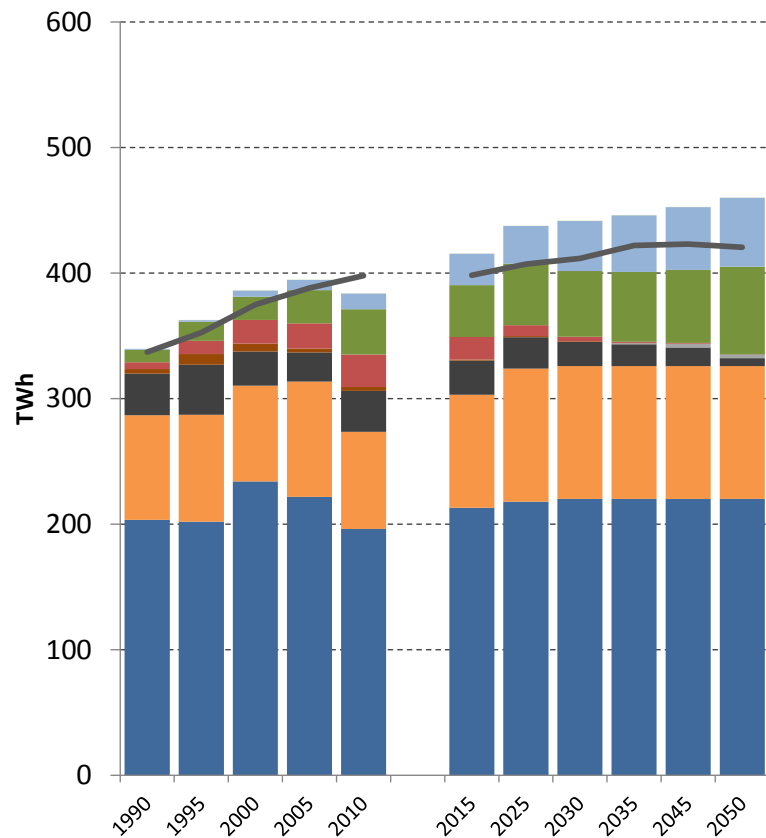
European interconnector capacity



Nordic electricity supply: significant growth in renewables especially if EU climate policy is stringent

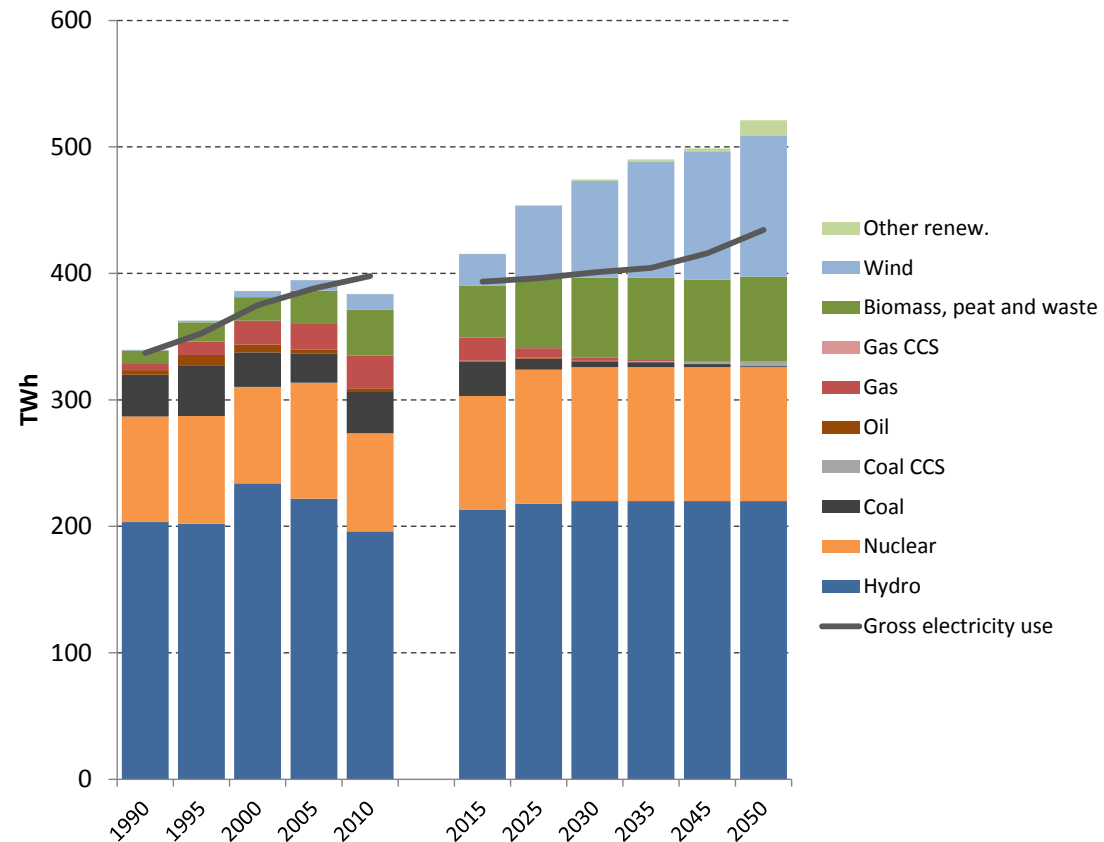
Modest European climate policy

-> From 10% to 5% fossil-based electr. gen. by 2030



Ambitious European climate policy

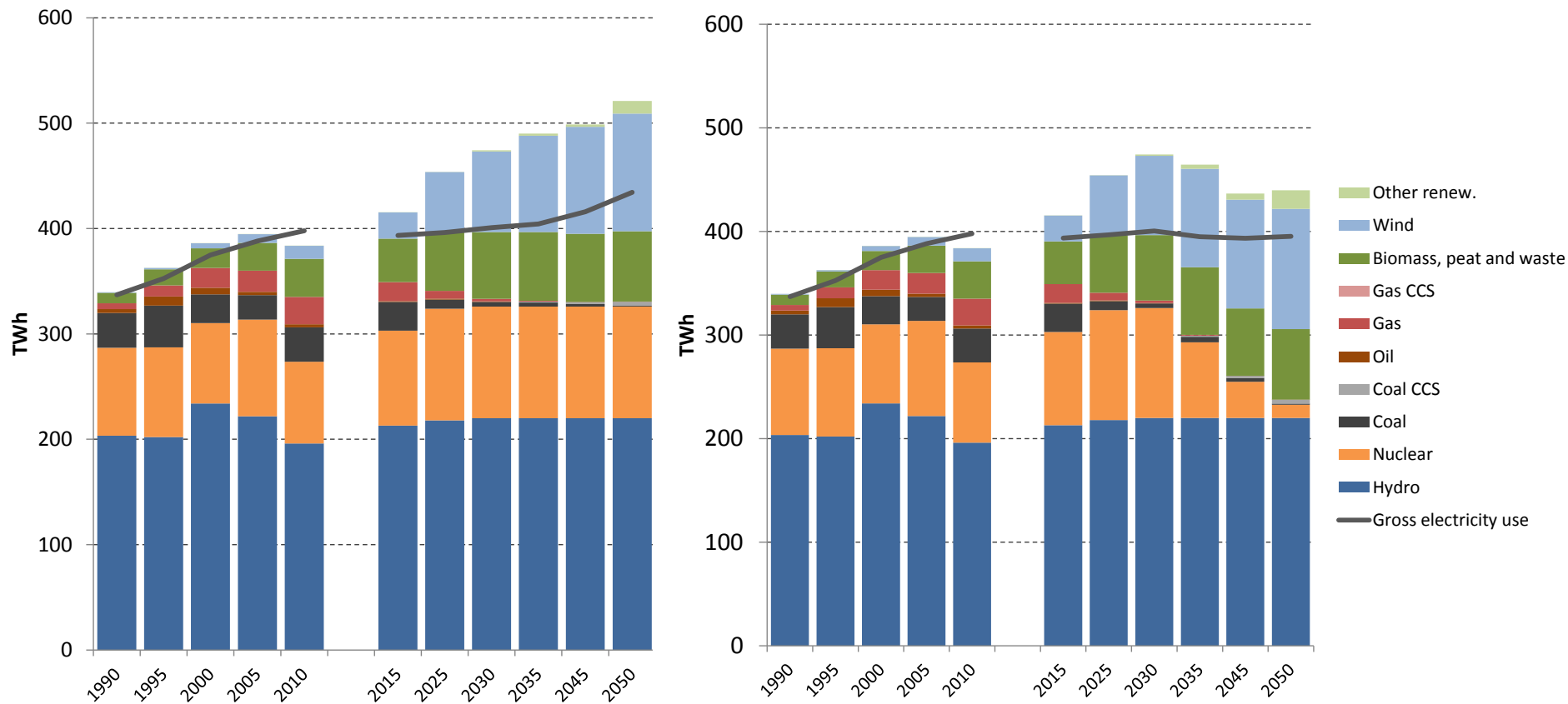
-> From 10% to 1% fossil-based electr. gen. by 2030



Nordic electricity supply: nuclear power plays a key role

Ambitious European climate policy

Ambitious European climate policy
– nuclear phase-out



Model runs indicate that a modest European climate policy combined with a Nordic nuclear phase-out would imply a tighter capacity balance than shown above

Large potential for Nordic net electricity export

- But depends on a number of key factors..

Nordic net electricity export to Continental Europe

