LOW-CARBON HYDROGEN IN BRAZIL: MACROECONOMIC IMPACTS TO 2050

ABIHV
Associação Brasileira da Indústria do Hidrogênio Verde
@abihv_br /company/abihv contato@abihv.org.br abihv.org.br

KEY MESSAGE

A study by LCA Consultores for ABIHV estimates the macroeconomic impacts of developing Brazil's low-carbon hydrogen (LCH) industry between 2026 and 2050, based on three scenarios from the International Energy Agency (IEA).

The results indicate that, **even in the most conservative scenario, the industry could deliver substantial gains in GDP, investment, tax revenue and employment**, with economic effects emerging as early as the project construction phase.

How quickly these impacts materialise depends mainly on global carbon pricing trends and how effectively instruments such as **PHBC** and **REHIDRO** enable offtake contracts and stimulate investment.

Even in the conservative scenario, LCH could add around BRL 1.67 trillion to Brazil's cumulative GDP over 2026–2050 and generate about 3 million job-years during the period.

BRL 618 bn to BRL 5.8 tn
Productive investment mobilised by 2050, depending on the scenario.

3 to 30 million
job-years

BRL 258 bn to BRL 2.7 tn
Additional net tax revenue by 2050, after deducting the PHBC and REHIDRO incentives.

Values reflect the range across the study's CPS*, STEPS* and NZE* scenarios.

GLOBAL OUTLOOK.
Expectations recalibrated; growth remains substantial.

In 2024, global hydrogen demand reached almost **100 million tonnes**, concentrated mainly in traditional uses such as oil refining and industry.

Low-carbon hydrogen production still accounts for a small share of the market, but is expected to grow over the coming decades.

The IEA projects:

CPS | Current Policies
33 Mt of LCH in 2050.

STEPS | Stated Policies
39 Mt of LCH in 2050.

NZE | Net Zero Emissions
376 Mt of LCH in 2050.

Global LCH production in 2050, by IEA scenario

2024 (observed)	CPS 2050	STEPS 2050	NZE 2050
0.7 Mt	33 Mt	39 Mt	376 Mt

*CPS (Current Policies Scenario), STEPS (Stated Policies Scenario) and NZE (Net Zero Emissions by 2050 Scenario) are IEA scenarios.

Source: IEA, World Energy Outlook 2025. Compiled by LCA.

BRAZIL'S ROLE.
Renewable energy competitiveness and export potential.

Brazil could play a significant role in the global green hydrogen market.

Under the study's assumptions, Brazil's share of global green hydrogen production would rise from:

4.8% CPS | 5% STEPS | 12% NZE in 2030



to 15% in 2050 in all three scenarios, considering only global green hydrogen production.

The green hydrogen production modelled in the study is concentrated in Northeast Brazil, which accounts for over 80% of the projects mapped by ABIHV, CNI and EPE.

In 2050, exports could account for:

- **60% | CPS**
- **23% | STEPS**
- **58% | NZE**

of domestic production, while domestic demand would expand into fertilisers, steelmaking, transport and other industrial applications.

GREEN HYDROGEN PRICES AND COMPETITIVENESS

Brazil has **the lowest levelised cost of green hydrogen production (LCOH) among the countries analysed by BloombergNEF**, thanks to the quality of wind and solar resources in Northeast Brazil.

This competitive advantage, however, is not exclusive to Brazil.

Other countries also have low costs, reinforcing the need for instruments to **stimulate initial investment and strengthen the Brazilian industry**.



Green hydrogen
Initially, USD 5.3 bn in CAPEX per GW of electrolyser capacity, with 100% of power from new plants.



Green hydrogen Electrolysers
Projected **80% decline in cost by 2050.**



Blue hydrogen
Estimated effective CAPEX: **USD 1.3 bn per Mt**, assuming retrofits of existing plants.

METHODOLOGY AT A GLANCE

The study estimates the economic impacts through two main channels:

1. Investment phase: CAPEX
Direct, indirect and induced effects of investment on the economy.

2. Production phase
Value added from the production of hydrogen and its by-products.

Estimated multiplier:

+2.2 for green hydrogen (CAPEX phase effect).

With a larger domestic share in the equipment supply chain, the green hydrogen multiplier could approach **+2.5**.

Note: Results may be considered a lower bound, as they exclude additional effects from end-use sectors such as SAF, fertilisers and green steelmaking, and any greater domestic share in the supply chain.

Note: Export shares are calculated as a percentage of Brazil's green hydrogen production in each scenario. The study also estimates a +2.1 multiplier for blue hydrogen, included in the aggregate LCH results.

ECONOMIC IMPACTS FOR BRAZIL

INDICATOR	CPS Conservative	STEPS Moderate	NZE Optimistic
Brazilian low-carbon hydrogen production in 2030	0.2 Mt/year	0.5 Mt/year	2.0 Mt/year
Brazilian low-carbon hydrogen production in 2050	4.7 Mt/year	5.3 Mt/year	46.0 Mt/year
Domestic green hydrogen demand in 2050 (see note)	1.8 Mt/year	3.8 Mt/year	18.8 Mt/year
Electrolyser capacity in 2050	45.3 GW	51.6 GW	475 GW
Productive investment by 2050	BRL 618 bn	BRL 666 bn	BRL 5.843 tn
Additional GDP, 2026–2050	BRL 1.67 tn	BRL 1.869 tn	BRL 16.123 tn
Additional net tax revenue by 2050	BRL 258 bn	BRL 293 bn	BRL 2.737 tn
Additional employment, 2026–2050 (job-years)	3.021 m	3.263 m	30.059 m

Source: LCA Consultores (2026), based on IEA, IRENA, NREL, BNEF and ABIHV data.
Tax incentives modelled through 2034, in BRL at 2025 prices: PHBC, BRL 18.1 bn in each scenario; REHIDRO, about BRL 3 bn in CPS, BRL 4 bn in STEPS and BRL 10 bn in NZE. Tax revenue is already net of both incentives.

PUTTING THE IMPACT IN PERSPECTIVE

In 2050, annual value added from the production phase could range from **BRL 38.6 bn in CPS to BRL 355 bn in NZE**.

During the CAPEX phase, almost 100% of the estimated employment is associated with green hydrogen, in addition to the permanent jobs created in plant operations and renewable power generation.

PUBLIC POLICY RECOMMENDATIONS

Net tax revenue remains positive

In LCA's simulations, net tax revenue, after deducting PHBC and REHIDRO incentives, remains positive in every scenario, including the most conservative.

Use existing renewable electricity surpluses

Using structural electricity surpluses in the early stages could help make the first projects viable. Excessively strict additionality requirements in the short term could constrain sector growth.

Develop domestic equipment manufacturing

Domestic manufacturing of electrolysers and renewable generation components could increase the economic multipliers and retain more of the benefits in Brazil.

For Brazil, the challenge is to turn competitive advantage into economic development.
Unlocking the first projects, encouraging offtake contracts and ensuring stable policies are important steps in converting Brazil's LCH potential into investment, GDP, tax revenue and employment.

Main source: LCA Consultores. Macroeconomic impacts of the development of the low-carbon hydrogen industry in Brazil. Study prepared for ABIHV, July 2026.