

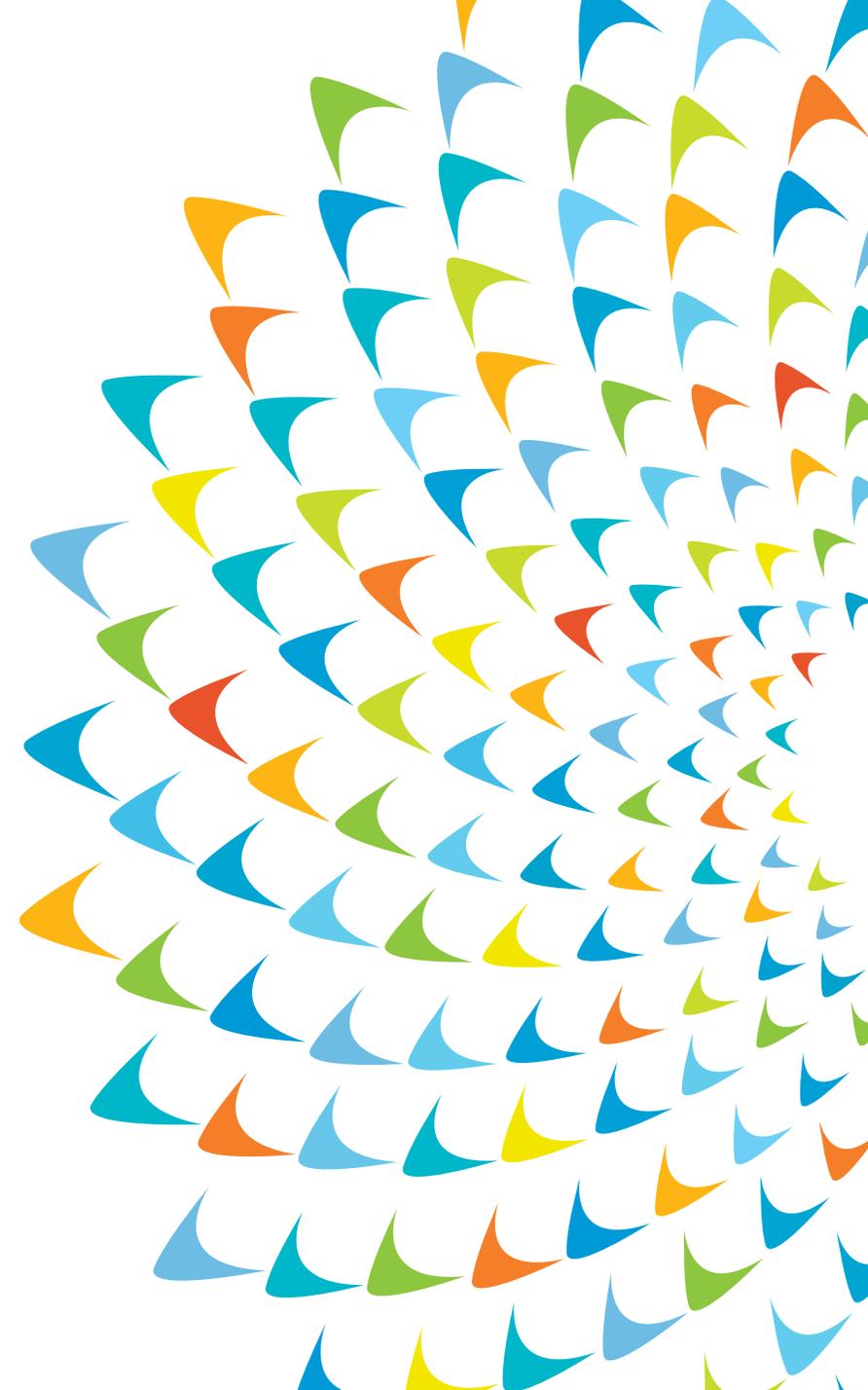


# Green Hydrogen Energy Activities in ADB

01 March 2024

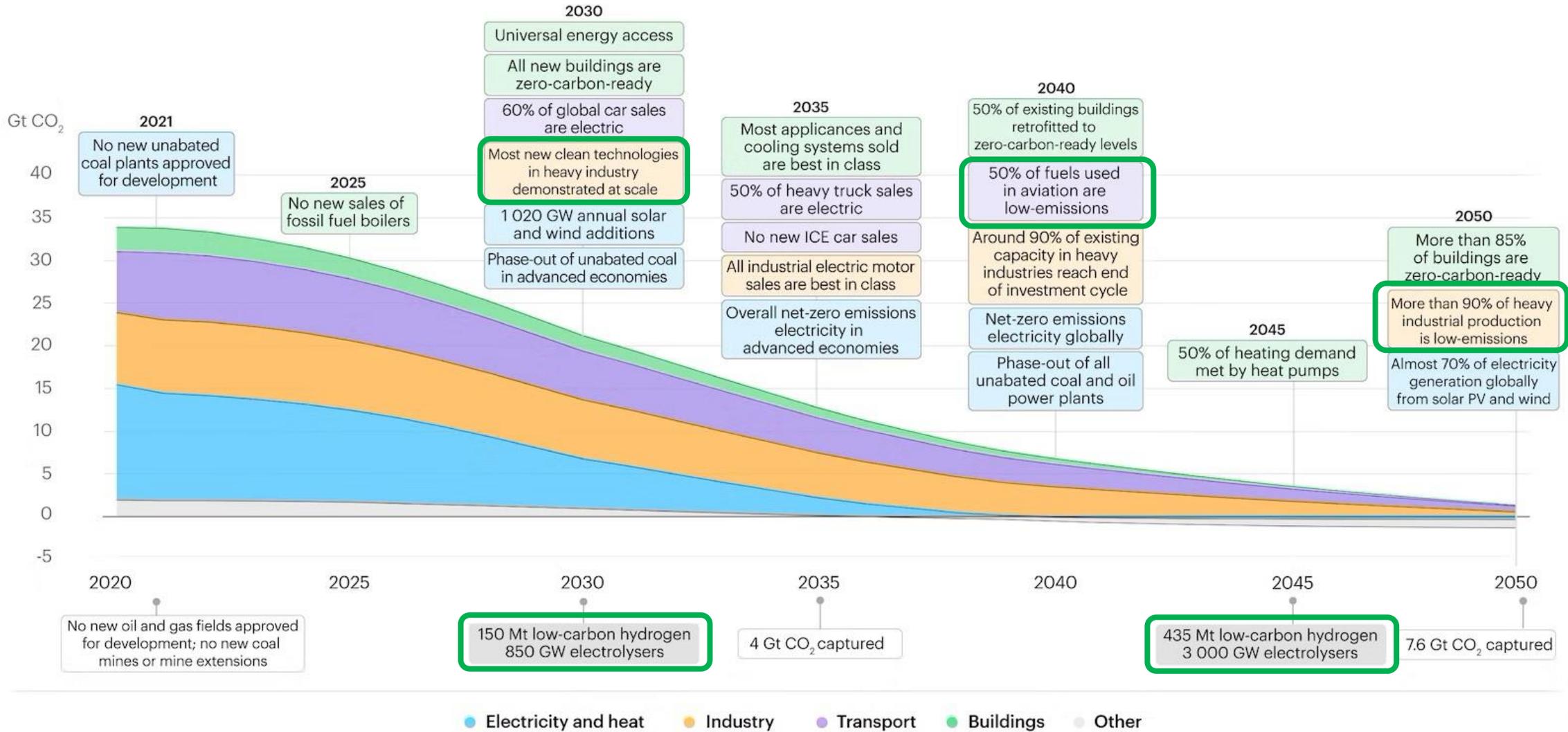
**ENE-Energy Transition,  
Sectors Division,  
Asian Development Bank**

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# Hydrogen's role in Net-Zero



Source IEA



# Ongoing Hydrogen Related Activities

**Knowledge Events at Asia Clean Energy Forum 2023** – half day session on hydrogen activities and how to enhance engagement with DMCs and Private Sector.

**On going support in SARD for Hydrogen through Engagement with India and Bangladesh Q3 2023** - Discussions with Central Ministries and State/Provincial Government on policies, regulations, standards, road maps and workshops to increase capacity and awareness of best international practice in the hydrogen Economy.

**Engagement in SARD and CWRD on Hydrogens Role in hard to abate sectors (Steel, Cement, Fertilizer, Aviation and Marine Transport) Q2 2024** – supporting countries in SARD and CWRD to build capacity and workshop needs related to green hydrogen in the hard to abate sectors.

**Creation of a hydrogen data room and knowledge sharing platform under developmentasia.com** – hub for sharing webinars, articles, technologies, case studies for ADB hydrogen related activities. Whilst in public domain, the data room will be a central point for ADB, its consultants, stakeholders and DMCs to access knowledge.

**Support for International Solar Alliance’s green hydrogen innovation center portal** – ISA has developed a portal under the auspices of the G20 to support green hydrogen activities internationally. It will draw from the ADB data room for content. (see next slides)



# OneADB Green Hydrogen Engagement

GH Pillars Study launched at Vibrant Gujarat Jan 2024 By CM Gujarat    ISA Green Hydrogen Innovation Centre launched 2023



GH Unleashed Workshop, Gujarat Nov 2023 By CM Gujarat



Marine GH Forum Kuala Lumpur Feb 2023 with Minister of Economy, Malaysia



# ADB Hydrogen Industry Support Focus

- I. **Knowledge sharing** (*workshop, handbook and other knowledge products*) - *Policy makers and industry players awareness of trends and technologies, capacity building and safety.*
- II. **Support government policy development** - *Strategy, roadmap and regulatory framework for H2 energy development.*
- III. **Enhance the hydrogen trading platforms** - *Support international H2 supply chain with competitive market/trading hubs.*
- IV. **Engage with industry and associations** – *Engage industry and associations on standards and knowledge sharing.*
- V. **Support pilot and scaling up** - *Pilot H2 technologies and business models for demonstration and scaling up (feasibility study with consultants). This include Transaction Support Technical Assistance.*
- VI. **Support finance** - *Finance H2 energy projects, including production, transportation and distribution infrastructure, as well as market applications.*



# Proposed Hydrogen Related Activities

**Proposed Sovereign Project | 55173-001 India : Supporting Green Hydrogen Through High Technology** – creating the conditions for green H2 Industry in India for policy and regulatory frameworks, road maps, workshops and capability development.

Status: Proposed 2024 \$2m      Targeted Country: India

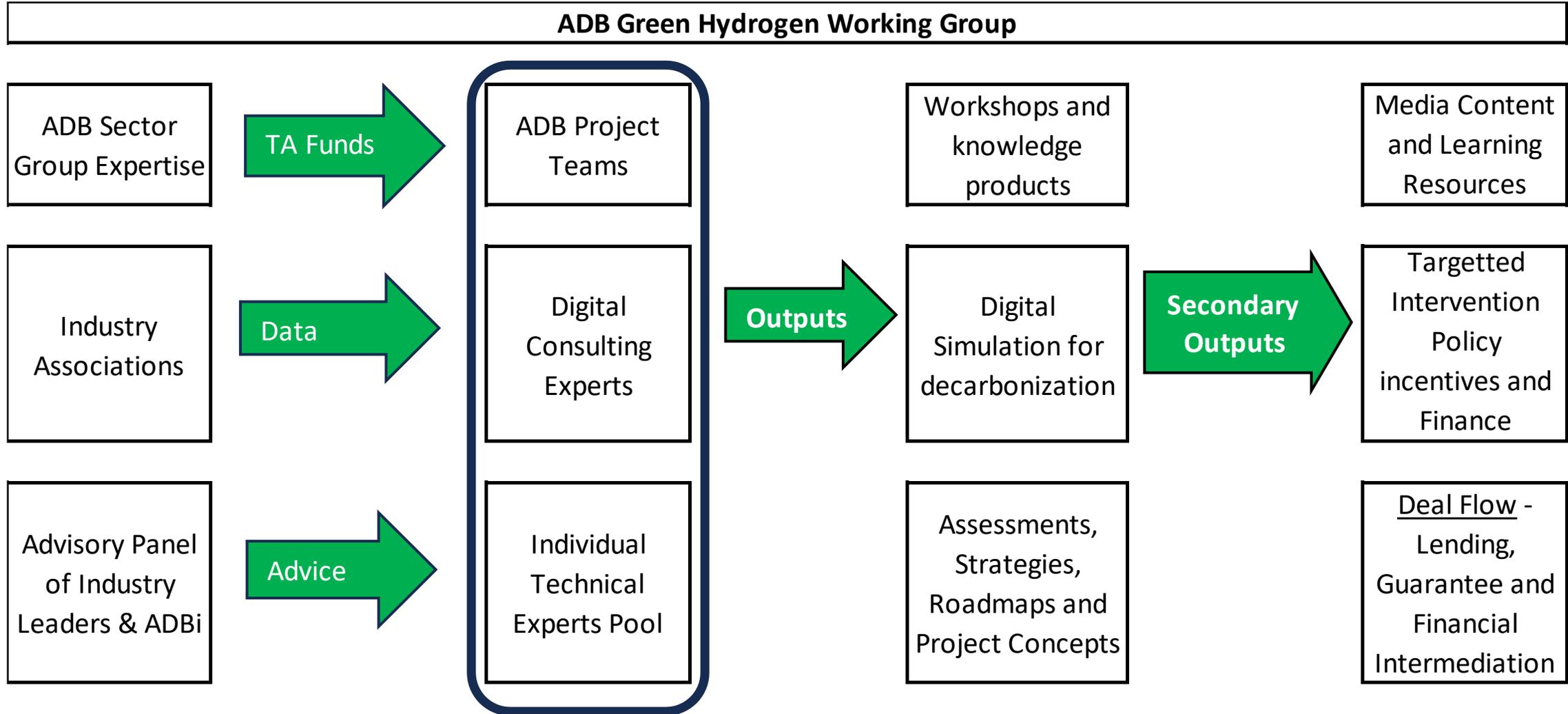
**Proposed Regional TA: Decarbonization of ‘Hard-to-Abate’ Industrial sectors, and Long-distance Transportation** - facilitating future investment in decarbonizing the hard to abate sectors of steel, cement, fertilizers, aviation and marine transport. The proposed TA will assist DMCs with a comprehensive package of solutions including (i) creation of digital simulation tools for decarbonization of hard to abate sectors, (ii) road maps, economic viability assessments and (iii) capability development.

Status: Concept Stage \$1.5m      Targeted countries: India, The Philippines and Turkmenistan.

**Knowledge Events at Asia Clean Energy Forum 2024** – half day sessions on hydrogen and hard to abate sectors activities and how to enhance engagement with DMCs and Private Sector.



# ADB Green Hydrogen Working Group





# ADB Green Hydrogen Entry Opportunities

Green hydrogen as a commodity	Green Hydrogen as a component of decarbonizing the Hard to Abate Sectors	Green Hydrogen as a distributed level
Large scale renewable energy production including hydrogen valleys/hubs and green ports infrastructure.	Use of green hydrogen in decarbonizing steel, cement and fertiliser production, aviation fuels and marine transport.	Small scale production of green hydrogen from agricultural/municipal waste or be spoke renewable and the related transport and distributed filling infrastructure.
Lending modality includes PBL support to DMCs and PSOD lending to Corporates.	Working with industry organizations at TA level. Lending modality to SOEs and Corporates.	Working with industry organizations at TA level. Lending modality to SOEs, Financial Intermediation or PS loans.
Lending Size – \$ 100-500m	Lending Size – \$ 50-100m	Lending Size – \$ 1-50m
Commodity Standard/Price Ill defined with competing fossil commodities.	Use where “ <b>no real alternative</b> ” exists with energy/process efficiency measures – <u>ADB Corporate Priority</u> .	Driven by specific use cases and off-taker needs. High Development potential for lower cost.

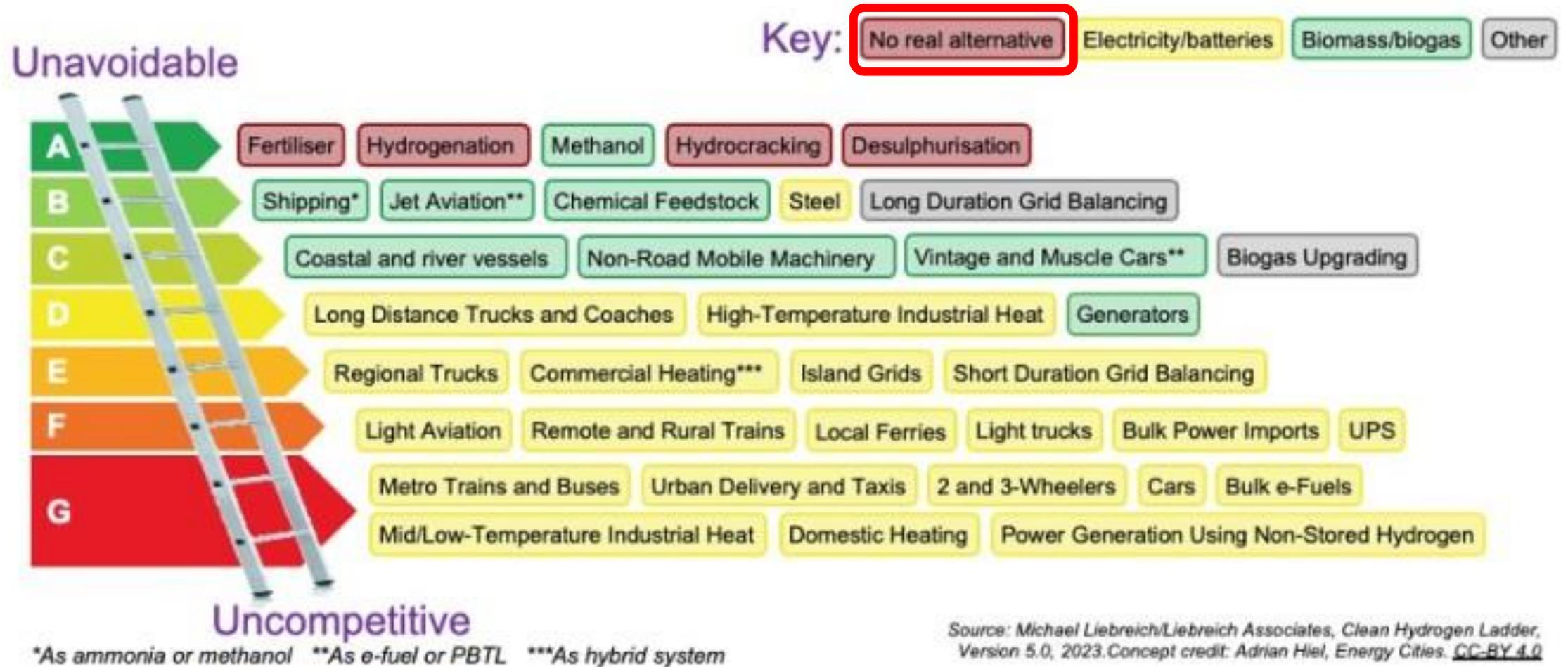


Thank you for your kind attention.

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# Hydrogen Ladder 5.0



Source: Liebreich Associates Hydrogen Ladder provides a ready reference for the role of hydrogen, its derivatives and alternate energy sources.



# Past Hydrogen Activities

## Knowledge sharing

- H2 energy workshop - Capacity building for DMC government officials, presentation by leading hydrogen engaged companies, and networking as “Friends of Hydrogen”.
- Hydrogen energy handbook - Prepared for project officers outlining role of hydrogen, technologies & products, business model, challenges and risks, policy recommendation. To be published 2024.

## Research

- Study of hydrogen trading market - International H2 supply chain review with focus on potential physical/trading hub in Asia including lesson learnt from LNG market. Setting Long-Term targets/Incentives/Create demand for H2/Infrastructure investment/harmonizing standards. Mobilizing private capital.
- Prefeasibility study on deployment of renewable H2 energy in Pakistan and Palau - Identification of available resources/infrastructure, energy solution required including business models suggestion, financial analysis, identify barriers and challenges.



1<sup>st</sup> H2 energy workshop in Shanghai, 2019



2<sup>nd</sup> H2 energy workshop in Tokyo, 2020





# Ongoing Hydrogen Related Activities

**TA 6966-GEO: Preparing Energy Storage and Green Hydrogen Sector Development Program** – creating the conditions for green H<sub>2</sub> to be generated from abundant renewable energy resources through:

- (i) policy and regulatory framework to allow sustainable battery energy storage system (BESS) deployment approved;
- (ii) policy, strategy, and regulatory framework to encourage development of green hydrogen with private sector participation developed; and
- (iii) sustainable battery energy storage system (BESS) to be installed.

**TA 6619-REG: Marine Aquaculture, Reefs, Renewable Energy, & Ecotourism for Ecosystem Services** - facilitating future investment in sustainable ocean economy development through two main activities:

- (i) assessment of marine resource commercialization prospects (including energy, seafood, and tourism) and identification of investment projects in selected developing member countries (DMCs); and
- (ii) review and recommendations on policy and regulatory frameworks to facilitate large-scale investment and on mechanisms to accelerate financing of selected projects