

# Survey of failures and lessons learned in international projects

What slowed the first global wave and what has advanced so far

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## Executive Summary



### Real investment:

More than 500 clean hydrogen projects at FID, under construction or in operation worldwide, totaling approximately US\$ 110 billion.



### Natural screening:

Around 52 projects ( $\approx 4$  Mtpa) have recently been reassessed or cancelled. This indicates a process of selection and maturation, not a systemic crisis.



### Success factors:

Projects that advance to FID share three common pillars:

- firm demand/offtake agreements;
- clear regulatory frameworks;
- consistent financing structures.



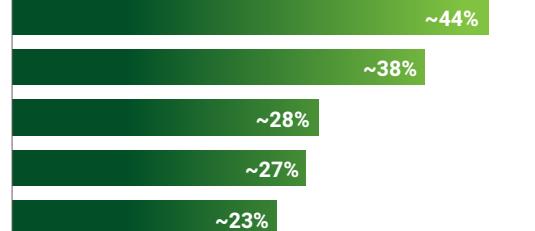
### Brazil's opportunity:

The Northeast region can lead the industrial phase, provided the country combines:

- demand-side instruments (mandates, targets, public procurement);
- auctions with maturity criteria;
- catalytic capital.

## Reasons for cancellation/reassessment of hydrogen projects (global)<sup>2</sup>

- Licensing/bureaucracy/regulation
- Political and market uncertainty
- High costs/project economics
- Financing challenges
- Lack of firm offtake/demand



Note: Percentages exceed 100% because projects often cite more than one reason for cancellation or reassessment.

## Consolidation: the “Fill, Hold and Fold” strategy adopted by large companies

The global hydrogen market is transitioning from a phase of announcement-driven enthusiasm to one of rational execution. Large companies are adopting a “Fill, Hold and Fold” strategy:

**“Fill:**” secure positions in strategic projects with the best combination of resources, infrastructure and demand.

**“Hold:**” keep projects on standby while awaiting greater regulatory and market clarity.

**“Fold:**” deprioritize or cancel projects incompatible with the new reality of costs, interest rates and regulatory risk.

This movement explains much of the recent pipeline screening and reinforces the importance of project maturity criteria.

## Funding structures in reference projects

Access to competitive capital and clear public policies is essential to enable hydrogen projects.

In 2024–2025, 28% of projects cited economic challenges and 27% financing difficulties.

In Europe, new funding mechanisms and auctions are advancing. In reference projects—such as those in Mongolia and Saudi Arabia—the State acts as a shareholder and assumes part of the equity risk.



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### Successful cases in clean hydrogen and derivatives



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## What is missing for Brazil to move forward?

 <p><b>Demand side:</b></p> <ul style="list-style-type: none"> <li>Absence of relevant domestic offtakers with long-term contracts for green hydrogen and derivatives.</li> <li>Lack of mandates, targets and demand-side management instruments (sectoral targets/requirements, public procurement).</li> </ul>	 <p><b>Regulation:</b></p> <ul style="list-style-type: none"> <li>Uncertainty regarding certification and traceability of the "green" attribute.</li> <li>Questions surrounding book &amp; claim models within the Brazilian regulatory context.</li> </ul>	 <p><b>Infrastructure and cost of capital:</b></p> <ul style="list-style-type: none"> <li>Need for investments in ports, ammonia hubs and integration with industrial value chains.</li> <li>Higher financial costs compared to developed countries, requiring catalytic capital solutions.</li> </ul>
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## How to design efficient green hydrogen auctions

International experience shows that auctions designed solely around the lowest price, without maturity criteria, tend to reward projects that never reach FID or operation. The result is an "announcement bubble" with limited real delivery.

Aspect	What to avoid	What to do
Auction focus	Production price only	Integrated model (production + demand)
Project maturity	Low verification requirements	Technical, financial and commercial criteria
Guarantees	No guarantees or symbolic guarantees	Guarantees proportional to project size
Outcome	High cancellation and delay rates	Higher conversion of awarded contracts into FID and operational projects

## Minimum maturity criteria for auction participation

To avoid speculative auctions and ensure that awarded contracts translate into real projects, ABIHV recommends that auctions and instruments associated with the PHBC require, at a minimum:

 <p><b>Licensing:</b></p> <ul style="list-style-type: none"> <li>Evidence of an advanced stage (protocols, preliminary licenses or equivalent processes underway).</li> </ul>	 <p><b>Engineering:</b></p> <ul style="list-style-type: none"> <li>Consolidated technical-economic feasibility studies and financial models.</li> </ul>	 <p><b>Financial:</b></p> <ul style="list-style-type: none"> <li>Evidence of committed equity and presentation of guarantees (e.g., bid bonds) compatible with project size.</li> </ul>	 <p><b>Commercial:</b></p> <ul style="list-style-type: none"> <li>Demonstrated engagement with buyers (MoUs, HoAs or pre-contracts), especially in anchor industrial sectors.</li> </ul>
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## Strategic agenda 2025/2026

<p><b>Creating demand</b></p> <ul style="list-style-type: none"> <li>Establish blending mandates and/or sectoral targets for: <ul style="list-style-type: none"> <li>✓ fertilizers;</li> <li>✓ steelmaking;</li> <li>✓ refining;</li> <li>✓ maritime transport;</li> <li>✓ other hard-to-abate sectors.</li> </ul> </li> <li>Structure public procurement programs for green hydrogen and derivatives, coordinated with industrial and climate policy.</li> </ul>	<p><b>Financial instruments and catalytic capital</b></p> <ul style="list-style-type: none"> <li>Strengthen the role of BNDES and public banks as catalysts through: <ul style="list-style-type: none"> <li>✓ blended finance instruments;</li> <li>✓ credit guarantees;</li> <li>✓ participation in specialized funds.</li> </ul> </li> <li>Attract investment banks and institutional investors to hydrogen-specific financial products.</li> </ul>	<p><b>Green neo-industrialization</b></p> <ul style="list-style-type: none"> <li>Integrate the green hydrogen policy into the national industrial policy, focusing on: <ul style="list-style-type: none"> <li>✓ green steel production;</li> <li>✓ low-carbon fertilizers;</li> <li>✓ green fuels for maritime transport and aviation.</li> </ul> </li> <li>Avoid a strategy based solely on exporting the "molecule," prioritizing <b>complete value chains</b> within Brazilian territory.</li> </ul>
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<sup>1</sup> Data and information from October 2025.

<sup>2</sup> HYDROGEN COUNCIL; MCKINSEY & COMPANY. Clean Hydrogen Monitor 2025. Brussels: Hydrogen Council, 2025. p. 10. Exhibit 5 – Main reasons for cancellations of clean hydrogen projects (share % of 52 cancelled projects).