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Regulation & Financing of the German H2 Grid
Presentation at Strommarkttreffen

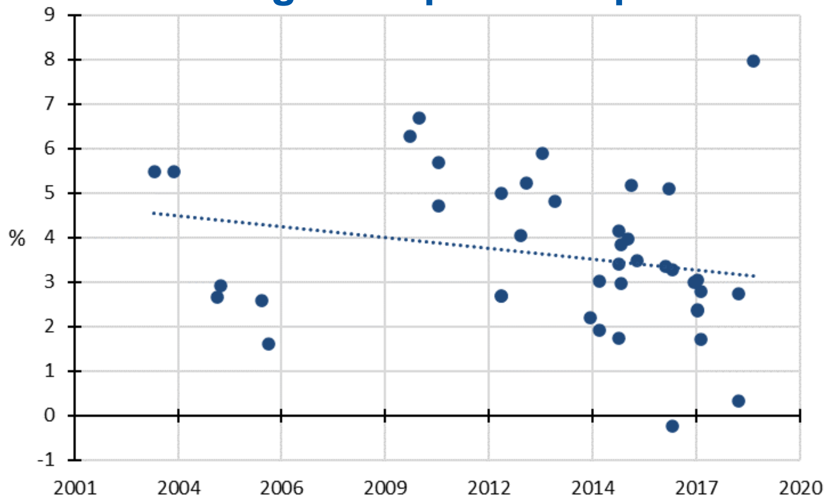
15 December 2023

Berlin

Early-stage investments in H2 infrastructure face technological risks and cross-chain risks, amongst others

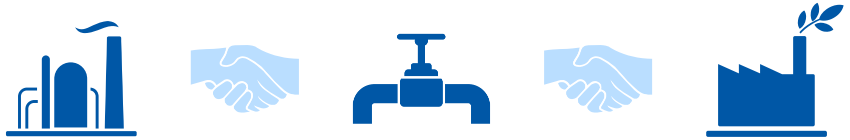
- Using novel and untested technologies entails risk of construction delays, opex and capex overruns and operational disruption
- The market success of early-stage H2 investments typically depends on few counterparties along the value chain:
  - H2 production: withdrawal of anchor off-takers or unavailability of H2 transport infrastructure or CCS infrastructure are key risks
  - H2 transport: limited number of customers and uncertainty regarding available H2 quantities creates volume risk
  - H2 off-take: uncertainty regarding availability of sufficient quantities and regarding access to transport infrastructure are key risks
- The combination of immature technology risks and mutual dependencies has the potential to result in delays and an under-sized H2 network (relative to projected demand)

Wind project bonds show that immature technologies require risk premia



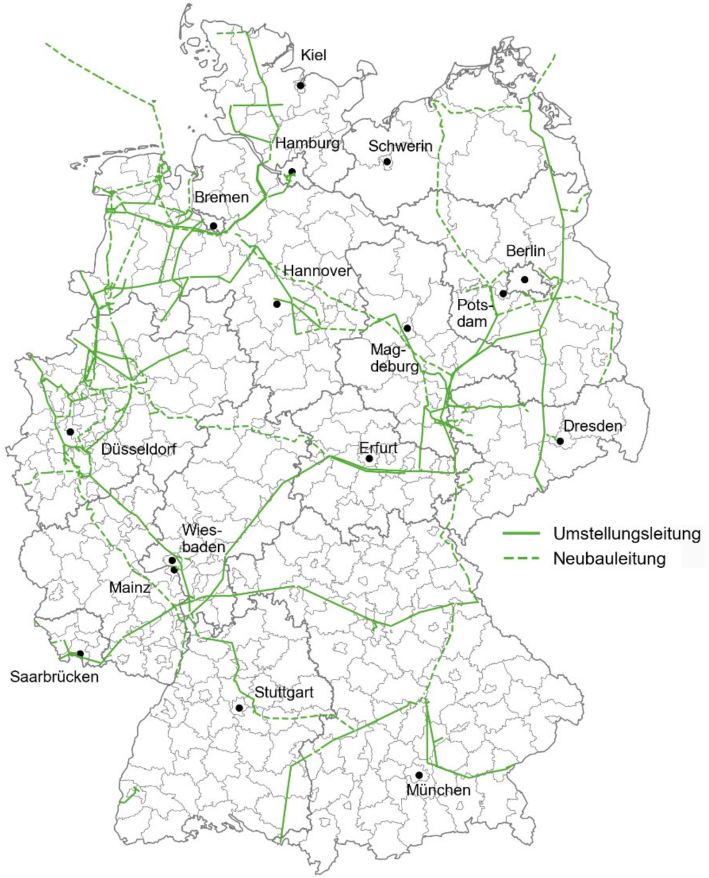
Sources: NERA, DataStream, Crédit Agricole

Market success of early-stage hydrogen projects depends on few counterparties



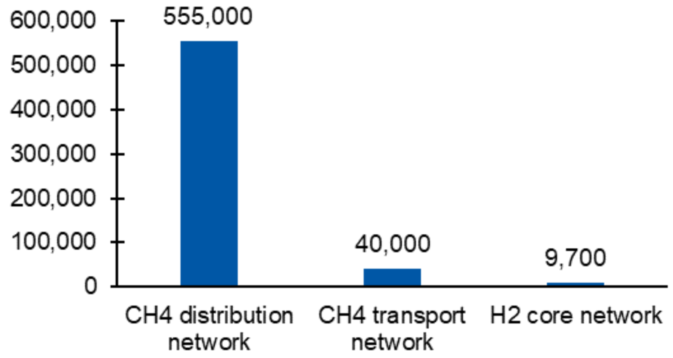
German H2 core network is considered a milestone and a signal for players along the value chain

Draft German H2 core network (November 2023)

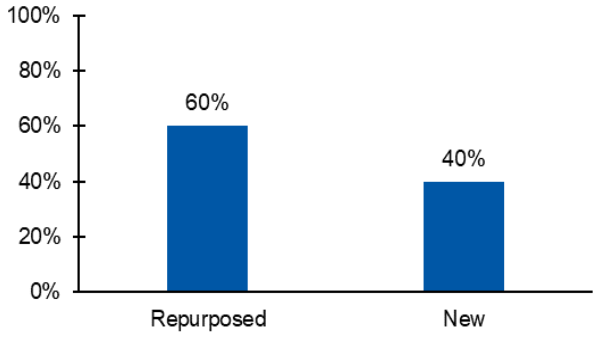


Source: FNB Gas

Length (km)



Repurposing



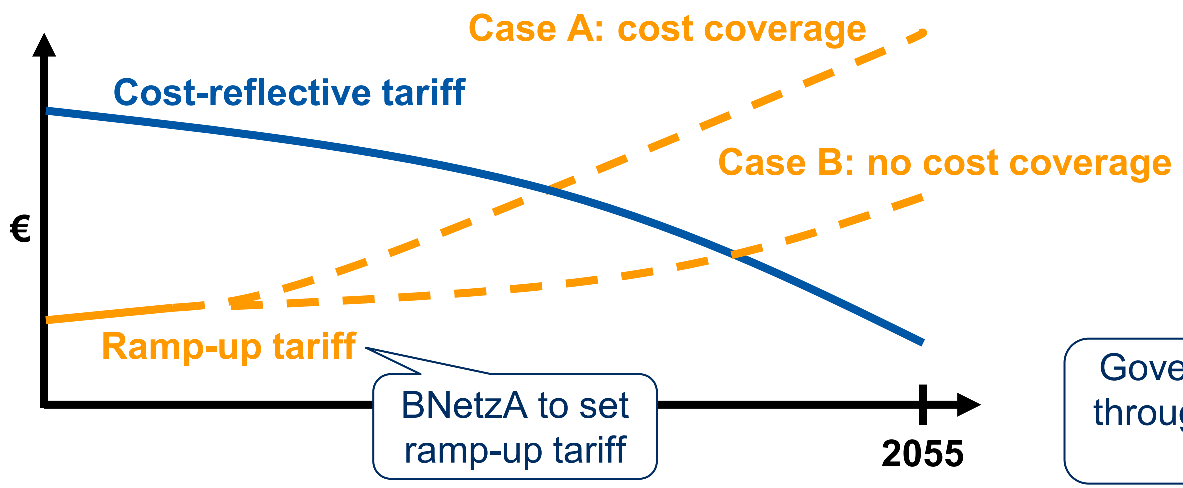
- Federal network agency to confirm H2 core network
- CH4 TSOs as designated operators of H2 network
- Key features of core network set politically (interconnection points, coverage of industries, federal states and IPCEI projects)
- Projected investment cost of € 19.8bn (compare to € 239.7bn until 2045 in NDP of electricity TSOs)
- Full network expected to be operational in 2032, constructions to commence in 2024

Draft law creates a roadmap and entails a mechanism to address key risks…

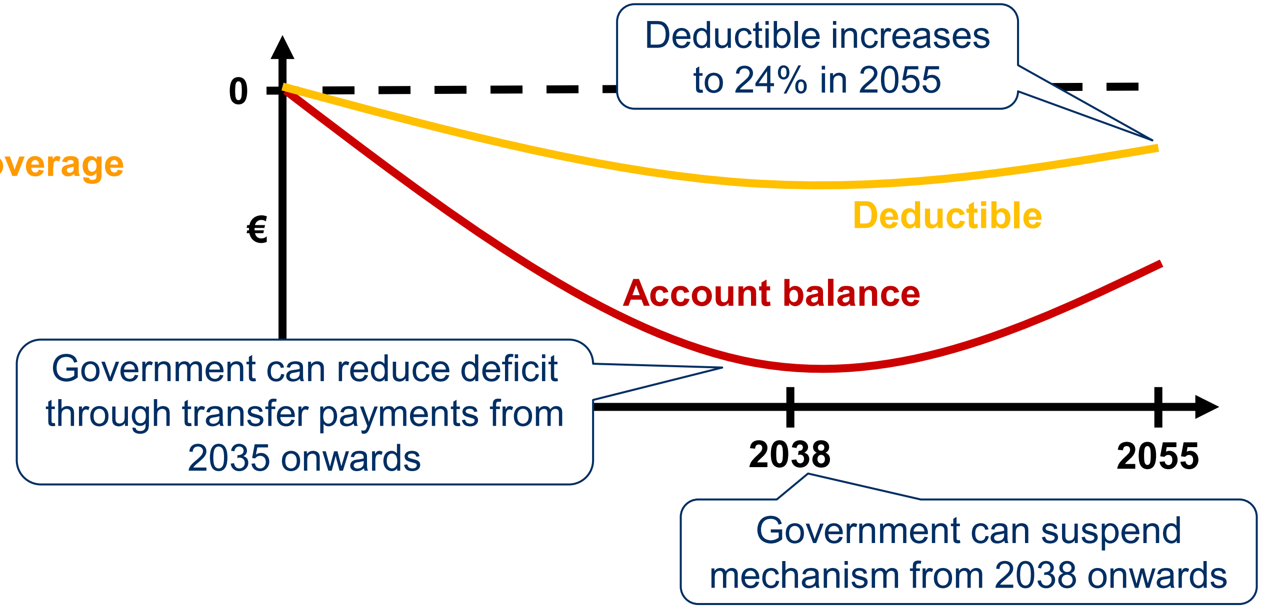
Draft law entails …

1. Process for regular H2 network development process (outside of H2 core network)
2. Financing mechanism for H2 core network

Network costs and tariffs



Amortisation account and deductible (Case B)



… but some questions remain, particularly regarding ability to attract private capital

Attractiveness of proposed risk-return profile

- Proposed return on equity of 5.47 % (nominal, post-tax) for 2025-2027 appears low:
  - New investments in electricity networks earn higher rate despite lower risks
  - Average German corporate bond yields stand at 4.23 % (November 2023)
- Potential mitigants: increasing allowed return, decreasing deductible, excluding repurposed pipelines from deductible

Stability of proposed mechanism

- Proposed mechanism runs until 2055, laws can change, and it appears questionable whether market participants will have sufficient trust in proposed mechanism to commit capital
- Potential mitigant: agreement on public-private contract between network operators, regulator and state

Proposed tariffication

- Regulatory tariff-setting process is likely to be contentious
- Uniform post-stamp tariff does not allow for locational price signals and implies a shared liability in case of underutilisation on single pipelines

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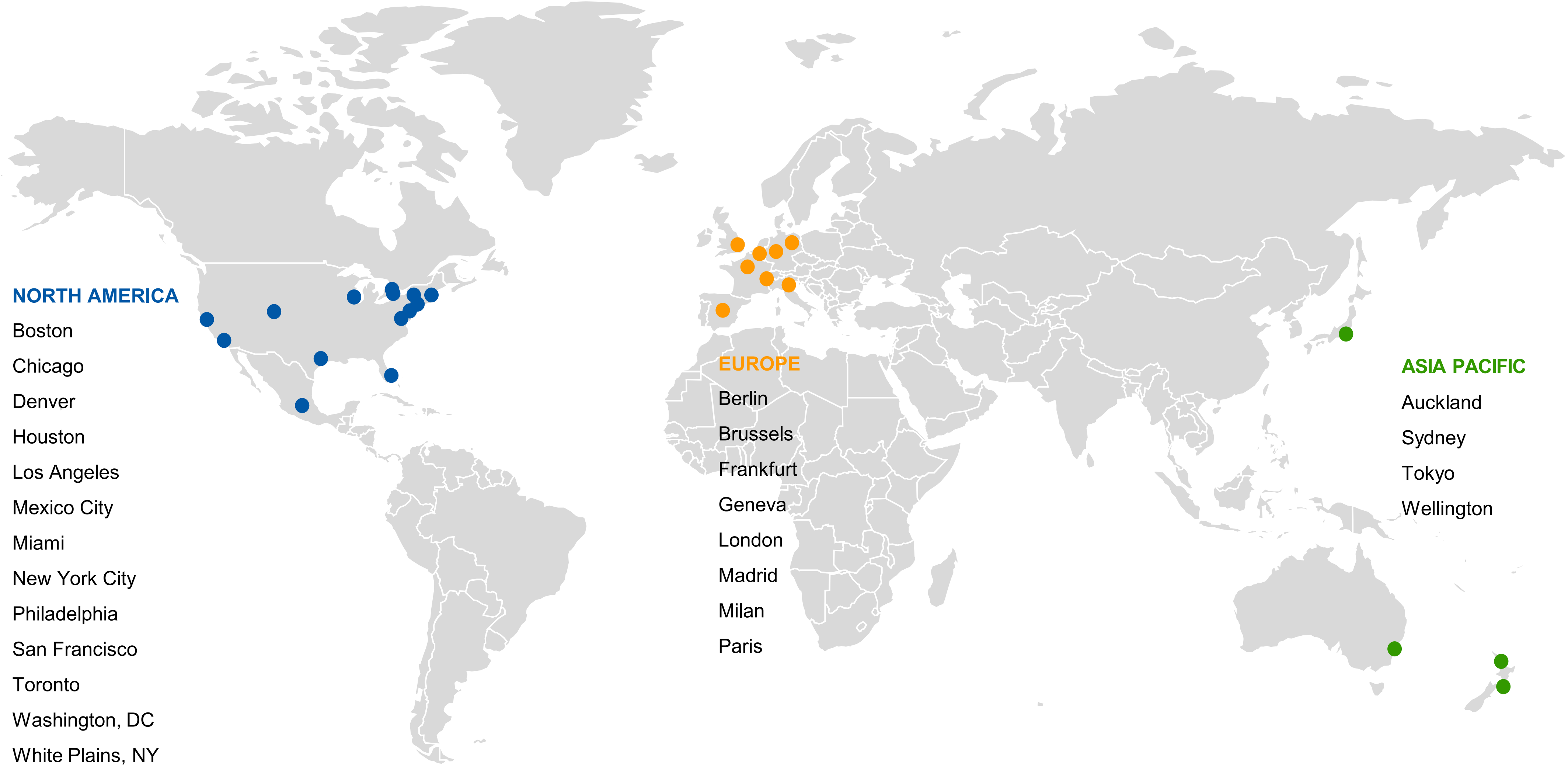
GLOBAL LOCATIONS



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MEET THE EXPERT

Lorenz Wieshammer
Director
Berlin

Experience

- Energy market design and infrastructure regulation
- Valuation in the context of transactions, litigation and arbitration

Education

- Chartered Financial Analyst (CFA)
- MSc Economics (London School of Economics)
- BSc Economics (Mannheim University)

Publications (co-authored)

- German efficiency gone wrong: Unintended incentives arising from the gas TSOs' benchmarking. Energy Policy, 2022, 160, 112595.
- Cost of equity for regulated networks: recent developments in continental Europe. The Electricity Journal, 2019, 32(3), 1-3.

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