



Regulating Co2 transport – lessons learnt from H2?

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Your speaker today

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- Member of NERA's Global Energy, Environment, Communications and Infrastructure Practice, based in Berlin
- MPhil in economics from the University of Oxford and BA and MA in economics from the University of Cambridge
- Joined NERA in 2008
- Relevant recent work includes
 - Analysis of the regulatory framework / applicable cost of capital for CCS in different European countries
 - Regulatory due diligence of CO2 and H2 pipeline conversion plans as part of the due diligence of a gas TSO
 - Competitiveness analysis of different H2 supply routes to Germany under different regulatory scenarios
 - Analysis of German government plans for H2 grid regulation
 - Cost of capital uplift for H2 networks in Germany
 - Analysis of offshore H2 auction mechanisms (also see [here](#))

H2 – the ambition

- 10Mt of renewable hydrogen and 10Mt of imports by 2030
- Total investment needs of €335-471 billion including €200-300 billion needed for additional renewable energy production
- Combined annual electrolyser manufacturing capacity of 17.5 GW by 2025 in Europe
- “European Hydrogen Bank will establish a full hydrogen value chain in the EU”

A meshed European grid by 2040



Source: European Hydrogen Backbone Initiative

H2 – the reality – 99 problems...

June 20, 2022 • Hydrogen



Sources: Florian Painke via Wikimedia; SMARD;

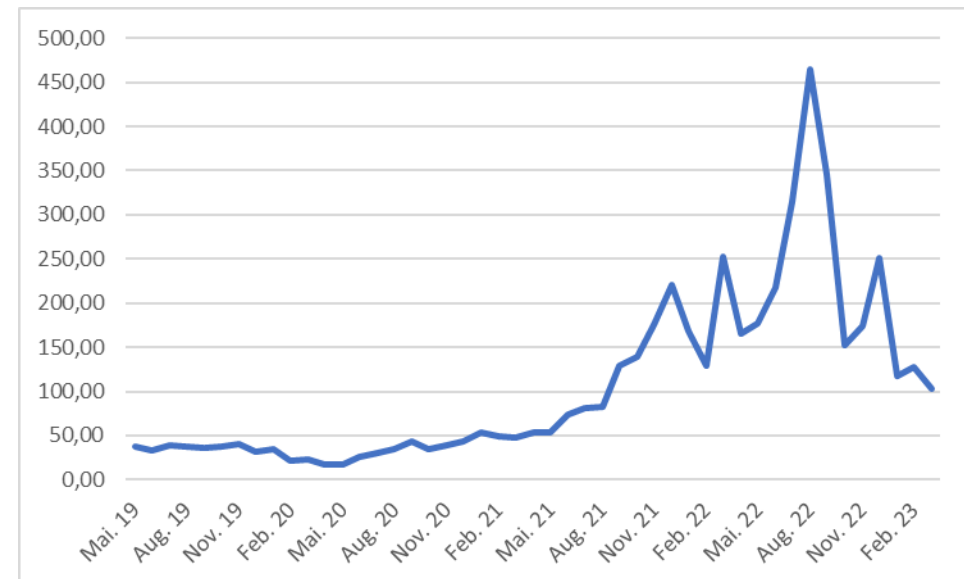
EU hydrogen growth stalls on state aid delays

‘Arguing like children’: Acrimony as RED talks cancelled over delay to green hydrogen rules

The European Parliament’s lead negotiators have cancelled backroom talks over reform of the Renewable Energy Directive (RED), citing the Commission’s failure to publish rules clarifying when hydrogen can be considered ‘renewable’.

Rift between 16 EU states over role of nuclear hydrogen could delay European green H2 deployment

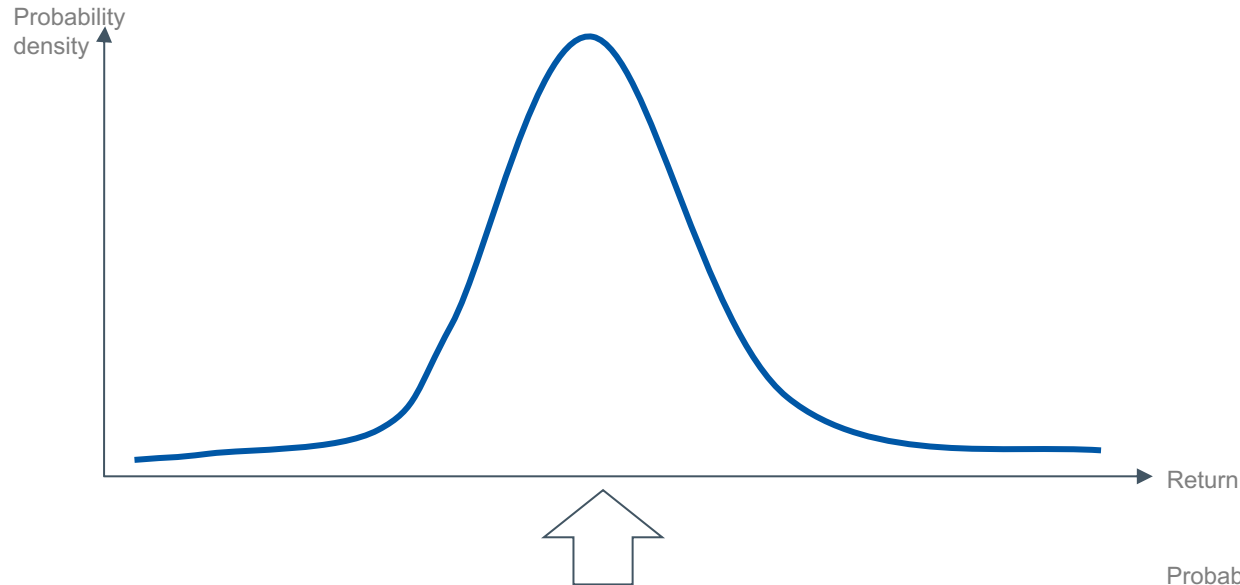
DE baseload power price



...but the (H2) grid ain't one???

Opt-in regulation without downside protection does not work

Unregulated distribution of returns

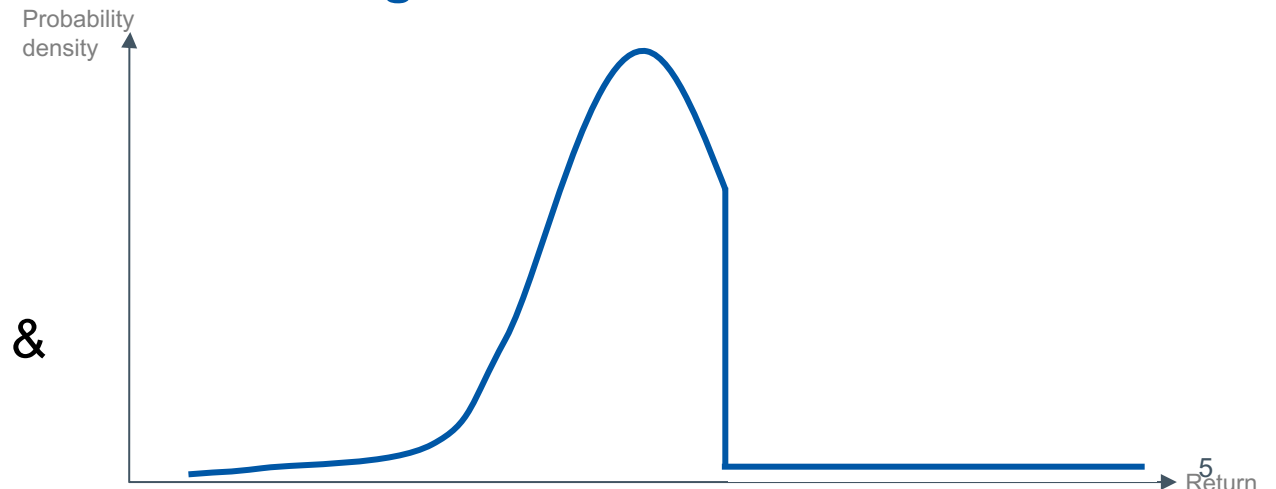


- Developer takes upside and downside risk (possibly with contractual mitigants, subsidies)
- Classic TSO regulation also makes distribution symmetric through reg account & AMELIE / REGENT

- Opt-in regulation cuts out the upside without providing downside protection
- Explicit threat of (eventual) transition of all unregulated pipelines onto regulation further delays build-out



Regulated return distribution



What could CO2 transport regulation look like?

Some possible options

Full regulation



- UK Energy Security Bill 2023 - CO2 storage and transport license
- Allowed revenue = efficient cost + reasonable return



Regulatory guardrails only



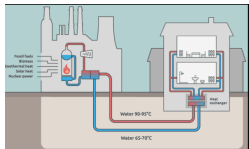
- NL next generation networks regulation
- Ex ante commitment to only intervene if IRR exceeds WACC + risk premium + (decreasing) buffer



Best available technology



- E.g. district heat in Norway
- Price of regulated good (CCUS) driven by alternative (essentially EUA purchase)



Commercial negotiation



- Current model for offshore gas networks
- Long-term contracts with high credit rating counterparty can provide strong stability but incentives to undersize



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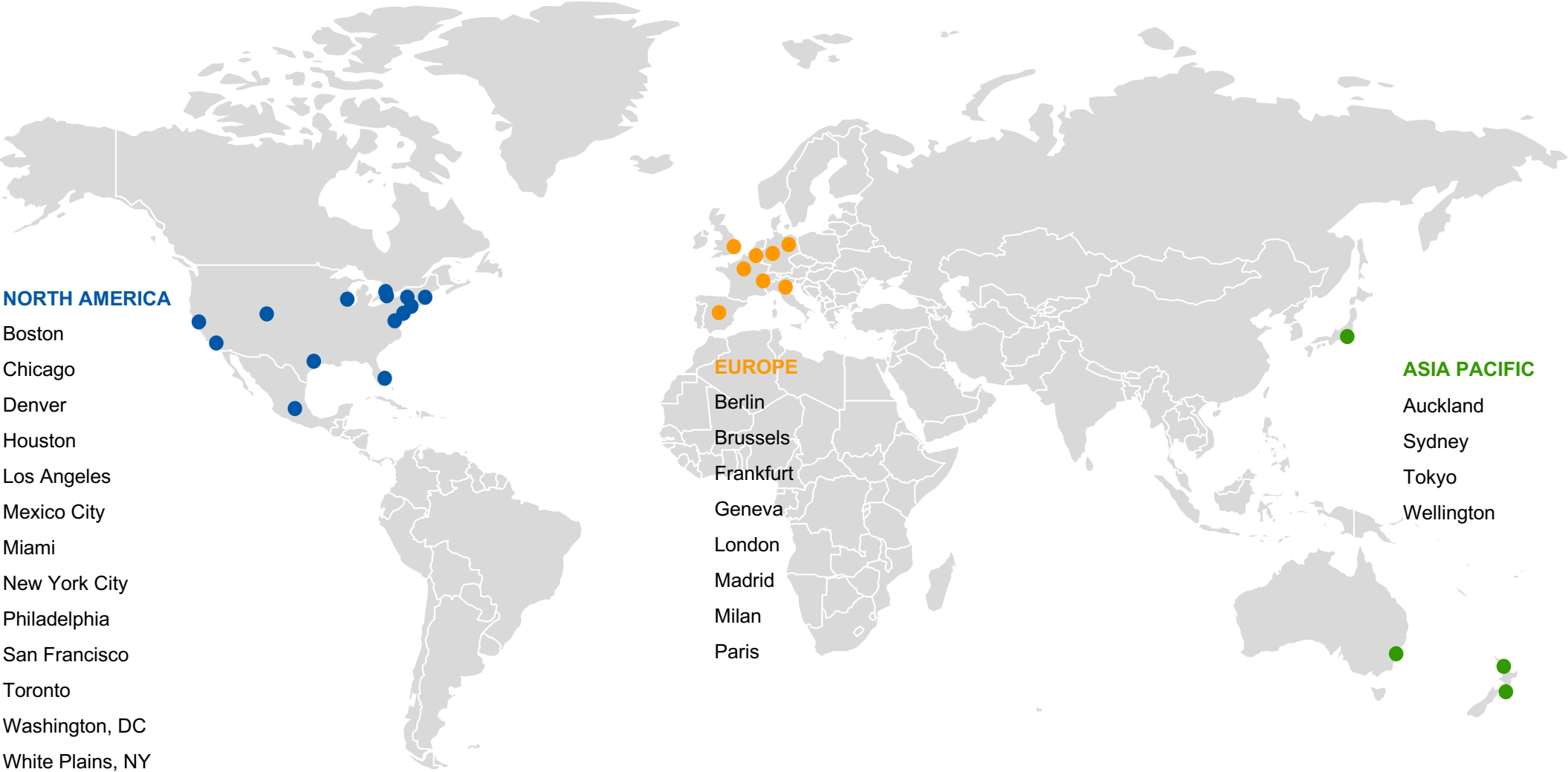
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