

Modeling issues in Norway- ongoing projects

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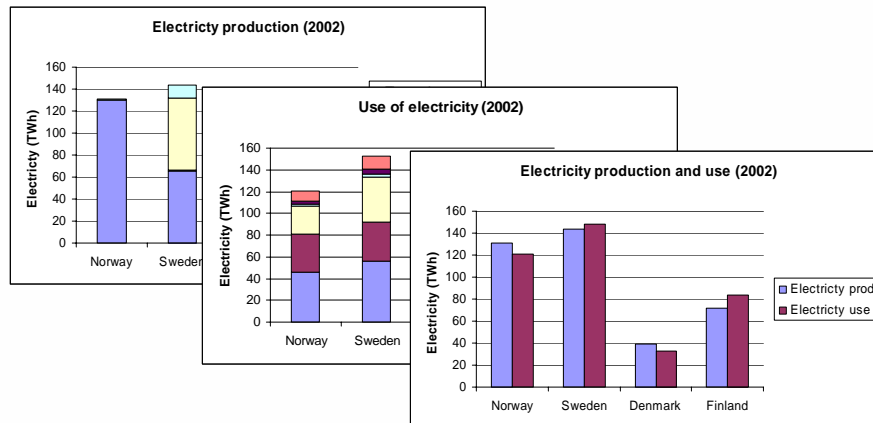
Ongoing projects related to MARKAL

- TRANSES
 - Sustainable development, Multi-Attribute Trade-Off
- NORWAYS
 - Hydrogen, biofuels, linking Markal to infrastructure models/GIS
- Low emission scenarios for Norway
 - Linking top down and bottom up analysis
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Electricity production and use in the Nordic region



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The Nordic MARKAL model

- Four national models linked by electricity grid (Nordpool)
- Covers energy supply and demand in stationary sector (electricity and heat)
- Common fossil fuel market
- Harmonized large power plants assumptions

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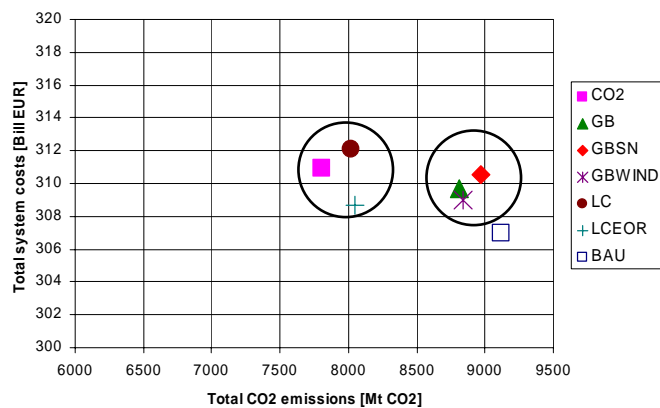
TRANSES scenarios (2005)

- Business as usual (BAU)
- Low Carbon (LC)
- Green business (GB)
- Reduced Consumption (RC)

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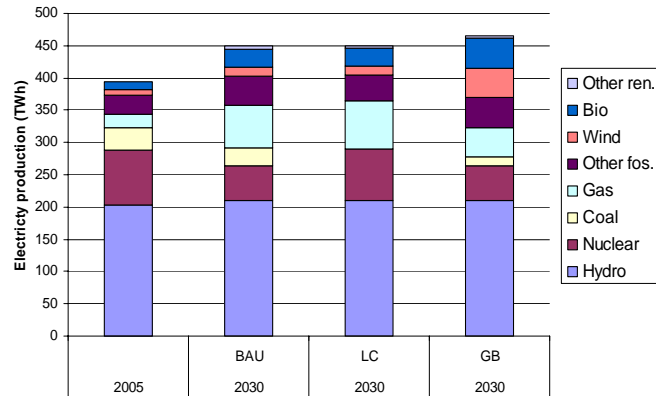
Example of preliminary results- scenario indicators



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Example of preliminary results- electricity production



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New scenario approach

- Technological options → energy policies
- Investigate a large number of technological strategies for energy supply and end use
- Including more options than minimizing costs
- Future uncertainties taken into account by doing sensitivity runs

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Strategies and Uncertainties

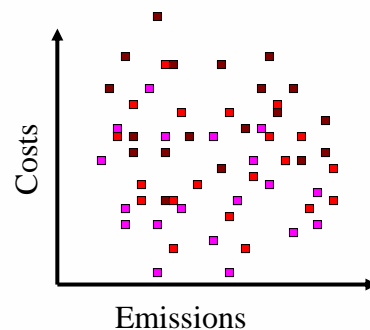
- Example of strategies energy supply and uncertainties
 - Electricity supply
 - Wind power
 - Hydro
 - Thermal
 - Import/export
 - Heat and CHP
 - Biomass
 - Waste
- Uncertainties
 - Energy demand growth
 - Fuel prices
 - CO2 cost
 - European electricity prices

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Post-processing and trade off analysis

- Example handling uncertainties etc



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Norways – introduction of Hydrogen

- Follow up of HyWays to identify regions and market segments for H2 in Norway
- Modeling issues:
 - Regional modeling- link to infrastructure models/GIS
 - LP vs MIP

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Thank you for your attention!

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