



The perspective of an electro-intensive industry

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On behalf of Eurometaux, the European non-ferrous metals association
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Presentation Outline

1. Who we are, what we produce and how we produce
2. How we see the future electricity market
3. Electro intensive industry an integrated part of the electricity market
4. How to limit regulatory risk



1. Who we are, what we produce and how we produce

Europe's non-ferrous metals industry: Driving EU economic growth



900+ facilities



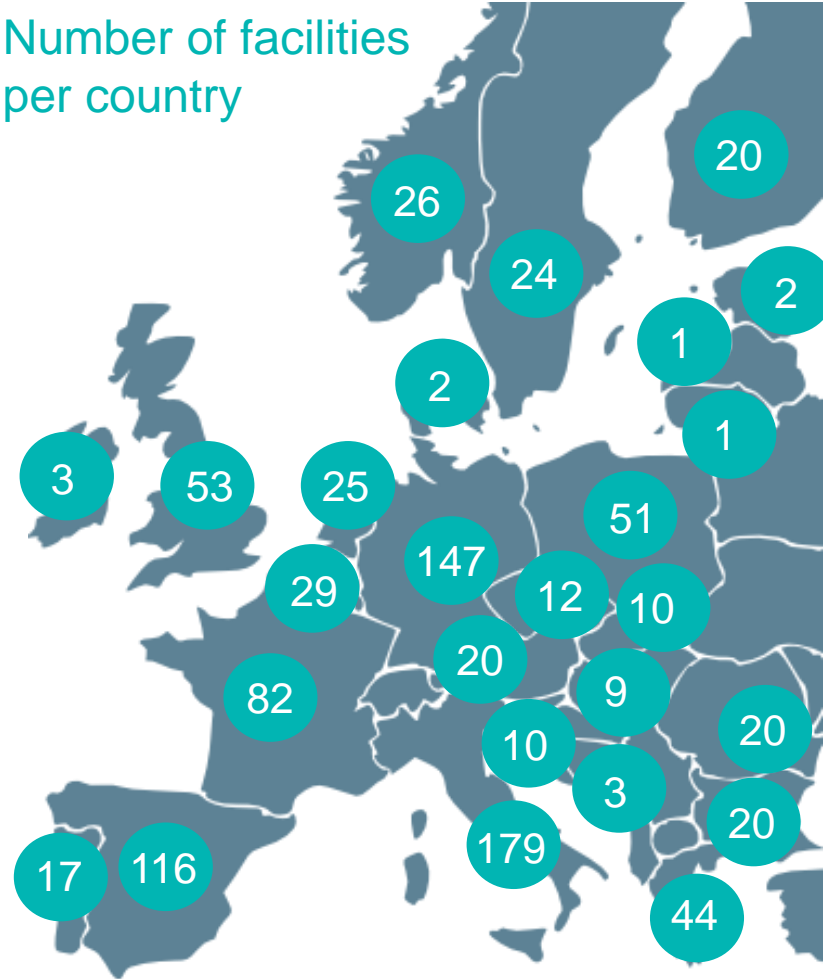
500,000 direct jobs



€120 bn annual turnover



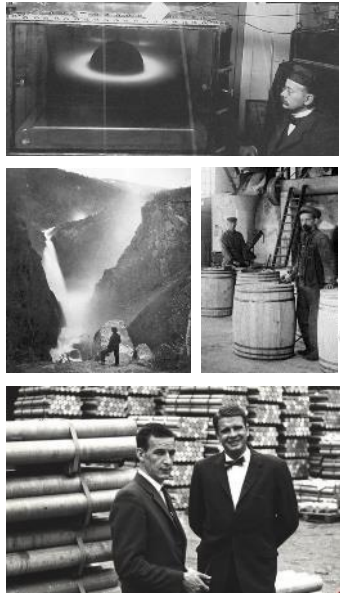
1/5 global production



Hydro - a global and complete aluminium company

“...create a more viable society by innovative and efficient use of natural resources and products”

More than 110 years of industrial development and responsibility



Aluminium – metal of the future



Hydropower – infinitely recyclable «green» energy



Engaged in the entire value chain – R&D, innovation and tailor-made solutions



35,000 employees at 150 locations in more than 40 countries



Involved and engaged



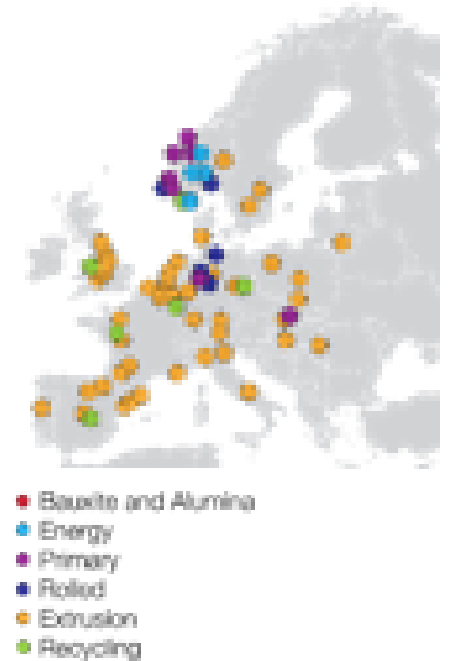
Norsk Hydro in Europe

Technology pilot Karmøy and Automotive line Grevenbroich

Benchmark efficiency



Millions of lighter cars





2. How we see the future electricity market

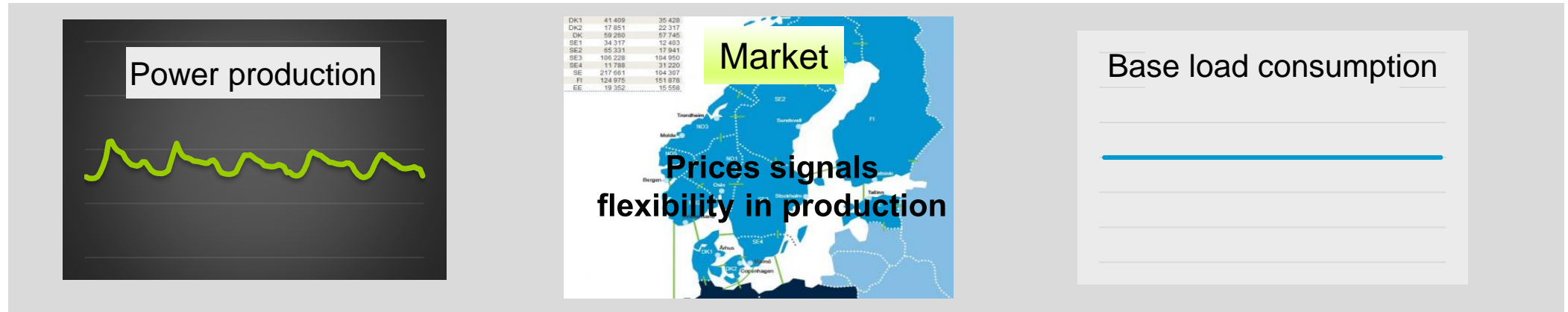
Future electricity market will be based on more renewable power



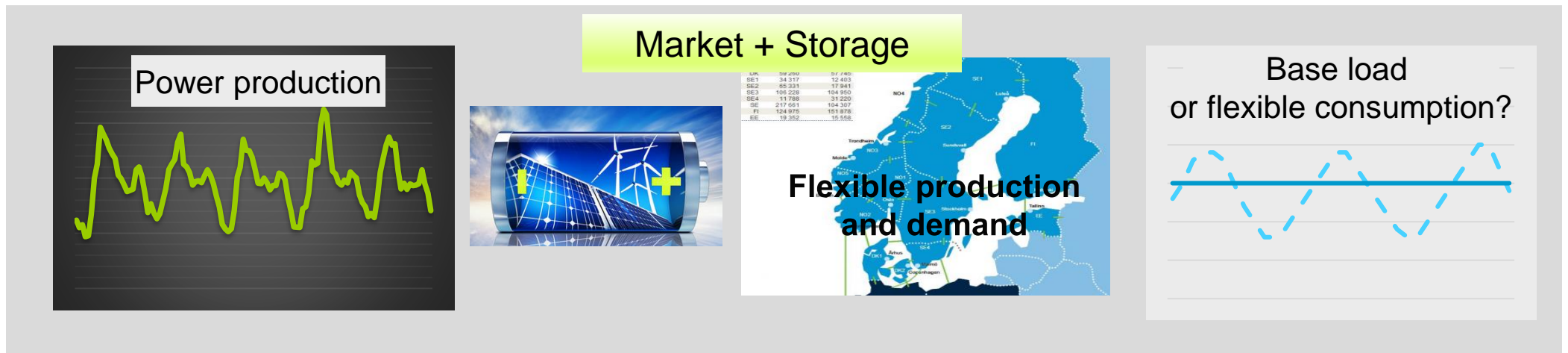
The future electricity system will be more volatile

This poses a challenge to industry

2016

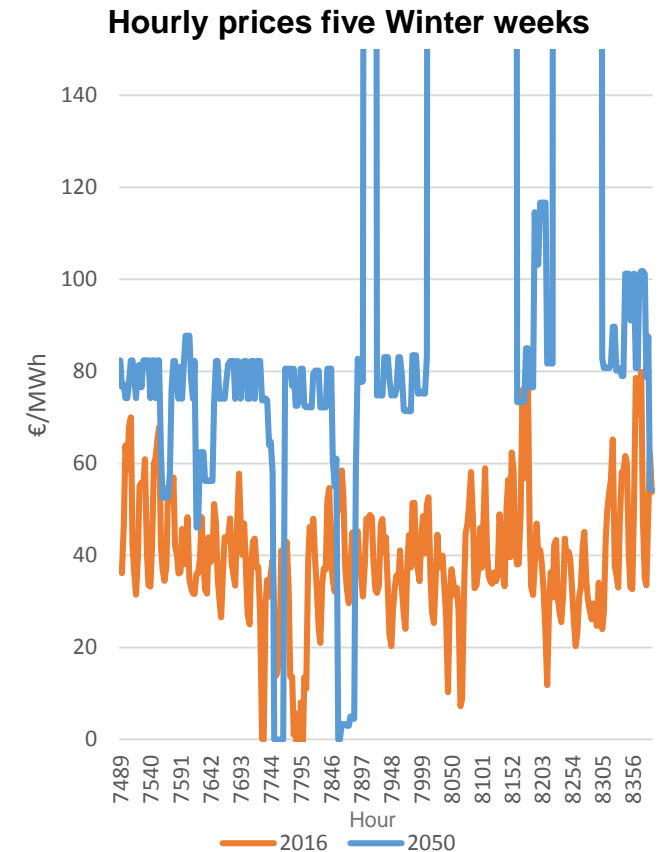
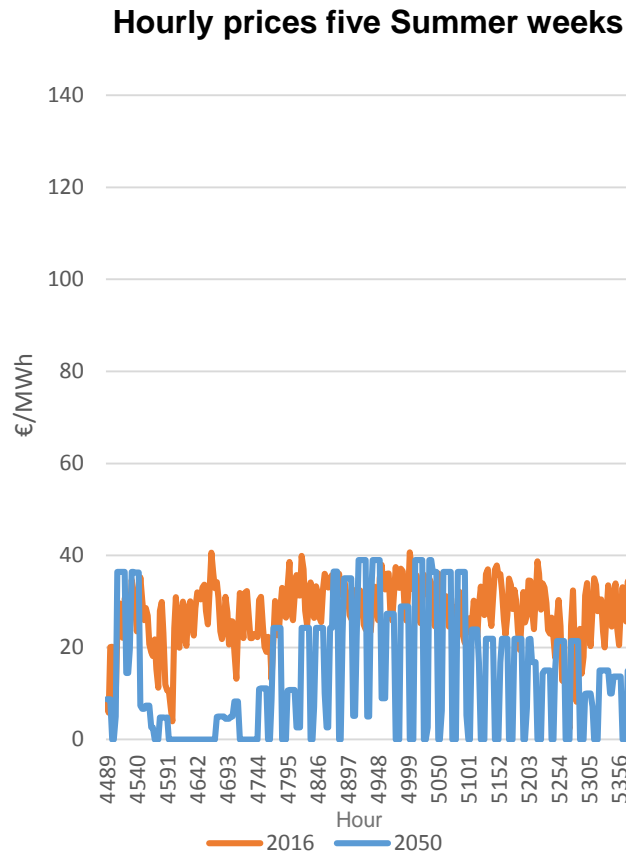
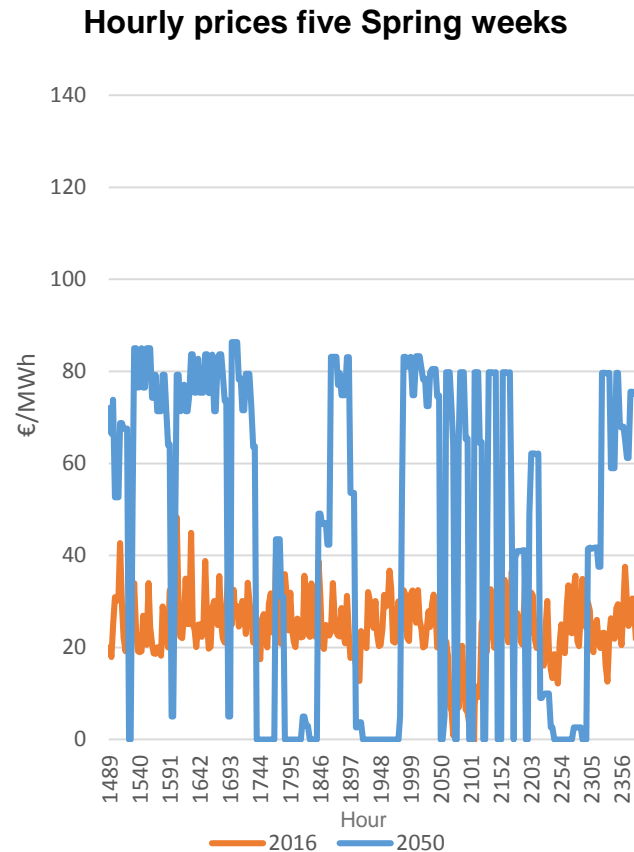


2030



Large price volatility in 2050, driven by wind and solar variation

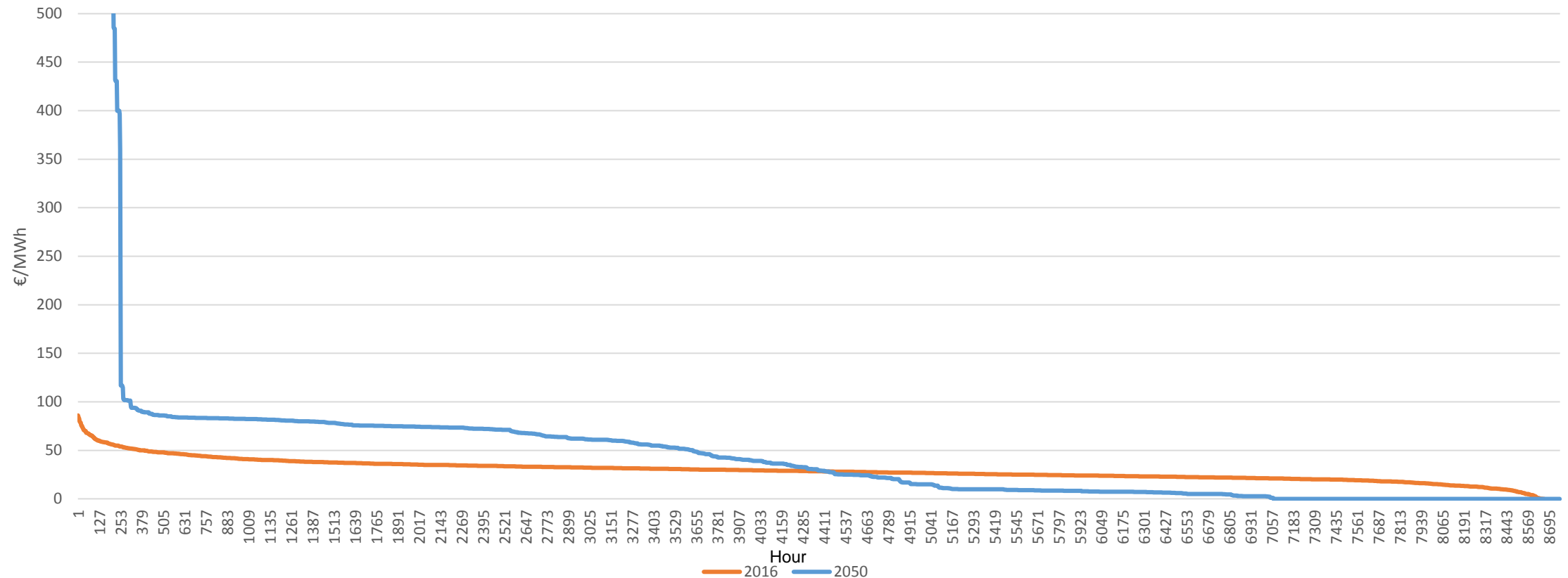
Simulated price structure Germany seasons in a 2050 year



Source: Hydro analysis

German duration curve in 2050 – **high** prices and **zero** prices

«Acceptable» variations?



Source: Hydro analysis



3. Electro intensive industry
an integrated part of the
electricity market

Electro-intensive industry integrated and active player in the electricity market



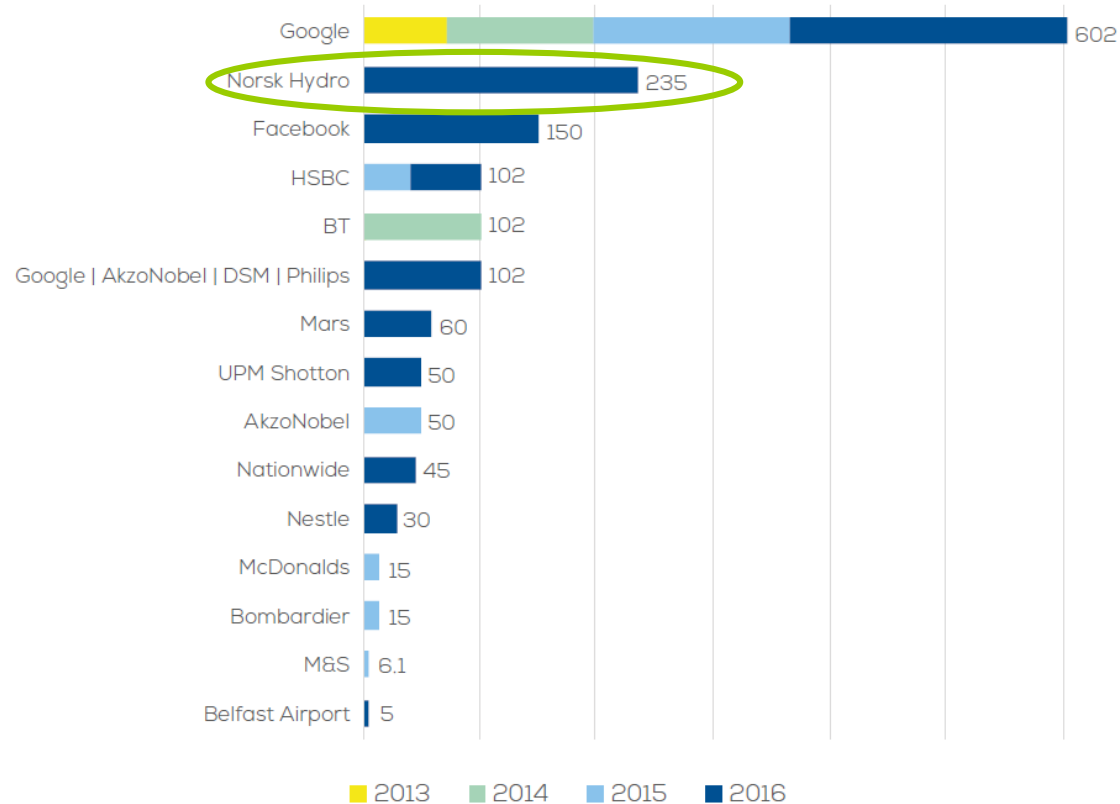
- Off-taker of wind power – enabling new large scale wind farms
- Demand side response
 - Norway and Germany
 - Mission is to produce aluminium, stability is focus, but balancing potential is substantial



Electro-intensive industry has mutual interest with wind power developers

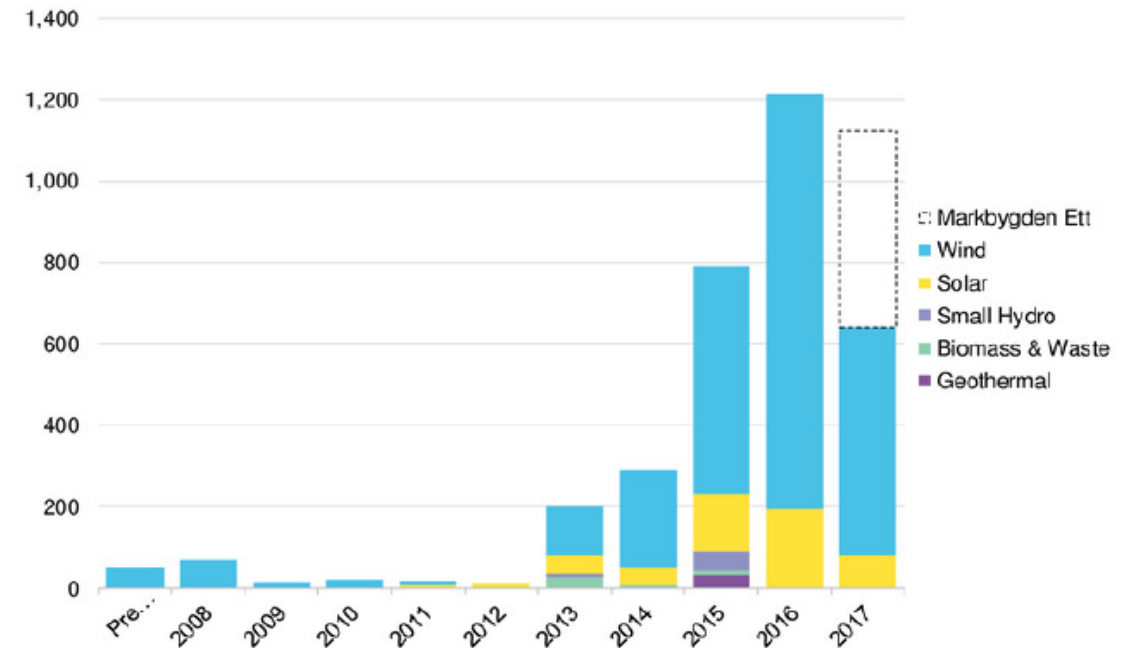
- Industry has long term investment perspective – wants to reduce risk
- Investors have high capital costs – wants to reduce risk

Wind off-takers in Europe 2013-2016 (MW)



Source: WindEurope

Figure 1: Corporate PPAs signed in Europe (MW), by estimated signing year and by sector

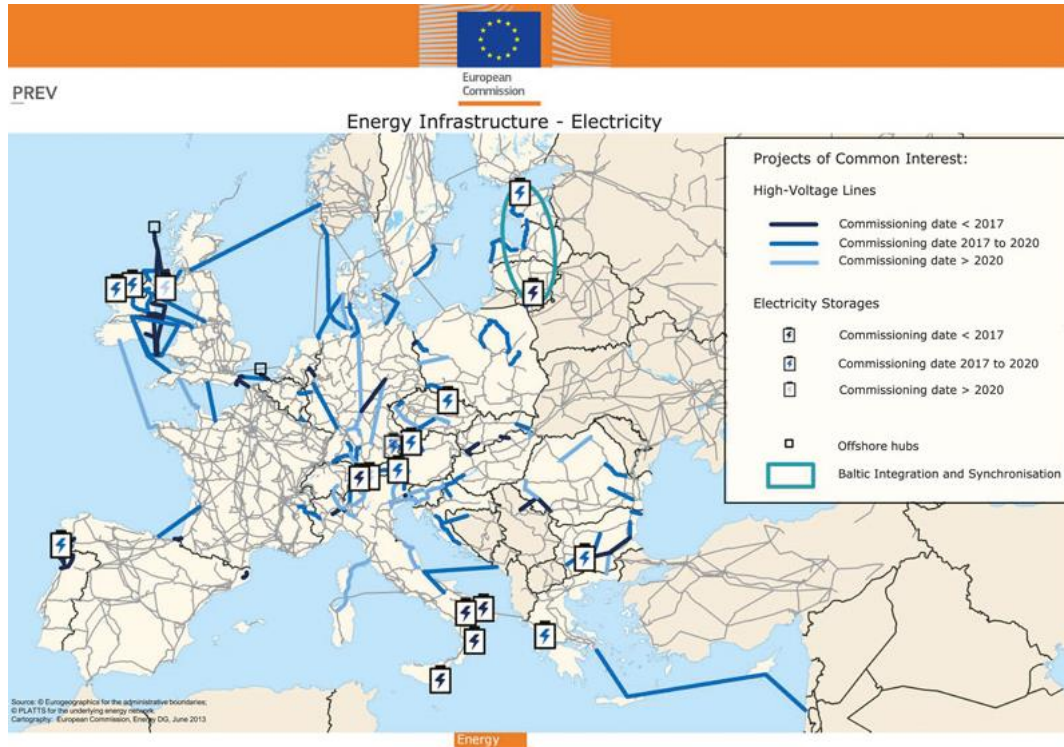


Source: Bloomberg New Energy Finance. Note: The Markbygden Ett figure assumes Norsk Hydro takes about 75% of the project's total output.



4. How to limit regulatory risk

The Clean Energy Package: Let electro-intensive industry play a role



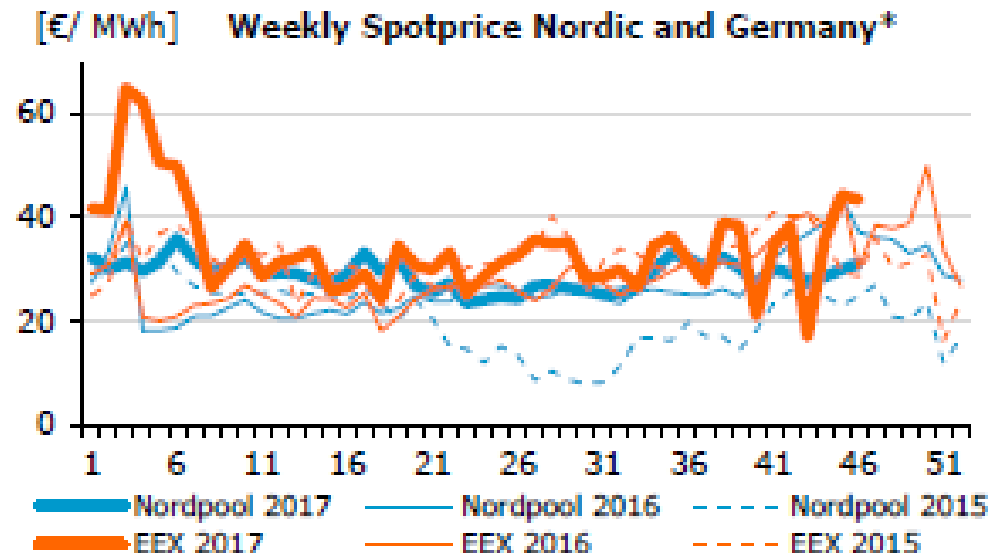
Market Design Directive Proposals

- Article 5.9
 - The industry needs a sufficient planning horizon to provide services for balancing capacity
 - Restrictions on contracting periods should therefore be avoided
- Article 17.2:
 - Restrictions on use on congestion revenues so that these can only be used for investments in grid connections, and no longer to reduce grid tariffs, should be avoided
 - There is no reason it should not be possible to use congestion income for both purposes
 - Decisions on network investments should be based on assessments of costs and benefits to society

Limitation of regulatory risk

Industry can handle market risk – our daily business

- Access to guarantees is available in the market
- Access to balancing competence/service is available in the market



Regulatory risk is the main obstacle – Legislators should reduce this risk

- Balancing and system costs
 - Increased need for balancing, and grid investments, must be cost efficient
- Compensation for indirect costs of the EU ETS
 - For aluminium production, the indirect costs of the EU ETS are 7 times great than the direct costs
 - Increasing price of EUAs urges the need for an adequate compensation system for the indirect costs of the EU ETS in Phase IV
- Energy and Environment Guidelines post 2020
 - Exemptions to the renewable energy surcharges in the EEAG must continue post 2020 (Crucial for future investments)

