2026

ITA INDUSTRIAL TRANSITION ACCELERATOR

MINISTÉRIO DO DESENVOLVIMENTO, INDÚSTRIA, COMÉRCIO E SERVIÇOS

GOVERNO FEDERAL BRASIL UNIÃO E RECONSTRUÇÃO

NOVA INDÚSTRIA BRASIL FORTE, TRANSFORMADORA E SUSTENTÁVEL

Financing industrial decarbonisation projects in Brazil

Project Support Programme
Insights Briefing

Return to Contents page

Contents

The Industrial Transition Accelerator

The Industrial Transition Accelerator (ITA) is a global multistakeholder initiative, managed by Mission Possible Partnership (MPP), to fast-track decarbonisation in energy-intensive industry and transport sectors.

Launched in December 2023 at the COP28 World Climate Action Summit by the UAE COP28 Presidency, UN Climate Change, and Bloomberg Philanthropies, the ITA brings together global leaders from across industry, energy, financial institutions, and governments to overcome challenges and unlock investment at scale to speed up the use of decarbonisation solutions across the following sectors: aluminium, aviation, cement, chemicals, shipping and steel.

Drawing on Mission Possible Partnership's extensive industry networks and deep expertise, the ITA works on the ground to unlock project finance and elevates learnings on the global stage.

The ITA is led by Co-Chairs H.E. Dr. Sultan Al Jaber, Simon Stiell, and Michael R. Bloomberg, supported by the wider ITA Leadership Council.

ITA Leadership Council members come from a variety of organisations — including international industry groups, intergovernmental institutions, and nongovernmental organisations — with a broad set of viewpoints. These diverse views and rich expertise inform the work of the ITA Secretariat. Leadership Council members welcome this publication, but they may not agree with every detail or recommendation. The organisations with which Leadership Council members are affiliated have not been asked to formally endorse this publication.

The Co-Chairs of the ITA

H.E. Dr. Sultan Al Jaber
Minister of Industry and Advanced Technology of the United Arab Emirates and COP28 President

Simon Stiell
Executive Secretary of UN Climate Change

Michael R. Bloomberg
UN Secretary-General's Special Envoy on Climate Ambition and Solutions, and Founder of Bloomberg L.P. and Bloomberg Philanthropies

Mission Possible Partnership (MPP)
MPP is an independent non-profit organisation advancing global clean industry transformation. Since 2019, we have been working with some of the most energy-intensive industries – aluminium, aviation, cement, chemicals, shipping and steel – to cut their global GHG emissions. We mobilise business, finance, government and civil society leaders to speed up the shift to clean materials, chemicals and fuels. Having charted sectoral pathways to net-zero, we continue to forge new territory, lifting the barriers to enable a critical mass of clean industrial projects to break ground by 2030. Mission Possible Partnership has people and partners on the ground in North America, Brazil, Europe, the Middle East, North Africa, India and Asia Pacific. Find out more at www.missionpossiblepartnership.org

The ITA Brazil Project Support Programme

To achieve its vision and mission, the ITA is undertaking a series of Project Support Programmes in specific geographies designed to support the pipeline of green industrial projects being developed there. In July 2024, the ITA and the Ministry of Development, Industry, Trade and Services of Brazil (MDIC) announced Brazil as the first country partner of the ITA and host of its first Project Support Programme, which was officially launched in October 2024.

The ITA Brazil Project Support Programme is led by a Steering Committee comprising the ITA Secretariat, the organisations of the ITA Co-Chairs, and MDIC. The ITA would like to thank Secretary Julia Cruz and her team at the Secretariat for Green Economy, Decarbonisation, and Bioindustry of MDIC for their contribution to this publication and their partnership on the ongoing execution of the ITA Brazil Programme.

The ITA Brazil Programme is also informed and guided by a Consultative Group comprising key national and international stakeholders. This publication was shared with this group for review, but members were not asked for their formal endorsement. The ITA expresses its gratitude to the following members of this group for their ongoing support.

Associação Brasileira do Alumínio (ABAL)

Brazil-UK Industrial Decarbonisation Hub (ID Hub)

Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável (CEBDS)

Federação das Indústrias do Estado de São Paulo (FIESP)

Glasgow Financial Alliance for Net Zero (GFANZ)

Instituto E+ Transição Energética

Sindicato Nacional da Indústria do Cimento (SNIC)

World Resources Institute (WRI) Brazil

The ITA would also like to thank Systemiq as the Anchor Partner of the ITA in Brazil for authoring this report and their ongoing support in the delivery of the ITA Brazil Project Support Programme.

Systemiq

Systemiq, the system-change company, was founded in 2016 to drive the achievement of the Sustainable Development Goals and the Paris Agreement, by transforming markets and business models in five key systems: nature and food, materials and circularity, energy, urban areas, and sustainable finance. A certified B Corp, Systemiq combines strategic advisory with high-impact, on-the-ground work, and partners with business, finance, policy-makers and civil society to deliver system change. Systemiq has offices in Brazil, France, Germany, Indonesia, the Netherlands and the UK. Find out more at www.systemiq.earth

Authors and Acknowledgements

Authors
Leonardo Barlach, *Systemiq*
Giulia Tonon da Matta Machado, *Systemiq*
Marc Farré Moutinho, *Mission Possible Partnership*

Contributors
Faustine Delasalle, *Mission Possible Partnership*
James Schofield, *Mission Possible Partnership*
Mathias Becker, *Systemiq*
Beatriz Makssoudian Ferraz, *Systemiq*
Gustavo Raschke Rameh, *Systemiq*

Contacts
Marc Farré Moutinho,
ITAsecretariat@missionpossiblepartnership.org

Executive Summary

Investors frequently assign high risk premiums to decarbonised industrial projects in Brazil—reflecting macro-economic, policy, technology, execution and market uncertainties—**driving up the cost of capital and the investment hurdle rates they must clear.** Although this view is common towards capital-intensive "mega-projects," such as some proposed large-scale green hydrogen projects under development in the country, **it also constrains relatively lower CAPEX decarbonisation projects centred around efficiency and optimisation** of existing assets.

Efficiency and optimisation projects offer an immediately actionable entry point for industrial decarbonisation as they can present relatively lower levels of risk. **In such cases the decisive barriers to reaching final investment decision (FID) are not technology, execution, or even market risks, but simply access to and the cost of financing.** Given the opportunity they represent, this briefing focuses on efficiency and optimisation projects and their financing barriers, rather than adopting a broader scope covering other types of projects that also face key barriers in other areas.

Although efficiency and optimisation projects display modest or low risk across the categories above and their sponsors are often well-capitalised industrial incumbents, internal capital-allocation frameworks place core business upgrades, strategic growth moves and mandatory maintenance ahead of decarbonisation. **As a result, these projects struggle to be selected for investment on their environmental impact alone, and meaningful decarbonisation will materialise only when it arises as a direct consequence of substantial productivity gains.** Therefore, targeted solutions that close the gap between their expected financial returns and their required hurdle rates can make the projects attractive enough to overcome internal capital allocation priorities and reach FID.

Exploring solutions to improve returns for project sponsors in parallel with mitigating any remaining investment related risks becomes the central task and the focus of this briefing. Its goal is to provide insight into how project investments are assessed, the opportunity represented by efficiency and optimisation projects, key remaining barriers they face, and solutions that can be applied today to overcome those barriers. This briefing will be valuable for industrial corporates in Brazil, who can apply the solutions in question directly to relevant projects they may be developing. Moreover, it is aimed at government, finance, and civil society stakeholders who can make those solutions more available and accessible, highlighting the near-term opportunity of efficiency and optimisation projects as the rationale for doing so.

This brief explores two groups of solutions. First, it summarizes selected financing options, both from domestic sources such as concessional credit lines from BNDES Fundo Clima, FINEP and EMBRAPII, as well as international sources of capital such as loans from multilateral development banks that may provide lower financing costs and improve the attractiveness of projects. **Second, it describes an alternative to lower cost financing in the form of "sustainability-as-a-service" models,** in which third-party providers finance, build, own

and operate decarbonisation projects for a fee, effectively working around corporate balance-sheet constraints and proving particularly relevant for certain types of efficiency and optimisation projects.

Many companies developing projects selected for support by the ITA have accessed BNDES or FINEP financing lines at some point in the past, implying good awareness of those lower cost finance options. However, lengthy internal approvals, project complexity, shifting priorities, and high application costs, especially for mid-sized investments, deter firms from using these instruments. **Consequently, although able to support industrial decarbonisation, these lower cost funds remain underutilised in this area.**

Taking such projects as illustrative case studies the following approach emerges:

1. **When a project involves non-core processes, the sustainability-as-a-service model is a viable route:** a specialist provider designs, finances and operates the new equipment, enabling the industrial firm to boost efficiency and lower emissions without committing capital off its own balance sheet capital.
2. **If outsourcing is not an option, then the Fundo Clima credit line at BNDES becomes the next best choice.** Its reduced interest rate and flexible limits—available directly or via commercial banks—make it a versatile source of debt for a wide range of projects.
3. Finally, ventures built around **innovative technologies obtain the lowest-cost financing from FINEP or from BNDES's Mais Inovação programme;** these facilities offer deeper subsidies than Fundo Clima, though their thematic scope is more restricted.

While both lower cost finance and sustainability-as-a-service show immediate potential, these solutions may not be enough to unlock all efficiency and optimisation projects in Brazil, let alone enable investment in other types of industrial decarbonisation projects. This is because, **on their own, these solutions are unlikely to address the broader range of risks that some projects face,** particularly market risks relating to issues such as demand and pricing, and ensure they can achieve sufficiently high returns for their corporate and financial proponents.

To accelerate investment in decarbonised industry in Brazil more generally public and private sector actors must work towards making a more fundamentally strengthened investment case for such projects. This includes making lower cost finance and sustainability-as-a-service more available and accessible in the country, but must go beyond this to creating conditions to more widely mitigate risks and improve returns for projects. Fostering these more favourable systemic conditions goes beyond the scope of this briefing, but it concludes with a few considerations on how this could be done.

Lastly, while the analysis and findings of this briefing focus on Brazil, it can be considered a reference case for other countries, particularly emerging economies with good economic fundamentals for decarbonised industry which also face high costs of capital.

1 Project characteristics, risks and implications

Securing the capital required for the global industrial transition is a significant challenge, particularly in emerging economies. This issue has been extensively documented by international organisations like the Organisation for Economic Co-operation and development (OECD),[1] the International Energy Agency (IEA),[2] and the World Economic Forum,[3] which have all highlighted the difficulty of mobilising capital given the associated risks.

Within the specific context of Brazil, the scale of this undertaking is substantial. A study published by Instituto Aya estimated that the industrial and energy sectors alone will require annual investments ranging from USD ~60-85 billion until 2033 to align with necessary transition pathways.[4] For the industrial sector, this investment will take the form of decarbonisation projects but ultimately will not materialise unless there is a clear path for those projects to reach final investment decisions (FIDs).

When undertaking a project, developers have two important financial bars in mind: **the cost of capital (what it would cost them to raise debt and equity) and the hurdle rate (the minimum return a specific project must earn).** For standard value-generating projects, the hurdle rate is typically set higher than the cost of capital to account for factors such as project-specific risks, opportunity costs, and management's risk appetite.

The specific cost of capital used as a baseline for the hurdle rate depends on the financing structure. In the case of **corporate finance,** typically used for brownfield projects, the investment is funded from the company's balance sheet. Therefore, the relevant benchmark is the company's **weighted-average cost of capital (WACC).** For **project finance,** where the project is funded as a stand-alone venture, the benchmark is a project-specific cost of capital, calculated based on the debt and equity raised for that venture alone. In all cases, the project's **risk premium** is critical in determining its hurdle rate. This premium reflects the real and perceived risks associated with the project. Therefore, the hurdle rate for a project equals the firm's cost of capital plus a project-specific risk premium.

In many cases, the risk premium of decarbonisation projects can be higher than that of conventional industry projects, which will increase their hurdle rate, making it more challenging to secure FIDs. This briefing identifies five categories of risk impacting the financial viability of projects in Brazil, many of which have particular relevance for decarbonisation projects:

1. **Macroeconomic and Currency Risk:** Macroeconomic risk relates to the economic environment of the host country. A key factor is the spread between Brazil's base interest rate (SELIC) and international rates, which directly influences the cost of capital for companies accessing global financial markets. Additionally, currency risk is the risk that fluctuations in the exchange rate will negatively affect project financials. Export-oriented projects that raise capital and earn revenue in the same international currency have a lower risk profile. In contrast, this risk is most acute when there is a currency mismatch, such as when a project is funded by loans in US dollars (USD) but generates revenue in Brazilian reais (BRL).
2. **Policy and Regulatory Risk:** The regulatory landscape plays a crucial role in determining project viability, especially

1 OECD (2024), Bridging the clean energy investment gap
2 IEA (2025), Cost of Capital Observatory
3 World Economic Forum (2024), The critical role of cost-of-capital and climate policies in net-zero transitions
4 Instituto AYA and Systemiq (2023), Caminhos para o Plano de Transformação Ecológica do Brasil

for decarbonisation projects where incentives and mandates can constitute a relevant source of value. Projects operating within stable and predictable regulatory environments face lower risks, while those dependent on emerging regulations or uncertain incentives experience greater uncertainty and therefore higher risk.

3. **Technology Risk:** The deployment of decarbonisation technologies that are not yet commercially proven at scale or are still in a pilot phase introduces additional uncertainty to projects. Technologies that have already been implemented at scale present a lower risk, whereas applications which are still being consolidated or scaled up face a higher risk and therefore demand higher returns.
4. **Project Execution Risk:** The successful execution of a decarbonisation project depends on factors such as access to reliable infrastructure, internal company capabilities, and supply chain maturity. Projects with access to well-established infrastructure and supply chains face lower execution risks, while those requiring significant infrastructure upgrades or new supply chains face higher execution risks.
5. **Market and Offtake Risk:** Market uncertainty presents a major challenge for decarbonisation projects, particularly when introducing new green products or when financial viability depends on securing a green price premium. Projects that do not rely on changes in market adoption face lower risk, while those that are introducing new products face higher risks.

For industrial decarbonisation projects, perceived risk can sometimes be higher than actual risk, particularly in some of the categories above. For example, a project in Brazil may use a technology that has been proven elsewhere, but nonetheless faces higher perceived technology risk because it has not yet been implemented or operated at scale in Brazil specifically. However, all of the categories remain relevant and comprise actual risks faced by projects in Brazil to some degree.

To illustrate how these risks present themselves for industrial decarbonisation projects in Brazil, they have been distilled into the framework set out in Table 1 and applied to the pipeline of projects selected by the ITA in the country:

Risk type	Low Risk	Medium Risk	High Risk
Macroeconomic and currency risk	Export-oriented projects that are financed and generate revenue in global currencies, representing low exposure to domestic macroeconomic and exchange rate fluctuations	Partial mismatch between financing currency and revenue currency, where the project is partially financed in global currencies but earns revenue mainly in BRL	Mismatch between financing currency and revenue currency, where project financing is provided in global currencies while revenues are earned in BRL
Policy and regulatory risk	Project is not dependent on changes in policy and regulation	Project relies on specific policy or regulatory changes that are already implemented or undergoing implementation	Project is highly dependent on policy and regulatory changes that are uncertain or not yet implemented
Technology risk	Project uses mature and proven technology	Project technology is still immature or not readily available domestically	Project uses first-of-a-kind technology or significant upgrade from existing process/ technologies
Project execution risk	Project faces little to no specific hurdles related to execution and infrastructure	Project faces some barriers related to infrastructure or supply chains that are not fully controllable by the developer	Project faces significant execution barriers that cannot be surpassed exclusively by the developer
Market and offtake risk	Target market is well established and output can be sold at existing market prices	Project targets an existing market but would need to secure a small or temporary green price premium	Project targets an existing market but requires a substantial premium or a new market that is not yet well defined

Table 1: Criteria for project risk evaluation

When applying the framework above to the 14 projects selected by the ITA in Brazil, every project presents risks in a different way, but can nonetheless be grouped into distinct archetypes of projects with similar characteristics and risk profiles as shown in Exhibit 1 and Table 2. It is important to note that the risk evaluation that follows is an aggregate assessment of projects selected by the ITA by sector, which may mask notable differences between projects within the same sector. Moreover, while projects selected by the ITA are useful illustrations of industrial decarbonisation projects in Brazil, they are not a perfect reflection of the full pipeline of projects in development in the country. As such, the risk assessment that follows offers useful insight but should not be taken to comprehensively apply to all decarbonisation measures being implemented by the relevant sectors in Brazil.

Sector	Expected investment per project (BRL)	Macroeconomic and currency risk	Policy and regulatory risk	Technology risk	Project execution risk	Market and offtake risk
Aviation	Above 15 billion	Low	High	High	Medium	High
Aluminium	50 million – 1 billion	Low	Low	Medium	Medium	Medium
Cement	40 million – 300 million	Medium	Low	Medium	Low	Medium
Chemical	1 billion – 20 billion	Medium	Medium	High	High	High
Steel	100 million - 15 billion	Low	Medium	Medium	Medium	High

Exhibit 1: Risk mapping of projects selected by the ITA by sector

Low Medium High

Across sectors, macro- and currency-related risks form the backdrop against which all other risk dimensions are considered. The aviation and steel sectors typically finance projects in global currencies that mirror their revenue streams, so exchange-rate swings add little volatility. Aluminium relies on largely domestic finance and sales, which also results in lower exposure. Cement and chemical ventures, by contrast, earn mostly in local currency while importing equipment or arranging foreign-currency debt, producing a moderate but clear mismatch that raises their overall financial sensitivity.

Against that financial backdrop each sector's policy outlook can be considered. Aviation stands out with high policy and regulatory dependence, as the commercialisation of sustainable aviation fuel (SAF) in Brazil hinges on national and international mandates and incentives that face uncertainties. The steel and chemicals projects sit at medium policy risk, reflecting carbon-pricing debates and the emergence of hydrogen support schemes that are advancing but not yet settled. Cement projects operate within frameworks that are largely in place or evolving incrementally, so their policy exposure is medium-to-low, while aluminium decarbonisation proceeds within a relatively stable incentive environment and therefore also registers lower policy risk.

Technology maturity follows a similar gradient. First-of-a-kind pathways dominate aviation fuels and several new chemical processes, placing these sectors at the high end of technology risk. Aluminium smelter upgrades, early-stage cement decarbonisation methods, and hydrogen-based steel routes occupy the middle ground, where proven elements exist but require phased integration. Incremental or established

improvements—such as efficiency upgrades in cement or the use of renewable electricity in aluminium—illustrate the lowest levels of technological uncertainty across the group.

Execution difficulty mirrors technology novelty and infrastructure dependence. Chemical projects face the greatest execution hurdles because they demand new feedstock supply chains, specialised utilities, and entirely new plant architectures. Aviation initiatives rank in the medium band, given the need to coordinate fuel producers, airports, and carriers. Aluminium and steel retrofits encounter moderate execution complexity due to energy-supply and infrastructure requirements, whereas smaller-scale cement upgrades display the lowest execution risk thanks to limited site changes and familiar construction practices.

Finally, the maturity of end-markets governs offtake risk. Aluminium, cement, and steel sell into long-established markets, so baseline demand is steady and offtake exposure is low-to-medium, even if premiums for low-carbon variants are still limited. Aviation fuels and novel chemical products face higher offtake risk because of relatively greater price premium requirements and emergent product standards; market access therefore remains contingent on the evolution of agreements, certification regimes, and price signals specific to these newer value chains. Across all sectors, market and offtake risk stands out as the most relevant category, given the impact of associated risks on the volume and stability of revenues expected for a project which significantly affect its bankability.

In the context of the risks faced by projects selected by the ITA and in trying to identify suitable investment solutions, it is useful to think of each project as belonging to a specific archetype. The goal of these archetypes is to present typical project characteristics that correspond to certain risks and imply specific financing needs. Based on the analysis above combined with expert input, the ITA considers four distinct archetypes for industry decarbonisation projects:

- **Technology innovation:** This archetype comprises projects ranging from early research and development (R&D) efforts through to developing initial pilot facilities, all aimed at developing new decarbonisation technologies. They tend to have lower capital requirements, however they have higher levels of uncertainty regarding their timelines and results.
- **Efficiency and optimisation:** This archetype includes incremental improvements to existing (brownfield) operations that reduce emissions while often achieving secondary benefits, such as operating cost reductions or productivity improvements. They have smaller investment requirements than new plants and less acute risk profiles. Their main financial challenge is ensuring that the returns from cost savings or additional production can meet the relevant hurdle rate and justify the necessary capital expenditure (CAPEX).
- **Infrastructure and asset replacement:** This archetype includes projects to build the supporting infrastructure required by projects from the other archetypes, such as investments in renewable energy, transmission lines, and logistical infrastructure. While projects of this type are not a specific focus of the ITA and have therefore not been selected by its programme in Brazil, they are important for enabling industrial decarbonisation. These projects can have significant investment requirements and large policy or execution risks but typically have medium-to-low technological and market risks.
- **Mega-projects:** This archetype is composed of the large, greenfield projects that deploy new technologies to produce significantly low-emissions (and sometimes novel) goods. These projects involve very large investments, often in the billions of dollars, made through project finance structures. This large scale comes with complex sets of risk that must be addressed to ensure project bankability.

Archetype	Characteristics	Investment (BRL)	Technology readiness	Brownfield/ Greenfield	Risk profile
1. Technology Innovation	Up to pilot scale projects, with long development cycles and new technologies	Up to 50 million	Pioneering technology	Both brownfield and greenfield	High technology risk, long payback period
2. Efficiency and Optimisation	Incremental improvements, short implementation time, mature technologies	Up to 1 billion	Localising or scaling technology	Brownfield	Low technology risk and low execution risk
3. Infrastructure and Asset Replacement	Large-scale projects, mature technologies	Above 500 million	Localising or scaling technology	Both brownfield and greenfield	Medium technological risk, medium execution risk
4. Mega-Projects	From structural changes and deployment of new technology to global mega-projects with high decarbonisation potential, 10+ year maturation, large impact	Above 1 billion	Pioneering to mature	Mostly greenfield	Moderate to high risk in all dimensions, dependence on public policies and new offtake markets

Table 2: Overview of project archetypes

Most projects selected by the ITA in Brazil fit either in the efficiency and optimisation archetype or the mega-projects archetype, as shown in Exhibit 2, below.

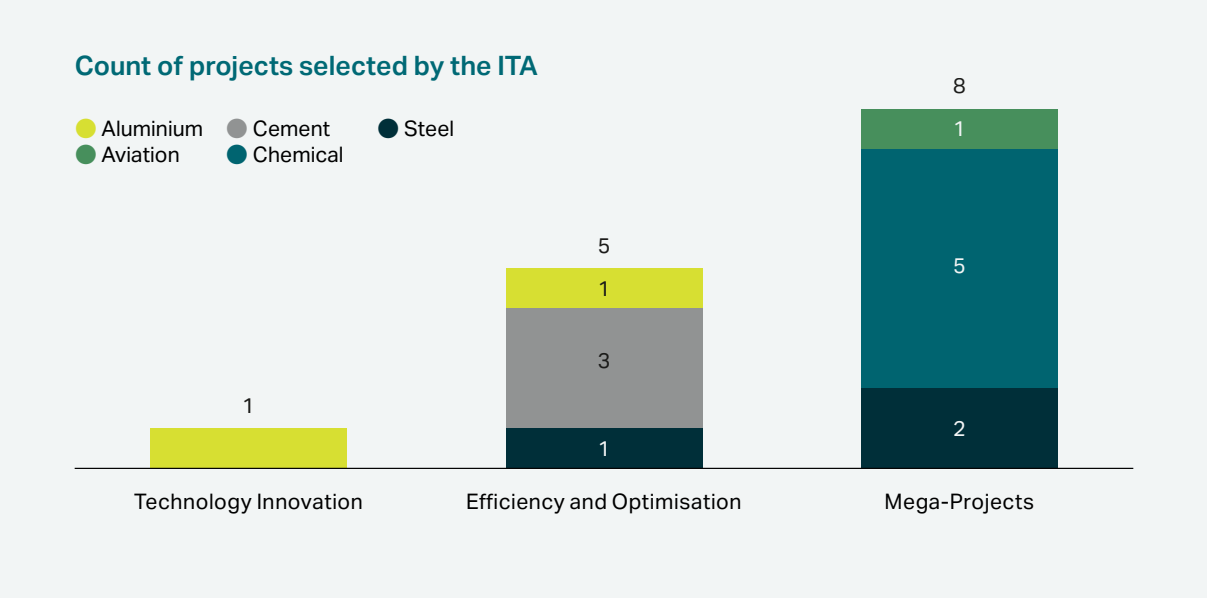


Exhibit 2: Distribution of projects selected by the ITA in Brazil across project archetypes[5]

The mega-projects represent large, greenfield projects with significant investment requirements (above BRL 1 billion or USD 189 million)[6] and clear associated risks. These projects are in the chemicals (green ammonia, e-methanol, green fertiliser), steel (green hot briquetted iron - HBI), and aviation (SAF) sectors. All of these projects are introducing deeply decarbonised alternative products to market, rely on supportive domestic or international

5 The Infrastructure and Asset Replacement is not displayed as the ITA has not selected any projects in Brazil of that archetype.
6 BRL values in this document are converted into USD where relevant at a rate of 0.1891, based on the rate indicated by the Banco Central do Brasil on 09/03/2026.

policy, represent first-of-a-kind deployment of new technologies at scale in the country, and must overcome significant infrastructure or supply chain barriers. Securing FID for these projects requires addressing each of their associated risks to a level that makes them bankable for investors.

On the other hand, the Efficiency and Optimisation archetype comprises incremental but significant decarbonisation projects at existing plants in Brazil, with investment levels ranging from tens to hundreds of millions of USD. Examples include substituting fossil fuels with waste and biomass in cement plants, activating a clay calciner to produce supplementary cementitious materials (SCMs) for cement production, or electrifying heat generation in alumina refining. A common characteristic is low project execution risk, since they are being implemented within existing operations. **Most of these initiatives do not rely on new regulation or market strategies and can achieve returns by reducing costs or increasing productivity.** While the technologies being deployed have varied levels of maturity, their smaller scale relative to the overall operation they are being integrated into allows for manageable risk. As these projects are being developed at existing assets, achieving FID requires ensuring the returns they generate are sufficient to exceed the investment hurdle rate required by the asset holders.

Finally, the Technology and Innovation archetype includes one project developing technology involving waste from the alumina and aluminium production chain to enable carbon capture, utilisation and/or storage (CCU/S) of residual process emissions from aluminium smelting. While the ultimate aim of the project is to deploy the technology at commercial scale, it is currently in the R&D stage, implying lower current investment requirements, an uncertain technological outcome, and a longer path to generating a return on investment.

While projects selected by the ITA are only a sample of overall industrial decarbonisation efforts in Brazil, they reflect trends seen in industry more widely around the world. All large greenfield projects involve either green hydrogen (via chemicals or HBI) or SAF, two products that are attracting significant attention globally. At the same time, the aluminium and cement sectors are mostly represented in the efficiency and optimisation archetype, as technologies that would be needed to fully decarbonise these sectors, such as CCU/S, are not yet commercially available for the necessary applications.

Given the goal of this briefing to highlight financial instruments that can accelerate industrial decarbonisation in Brazil, taking an archetype-based approach is valuable, as each has distinct needs that require different solutions. Focusing on an archetype that is well represented among the portfolio of projects selected by the ITA enables analysis based on real-world case studies, strengthening the applicability of findings and solutions.

Discussions with the proponents of the mega-projects selected by the ITA indicate that the most immediate and significant barriers they face do not relate to project financing, arising instead from challenges relating to infrastructure development, offtake agreements, and technology maturation. **While raising capital for CAPEX is a key priority, it typically only becomes a relevant priority after these other more fundamental risks have been mitigated.** For efficiency and optimisation projects, however, these non-financing barriers are generally less significant. Instead, **proponents cited clearing their internal corporate investment hurdle rate as the primary remaining obstacle.**

Mitigating the key risks outlined above is crucial for enabling industrial decarbonisation more broadly, including mega-projects, and consequently constitutes a key focus for the ITA

in Brazil. However, the potential of efficiency and optimisation projects to secure investment and deliver climate impact in the near-term presents an opportunity that should not be overlooked. For this archetype, financing instruments that improve project returns, reduce risks and reduce the cost of capital can be the deciding factor that moves a project from unattractive to investable. Therefore, this analysis will focus on solutions tailored to efficiency and optimisation projects with a view to unlocking investment in the near-term and to complement efforts to mitigate more fundamental challenges that industrial decarbonisation often faces.

A detailed analysis of efficiency and optimisation project archetype (considering both real-world case studies from the projects selected by the ITA as well as broader industry analysis) reveals specific strengths that can facilitate funding, as well as remaining barriers that prevent projects from reaching FID. While many characteristics of this category suggest they should be easier and faster to fund, other aspects of those characteristics present challenges that sometimes offset inherent advantages.

Several strengths have been identified across these projects:

- **Improvements to existing plants:** Efficiency and optimisation projects leverage the existing industrial plant in many ways. The project can be funded by revenues from the current operation and can utilise existing staff expertise, licences, and permits.
- **Lower technology and execution risks:** Companies can often prove and validate the technology through lab or pilot-scale testing in scenarios very close to their existing operations, significantly reducing technology risk. The availability of existing infrastructure also minimises execution risk.
- **Well-capitalised companies:** The industrial companies considering these projects are often already well-capitalised. This means they are typically strong, bankable counterparties capable of providing the financial guarantees necessary to secure funding.
- **Low total investment requirements:** In general, these projects have lower total investment levels, especially when compared to the CAPEX required for greenfield projects.

Despite these strengths, several barriers still prevent these projects from reaching FID:

- **Financial return gap vs. hurdle rate:** The value these projects generate from cost savings and/or increased productivity often falls short of a financial return that exceeds the company's required hurdle rate. Customers - particularly in local markets – have a limited appetite to pay meaningful premiums for low-emission products, reducing a potential additional revenue source that could close this gap. Generating and monetising carbon credits or other types of environmental attribute certificates (ECAs) can offer another revenue stream, but uncertainties around certification and pricing mean projects often cannot rely on them. Insufficient financial returns are then main barrier to reaching FID.
- **Internal capital allocation priorities:** Within most companies, the environmental case for decarbonisation is often insufficient on its own to secure internal capital. Investment is first channelled to three stronger priorities: high-return core business upgrades, strategic growth initiatives (e.g. new market entry), and indispensable maintenance or safety overhauls. These alternatives offer quicker and higher profits, future growth, or essential operational reliability, so limited funds flow to projects proposed solely for their environmental benefits. Even if a decarbonisation project exceeds the hurdle rate it must still compete with core business priorities.

- **Inadequate external funding sources for mid-sized projects:** Mid-sized efficiency projects face a financing "middle gap." They are often too mature for early-stage R&D support (such as grants) yet too small to tap the instruments designed for large-scale industrial projects. Internally, their modest financial returns push them down the priority list. Externally, potential lenders subject their relatively small tickets to the same due diligence and compliance requirements imposed on much larger projects. The resulting administrative complexity, protracted processes, and high transaction costs frequently outweigh the benefits of the external capital sought, causing many of these projects to stall.

Reaching FID for these projects in the near-term requires solutions that can quickly close the gap between their expected financial returns and their required hurdle rates. These solutions must make the projects attractive enough to overcome internal capital allocation priorities and administrative hurdles.

2 Investment and funding options

Accelerating industrial decarbonisation projects in Brazil centred around efficiency and optimisation requires solutions that strengthen project economics and lower investment barriers. Given these goals, this briefing considers two principal solutions to unlock FIDs for these types of projects: 1) lower cost finance and 2) sustainability-as-a-service business models.

In the first instance, **lower cost finance represents an attractive option.** In this briefing, "lower cost finance" is defined as any finance available at a lower cost than what is generally offered by commercial banks in Brazil. This mostly covers 'concessional' finance which is deliberately offered at below-market rates and with other favourable terms to support investment in specific areas, taking forms such as grants (repayable and non-repayable) or subsidised loans. However, lower cost finance also covers instruments that are not specifically designed to support investment in specific areas in Brazil but nonetheless happen to be cheaper than what domestic commercial banks normally offer.

Lower cost finance can address investment challenges from multiple angles. Grants reduce upfront capital outlays, directly raising returns, while low-interest or long-tenor loans lower the project-specific cost of capital and, by extension, the hurdle rate. Such instruments are also typically issued by institutions such as development finance institutions (DFIs), multilateral development banks (MDBs), green banks or philanthropic entities, which can provide a 'halo effect' of additional reputational benefit: rigorous due diligence requirements reduce perceived risk, prompting other lenders and investors to narrow their risk premium. The combined effect is a virtuous cycle of cheaper capital, higher expected returns and swifter FIDs.

However, lower cost financing options, particularly concessional capital, are not without their limitations. Limited appetite of providers for certain types of risks, high transaction costs, and conditions on funding, among other factors, can constrain the applicability of these financing solutions for industrial decarbonisation projects. Even when they can be applied in a supportive way, projects can still struggle to fully overcome internal constraints such as competing strategic priorities and limited corporate balance sheet capacity.

In such cases, **alternative business models offer a complementary solution.** In a "sustainability-as-a-service" arrangement, specialised providers design, finance, install and operate the equipment envisaged by a project in an industrial site, with the client paying lease or service fees over time instead of having to make the large upfront investment themselves.

These providers can often secure capital at lower rates, whether through concessional facilities, cheaper debt or equity attracted by long-term contracted revenues, allowing them to meet return thresholds that might be harder to achieve by the host company. Their dedicated focus and technical expertise further drive down procurement and deployment costs, turning efficiency gains into a compelling investment proposition. By blending lower cost finance with service-based delivery models, Brazilian industry could unlock investment in a broader portfolio of decarbonisation projects, accelerate implementation and achieve meaningful emissions reductions with minimal disruption to core operations. For more information on the solutions outlined below, including sources with further detail, please see Appendix 1.

2.1 Domestic sources of lower cost finance

Mapping of available options

In recent years, there has been an expansion of lower cost finance sources available for industrial projects in Brazil, particularly those focused on decarbonisation. This process accelerated in 2023 when the new federal administration launched or reinforced many grants and credit lines with the goal of achieving the decarbonisation of the economy, in line with the country's goals in its Nationally Determined Contribution (NDC) under the Paris Agreement.

Historically, the main source of long-term funding for industry in Brazil has been the *Banco Nacional de Desenvolvimento Econômico e Social* **(BNDES - National Bank for Economic and Social Development).** Over its history, BNDES's strategy has been deeply intertwined with Brazil's industrial policy. In 2023 and 2024, the *Plano de Transformação Ecológica* (Ecological Transformation Plan) and later the *Nova Indústria Brasil* (NIB - New Industry Brazil) plan set new strategic priorities for the bank, which were followed by increases in funding availability for innovation and decarbonisation loans with lower interest rates than most conventional credit lines.

In addition to BNDES, other federal agencies have relevant roles in financing industrial projects and also support decarbonisation initiatives. First is the *Financiadora de Estudos e Projetos* **(FINEP - Financer of Studies and Projects).** FINEP is a key provider of concessional funding aimed at nurturing the country's innovation ecosystem. This funding can take the form of non-repayable grants for high-risk R&D projects, subsidised loans for all levels of project development up to implementation, and venture capital or equity investment. As with BNDES, FINEP saw a significant increase in funding starting in 2023, with new financing priorities set under the NIB.

Another relevant federal agency is the *Empresa Brasileira de Pesquisa e Inovação Industrial* **(EMBRAPII - Brazilian Company for Industrial Research and Innovation).** EMBRAPII was created to strengthen the connection between industry and academia in Brazil and address the underutilisation of capacity in public research institutions. The agency addresses these issues by co-funding R&D projects that are developed in partnership between industrial companies and accredited research centres. While it is mostly focused on earlier-stage research, for topics associated with NIB priorities (including industrial decarbonisation), it can support projects up to the pilot and implementation scale, covering a significant share of innovation costs.

Finally, in addition to funding sources directly from the federal government, **private and commercial funds are directed to decarbonisation projects via regulations and the tax code.** These include funds from commercial banks, capital markets, and private investors.

Given these sources, the following section explores specific funding lines available to industrial companies seeking to implement decarbonisation projects, focusing on instruments deemed most relevant for efficiency and optimisation projects. It is important to note that these instruments also encounter some of the previously mentioned limitations, although this depends on the instrument in question. For example the entities above may place local content requirements on projects as a condition of funding. In general, the limitations that are common to concessional finance should be borne in mind and more specific limitations are noted where relevant (see Appendix 1 for additional detail).

Innovation funds

These concessional funding sources target projects with a focus on technology innovation. These funds are relevant to industrial decarbonisation projects because they often involve the deployment of state-of-the-art equipment for more energy efficient and productive processes. Projects that involve the deployment of mature technology for the first time in Brazil or within a specific sector often also qualify as innovative for the purpose of accessing these funds.

The main benefit of these funds is that they are the lowest cost sources of finance available from the federal government. In addition to grants, which are non-repayable, credit lines are very inexpensive, with some interest rates as low as 2% per annum. However, their focus on innovation often translates into an emphasis on smaller projects and a relatively lower availability of funding per application, constraining their use for higher CAPEX projects.

- **EMBRAPII Inova+:** The main fund available from EMBRAPII, accessible as a non-repayable, concessional co-investment delivered through a tripartite model. In this model, an industrial company partners with research centres to develop the research project. EMBRAPII channels funding directly to the research centre up to 1/3 of total project cost. In general, EMBRAPII will support research projects for technologies with Technology Readiness Levels (TRL)[7] between 3 and 6. However, for projects associated with priority topics within the NIB, it will support technologies up to TRL 9.
- **FINEP grants:** FINEP provides non-repayable grants to companies for high-risk R&D projects in strategic areas. These grants are made available for many topics, not just industrial decarbonisation, with a significant share directed to defence and aerospace sectors.
- **FINEP loans:** For companies moving from R&D to larger-scale deployment, FINEP offers loans at highly subsidised interest rates, as low as 2% per year. Interest rates for these loans depend on the level of innovation involved, as well as alignment with NIB priorities. As with their grants, only a small share of the funding available for these loans is earmarked specifically for decarbonisation projects. That said, 80% of total funding contracted via these loans since 2020 has flowed to industrial firms, underscoring their role as a key source of concessional capital for the sector.
- **BNDES Mais Inovação:** This credit line serves a similar role to the FINEP loans, with the only major difference being that BNDES conducts its own analysis of project eligibility.

Decarbonisation credit lines

This category includes credit lines available from BNDES for decarbonisation initiatives, with Fundo Clima being the most relevant. All these lines include subsidised interest rates and other characteristics common to BNDES lines, such as the longer repayment periods, specific reporting necessities, and credit guarantee requirements.

- **BNDES Fundo Clima:** This is the main credit line within BNDES for funding decarbonisation projects in Brazil, with a higher level of subsidy than other lines. While it has existed since 2011, it received a significant influx of funds in 2024 after Brazil issued USD 2 billion in sovereign sustainable bonds, which were directed to seven priority sectors, one of which is Green Industry. It can be accessed directly from BNDES or indirectly via a commercial bank. As the BNDES credit line with the largest volume of concessional finance available for decarbonisation projects, its implications for industry are detailed further separately below.
- **BNDES – Finame Baixo Carbono:** The Finame line aims to support the purchase of Brazilian-made industrial equipment. The *Baixo Carbono* subline is specifically for equipment intended to reduce carbon emissions, such as energy efficiency technology.

7 Technology Readiness Level is standard measurement for technology development which ranges from 1 for basic principles observed to 9 for mature technology in operation.

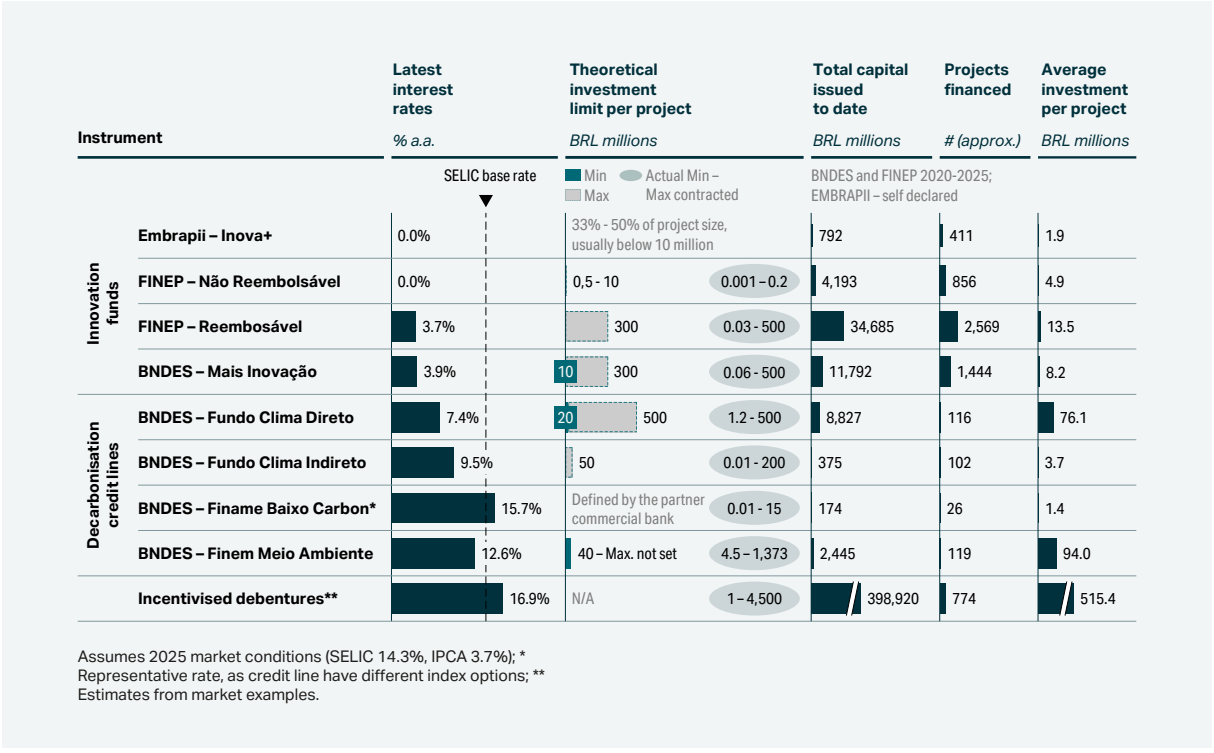
- **BNDES – Finem Meio Ambiente:** The Finem line is a major credit line for large industrial and infrastructure projects. The *Meio Ambiente* subline supports projects with specific environmental benefits.
- **PATEN:** The *Programa de Aceleração da Transição Energética* (PATEN - Energy Transition Acceleration Programme) is not a credit line, but instead a tool to help companies obtain the guarantees necessary to access credit lines from BNDES. It allows companies to use tax credits from federal taxes as well as other government credits as loan guarantees, reducing the need to secure such guarantees from commercial banks.

Lower cost credit from commercial sources

In addition to the grants and credit lines directly offered by the federal government, there are financing solutions available from commercial sources that are subject to specific regulatory benefits that reduce their cost when applied to industrial decarbonisation projects.

- **Incentivised debentures:** These are corporate bonds that companies can issue in the Brazilian capital market that are exempt from the usual 15% income tax for investors. Currently, these debentures are limited to infrastructure investments and investments in low-emission hydrogen production.
- **Eco Invest:** Launched by Brazil's Ministry of Finance (MF), this is a programme designed to mobilise private capital towards sustainable investments. Its primary mechanism involves blended finance whereby the federal government provides low-cost finance to banks who then combine it with their own capital, and it also offers solutions to mitigate currency exchange rate risk (hedging) for foreign investors.

Each of the financial instruments above have different characteristics and historical use, as outlined in Exhibit 3 below:



Assumes 2025 market conditions (SELIC 14.3%, IPCA 3.7%); * Representative rate, as credit line have different index options; ** Estimates from market examples.

Exhibit 3: Quantitative overview of domestic sources of lower cost finance accessible to industry decarbonisation projects[8]

8 Systemiq analysis based on data from EMBRAPII (2026), Dados EMBRAPII; FINEP (2025), Central de painéis; BNDES (2025), Projetos patrocinados pelo BNDES; ANBIMA (2025), Boletim de debêntures incentivadas e de infraestrutura

Exhibit 3 shows that, across all eligible sectors (not only industry) the Fundo Clima Direto line has supported larger projects, with an average ticket size of roughly BRL 76 million (USD 14 million) versus about BRL 13 million (USD 2 million) supported by FINEP's reimbursable loans, yet a larger total volume of capital has flowed through FINEP facilities, which have already allocated nearly BRL 40 billion (USD 7.5 billion) compared with a little over BRL 9 billion (USD 1.7 billion) from the Fundo Clima in the same period. Even so, both FINEP and Fundo Clima remain far behind incentivised debentures, whose issuances exceed BRL 390 billion (USD 73.6 billion) with average tickets above BRL 500 million (USD 94.6 million) per operation. Turning the focus to industrial decarbonisation specifically, **this contrast underscores that lower cost finance instruments offered directly by public entities can help scale investment in this area in the near term, but achieving greater scale and mobilisation of private capital would likely require more robust fiscal incentives.**

Further analysis of how these sources of lower cost finance can support industrial decarbonisation projects, especially those in the efficiency and optimisation archetype, reveals several useful insights:

- **Fundo Clima is a versatile funding source:** The mix of lower interest rates and a wide range of potential funding levels makes the Fundo Clima useful for multiple types of decarbonisation projects. The indirect option (in which companies access the funding via commercial bank intermediaries) has no minimum funding level, meaning it can be particularly useful for less capital-intensive efficiency and optimisation projects. At the same time, the upper limit of BRL 500 million (USD 94.6 million) means it can also help cover larger investments. Due to its high applicability, the Fundo Clima will be the focus of further analysis in this briefing.
- **Innovation funds are highly subsidised and have grown significantly:** Both FINEP and BNDES offer highly subsidised credit lines for innovation, alongside non-refundable grants from FINEP and co-investment from EMBRAPII. Funding for these facilities has grown significantly since 2023. FINEP has been a relevant source of credit for industry, with 80% of its BRL 34 billion (USD 6 million) in loans between 2020 and May 2025 directed to industrial companies. However, the bulk of these loans have been and continue to be directed towards general innovation projects rather than specifically towards decarbonisation projects.
- **An important role for non-repayable grants:** Non-repayable support from FINEP and EMBRAPII can significantly impact a project's financial viability, especially for projects with smaller investment sizes. However, deeper analysis reveals that these facilities have offered limited support for industrial decarbonisation specifically. For FINEP, all grants exceeding BRL 40 million (USD 7.6 million) since 2020 have been directed to the defence and aerospace sector, and the median grant size is only BRL 2 million (USD 0.4 million). In EMBRAPII's case, its rules require a partnership with an external research centre and prohibit the use of funds for CAPEX, which limits its applicability for projects focused primarily on acquiring machinery.
- **A wide range of options are available:** A broad spectrum of lower cost funding sources and instruments can be accessed by industrial decarbonisation projects. Smaller projects can access BNDES facilities via partner commercial banks (albeit at a higher interest rate), while larger industrial projects can complement Fundo Clima with other lines like BNDES Finem, which have no upper limit on project size.
- **Incentivised debentures represent a significant pool of private capital:** Although currently limited to specific infrastructure applications (including some renewable energy projects), incentivised debentures have mobilised a total volume of capital several times larger than the capital provided by BNDES. Given their impact for existing applications, extending their scope to cover industrial decarbonisation more directly could be worthwhile.

For the efficiency and optimisation projects considered prioritised by this analysis, each of these lines has different levels of applicability due to characteristics such as their funding limits, interest rates, and availability. **The combination of lower interest rates and wide applicability makes the Fundo Clima the most appropriate sources of concessional debt finance for decarbonisation projects in general, while FINEP debt is best suited to support those with a high level of technology innovation.**

Fundo Clima deep-dive

The *Fundo Nacional sobre Mudança do Clima* **(*Fundo Clima* - National Climate Change Fund),** operated by BNDES, stands out as the primary federal government credit line dedicated to supporting decarbonisation projects across Brazil and is relevant for industrial efficiency and optimisation projects. After averaging budgets of around BRL 500 million (USD 94.6 million) per year between 2020 and 2023, it grew to BRL 10.5 billion (USD 2 billion) in 2024 and BRL 11.2 billion (USD 2.1 billion) in 2025.

Under its current format, its strategic objectives are pursued through seven priority areas, one of which is "Green Industry." This priority area aims to bolster energy efficiency within industrial operations, encourage greater adoption of circular economy practices, and promote the deployment of newer, lower-emissions technologies. This makes Fundo Clima relevant and applicable to industrial decarbonisation efforts involving efficiency and optimisation projects as well as larger greenfield projects. However, certain characteristics of the fund and the ways in which its resources are made available have limited its use by industrial decarbonisation projects. Both strengths and limitations are explored below and help point to potential areas of improvement for Fundo Clima to better address its stated priorities in green industry.

Operational Structure and Financial Conditions

Access to Fundo Clima resources is structured through two distinct pathways, catering to projects of varying scales:

- **Direct BNDES financing:** Larger projects, currently defined as those with investment values exceeding BRL 20 million (USD 3.8 million) and up to a limit of BRL 500 million (USD 94.6 million) per corporate group, can apply for funding directly from BNDES. These direct operations benefit from a more favourable interest rate structure, currently set at 6.15% per annum plus a BNDES remuneration fee of 1.3% per annum.
- **Indirect financing via partner banks:** Smaller projects, with values up to BRL 50 million (USD 9.5 million), can access Fundo Clima resources through accredited commercial banks. For these operations, the base interest rate is also 6.15% per annum, with a BNDES fee of up to 1.4% per annum. Additionally, the partner commercial bank is entitled to a spread, capped at an additional 2.5% per annum.

Funding Allocation and Disbursement Trends

The Fundo Clima is capitalised from a variety of sources, including allocations from the federal budget, oil and gas royalties, proceeds from sovereign green bond issuances, and international donations. Exhibit 4 below depicts the budgeted, approved, contracted and spent values for Fundo Clima per year since 2020.

Analysis of Fundo Clima's budgetary allocations and execution reveals two key trends. Firstly, BNDES demonstrated the capacity to approve a volume of projects in 2024 nearly equal to the substantially increased budget for that year. This indicates a strong capacity from BNDES to adjust to this new scale and evaluate projects at the necessary pace.

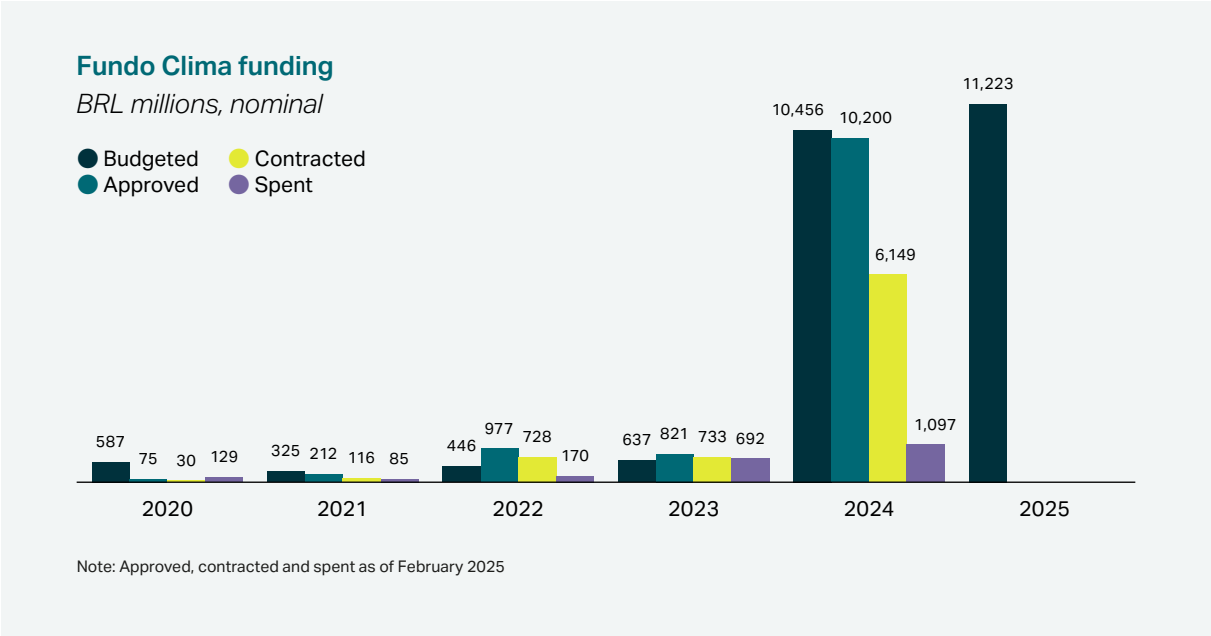


Exhibit 4: Fundo Clima funding over time[9]

Secondly, a discernible lag exists between project approval, contracting, and the actual disbursement of funds. Interviews with BNDES indicate that the bank currently requires between six months to a year to move from application to contract, as the relevant BNDES teams have to thoroughly analyse multiple different projects and, in parallel, applicant companies must complete all administrative steps to finalise the loan agreement. Furthermore, funds from BNDES loans like the Fundo Clima are only disbursed *after* an applicant company makes the capital investment and submits paperwork verifying the expenditure. This reimbursement-based approach is used to ensure that government-subsidised funds are used only for the approved purpose and are not repurposed for other uses. This process, combined with the physical constraints of project timelines, means actual disbursements can take years to complete after a contract is signed.

Sectoral Distribution of Contracted Projects

Exhibit 5, below, displays the distribution per sector of Fundo Clima resources approved for loans in 2024, after the new, higher budget was set. It uses categories as determined by BNDES, in which "Energy transition" refers to projects in sectors such as renewable energy generation and conventional biofuels, while "Green industry" covers industrial decarbonisation projects, including those similar to the projects supported by the ITA.[10]

Of the BRL 10.2 billion (USD 1.9 billion) approved for the Fundo Clima in 2024, approximately BRL 6.1 billion (USD 1.2 billion) (~60%) were approved for projects in BNDES's "Energy transition" category. This includes BRL 3.3 billion (USD 624 million) (~32%) for renewable energy generation and BRL 2.5 billion (USD 473 million) (~25%) for ethanol production. While undoubtedly relevant to Brazil's overall climate goals, these are now largely mature and highly competitive sectors, particularly solar photovoltaic (PV) and wind energy, capable of attracting investment with less reliance on subsidised credit.

9 Systemiq analysis based on BNDES (2025), Fundo Nacional sobre Mudança do Clima (FNMC) Relatório de Execução 2024 – Recursos reembolsáveis

10 The other categories used by BNDES are logistics, mobility and transportation, which relates to both public investments in public transit and other infrastructure as well as private logistics improvements; urban development, which relates to urban resilience projects, and forest and water, which are used for reforestation and conservation projects.

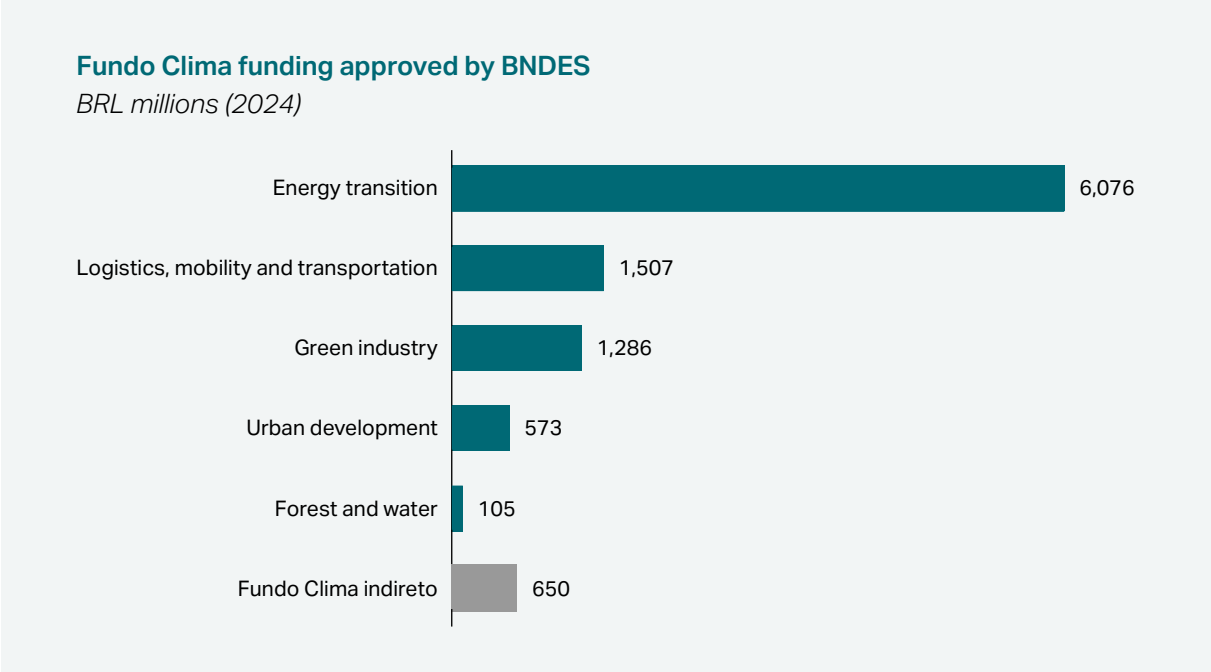


Exhibit 5: Fundo Clima funding approvals by sector[11]

Despite the challenge of industrial emissions in Brazil, only BRL 1.3 billion (USD 246 million) (~13%) of funding approved within the Fundo Clima in 2024 was directed toward the "Green Industry" area. Analysis of the approved projects shows that this funding was directed to only four projects, of which only one corresponds to the types of projects analysed in this document (an upgrade to a chlorine/soda production plant using higher-efficiency technology).

This low allocation reflects the difficulties faced by industrial decarbonisation projects. One of the primary obstacles is the extended time required for their development and detailed engineering. Unlike solar PV projects, which can be developed in a faster and more standardised way, industrial projects are more complex due to the diverse technologies they can employ and unique project requirements that often arise. These characteristics can be seen in the relevant projects selected by the ITA, each of which uses a different technology to achieve its decarbonisation goal. Using traditional staged engineering processes, the companies behind these projects required at least six months to develop these projects to the point where they could consider proceeding towards an investment decision and seek funding. This higher complexity translates into longer timelines on the BNDES side too, as it takes more time for the bank's staff to analyse a unique industrial project than it does for a standardised solar PV project.

Longer engineering and approval timelines put industrial projects at a disadvantage when trying to access Fundo Clima resources in 2024. The funds in question are made available on an annual basis and applications were reviewed on a "first-come, first-served" basis, meaning projects that were ready to submit applications quickly were able to claim a large share of the available resources. As more industrial projects reach maturity, it is expected that the share of funding for industrial decarbonisation will increase.

11 Systemiq analysis based on BNDES (2025), Fundo Nacional sobre Mudança do Clima (FNMC) Relatório de Execução 2024 – Recursos reembolsáveis

2.2 International sources of lower cost finance

In addition to domestic sources, companies can also access a growing pool of international capital looking at climate-focused investments that can serve as lower cost finance for industry decarbonisation. Interviews with experts and stakeholders indicated five main categories of funding sources:

- **International climate funds:** Entities such as the Green Climate Fund (GCF) and the Climate Investment Funds (CIF) mobilise concessional finance for climate investments in countries around the world and are increasingly looking into industrial decarbonisation, with the CIF Industry Decarbonisation Program (IDP) standing out as a flagship example. For country-specific programmes, these funds often channel their resources through financial institutions operating within the country, but can sometimes receive applications directly from the private sector depending on the programme.
- **Export Credit Agency (ECA) finance:** ECA-backed loans can reduce the cost and risk of importing foreign equipment by offering lower interest rates, stable repayment terms and host country political risk cover. Their scope, however, is limited: financing is typically tied to goods sourced from the ECA's country of origin, covers only part of equipment costs, and demands rigorous due-diligence and ESG compliance from borrowers.
- **Multilateral Development-Bank (MDB) finance:** MDBs such as the Inter-American Development Bank (IDB), the New Development Bank (NDB) or the Asian Infrastructure Investment Bank (AIIB) can offer competitively priced and concessional finance, together with technical expertise and credibility that can unlock co-financing from other investors. While most MDB lending by volume is not concessional, they can nonetheless still offer finance at costs that can be attractive for industrial players in Brazil. Accessing these resources, however, entails extensive documentation, strict compliance requirements and, in many cases, the participation of a national government partner.
- **Green bonds in international capital markets:** Issuing a green bond internationally exposes a company to a broad pool of sustainability-focused investors, who can offer capital at a lower cost and on a larger, longer-tenor basis than domestic investors. The challenges

however are higher issuance complexity, compliance and certification costs, which can be more easily borne by large, creditworthy corporates. Proceeds raised in foreign currency also introduce exchange-rate risk.

- **Sovereign Wealth Funds (SWFs) and pension funds:** While these institutions are not concessional finance providers, some can position themselves to offer deep pools of long-term capital and strong signalling effects that can crowd-in other investors, particularly for export-oriented sectors. Their scale and investment mandates, however, favour platform-level or portfolio approaches over individual projects, and they typically require mature risk-return profiles before committing capital.

Overall, **the main benefit of accessing international sources of funding is the lower interest rates they can offer relative to the Brazilian market.** In international markets, even commercial loans will be priced off benchmarks such as US Treasury bonds, which are significantly cheaper than the Brazilian base rate (~4% vs. ~15% as of mid-2025, as shown in Exhibit 6). When considering the additional support from development banks or other concessional finance providers described above, this becomes even more attractive.

On the other hand, **these funding sources can expose projects to currency risk.** This is a smaller issue for companies focused on export markets – which earn revenue in hard currency to repay their financing - but it can be a significant issue for companies operating in the domestic market with local currency revenues. Other challenges include the added complexity of accessing these sources and the higher level of reporting requirements for concessional funding from relevant providers.

Among the different players, **ECAs and MDBs stand out as the most appropriate international funding sources for most efficiency and optimisation decarbonisation projects.** These sources are more suited to the typical ticket size of these projects and often provide lower interest rates for specific applications.

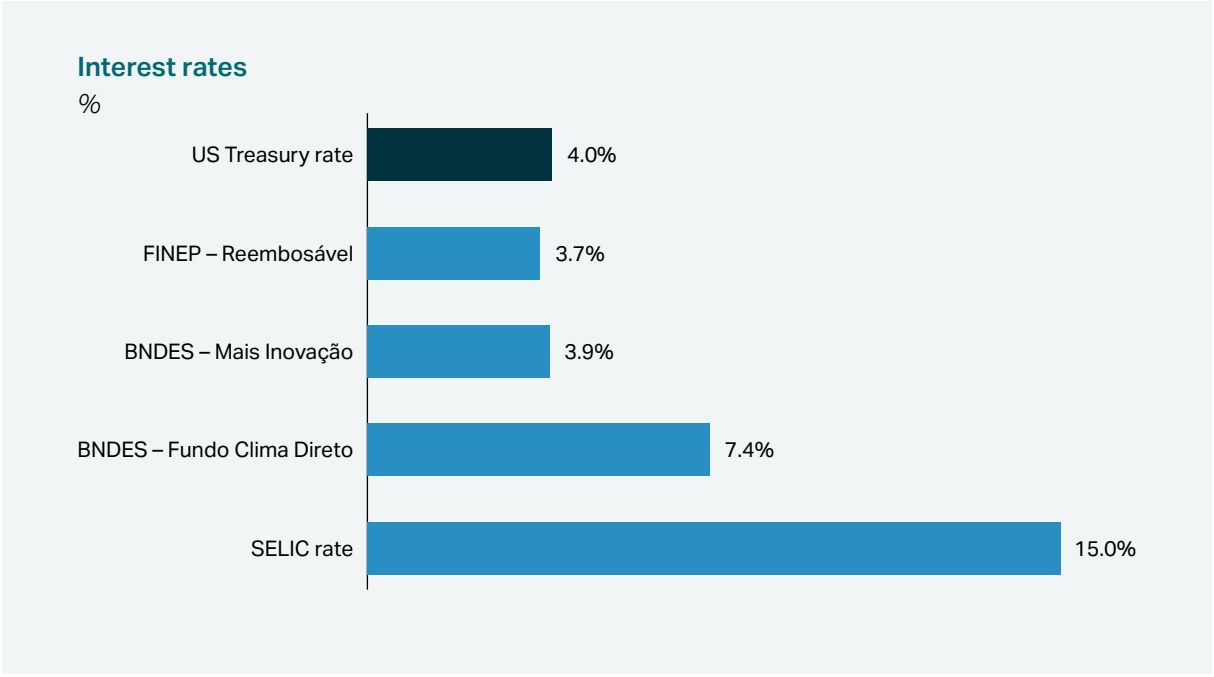


Exhibit 6: Comparison of interest rates in Brazil versus the base US Treasury rate[12]

12 Systemiq analysis based on BNDES (2025), Fundo Nacional sobre Mudança do Clima (FNMC) Relatório de Execução 2024 – Recursos reembolsáveis

2.3 An alternative to direct investment: Sustainability-as-a-service

"Sustainability-as-a-service" is an alternative business model for industrial companies to develop and finance decarbonisation projects. In this model, described in Exhibit 7, industrial companies contract specialised service providers to design, finance, deploy, and often operate specific assets within their plants that provide greater efficiency and lower emissions.

What is it?

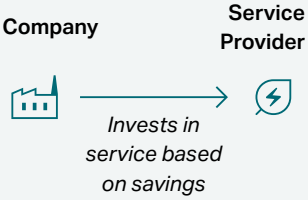
A new business model where industrial companies adopt decarbonisation technologies without using their own capital or taking on debt by contracting a specialist third party to deploy the technology as a service.

When does it makes sense?

When a solution involves a standardised process that is not part of the company's core technology. This includes industrial utilities such as steam, compressed air, industrial heat.

How does it work?

1. The specialised provider finances, installs, and operates the equipment.
2. The company pays a service free to either rent the equipment or purchases the utility supplied.
3. After 10–15 years, assets may be transferred to the company at low or no cost.



Key Benefits

- Off balance sheet (no new debt)
- Easier to approve OPEX vs. CAPEX
- Higher cost-efficiency due to specialist provider expertise
- Frees up capital for core business

Success Cases in Brazil

Non- Exhaustive

Comerc: Invests in electric systems and shares savings

Neoenergia: Offers electric heat and small green hydrogen plants as a service

Exhibit 7: The sustainability-as-a-service business model for industrial decarbonisation

Under a sustainability-as-a-service arrangement, an external **provider designs, finances, installs and operates efficiency-enhancing equipment in exchange for a service fee from the industrial company.** This model offers two immediate advantages. First, the provider's purchasing power, specialised know-how, and faster learning curve (considering the provider will have done similar projects in the past) enable **faster delivery at lower cost than the host company could achieve on its own.** Second, because the assets remain off the client's balance sheet, the project does not consume internal CAPEX capacity. Instead, the industrial company records the service payment as OPEX, which can be attractive if the project lowers running costs compared to the legacy equipment it replaces.

Experience shows that the model works best when the **outsourced process is ancillary to the client's core technology or competitive advantage and when the provider can exploit standardised, utility-like solutions** (such as heat generation, air-conditioning or compressors) to achieve economies of scale. Projects involving

these processes can be modest relative to the company's overall operations. For larger undertakings, industrial companies are more inclined to handle financing and execution themselves. Depending on the project, sustainability-as-a-service and direct financing supported by lower cost capital need not be considered as mutually exclusive solutions, but could be applied together in a complementary way, with the former applied to ancillary processes while the latter is applied to core ones.

The arrangement is particularly compelling when **the provider's hurdle rate undercuts that of the industrial corporate client,** either because it can secure cheaper debt, attract equity on the strength of long-term service contracts with high-credit clients, or simply avoid the internal strategic constraints that often delay corporate capital allocation decisions in large industrial companies. Greater technical expertise also lowers execution risk and raises expected returns.

To realise these benefits, the industrial company must define clear project boundaries to ensure that outsourcing does not impinge on any proprietary process. If the project generates carbon credits or EACs, the service contract must specify how those credits are allocated between the parties. **Finally, a rigorous technical-economic procurement process is essential to secure favourable terms over the life of the service agreement.**

Overall, **this business model presents a very attractive alternative for efficiency and optimisation decarbonisation projects.** It allows companies to make faster decisions and benefit from outsourced expertise while maintaining control of their core technologies. It is more attractive for this archetype compared to larger projects or R&D initiatives precisely because it leverages the lower technology risks that are characteristic of these types of projects.

3 Implications for projects and the investment ecosystem

Given the ITA's focus on supporting the needs of real-world projects, this final chapter returns to the specific efficiency and optimisation projects selected by the ITA and uses them as case studies in how the lower cost finance and alternative business model solutions analysed in this briefing could be applied to such projects. The chapter concludes by offering broader recommendations on how to systematically accelerate investment in such projects in Brazil more widely.

3.1 Solutions for projects selected by the ITA

The analysis presented in this briefing has been mostly driven by engagement between the ITA and the companies pursuing the efficiency and optimisation projects selected by the initiative in Brazil.[13] This engagement has involved mapping project needs against the landscape of available financing instruments, identifying the most suitable solutions, and connecting project developers with the appropriate finance or service providers. This project-specific analysis has revealed specific challenges and gaps, allowing the ITA to offer tailored guidance and connections to help progress vital decarbonisation investments.

An overview of each relevant case study is presented below, highlighting the solutions that ITA believes would be most suited given the context of the project.[14] While this analysis has been guided by the case studies in question, they are representative of the types of the efficiency and optimisation projects that industrial players in Brazil are likely to consider, making the following findings relevant for national industry more widely.

Mizu Cimentos seeks to install pyrolysis units at a cement factory to produce energy from waste biomass to substitute fossil fuel use at the site:

- **FINEP or BNDES – Mais Inovação** funding would apply for this project since this is the first application of biomass waste pyrolysis for cement production in Brazil. It is the cheapest source available, as low 3% per year, and is of a suitable size, given the relatively lower CAPEX of the project.
- **ECA finance** could be an option since the equipment being considered is not commercially available in Brazil and will likely need to be imported. A loan from the ECA of a potential supplier country could cover a large share of equipment CAPEX at a lower cost.
- Funding from **Fundo Clima** or grants from **MDBs,** when they are available, can complement the funding, if necessary.
- The **sustainability-as-a-service model** could be an option for this project, as long as there are service providers in Brazil who can work with the technology in question, including importing the necessary equipment if needed.

The Eco Fusion consortium seeks to install gasifiers at cement factory owned by **Apodi Cimentos,** producing energy from waste as a substitute for fossil fuel use:

- **EMBRAPII** funding could be used to cover some of the technical analysis needed to validate the gasifier technology, if it can be outsourced to research centres, such as the Argo Institute of Science and Technology (a sister organisation of one of the consortium partners). The funding would cover up to half of the cost of the analysis.
- **FINEP and BNDES – Mais Inovação** are the most cost-effective sources of funding for innovative equipment and would apply to capital investments related to the gasifiers. **Fundo Clima** would be the most appropriate source of funding for the parts of the project that are not covered by EMBRAPII or FINEP.
- The **sustainability-as-a-service model** between the cement site owner and the gasifier technology provider could be a viable option, depending on preferences among consortium partners regarding ownership and operation of the equipment and the capacity of individual partners to raise lower-cost funding.

13 ITA (2025), Industrial Transition Accelerator (ITA) selects seven new decarbonisation projects to support in Brazil
14 The information and descriptions of the following decarbonisation projects are based on publicly available sources. No confidential or commercially sensitive information was used.

Alcoa aims to electrify the boilers at an alumina refinery, reducing fossil fuel consumption for heating processes:

- The **sustainability-as-a-service** model would clearly apply to this case, as steam generation is a standardised process that is not core to the company's technology competitiveness and there are already multiple companies capable of developing this project.
- **Fundo Clima** would be the most appropriate source of funding in Brazil, should the company choose not to use a third-party service provider, given its lower interest rate, currently at 7.7% (as of May 2025), and high funding level, at BRL 500 million (USD 94.5 million).
- **International commercial banks** would also be able to provide loans at better rates, given the company's international presence, export sales, and double-A credit rating.

From these cases, three key points stand out:

1. In all cases the financial gains expected by the projects do not depend solely on revenues from carbon credits, but are rooted in cost savings coming from energy efficiency improvements. **Decarbonisation alone does not yet create enough value to repay and justify the required investments.**
2. **When projects involve upgrades to non-core processes, the sustainability-as-a-service model offers an attractive solution:** a specialist provider designs, finances and operates the new equipment, enabling the industrial firm to boost efficiency and phase out fossil fuels without having to commit its own balance sheet capital or seek external finance itself.
3. **If outsourcing is not an option, the Fundo Clima credit line at BNDES becomes the next-best choice.** Its reduced interest rate and flexible limits—available directly or via commercial banks—make it a relevant source of debt for virtually any project. Projects specifically built around innovative technologies can also find solutions from FINEP or from BNDES's **Mais Inovação** programme; these facilities offer deeper subsidies than Fundo Clima, though their thematic scope is more restricted.

In interviews, the companies behind the projects selected by the ITA indicated that have tapped BNDES or FINEP credit lines in the past (for investments unrelated to decarbonisation) and have broad access to commercial banks as well, so awareness of domestic concessional financing instruments and connections to their sources do not pose a fundamental barrier.

In practice, however, lengthy internal decision processes, the technical complexity of the projects, shifting corporate priorities and the high transaction costs of preparing concessional funding applications often outweigh the perceived benefits of pursuing decarbonisation projects, particularly for small- to mid-sized investments where expected value and returns appear modest relative to the effort required. As a result, these well-established funding channels are frequently underutilised despite their applicability for industrial decarbonisation.

3.2 System-level recommendations

If efficiency and optimisation projects represent one of the best near-term opportunities for industrial decarbonisation at scale in Brazil, then lower cost finance and sustainability-as-a-service are examples of solutions that can swiftly unlock that opportunity. As shown above, **these solutions are already available to projects in the country today, and both the public and private sectors can take action to make them more accessible and impactful.**

As an illustrative example on the private sector side, industrial companies considering relevant projects can issue requests for proposals to outsource those projects, sending a demand signal for sustainability-as-a-service and fostering a market offering from existing and prospective providers. On the public sector side, measures to improve the availability and accessibility of lower cost and sustainability-as-a-service solutions for industrial decarbonisation projects would be valuable. The nationwide expansion of the PotencializEE energy efficiency programme,[15] action proposed by MDIC to allocate part of Fundo Clima funding specifically to green industrial projects and Brazil's successful expression of interest to the CIF IDP are promising steps in this direction.[16]

The aim of this briefing to highlight near-term opportunities and solutions underlies its focus on efficiency and optimisation projects and how lower cost finance and sustainability-as-a-service can help them secure investment. However, despite their immediate potential, it is important to note that **these solutions may not be enough to unlock all efficiency and optimisation projects in Brazil, let alone enable investment in other archetypes of industrial decarbonisation projects.** This is because, on their own, solutions like lower cost finance and sustainability-as-a-service are unlikely to address the broader range of risks that some projects face and ensure they can achieve sufficiently high returns for their corporate and financial proponents.

To accelerate investment in decarbonised industry in Brazil more generally, including efficiency and optimisation projects as well as other archetypes, public and private sector actors must work towards making a more fundamentally strengthened investment case for such projects. This includes making lower cost finance and sustainability-as-a-service more available and accessible in the country, but must go beyond this in **creating conditions to more widely mitigate risks and improve returns for projects.** Given the significance of market and offtake risk to the investment case of such projects, action focused on demand for decarbonised industrial goods is crucial.

Identifying and fostering these systemic conditions is a key objective of the broader activities of the ITA Brazil Programme but goes beyond the scope of this specific briefing. The topic is touched on in other programme publications[17] and the broader subject of financing industrial decarbonisation is also addressed in the work of programme Consultative Group members such as the E+ Energy Transition Institute,[18] World Resources Institute (WRI) Brazil,[19] and other collaborators of the ITA in Brazil.[20] That said, it is worth setting out some brief considerations of what these conditions could look like, how they have been achieved in Brazil and abroad in other

15 PotencializEE (2026), Ministro Alexandre Silveira lança, em Minas Gerais, programa PotencializEE em nível nacional
16 MDIC (2025), Consulta Pública sobre a Estratégia Nacional de Descarbonização Industrial (ENDI), MF (2025), Programa de Descarbonização da Indústria
17 ITA (2024), Challenges and opportunities for commercial-scale green industry in Brazil
18 E+ Energy Transition Institute & Itaúsa Institute (2025), Financiando a transição: análise e recomendações sobre mecanismos de financiamento climático no Brasil
19 WRI Brazil (2025), Quem são e como se conectam os atores que impulsionam a transição de baixo carbono na indústria brasileira? UK PACT (2025), Unlocking finance for industrial decarbonisation in Brazil
20 UK PACT (2025), Paving the way to unlock finance for greening hard-to-abate sectors in Brazil

sectors and what lessons that offers for green industry (see Appendix 2 for further detail):

- **Agriculture in Brazil:** Agriculture stands as a pillar of the Brazilian economy, renowned for its global competitiveness and crucial role in generating export revenue. This economic significance has historically translated into strong regulatory support and a well-developed, sophisticated financial ecosystem tailored to its needs. The total value available from agriculture finance instruments is significant. Funding allocated by the government to the Plano Safra programme for the 2024/2025 harvest was set at over BRL 400 billion (USD 75.6 billion).[21] For the private sector, financing from all instruments add up to over BRL 1.2 trillion (USD 227 billion) in total credit, as of April 2025.[22] A mature credit architecture shows how targeted credit lines, technical support and robust monitoring can mobilise vast sums when strategic sectors are prioritised accordingly. Taking a similar approach towards clean industry could significantly accelerate investments in the sector.
- **International decarbonisation incentives:** Climate finance programmes now serve as vital engines for the net-zero transition in many regions around the world by strengthening the investment case for decarbonisation to draw in private investors. Their effectiveness has secured strong policy backing and fostered a sophisticated ecosystem of contracts, grants, tax credits and blended-finance funds designed to de-risk green projects. These measures have been able to direct large amounts of blended finance capital to decarbonization projects, for example with EUR 4 billion via Germany's carbon contracts-for-difference (CCfDs),[23] EUR 40 billion via the EU ETS-funded grants[24], over USD 391 billion via the US Inflation Reduction Act (IRA) tax credits[25] and a targeted USD 250 billion via the Tropical Forests Forever Facility.[26] Deploying a comparable mix of long-term revenue certainty mechanisms, earmarked carbon market revenues, and blended finance instruments could unlock similarly transformative investment in industrial decarbonisation in Brazil. It would be worth exploring how such solutions could be adapted to the country, leveraging Brazil's own financial resources as well as support from development finance institutions at home and abroad (including MDBs).

Many of the international examples above have a clear impact on financial returns in a conventional sense but also encourage a broader view of project returns. When returns are expressed not only in conventional internal rate of return (IRR) terms but also as monetised carbon savings, resilience gains and reputation premiums, corporate hurdle rates shift and investment flows. Complementary tools like carbon-pricing signals, innovation funds, risk-sharing facilities and "sustainability-as-a-service" contracts further compress perceived risk by turning decarbonisation into a performance-based service rather than a one-off CAPEX hit. Woven together, elements such as these can transform the system in which projects are developed today into a self-reinforcing ecosystem where well-prepared projects progress smoothly to finance, capital sees clear risk-adjusted returns, and industry captures enduring, system-wide value.

The examples above also highlight that while solutions to strengthen the investment case for decarbonised industry will require the involvement of both public and private sector actors, robust action by the former is indispensable. **Policy responsibilities across industry, finance, procurement, and trade give the public sector a wide range of powerful tools to mitigate key risks for industrial decarbonisation projects and improve their**

21 MAPA (2024), Governo Federal lança Plano Safra 24/25 com R$ 400,59 bilhões para agricultura empresarial
22 MAPA (2025), Boletim de Finanças Privadas do Agro
23 German Federal Ministry of Economic Affairs and Energy (2024), First round of carbon contracts for difference launched
24 European Commission (2025), Innovation Funds
25 CBO (2022), Estimated Budgetary Effects of H.R. 5376, the Inflation Reduction Act of 2022
26 MF (2025), Tropical Forest Forever Facility (TFFF)

bankability. Many such tools have already been identified in the country's first national strategy for industrial decarbonisation,[27] published for public consultation at COP30. Taking the actions proposed in the strategy forward to the final version of the document, due to be completed this year, and advancing them to implementation will help improve the investment environment for industrial decarbonisation across the board.

To conclude, while the analysis and findings of this briefing focus on Brazil, it can be considered a reference case for other countries, particularly emerging economies with good economic fundamentals for decarbonised industry which also face high costs of capital. In these contexts, efficiency and optimisation projects may also stand out as low-risk and viable options for industrial decarbonisation while being hampered by internal corporate investment hurdle rates, resource allocation priorities, and the challenges of securing suitable financing from external sources. In such countries, lower cost finance for industrial decarbonisation and sustainability-as-a-service may also stand out as solutions to unlock investment in the near-term and their applicability to other national contexts should be explored further.

In the same way that Brazil offers a reference case for how lower cost finance and sustainability-as-a-service can unlock efficiency and optimisation projects, the need to fundamentally strengthen the investment case for industrial decarbonisation to unlock a much broader range of projects is present in other countries too. Solutions to achieve this, particularly policy measures, will be driven by local contexts to an even greater degree and should be explored accordingly, but will invariably be crucial for countries around the world to make decarbonised industry a reality.

27 MDIC (2025), Consulta Pública sobre a Estratégia Nacional de Descarbonização Industrial (ENDI)

Appendix 1:

Domestic and international lower cost funding options

Instrument	Benefits	Challenges
EMBRAPII[28] EMBRAPII provides public funds for research, development and innovation, to be used with participating universities and research centres. In 2023, EMBRAPII announced a total of BRL 145 million available in funding.	Support for early-stage innovation up to pilot scale through non-reimbursable funds. Encourages companies to access research infrastructure in public universities and research centres, reducing the need for investment in their own laboratories. EMBRAPII funds 1/3 of the cost of the research project, with an additional 1/6 of the cost from the partner research centre/university. The company funds the residual half of the research cost.	Limited in scope, as EMBRAPII funds can only be used for partnerships with research centres and cannot be used for capital investments. Partnership with universities and research centres presents transactional costs and administrative challenges, such as handling shared staff.
FINEP – Não Reembolsável This is a non-repayable grant that FINEP provides for private companies to fund high risk science and technological investment.	Support for innovation projects through non-reimbursable funds, significantly reducing the risk of these R&D projects. Projects aligned with the national industrial policy priorities of the NIB are more likely to be selected in public calls.	Availability depends on thematic calls from the Ministry of Science and Technology. In each call, values are not explicitly set for how much funding is available and under what conditions.
FINEP Reembosável[29] Subsidised loans for the deployment of innovative technology.	Highly subsidised interest rates with reasonably high funding limits makes it very attractive for the deployment of innovative decarbonisation technology. Available for innovation development up to mature projects.	Availability depends on thematic calls from the Ministry of Science and Technology. Changes in funding availability and interest rates between award and disbursement creates uncertainty.
BNDES - Fundo Clima[30] Credit line specifically for decarbonisation projects, funded by the National Climate Change fund. Currently the largest source of funding for decarbonisation projects in Brazil.	Funding available for a wide range of decarbonisation projects in the 7 key sectors, including Green Industry. Accessible for most mature, ready-to-finance, industrial decarbonisation projects Very long tenors, up to 16 years depending on the line, with up to 5 years grace period on debt repayment.	As with other BNDES lines, this one requires that applicants post bank guarantees, such as liens on equipment. These guarantees are negotiated on a project-by-project basis. Long approval times, usually between 6 months and 1 year. This is especially challenging for industrial projects, which tend to be more complex and less standardised. Total funding available for loans is defined each year by the federal budget. For 2025, it was set as BRL 11 billion. In 2024, 98% of the BRL 10.5 billion budget was approved, with BRL 6.1 bn fully contracted. This ultimately limited pool of capital implies competition for companies trying to access this credit line.

28 EMBRAPII, inova+ - Indústria Digital e Sustentável
29 FINEP (2025), Chamadas Públicas
30 BNDES, Fundo Clima

Instrument	Benefits	Challenges
BNDES - Finame Baixo Carbono The Finame credit line is focused on supporting the purchase of Brazilian-made equipment. The *Baixo Carbono* subline focuses on equipment for decarbonisation projects.	Funding available for a wide range of technologies relevant for industrial decarbonisation, such as biomass heat generators, energy storage, and energy efficient equipment, among others. Long tenors, up to 10 years, with up to 2 years grace period.	Limited to the purchase of Brazilian-made equipment. Interest rates are closer to market rates, with lower subsidy than Fundo Clima. As with other BNDES lines, this one requires that users post bank guarantees, such as liens on equipment. These guarantees are negotiated on a project-by-project basis.
BNDES – Finem Meio Ambiente Finem is BNDES' line for productive investments, usually associated with capital projects. The *Meio Ambiente* subline is directed at environmental projects, including energy efficiency, circular economy and others.	Unlike Fundo Clima, this line is not limited by funding made available by the National Climate Change Fund, which gives BNDES more flexibility to provide these loans. Very long tenors, up to 20 years, depending on company credit.	Interest rates are closer to market rates, with lower subsidy than Fundo Clima. As with other BNDES lines, this one requires that users post bank guarantees, such as liens on equipment. These guarantees are negotiated on a project-by-project basis.
BNDES Mais Inovação BNDES line for innovation projects. Projects aligned with national policy goals, such as climate mitigation, are eligible.	Highly subsidised interest rates, making it very attractive for innovative climate projects. Very long tenors, for projects aligned with the national climate policy it can be up to 16 years, with a 4-year grace period on repayment. Does not depend on FINEP public calls.	Limited to innovation projects. Unlike FINEP funding, this funding is not made available through public with explicit selection criteria, creating higher uncertainty of project approval. As with other BNDES lines, this one requires that users post bank guarantees, such as liens on equipment. These guarantees are negotiated on a project-by-project basis.
Incentivised debentures[31] Fixed income instruments exempt from income taxes that companies can issue to raise funds directly in the capital markets.	Bonds allow for much higher levels of funding than bank loans, as companies will be able to access the broader capital market. Tax exemptions make these debentures more attractive to investors, reducing the interest rate companies need to pay. Funds can be raised at the company level, or specifically for large projects.	Limited in scope by current legislation, only eligible for infrastructure, energy and green hydrogen, or agricultural production. As with all bonds, these must comply with the regulation of the Securities and Exchange Commission of Brazil (*Comissão de Valores Mobiliários* - CVM). These rules often limit the flexibility of the terms of the bonds.
PATEN[32] The Energy Transition Acceleration Programme (*Programa de Aceleração da Transição Energética* – PATEN) is a new measure which allows companies to allocate credits from federal government, such as *precatórios*,[33] or tax credits to a fund which can be used as a bank guarantee	Allows companies to use their credits with the government as a guarantee for BNDES lines, such as Fundo Clima. This can reduce the cost of capital, since it does not require liens on equipment or other forms of guarantees.	Recently approved law which has not yet been fully implemented. Limited by the credit a company has with the government, which would limit the use by new companies.

31 MIDR, Debêntures Incentivadas
32 MME (2025), Programa de Aceleração da Transição Energética foi sancionado nesta quarta-feira
33 Precatórios are credits from the federal government, usually issued as the result of court decisions won on final decision.

Instrument	Benefits	Challenges
Eco Invest[34] Commercial loans funded by private capital blended with low cost public funds under the Eco Invest programme.	Funding directly available through commercial banks, which are less constrained than BNDES and can offer a wider range of loan structures. Interest rates below market rates due to blending of concessional finance from the government.	Access to these funds need to be negotiated directly with commercial banks. While this might be faster than BNDES, it may require engaging multiple banks to secure the best solution.
Financing from domestic impact funds These are private impact funds that focus specifically on decarbonisation investments which can offer equity and/ or debt.	Private equity funds with impact mandates can provide even more flexible terms than commercial banks. Flexible offering, often including equity as well as different types of debt (e.g. bridge or mezzanine loans), can be tailored to project needs. Depending on the fund, can provide expertise and technical support for projects.	Each fund has its own mandates and objectives, which may not match the characteristics of a project a company is seeking to fund. Loans are generally smaller than bank loans, due to smaller capital pools.
International climate funds finance Resources from entities such as Green Climate Fund (GCF) and the Climate Investment Funds (CIF) mobilise finance for climate investments in countries around the world.	Funding often made available on a concessional basis with reduced costs and favourable terms. Funding commitments can enhance project credibility, improving its attractiveness towards other investors, not unlike MDB finance.	Funds often made available only by specific programmes. Given the concessional nature of finance, applications often require a high level of documentation and compliance, raising transaction costs for projects.
Export credit agency (ECA) loans Loans from institutions such as Germany's KfW IPEX-Bank or the Japan Bank for International Cooperation (JBIC), designed to support the export of goods manufactured in their home countries.	These loans can be denominated in the country's currency or another hard currency, often at better interest rates that lowers the cost of financing equipment imported from abroad. ECAs are often backed by the government of their home country, making them a stable and reliable source of funding.	Loans are normally limited to the cost of the imported equipment and will not cover other costs such as construction. This funding is often limited a part of the cost of equipment, requiring companies to take additional debt for other parts of the project. ECAs can apply a high level of due diligence, compliance and ESG requirements on debtors.
Multilateral development bank (MDB) finance Loans from institutions such as the Inter-American Development Bank (IDB), New Development Bank (NDB), or Asian Infrastructure Investment Bank (AIIB)	Loans can be made available on a lower-cost basis, due to the development mandate of these institutions. MDBs can provide technical expertise, capacity building and technology transfer that can support project preparation. MDB financing can enhance project credibility, improving its attractiveness towards other investors.	MDBs will often not invest on their own or as a first funder, requiring participation of the national government and other investors. Preference for larger projects.

34 MF, Eco Invest Brasil

Instrument	Benefits	Challenges
Green bonds in international capital markets Bonds issued in international capital markets that follow frameworks such as the Green Bond Principles (GBP) from the International Capital Markets Association (ICMA) covering use of proceeds, project evaluation, management of proceeds, and reporting.	These bonds attract investors who are seeking exposure to assets related to decarbonisation and are may willing to offer a lower cost of capital compared to conventional bonds. The large and diverse investor base that purchases these bonds will allow companies to raise higher levels of funding. These bonds can have longer tenors than those available in the Brazilian market. The green bond standards can boost the environmental credentials of the issuing company, allowing to attract further investors.	Due to the complexity, scale requirements, and compliance costs associated with international bond issuance, this instrument is generally more accessible to larger corporations seeking substantial funding amounts Raising high levels of funding from international capital markets exposes companies to currency volatility.
Investments from Sovereign Wealth Funds (SWFs) and pension funds These large international institutional investors, including SWFs from resource-rich nations (e.g., Mubadala, Norges Bank Investment Management - Norway) and major global pension funds with sustainability mandates can provide funding for decarbonisation projects	While most SWFs and large pension funds would not be considered as concessional finance providers, some can position themselves in that way by representing a large pool of capital with decarbonisation targets that can be leveraged for industrial projects. For export-oriented sectors, they can also provide support in opening markets. Investment from internationally-recognised funds can bring credibility to projects, making them more attractive to other investors.	Due to their scale and investment strategies, they typically focus on larger investments at the corporate or platform level rather than financing individual, smaller-scale industrial projects directly. These funds often have a higher aversion to risk and often are more willing to invest only in mature, high-quality assets.

Appendix 2:

Other relevant initiatives in Brazil and abroad

Relevant initiatives in Brazil

Eco Invest Brasil
Launched by the Ministry of Finance in 2024, Eco Invest Brasil is a program designed to accelerate sustainable investments, primarily through blended finance instruments. It offers solutions in four main ways:

- **Blended Finance for Mobilising Private External Capital:** Provides low-cost public funds to banks, which must leverage these with their own capital to create credit lines for decarbonisation projects. This attracts private funding while lowering borrowing costs. The first auction (Nov 2024) allocated BRL 6.8 billion in public funds, expected to mobilize an additional BRL 37.5 billion from banks.
- **Liquidity & Currency Volatility Mitigation:** Planned to offer bridge loans to solvent projects facing temporary liquidity issues due to exchange rate fluctuations.
- **Credit for Promoting Currency Hedging:** Aims to enable financial institutions to offer better, longer-term currency hedging products. It involves a credit line whose investment returns would fund reserves, backstopping risk and allowing banks to offer more favourable hedging terms for foreign currency investments.
- **Credit for Project Structuring:** Intended to provide funding for pre-FID activities for large, complex projects, reducing development costs and expanding the project pipeline.

In addition to the lower-cost debt it already helps to provide, Eco Invest will become very relevant for project investments that will require currency risk protection. The current market for currency derivatives for industrial projects in Brazil is still very small, so dedicated support in this area would allow companies to more easily access international funding sources while being protected from volatility.

Brazil Climate and Ecological Transformation Platform (BIP)
Launched by the Ministry of Finance alongside the Ministries of Environment and Climate Change (MMA), Development, Industry, Trade and Services (MDIC), and Mines and Energy (MME), the BIP acts as a strategic platform connecting large-scale Brazilian decarbonisation projects with global investors and financial institutions. Run by BNDES, with the support of the Glasgow Financial Alliance for Net Zero (GFANZ) and other stakeholders, the platform provides matchmaking and support to projects - particularly by facilitating connections between project sponsors and potential funders, and by advancing de-risking mechanisms to address financing barriers, either through its own initiatives or in partnership with programs such as the ITA.

The BIP considers projects with material climate impact and alignment with the NDC of the country as well as substantial capital needs.[35] The matchmaking support it offers can be meaningful for projects above its minimum investment size threshold, since it allows companies to more easily access a wide pool of funding from international banks, even if they do not usually have the infrastructure to seek those contacts.

35 MF (2025), Plataforma Brasil de Investimentos Climáticos e para a Transformação Ecológica – BIP

Brazil-UK Hydrogen and Industry Decarbonisation Hubs

The Brazil-UK Hydrogen and Industry Decarbonisation Hubs (Hubs) are the product of a bilateral partnership between the governments of Brazil and the UK, the latter represented by the Department of Energy Security and Net Zero (DESNZ) and the former represented by MME (for the Hydrogen Hub) and MDIC (for the Industry Decarbonisation Hub).

The purpose of the Hubs is to facilitate the coordination of international assistance towards clean hydrogen and industrial decarbonisation in Brazil, including financial assistance in the form of concessional capital.[36] This presents a valuable opportunity for projects being developed in the country by Brazilian companies, some of which can be quite familiar with the domestic landscape of concessional finance solutions but often have less exposure to the international sources that the Hubs can highlight.

Financing agriculture vs industry in Brazil

A comparative analysis of their respective financing landscapes reveals clear differences between Brazil's agricultural and industrial sectors, offering potential insights for supporting industrial decarbonisation.

Agriculture stands as a pillar of the Brazilian economy, renowned for its global competitiveness and crucial role in generating export revenue. This economic significance has historically translated into strong regulatory support, including via the *Sistema Nacional de Cadastro Rural* (SNCR – National Rural Credit System), resulting a well-developed, sophisticated financial ecosystem tailored to its needs. This contrasts with the national industrial sector which, like in many other nations, has faced significant competitiveness challenges over recent decades, partly due to intense global competition and pressure from low-cost imports. Examining the robust financing framework that supports agriculture may therefore offer valuable lessons for bolstering investment in industrial decarbonisation even in the face of macroeconomic challenges.

Public Financing: National Rural Credit System

Purpose: Provide affordable finance to the entire agricultural value chain through regulated and market-based rural credit.

Main Tool: Plano Safra, coordinated by the Central Bank of Brazil, allows the government to deploy subsidised capital and offer lower interest rates for specific priority sectors and activities, including sustainability initiatives.
- PRONAF: Credit for small family farms
- PRONAMP: Credit for medium-sized producers
- RENOVAGRO Program (ex-ABC+): Credit for low-emissions agriculture (ILPF, pasture recovery, agroforestry) with favourable interest rates (~7%)
- Other lines: Market-based credit for large farms

The agricultural sector **shows the value of integrated financing plans,** tailored credit lines, and strong public-private coordination. **Industry could replicate this** by creating structured, predictable financing ecosystems to drive green and productivity-enhancing investments.

Private Financing: Capital Market Instruments

Purpose: Mobilise private capital for agriculture via instruments with attractive features such as tax exemptions or higher accessibility such as securities and funds.

Capital Market Securities:
- CRA: Receivables Certificates
- LCA: Agribusiness Credit Bills
- CPR: Rural Product Bills
- CDCA: Agribusiness Credit Rights Certificates

Investment Funds (FIAGRO):
- FIAGRO-FII: Real estate (leasing farmland)
- FIAGRO-FIDC: Credit rights portfolios
- FIAGRO-FIP: Equity in agribusiness companies

Agriculture leverages **incentivised financing instruments to greatly increase the scale of private investment,** especially from retail investors. This could be replicated for the industrial sector by developing similar investment vehicles and instruments **tied to green transition and productivity goals.**

Exhibit 8: Financial instruments for the agricultural sector in Brazil

36 DESNZ (2023), Joint statement of intent between Brazil and the United Kingdom to co-chair a Brazil-UK Hydrogen Hub; UNIDO (2024), New Industrial Decarbonization Hub to accelerate net zero projects in Brazil

The total funding available from the instruments outlined in Exhibit 8 is significant. From the public sector, government funding made available for the Plano Safra for the 2024/2025 harvest exceeded BRL 400 billion.[37] For the private sector, financing provided across all instruments added up to over BRL 1.2 trillion in total credit, as of April 2025.[38] Leveraging a similar level of capital for the industry could significantly accelerate investments in the sector.

Lessons from international cases

The international landscape of climate finance measures can serve as a basis for options in Brazil. This section provides additional detail on the four measures raised earlier in this briefing, highlighting their core mechanisms and objectives and offering potential lessons for Brazil.

Carbon Contracts for Difference

Objective: De-risk green investments in hard-to-abate industries.

How it works:
- 15-year contracts hedge against carbon price fluctuations.
- Government pays the gap if carbon prices fall below a certain threshold, and vice versa.
- Competitive auctions award contracts to projects with the lowest carbon abatement cost.

Key Takeaway: Offers financial certainty to address risks faced by projects; auctions ensure efficient public spending.

EU ETS-Funded Grants

Objective: Support first-of-a-kind low-carbon technologies to scale.

How it works:
- Funded by auctions of allowances under the Emissions Trading Scheme (ETS) (~ EUR 40 billion by 2030).
- Covers up to 60% of CAPEX & OPEX.
- Selects projects based on innovation, scalability, abatement potential, and cost-effectiveness.

Key Takeaway: Carbon market revenues can fund decarbonisation, creating a self-reinforcing financial cycle.

Inflation Reduction Act Tax Credits

Objective: Accelerate clean energy deployment and manufacturing.

How it works:
- Long-term tax credits (10+ years) based on investment in clean power, industry, hydrogen, CCS, EVs, etc.
- Bonuses for local content, labour, or targeted geographies.
- Transferable/direct pay options increase accessibility.

Key Takeaway: Tax incentives enhance the investment case for projects and help mobilise capital with less bureaucracy.

Tropical Forests Forever Fund

Objective: Reward verified forest protection or restoration in tropical nations.

How it works:
- Blended finance model using low-cost capital invested to generate returns.
- Capital not disbursed as aid but instead invested in a diversified portfolio.
- Investment profits fund annual results-based payments (i.e. USD/hectare).

Key Takeaway: Creative results-based financing arrangements can fund environmental outcomes.

Exhibit 9: Relevant international cases of decarbonisation incentives

While far from exhaustive, the examples shown in Exhibit 9 can inform similar solutions in Brazil. Even when considering the different fiscal contexts of countries in question, there are still valuable concepts and principles that could be adapted.

37 MAPA (2024), Governo Federal lança Plano Safra 24/25 com R$ 400,59 bilhões para agricultura empresarial
38 MAPA (2025), Boletim de Finanças Privadas do Agro

ITA INDUSTRIAL TRANSITION ACCELERATOR

MINISTÉRIO DO DESENVOLVIMENTO, INDÚSTRIA, COMÉRCIO E SERVIÇOS

GOVERNO FEDERAL BRASIL UNIÃO E RECONSTRUÇÃO

NOVA INDÚSTRIA BRASIL FORTE, TRANSFORMADORA E SUSTENTÁVEL