

Green Hydrogen Policies: Current Landscape & Future Directions



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**GREEN
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CONFERENCE & EXHIBITION

10 - 12 JUNE
2024

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Songhyun Baik
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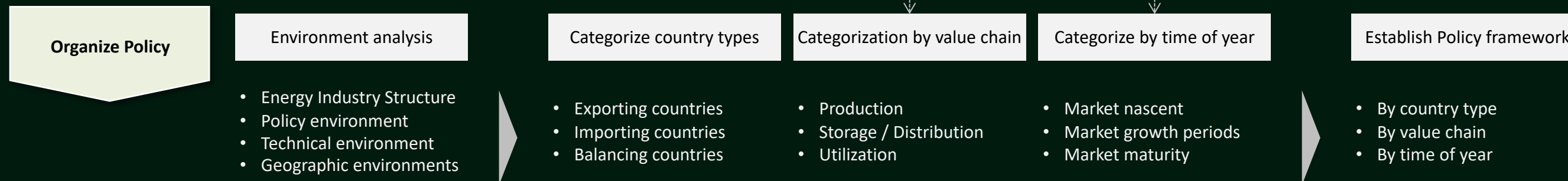
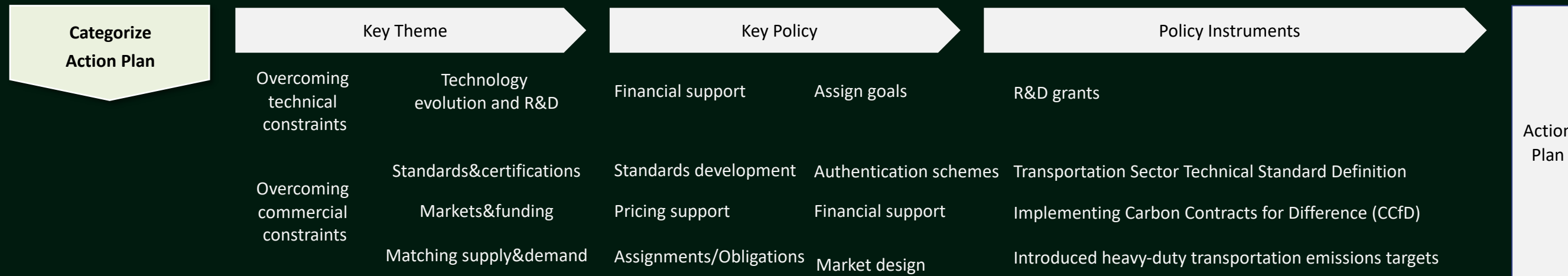
Hydrogen Policy Formulation Process



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The hydrogen industry is still in its infancy, and governments are driving the hydrogen economy for carbon neutrality

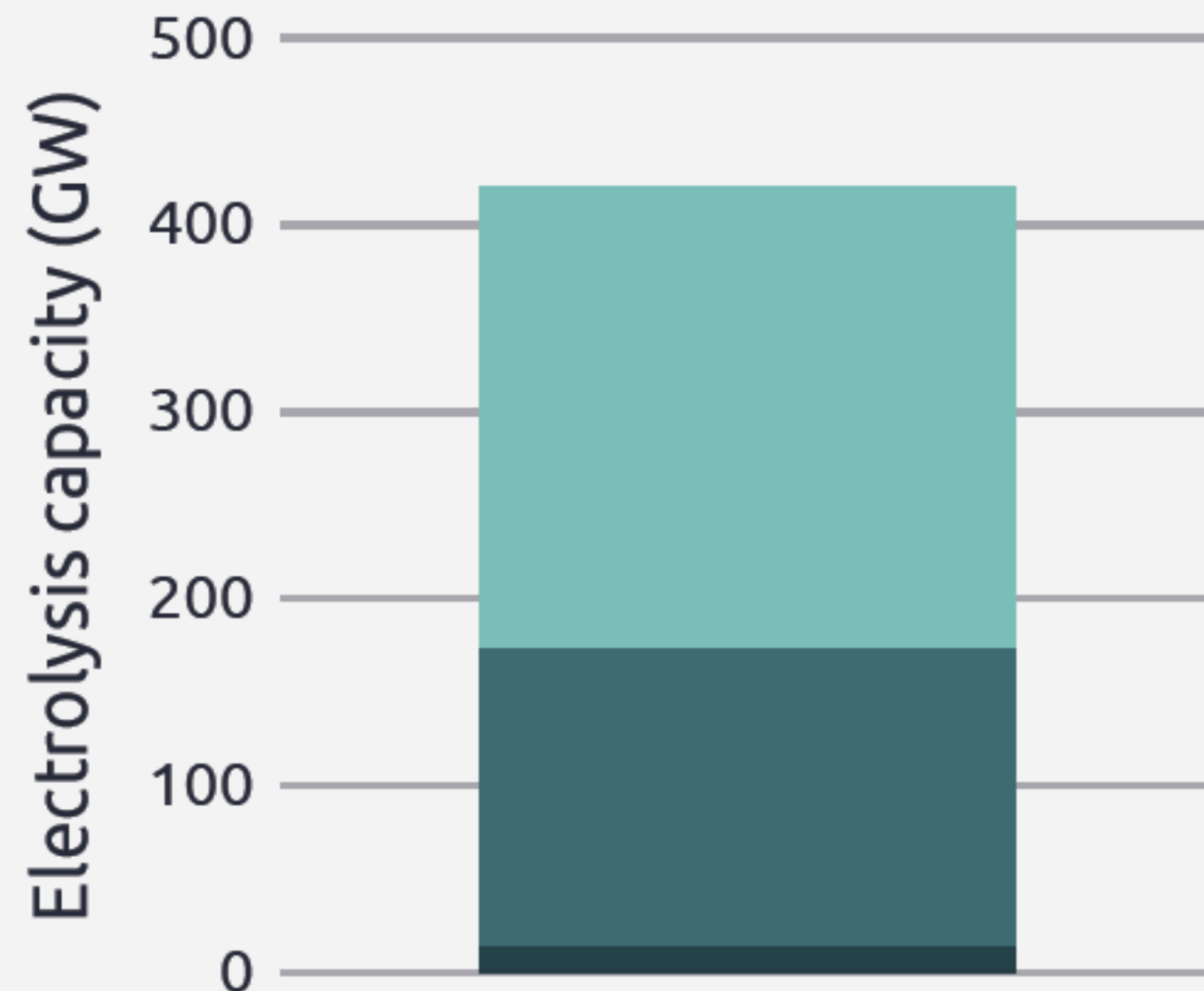


Reaching for Green hydrogen



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Project status 2030

Early stages

Feasibility study

Operational/FID

Source: Hydrogen Review 2023, IEA

Getting Tougher to be GREEN



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Proposed US guidelines on green hydrogen production tax credit (Dec 2023)

① Additionality

hydrogen producers to source their power from zero-carbon projects built within three years of the H2 project

② Temporality

calling for renewable power to be matched on an annual basis up to 2028, and then hourly from then on

③ Deliverability

green hydrogen projects to be within the same regional grid as the renewable energy projects powering them

“likely to increase project scope and capital costs while reducing efficiency, limiting project credit upside...which elevates counterparty risk”

- Fitch, Mar 2024

Bold Move to be GREEN

For green hydrogen, we would witness a similar story to that of solar PV – capital intensive. We can reduce cost by scaling up manufacturing of renewable technologies and electrolysers while a bold move is strongly needed

Decarbonization of European Refineries by Green Hydrogen

September 2023, Tender Called

TotalEnergies has launched a call for tender for the supply of 500,000 tonnes of green hydrogen per year by 2030 to replace the grey H₂ used at its six oil refineries (and two biofuel refineries) in Europe

June 2024, Off-take Deal Signed

TotalEnergies and Air Products have signed a 15-year agreement for the annual supply in Europe of 70,000 tons of green hydrogen starting in 2030



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Policy Instruments for Decarbonizing



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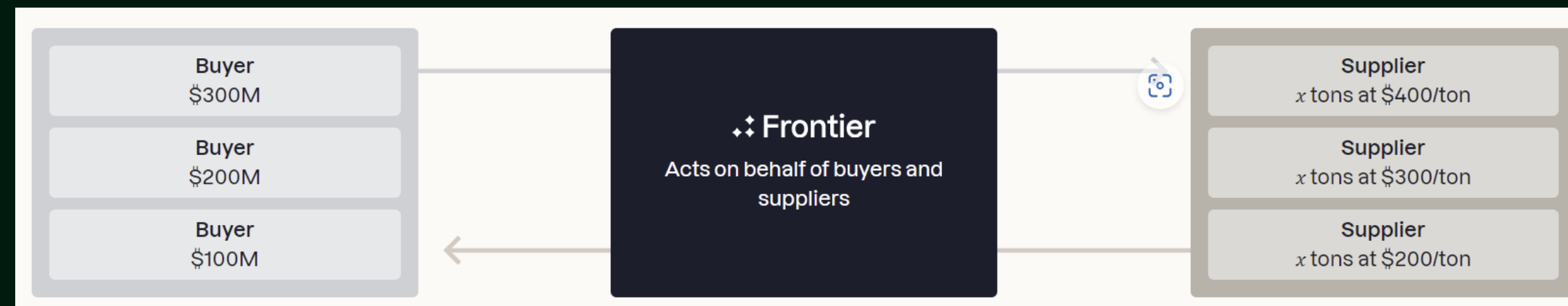
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Green Hydrogen by AMC and Contracts for Difference (CfDs)

- Advance market commitments (AMCs) are contractual agreements for the future purchase of products that are still under development

*Pneumococcal vaccine case: \$1.5 billion pledged upfront to make vaccine affordable (by government funding and donor support) → Accelerated vaccine rollout by 5 years and saved an estimated 700,000 lives

**Frontier, is made up of a group of companies that have committed to purchasing just over \$1 billion worth of permanent carbon removal between 2022 and 2030



- Contracts for difference (CfDs) are contractual agreements that pay the difference between a pre-determined price of a product under development and the market price of that product when it's ready for sale

→ To boost production of low-carbon hydrogen, the EU & U.S. have proposed CfDs and France will be implementing CCfDs starting in 2024

Electricity Policy for Green Hydrogen

Green hydrogen relies on renewable energy. Green hydrogen production requires an electricity market that can ensure “green” power and **renewable PPAs for electrolyzers ensure that the hydrogen they produce will be “green”**.

EU introducing rules to govern green hydrogen and PPAs – PPAs with hourly energy attribute certificates (EACs) or 24/7 clean PPAs – can enable to meet the global standards.

- June 2023, Statkraft’ wind power purchase agreement (PPA) will power Air Liquide’s new electrolyser plant in Germany to produce green H₂ at industrial scale for industry and transport applications
- Oct 2023, German Butendiek offshore wind farm signs green hydrogen PPA
- Nov 2023, Kallista Energy will sell wind-generated electricity to green hydrogen producer Lhyfe under a 15-yr PPA that will help secure bank financing to repower the wind farm



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Considerations for Green Hydrogen Policy

- A predictable global policy environment
- Regulations and incentive schemes for market creation
- Cost reduction from financing / tariff perspective
- Introducing production-linked incentives for equipment manufacturing
- Enabling faster permitting for renewables





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a global green hydrogen hub

Songhyun Baik

shbaik@keicltd.com

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