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The EU H2-strategy as framework for Nordic developments

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Plan for the presentation

- EU H2 strategy – developments
- Policy and market status, challenges ahead
- Nordic opportunities and challenges
- Conclusions



EU H2-strategy developments

- **2020: Clean H2-strategy part of EU Green Deal**
 - From R&D to targets for deployment of renewables-based H2 (2024: 1 Mt; 2030: 10 Mt)
 - Open for broad end-use
 - Plan for infrastructure and market by 2030
- **2022: Revised strategy as part of RePowerEU Plan**
 - Upscaled target to 20 Mt consumption 2030
 - Specific target for imports – 10 Mt by 2030 with new corridor from north
- **2023-24: Policy implementation (Fit for 55)**
 - EU legalisation of binding targets – industry (42%) and transport (1%) clean hydrogen by 2030 (3-6 Mt)



Understanding changes in ambitions

- Green Deal 55% by 2030, net-zero by 2050 presupposes cut for hard-to-abate sectors
- Ambitious targets hyped by political leadership in the Commission and industry
- Cut in gas supply from Russia accelerate transition with import target reflecting poor conditions for renewables in NW Europe
- Legalisation of far lower binding targets reflects **‘reality check’**



Status EU regulatory framework

- Binding targets industry (42% by 2030 and 60% by 2050) and transport (1% by 2030),
- ETS – incentives for demand and production
 - Maritime sector included
 - Free allowances for production of hydrogen
 - Removal of free allowances for H2-consuming sectors
- FuelEU Maritime Regulation limits GHG intensity of energy used by ships (2% lower 2025, 80% by 2050)
- ReFuelEU Aviation Regulation: synthetic aviation fuels: 1.2 % in 2030, 35% in 2050
- Definition of renewable H2: additionality, temporality, geography
- Infrastructure and market: H2 included in TEN-E, Gas and H2 market legislation, Alternative Fuels Infrastructure Regulation

EU financing framework

- Innovation fund – wide funding along supply fund
 - European Hydrogen Bank – auction for production – lowest bid winner
- Other funding programmes
- State Aid Guidelines - IPCEIs

European Hydrogen Bank

- First pilot auctions - €720m
 - 7 projects (about 1.7GW electrolyzer capacity)
 - Spain and Portugal (5), Finland (1), Norway(1)
 - 1.6 mill tonnes H₂/ammonia
- 10-year fixed premium with ceiling € 4.80/kg
 - Far lower bid price than expected: € 0.37- € 0.48/kg
- Offtake: fertilizers, maritime, grid
- New second auction 2024-25 (€ 1.2 bill)
 - New criteria: lower ceiling (€ 4), dedicated funding to maritime sector (€200 mill), 25% limit for Chinese technology



Market status

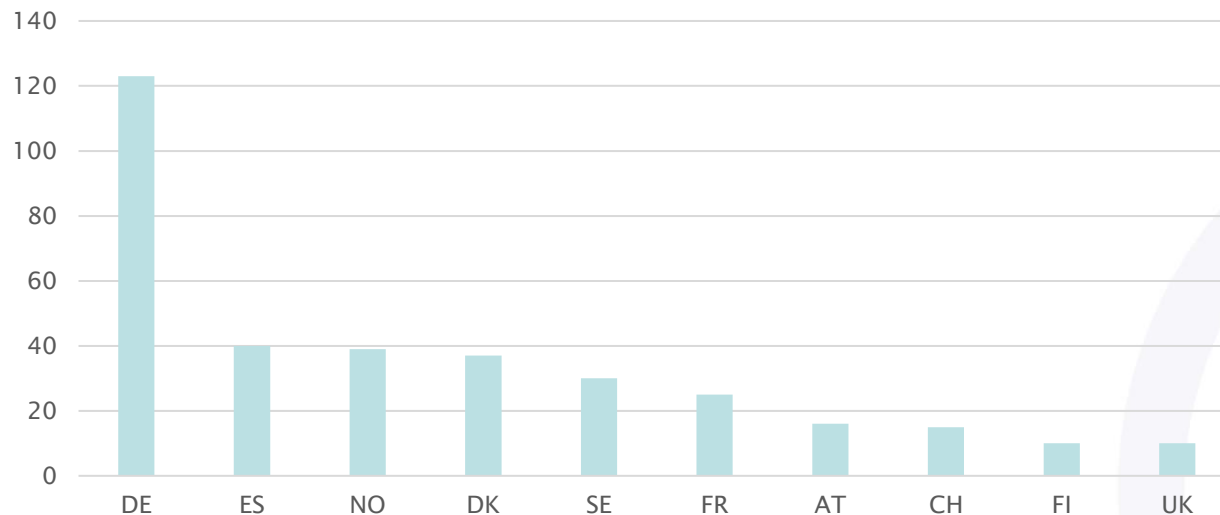
- Demand for H₂ was 7.9 Mt in 2023 down 15% from 2020
 - Lower production of ammonia and methanol due to high gas prices and competition
 - Higher production of fuels due to cut in supply from Russia
 - 95.5% of demand still covered by production based on fossil fuels



Market status 2023 -2024

- Electrolytic production capacity Europe (Sept 2024) 385 MWe (64 000 t), only 0.4% of total H2 production capacity
- Blue hydrogen: 0.5% of total production capacity

Installed and operational electrolysis capacity (MWe) - top European countries (Sept 2024)



Challenges ahead

■ Techno-economic

- Tech costs still very high, in particular for electrolytic hydrogen
- ‘Chicken and egg’ – lack of demand and infrastructure
- Safety standards to be developed

■ Financial

- EU funding is only a fraction of needs and final investment decisions postponed
- National funding best in Germany, the Netherlands, France, Italy, Denmark and Spain

■ Socio-political

- New economic order (Net-zero Industry and Minerals Act) – opportunities for manufacturing but more costly electrolyzers
- Changes in party-political landscape – transition cool down?



Nordic opportunities/challenges

- Opportunities
 - Strong technological and industrial base
 - Low-cost renewable energy sources
 - NO and FI among winners in first auction of EHB
 - NO/SE compliant without additionality in RED
- Challenges
 - Implementation of EU legislation – how to enforce legal targets?
 - Public funding to share risks a major challenge
 - Including for infrastructure
 - Socio-political developments
 - National energy policy focus or Nordic co-operation?
 - Public and commercial willingness to support net-zero industries

Conclusions

- EUs H2 strategy: from high ambitions to reality-checked steering targets for 2030
- Regulatory framework conditions established at EU-level but still missing parts
 - Standardization and funding to establish full supply chains
- EU hydrogen targets for 2030 will not be reached
 - but if climate policy ambitions continue, H2 will have a role in the European and Nordic energy systems
- Nordic countries have good opportunities to take the lead in establishing markets for hydrogen and hydrogen derivatives in Europe