Potential benefits and regulatory risks for new interconnections from Norway

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Agenda

- Economics of Interconnectors
  - Norway – Europe/UK
  - Benefits must exceed costs for all parties who can stop the project
    - Or it will not be realised
- Regulation matters – four examples
  - The case of ITC
  - Capacity pricing
  - Carbon pricing
- Regulatory risk: What can be done?
Decarbonisation => Reducing flexible generation and increasing intermittent renewable generation

- We need new flexibility in generation, consumption and storage
- We need transmission and interconnection in order to
  - Even out some of the variability of intermittent generation across Europe
  - Use existing flexibility efficiently
  - Develop new flexibility where it is cost efficient
Economics of Interconnectors
Norway – Continental / UK

- Capital intensive. Life span of up to 60 years. 1,2 M€/MW + national grid reinforcements
- Today: Available flexibility and "implicit pumping"
- Expansion beyond existing plans will soon require new generation capacity, and a bit later also increased pumping capacity
  - Pumping capacity: +/- 0,3 M€/MW
  - Higher short term cost of flexibility with pumping – energy efficiency 75%?
    - Interaction with increased Norwegian benefits from (seasonal) pumping?
  - May need coordinated expansion of interconnectors and hydro flexibility. New regulation?
Economics of Interconnectors
Norway – Continental / UK

Benefits / revenues come from

• **Price differences** (day ahead, intra day, ancillary services)
  • Congestion rent
  • Consumer and producer surplus

• Security of supply, reduced price uncertainty, more efficient competition
  • Capacity payments...
Diminishing incremental revenue when capacity is expanded

Price difference

Consumer + producer surplus

Congestion rent

Interconnection Capacity →
Price difference a normal week

Inntektspotensial mellom NO1 og Tyskland en typisk uke
Market shocks and fuel price variations increase profit.
Average price difference per week varies substantially (Norway – partner)
How much is profitable from a European perspective?

- The first new interconnectors seem to be profitable.
- History tells us...
- Technical potential > 20 GW
- More intermittent generation and higher CO2-prices increase profitability.
- But what about the PV and capacity payments cutting peak prices?
Benefits must exceed costs for everyone with the power to stop an interconnector

- Two countries must agree
  - And there are many stakeholders...
- Perceptions of future benefits may differ
- Uncertainty
  - Market development (e.g. fuel prices)
  - Technology
- Regulatory risk
Regulation example 1: Inter TSO Compensation (ITC)

- ITC generates payments between countries (TSOs) for the “use” of the grid in other countries
  - To cover variable cost and incremental capacity cost
  - Norway currently pays approx € 12 million per year
  - Suggested and postponed model: approx € 90 million per year
- E.g. Norway sells power to Denmark and have to pay for the use of the grid all the way to Italy...
-⇒ For Norway: A tax on interconnections – a strong disincentive if not kept under control
Example 2: Capacity payments

- Capacity payments increase capacity and reduce peak prices in the day ahead market
- *Distort investments unless demand, storage and interconnectors are included*
  - Worst case: supporting old coal plants instead of promoting new flexibility
Example 4: Too low carbon price

- Support for renewables and energy efficiency programs imply that we can reach a given emission level with a lower carbon price ⇒ Carbon price lower than shadow price of emissions
- Low carbon price → lower peak prices
  - Lower start and stop cost, lower MC in the higher end of the supply curve
- Reduces the profitability of an interconnection to Norway
Capacity payments and too low carbon price

- High carbon price + No capacity payment
- Low carbon price + Capacity payment
Can we reduce the risk?

- Reach a more stable and better market design, political framework and regulation? A common need for most investors in the power sector
  - E.g.: 2030 targets and a (more) credible political framework in Europa. Climate low in UK
  - National/EU agreements that exclude some regulatory risk
- Contracts or business models that reduce counter part risks?
  - E.g. Handling of grid congestions or hydro producers responding according to true costs and capacity
- EU, ENTSO-E, States, TSOs and other players involved
Regulatory risk: What can be done?

- Can we share the risk in a better way?
  - Business models and long term contracts?
  - For a country that needs flexibility, an interconnector reduces total risk
    - More diversified against system crises – easier to let the market solve the balancing
    - An argument for putting more of the financial risk on the importers?
  - Ownership?
Thank you