



AUGUST 12<sup>TH</sup>, 2024, FIEC: FEDERATION OF INDUSTRIES OF THE STATE OF CEARA, BRAZIL.

# Enhancing the Financial Viability

## Large-Scale Hydrogen Derivative Projects, Green Ammonia

Jorge Batarce - Industry Business Manager



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# Enhancing GH2 & PtX Financial Viability

## Agenda:

1. Markets and Trends
2. Navigating GH2
3. Projects considerations
4. Brazil Opportunity
5. ABB Value Proposition

August 12<sup>th</sup>, 2024



**Jorge Batarce**

**Global Industry Business Manager  
Hydrogen and PtX**

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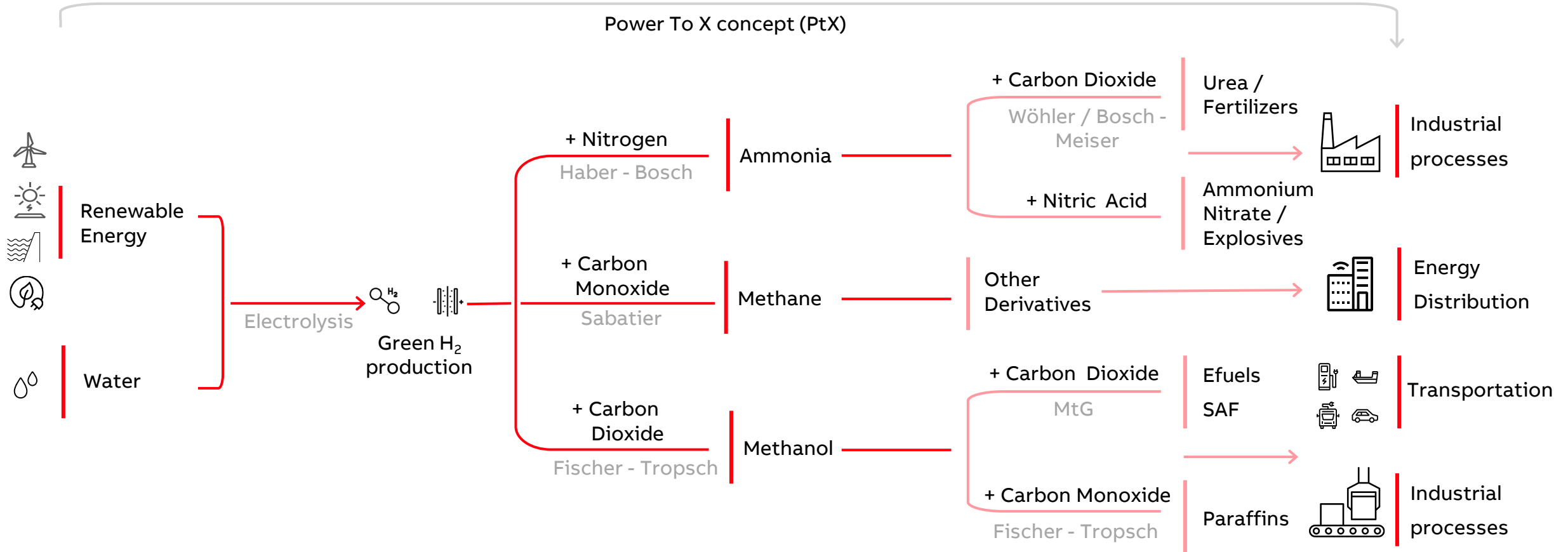
Jorge Batarce T. Is the global lead for Hydrogen and PtX for ABB.

He possesses ~20 years of experience in engineering projects, technology development and business units' managements.

Jorge is a Civil Engineer and holds a Master degree in Engineering, and MBA and a Master in Finance.

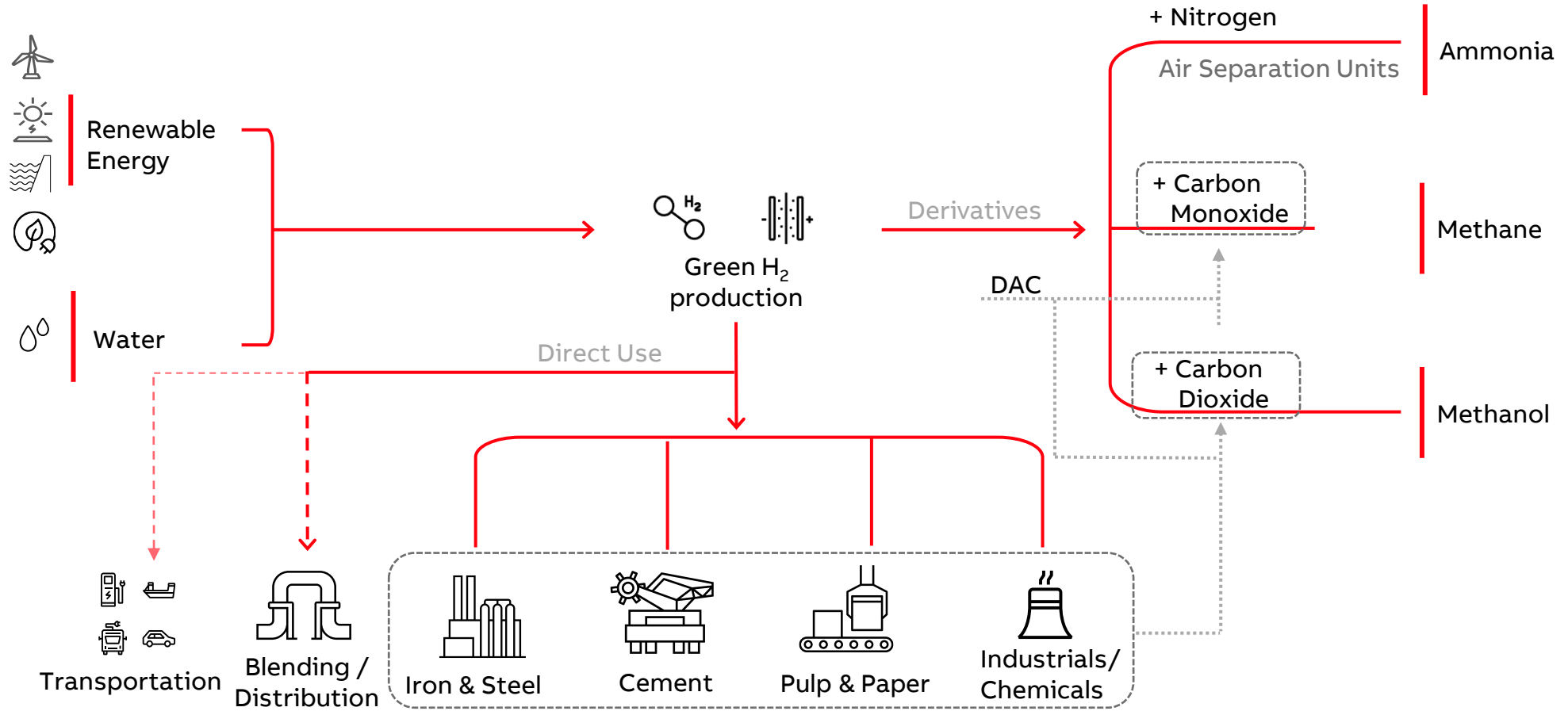
# 1. Market and Trends

## Steps and challenges of each path



# 1. Market and Trends

## Decarbonization paths with hydrogen and its derivatives

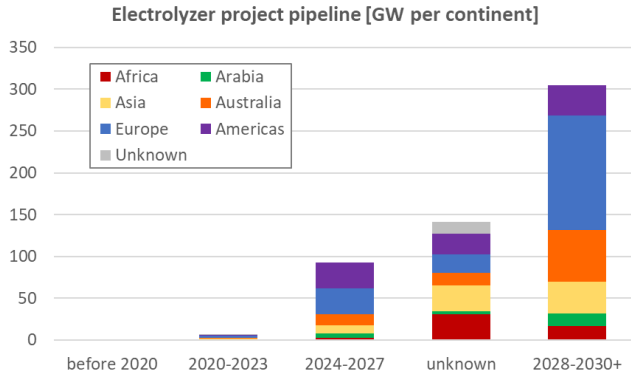




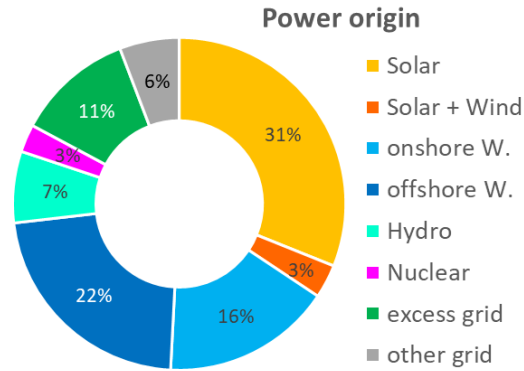
# 1. Market and Trends

## Industry Trends and Data (1990 – 2040)

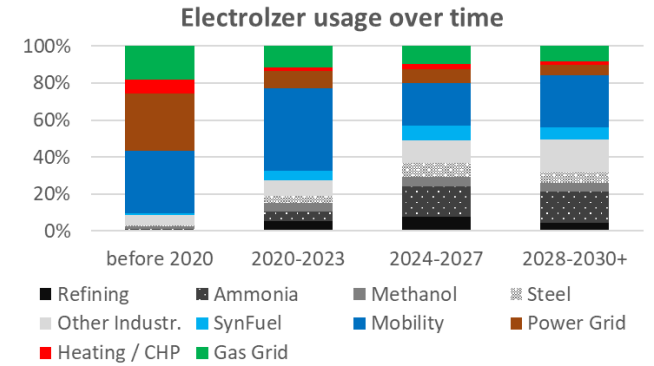
### 1. Geographically diversify market



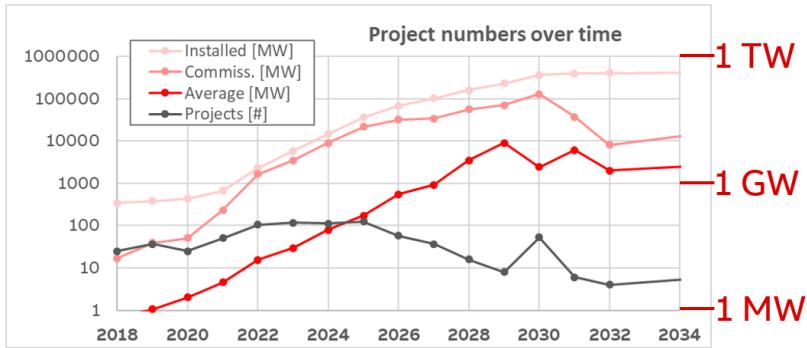
### 2. +80% presents volatile energy profile



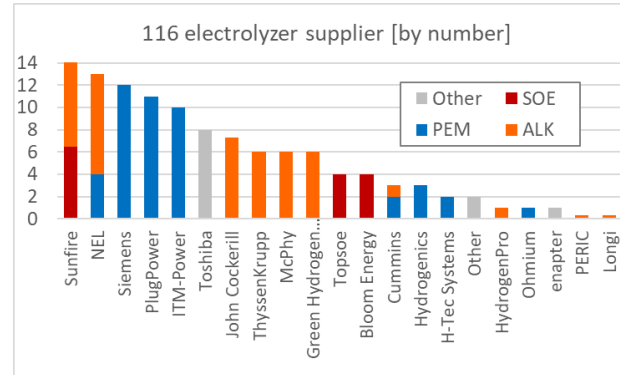
### 3. >50% represents derivatives paths



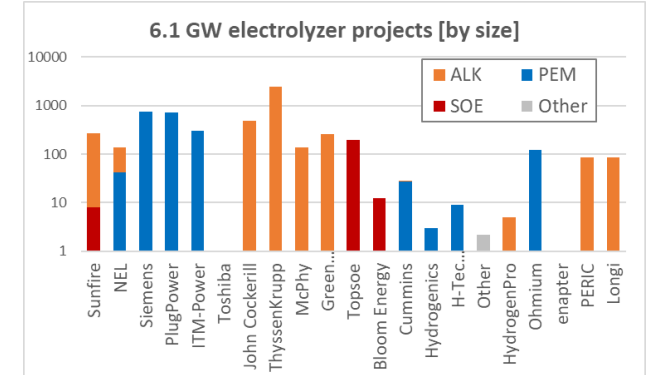
### 4. Annual project size increase, efficiency



### 5. Electrolyzer market, competitive



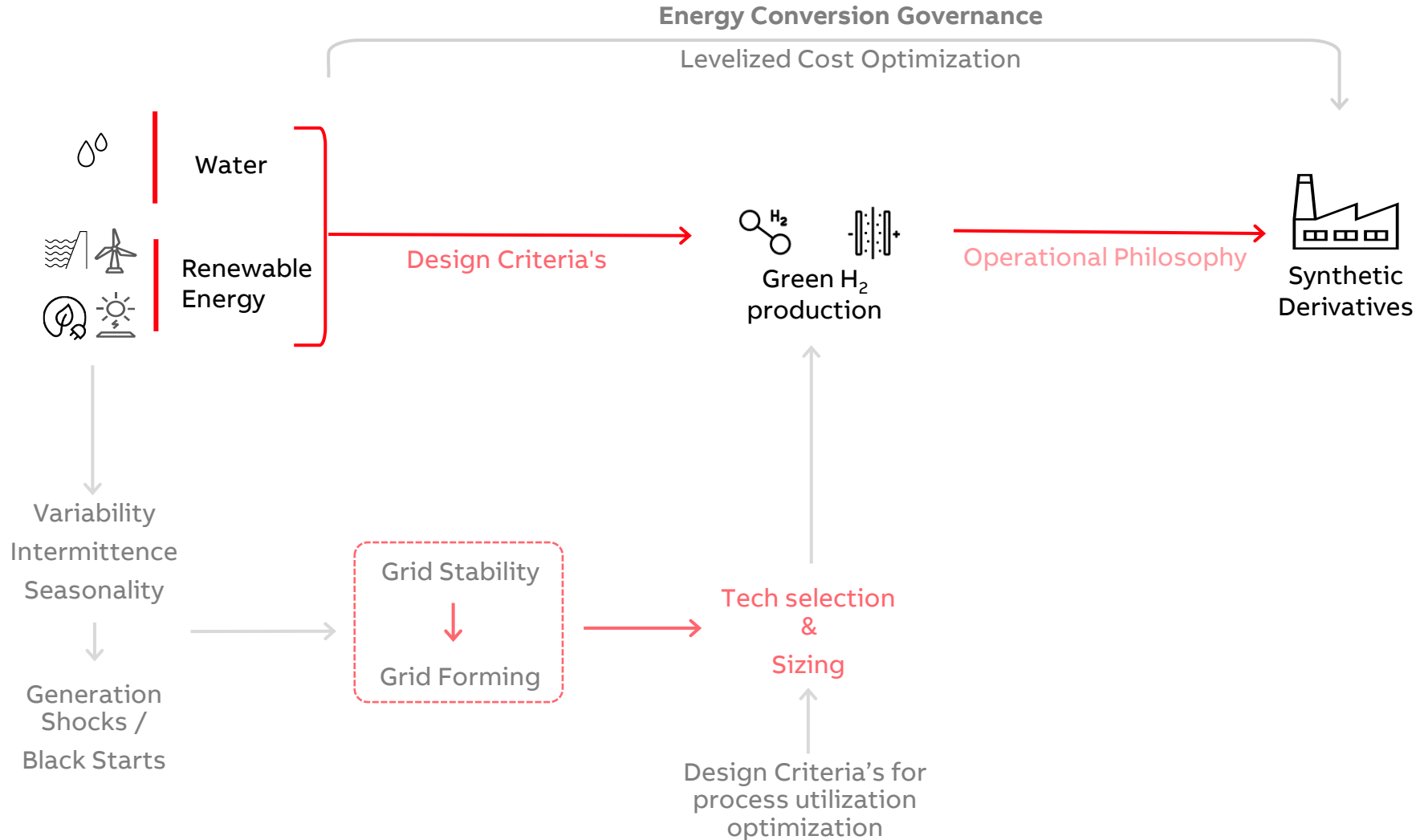
### 6. > 6GW (4AE / 2PEM) price sensitive



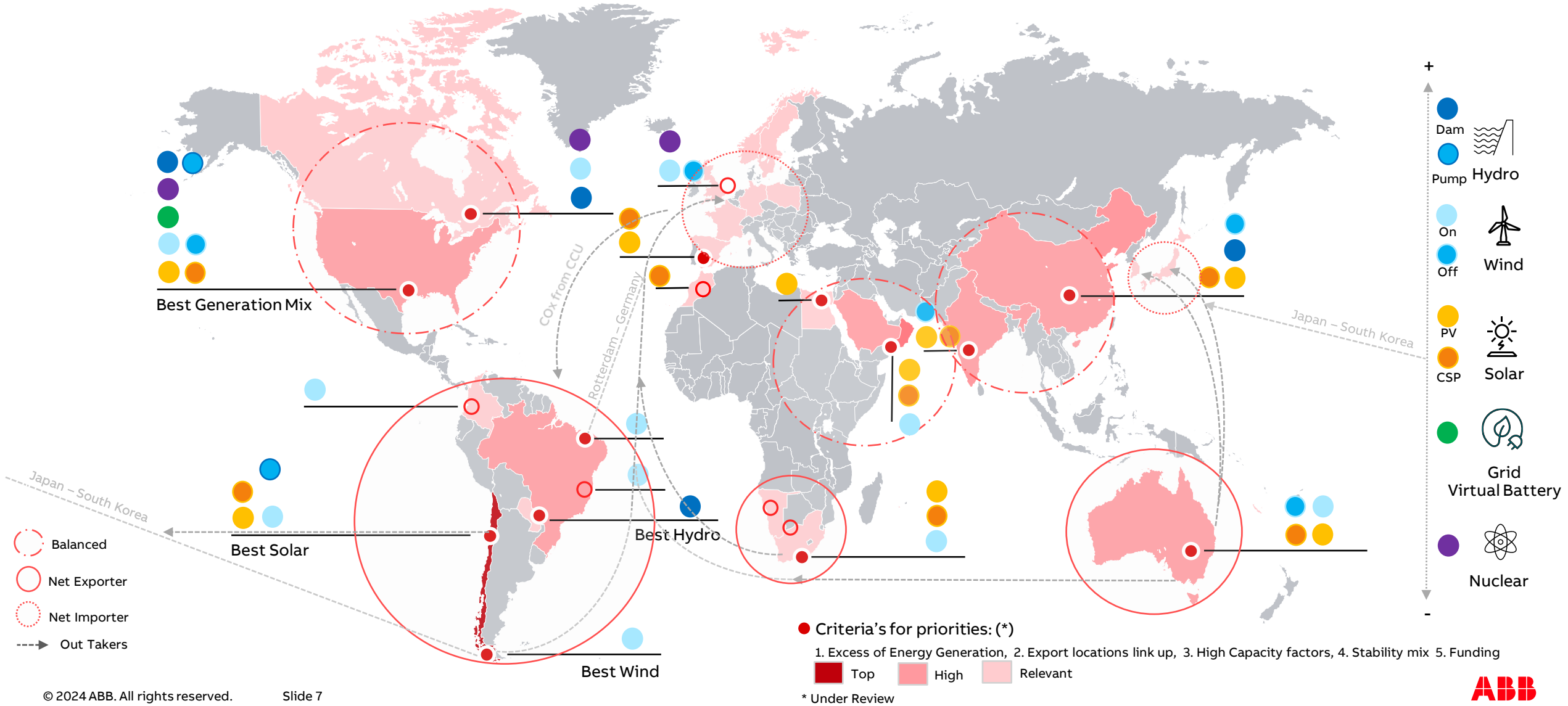
Based on IEA (2022-10) plus own entries (2023)

# 3. Project considerations

## Development challenges of a green hydrogen project

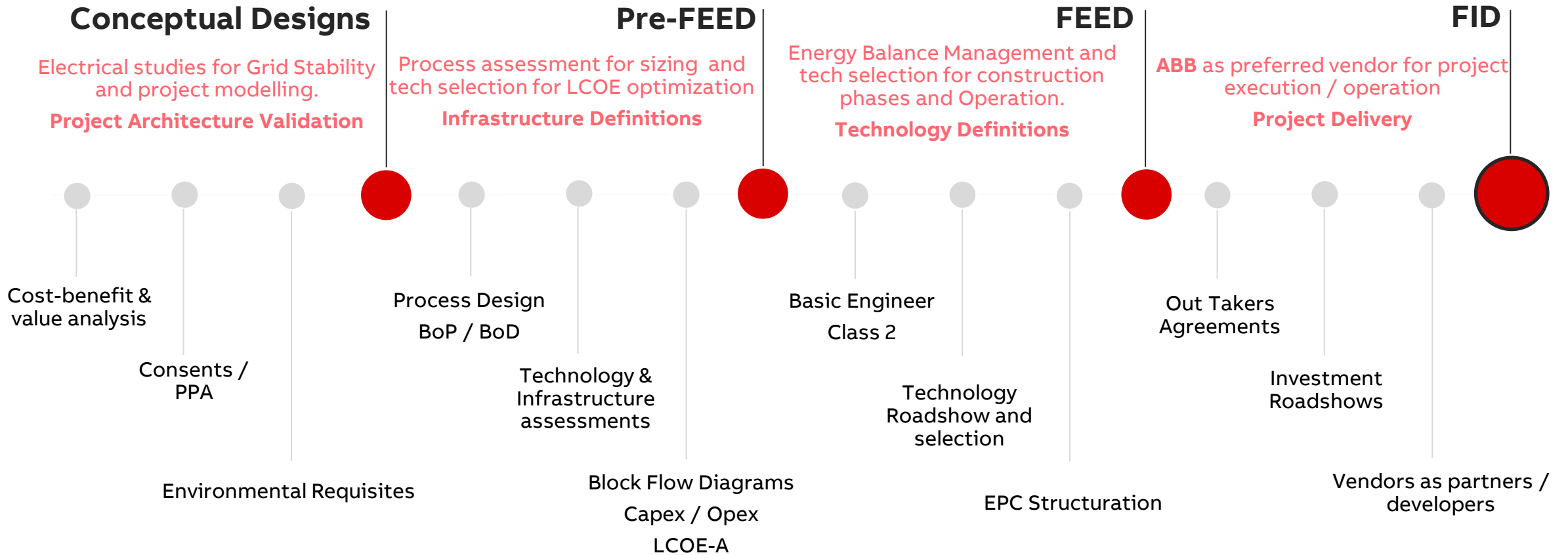


# 4. Brazil unique opportunity, the chase for *capacity factors* & *stability*



# 5. ABB value proposition

## Early Engagement with Electrical Studies





# ABB enabling the Hydrogen and its derivatives revolution

Unlocking the integration and development constraints in the value chain

## Developers

Search's for LCOE-A optimization so technology is key in balancing efficiency and total investments costs (TIC).

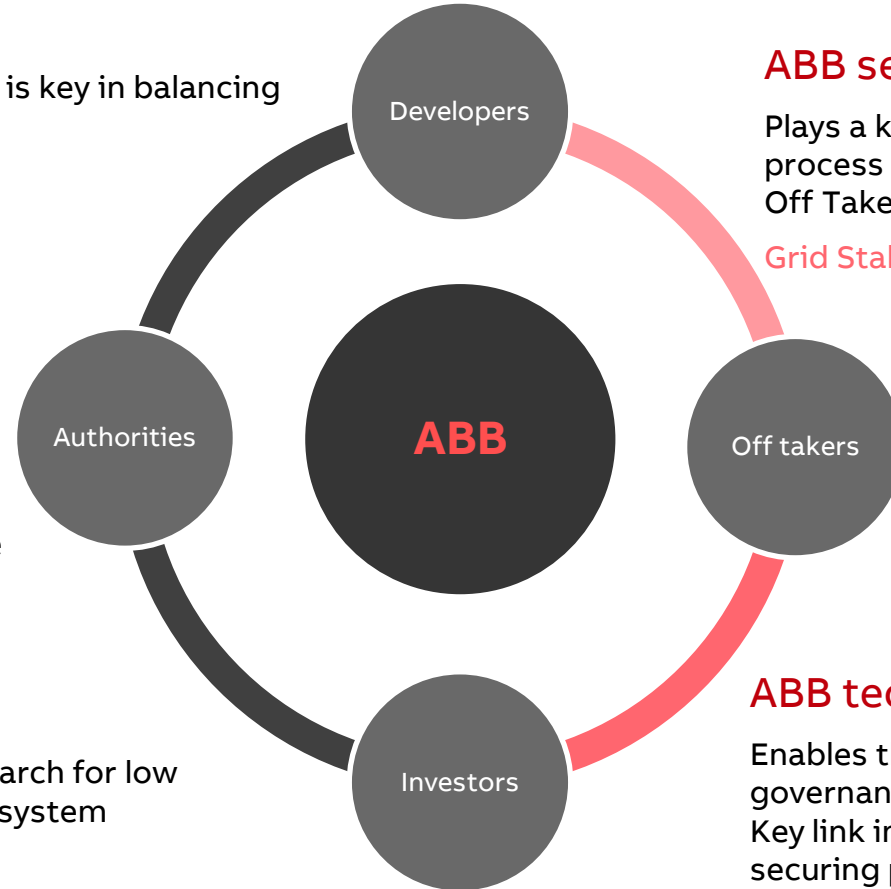
## Policy Makers

Will benefit from our understanding, as we will be able to define the path forward, in relation of what the technology will allow us to structure.

As not every energy profile will subject to be stabilize, making HV and Grids the enabler of the future for unstable and unpredictable operation.

## Investors

As capital requirements are so high, Investors search for low TIC and LCOE. So Out Takers are key part of ecosystem validating the feasibility and competitiveness.



## ABB services offering (Process Driven)

Plays a key role so Developers can structure a solid process architecture and competitive project, so Off Takers feel interest in signing in supply contracts.

Grid Stability and Process Governance Solutions.

## Off-Takers

Needs to secure supply contracts with developers and agreed on an expected price, given by LCOE-A

## ABB technology offering (Technology Driven)

Enables the overall robustness of the project, providing governances of the production process. Key link in the EPC structure so investors feel confident in securing projects.

Electrical, Automation, Digital Solutions and +

**ABB**