Technology neutral support in SWE/NO

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The Nordic electricity market

- 14 Mio. customers
- 400 TWh/year
- Early deregulation/liberalisation
- Nordpool power exchange
- Political ambition - common Nordic end-user market by 2015

The integrated market key to RES-E cooperation
The Support System

- One part of the Swedish energy policies
- Quota based certificate system
- Technology neutral (1 MWh = 1 green certificate)
- A common marked between Sweden and Norway
- Target of 26,4 TWh increased renewable electricity in 2020 compared to 2012.
- Before Norway, Sweden had built about 13 TWh within the system

The demand (and production) of electricity in Sweden and Norway is about 250 TWh!
Timeline

2003  SE green certificates system starts
2004  First bilateral discussions with Norway
2006  Discussions paused
2007  Limitations in the support (15 years)
2009  Governments agree on principles
       National legislations passed through parliaments
2011  Governments/parliaments agree on Treaty
       Norway implements RES Directive
2012  Common SE-NO market starts
2020  Target 26,4 TWh
2035  End of cooperation
Why a certificate scheme?

- Delivery – not more not less than target
- Long term predictability for investors
  - Most decisions by the market not politicians
  - Not financed over state budget
- Low costs for consumers
  - Tech neutrality -> cheapest first & competition drives costs down
  - Support level automatically adjusted to cost developments
- Expansion of market possible
Why a joint support scheme?

• Better market functioning
  – higher liquidity, better price formation
  – bigger market more attractive for investors

• Increased cost-efficiency
  – Access to larger production base

• Increased long term predictability for investors through politically stable system
Development of renewable electricity

Renewable electricity in the green certificate system

- Hydro
- Wind
- Bio
- Norway

Production [TWh]

Potentials and cost in Sweden and Norway

- The target is **26,4 TWh** increased renewable electricity.
- The marginal cost technology is onshore windpower with an LRMC of about 55 €/MWh
- The support today is about 25 €/MWh and the electricity price is about 35 €/MWh

Also below the cost of onshore Windpower:

- 7 – 8 TWh hydro
- 5 TWh Bio

The power technologies compete in similar cost range!
Summary

- Suits well with the Nordic liberalised electricity market
- The renewable technology are competing (complaints on low certificate prices but builds anyway)
- The system is well adopted by the stakeholders
- The cost for consumers are low 3 – 4 €/MWh (about 2 – 4 % of the end consumers electricity cost and about 10 % of the power price)
- Not triggering immature technologies
Main Policies and Measures

| Market and operating regulation adaptation |  |
| Supporting technologies (e.g. power grids) |  |
| Manage growth and policy cost |  |
| Public acceptance |  |
| Economic deployment support for mass market |  |
| Priority market access |  |
| Supply chain development |  |
| Financing |  |
| Targets |  |
| Initial plants / large-scale demonstration |  |
| Institutional and human capacity building |  |
| Resource/cost, technology portfolio assessment |  |

- Inception
- Take-off
- Consolidation

- Hydro power
- Heat pumps
- Bioenergy
- Onshore wind
- PV
- Innovative biogas
- Offshore wind
- Info/ network market barriers (onshore wind)
- CO2-taxation
- EU ETS
- Electricity certificates all RES-E

RD&D
Investment grant Wind, biogas, PV

tech specific measures

tech neutral policies
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Thank you for your attention!

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