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Preliminary lessons from Argentina, Brazil and Peru on financing NDCs

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DecarBOOST, or by its formal name “Deep Decarbonisation in Latin America: Enabling conditions for Investment in the Transition to a low-carbon society in Latin American countries”, is a three-year programme focused on interventions to support Argentina, Brazil and Peru to catalyse their transition to becoming low-carbon societies, promote investments consistent with resilient, low-carbon development, and contribute to the development of the next generation of Nationally Determined Contributions and the global stocktaking process as part of the Paris Agreement ambition mechanism.

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Methodology

\ Desk analysis of existing programme outputs
\ Multiple in-country consultations, semi-structured interviews, and formal stakeholder dialogues conducted by country teams online and in-person
\ Feedback on the content from country teams and implementing partners
\ Country programme examples of the different approaches added to this document where relevant

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Abbreviations

AFOLU	Agriculture, forestry, and other land use
BAU	Business as Usual
CANCC	High-Level Commission on Climate Change
CCUS	Carbon capture, utilisation and storage
CO_2	Carbon dioxide
COFEMA	Federal Council of Environment (in Spanish)
COP	Council of Parties
COVID-19	Coronavirus disease 2019
ECLAC	Economic Commission for Latin America and the Caribbean
ENCC	National Climate Change Strategy (Peru)
ESCO	Energy Services Company
FTDT	Fundación Torcuato Di Tella, Argentina
GDP	Gross Domestic Product
GFANZ	Glasgow Financial Alliance for Net Zero
GHG	Greenhouse gas
GNCC	National Cabinet for Climate Change, Argentina
IEA	International Energy Agency
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
LAC	Latin American countries
LTS	Long term strategy/ies
LULUCF	Land use, land-use change, and forestry
MINAM	Ministry of Environment, Government of Peru
Mt CO_2 eq.	Million Tonnes of carbon dioxide equivalent
NBS	Nature-based systems
NDC	Nationally Determined Contribution
PCAF	Partnership for Carbon Accounting Financials

PRI	Principles for Responsible Investment
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change

About the International Dialogue Project Level Input Dossier series

The objective of the International Dialogue Project-Level Input Dossiers is to share key Latin American and Caribbean (LAC) country lessons and insights from the DecarBOOST programme related to financing the enhanced Nationally Determined Contributions (NDCs) and Long-Term Strategies (LTS) that are in line with Paris Agreement-compatible pathways, and to add value to international dialogues through supporting peer-learning and knowledge exchange among countries in the region, and internationally.

The report incorporates findings from the LAC region and focuses predominantly on Argentina, Brazil, and Peru, the target countries of the DecarBOOST programme. Analysis is mostly conducted for these three countries, but findings from the broader LAC region help to provide context and highlight successes for low- and zero-emissions developments.

This is the first of two reports that cover insights from ongoing research undertaken within the DecarBOOST programme. The second edition is to be released in February 2023.

Introduction

The objective of this report is to share key country lessons and insights from Argentina, Brazil, and Peru deriving from in-country processes related to financing the enhanced Nationally Determined Contributions (NDCs) and Long-Term Strategies (LTS) and plans. These insights aim to add value to the international dialogue by contributing to peer-learning and knowledge exchange among countries in the region, and on the international stage.

The DecarBOOST programme was launched in 2020 and will run until the end of the first quarter of 2023. The project focuses on supporting three Latin American countries, Argentina, Brazil and Peru, in catalysing the transition to low-carbon societies and promoting investments consistent with resilient, low-carbon development. It aims to provide robust inputs to improve the policy framework to support financing NDC implementation and LTS in Latin American countries. Further, it aims to contribute to the development of the next generations of NDCs and the global stocktaking process as part of the Paris Agreement ambition mechanism. Key insights and learnings based on country team reports and analyses obtained through the project are summarised here, to feed into international processes and dialogues.

The DecarBOOST project supports the process of providing the evidence base for and proposals to influence policy reform, and to improving the enabling conditions to direct financial flows towards low-carbon and climate-resilient development pathways, as well as to avoid carbon-lock in.

To achieve these objectives, project activities include in-depth sectoral analysis (Argentina and Brazil), and research on Green Economic Recovery options (Peru) to assist the processes of reforming policy, developing financial instruments, and developing investment portfolios to effectively implement the NDCs in line with the objectives of the Paris Agreement.

DecarBOOST has undertaken multi-stakeholder dialogues to support the process of increasing ambition toward decarbonising local economies, and facilitate the design and implementation of effective financial instruments. Stakeholder target groups benefit from the establishment of regional, national and local communities of practice which foster peer-to-peer learning through exchanging experience, knowledge and climate investment opportunities.

This is the first of two reports that cover insights from ongoing research undertaken within the DecarBOOST programme. The first edition discusses the status of climate planning in the three target countries, preliminary country lessons and insights based on research and stakeholder dialogue processes, the role of Long-Term Climate Strategies, and an outlook for the region.

The second edition (to be released in February 2023) will discuss the final country lessons and insights from the DecarBOOST programme related to the research and stakeholder engagement processes on policy development, investment opportunities, and Sector Investment Plans. In addition, it will provide a view on how these results could add value to the international dialogue for the purpose of peer-learning and knowledge exchange among countries in the region and on the international stage.

1 Status of Climate Planning in Latin American Countries

To successfully implement NDCs and to scale up ambition over time, as required by the Paris Agreement, a key priority is to provide or increase finance for low-carbon investments. This includes implementing policies, instruments, mechanisms and measures to overcome the various barriers that currently hinder financing.

A country´s ability to catalyse climate finance, also referred to as 'climate finance readiness', involves a complex and lengthy process that firstly requires increased governance, institutional strengthening and planning. DecarBOOST's *Climate Investment in Latin America* report (NewClimate Institute, 2021) providers a qualitative overview of climate finance readiness in Latin America and the three target countries, based on a set of indicators reflecting governance, planning and access to climate finance.

All three countries have a medium-term climate strategy included in each country's updated NDC, and each has indicated it is working towards net-zero emissions by 2050. Argentina and Peru are in the process of developing a long-term climate strategy, while Brazil has developed a 2050 energy sector plan. Peru is also currently developing its National Climate Finance Strategy.

Table 1: Overview of climate strategies and plans for Argentina, Brazil, and Peru

Country climate strategies and plans	Argentina	Brazil	Peru
Medium-term climate strategy in place	✓	✓	✓
Net-zero emissions target	✓	✓	✓
Developing Long-term climate strategy	✓		✓
2050 energy sector climate plan		✓	
Developing National Climate Finance Strategy			✓

The following section details the status of climate planning in each of the DecarBOOST countries.



ARGENTINA

In Argentina, the National Cabinet for Climate Change (GNCC) a collegiate body chaired by the Head of the Cabinet of Ministers, was created in 2016 and then enacted by Law N° 27.520, the so-called Minimum Standards National Law on Adaptation and Mitigation to Climate Change, in 2019. The Cabinet's objective is to connect the different areas of the National and Interjurisdictional Public Administration, the Federal Council of Environment (COFEMA, in Spanish) and different actors within civil society. This institutional arrangement, among other functions and responsibilities, aims to ensure internal coordination of planning and implementation processes related to climate change strategies, programmes and plans while considering the alignment of long-term visions and mid-term targets, as well as compliance with international commitments.

By the end of 2019 Law N° 27.520, that establishes minimum standards for environmental protection, aims to ensure actions, instruments and appropriate strategies of adaptation to and mitigation of climate change throughout the entire national territory. The set of strategies, measures, policies and instruments developed to comply with the purpose of this law make up the "National Climate Change Adaptation and Mitigation Plan".

Argentina's first NDC target consisted of an absolute unconditional emissions target of not exceeding 482,7 Mt CO_2 eq. by 2030, and a conditional target of 369 Mt CO_2 eq., subject to the availability of international climate finance. The Second NDC, published in December 2020, presents a new absolute mitigation target which commits the country to not exceed net emissions of 358.8 Mt CO_2 eq. by 2030, including land use, land-use change, and forestry (LULUCF). This amount implies a 25.7% reduction in the national emission target by 2030 against the previous NDC's unconditional target.

The Second NDC also includes an initial, non-binding and non-exhaustive analysis of the prioritised means of implementation. Mitigation measures are grouped then tabulated in an axis in the different National Sectoral and Climate Change Action Plans. For each axis, levels of support required in terms of capacity building, technology development and transfer, and concessional financing are established, using a three-scale (high, moderate and minor) estimation.

Besides being more ambitious, the new NDC also integrates a communication on adaptation, as well as the announcement of the low emissions long-term strategy with the overall aim that the country reaches carbon neutrality by 2050, while preserving equity and inclusiveness, emphasising collective and individual responsibility, and calling for reinforced means of implementation given the country's investment, technology and capacity needs.

The NDC refers to different initiatives that the government has undertaken to secure financial resources needed to address the country's commitment, including:

- The creation of the Sustainable Finance Working Group with the aims of designing the enabling framework to align financial flows with the promotion of the 2030 Agenda and climate action in Argentina; as well as strengthening the country's position in relation to the regulation of Article 6 of the Paris Agreement.
- The creation of the International Finance Unit, that is responsible for evaluating, prioritising and following up on projects that the country submits to climate investment funds and multilateral and bilateral lending agencies.
- Developing the Country Programme with the objective of coordinating with the Green Climate Fund and other funds oriented to climate finance. Likewise, in its annual programming with other multilateral and bilateral credit agencies, it will seek the inclusion of financing for climate change projects.
- The identification and labelling of activities and programs related to adaptation and mitigation in the National Budget, in order to increase the transparency and traceability of the State's climate investment.
- The clarification that Argentina's 4th Biannual Update Report (presented in 2021) will document the needs and support received through international cooperation, formulated according to a robust and transparent national methodology to enable continuous and consistent follow-up.

Through these instruments and initiatives, and based on the identification of needs and priorities, the Argentine Republic will develop its long-term climate finance strategy.

In April 2021, President Alberto Fernandez announced a further 2% increase in NDC ambition during the Leader's Summit on Climate (Casa Rosada, 2021). This amount implies a 27.7% reduction in the national emission target by 2030 against the previous NDC unconditional target.

During that summit, President Fernandez emphasised the relevance of climate finance for its country in the following manner: "The agenda is clear: mobilisation of concessional and non-reimbursable resources, channelled through multilateral and bilateral banks, with agile and transparent processes. Payments for ecosystem services and debt swaps for climate action. New allocation of Special Drawing Rights, without discriminating against middle-income countries, to improve our environment. Reconfiguration of the analyses carried out by risk rating agencies, so as not to distort the reality of our countries. And attention to the phenomena of irresponsible over-

indebtedness -provoked before the pandemic and aggravated by this virus-, with greater flexibility in terms, rates and conditions.



BRAZIL

In Brazil, the largest challenge in the determination of the annual inventory of greenhouse gas (GHG) emissions lies in the estimation of AFOLU (agriculture, forestry, and other land use) emissions; in particular, with the land use change subsector, which includes the values related to annual deforestation in the country. The emissions caused by deforestation are significant and difficult to estimate, introducing an important complexity to the preparation of the Brazilian inventory (see La Rovere, 2021 for further detail on this process). Furthermore, the presented figures may not be definitive. As indicated in the NDC, information on base year emissions and reference values may be updated and recalculated due to methodological improvements applicable to the inventories. The base year value used to verify the achievement of 2025 and 2030 targets will be the most recently updated figures of the National Inventories available in 2025 and in 2030.

Although the country's federal administration has shown a negative bias in regard to national climate ambition some government programmes, such as Plan ABC+, Floresta Mais and RenovaBio, as well as the recently approved regulations on the Payment for Environmental Services and of a Decree establishing the basis for a Carbon Market, have provided a framework to a future improvement of climate ambition.

In addition, Brazil's Central Bank is increasingly promoting sustainable finance by incorporating sustainability criteria in its decision-making process, and the inclusion of adequate management of climate, social and environmental risks in the banking sector. Further, in 2020, it announced the creation of a "Green Bureau," to be associated with the rural credit information system containing information on farmers' sustainable practices and the intention to boost incentives to move rural credit in a green direction, and in 2021, it adopted stricter regulations on the transparency of the business sector regarding its exposure to climate risks.

After COP26, the Brazilian government shifted its indicative target for climate neutrality by 2060 to a commitment to net-zero GHG emissions by 2050, and increased its target from 43% to 50% in 2030 (Brazil Input to Negotiations Report, 2022).

Brazil´s NDC target covers the entire economy and aims to reduce GHG emissions by 37% in 2025 and by 50% in 2030, compared to 2005 emission levels. Since 2015, Brazil has submitted various updates of its initial NDC presented in that year to the UNFCCC. These updates have incorporated changes in the base year value of the country’s GHG emissions, resulting from updates in the National Inventory. As a result, from 2015 to 2022, the economy-wide absolute limit for GHG emissions increased by 22% in 2025 and by 7% in 2030, even after the increase of the 2030 reduction commitment to 50% of 2015 emissions (La Rovere, E. L., et al., 2022a).

The difference between the total quantity of net GHG emissions of Brazil in the adjusted base year values was mainly due to the alteration in the values considered in that year for the subtotal of land use change in the AFOLU sector.



PERU

The Peruvian government has been promoting a series of processes in line with its commitments under the UNFCCC. In 2020, it created the High-Level Commission on Climate Change (CANCC) to develop a national response to climate change in a comprehensive, inclusive, multisectoral and multilevel manner. This Commission will propose the adaptation and mitigation measures to climate change expressed in the NDC.

Currently, one of the government's priorities is to update the National Climate Change Strategy (ENCC) to 2050 as it is seen as a key tool to support the process of achieving the commitment to carbon neutrality, and the resilience of the population, ecosystems, livelihoods and productive and infrastructure systems. As such, the ENCC will reflect Peru´s LTS until 2050 to move towards a low-carbon development that is resistant to climate impacts (MINAM, 2020).

Similarly, regional governments are updating their regional strategies for climate change, which are aligned with ENCC proposals (MINAM, 2021b). Government also published the National Adaptation Plan in 2021, another key input for the development of the ENCC. In addition, it has implemented a monitoring and evaluation system, where it will show progress in adaptation measures (MINAM, 2021a).

In line with these processes, Peru joined the Climate Ambition Alliance, a group of 73 countries and numerous non-state actors who are determined to follow the recommendations of science as regards climate change, and as such upscale climate action by 2030 and achieve net-zero CO_2 emissions by 2050.

Finally, the government is also working on the construction of a National Climate Financing Strategy to contribute to the implementation of the adaptation and mitigation measures expressed in the NDC.

The NDC initially presented by Peru within the framework of the Paris Agreement aimed to reduce emissions by 30% by 2030 with respect to the Business as Usual (BAU) scenario. Of this commitment, 20% was unconditional and 10% was conditioned on international cooperation.

However, in the latest update of the NDC, the government has increased its ambition to 40% reduction, where 30% is unconditional and the remaining 10% is conditional. In addition, this ambition has been translated into absolute goals, so that the unconditional goal proposes limiting GHG emissions to a maximum level of 208.8 Mt CO_2 eq. and the conditional goal up to an additional 179.0 Mt CO_2 eq. (Government of Peru, 2020).

2 Financing Current and Enhanced NDCs: Preliminary Lessons and Insights

2.1 Regional setting

The DecarBOOST programme aims to improve the policy framework to support the financing of NDC implementation and long-term plans in Latin American countries (LAC). Firstly, it is important to note the economic context of the region, as this will affect the policy decision-making, finance flows, and investment opportunities that are addressed in this project. LAC is the region with the greatest economic contraction in the world as a result of the COVID-19 pandemic. According to the Economic Commission for Latin America and the Caribbean (ECLAC), more than 2.7 million businesses closed, and more than 44 million people lost their jobs. Gross Domestic Product (GDP) fell by 7.7% and investment contracted by 20%.

In addition to the economic impact, the region continues to be one of the most unequal in the world. Half of the region's working population is employed in the informal sector which was the most affected during the pandemic. Furthermore, the vulnerability of this population to climate change is expected to increase dramatically. For example, climate impacts such as heat waves are expected to cause 2.5 million job losses by 2030 (Saget, C., Vogt-Schilb, A. and Luu, T. 2020).

The emissions structure LAC is quite different when compared with global emissions. The agriculture, forestry, and other land use (AFOLU) sector plays a major role in the region, whereas energy is the dominant source of GHG emissions at a global level. This is partly due to the power sector having a lower emissions intensity level in the LAC region thanks to vast hydropower resources (now threatened by climate change), and also to the important role of agriculture as the LAC region is one of the main exporters of agricultural products globally. In particular the livestock sector is a major driver of emissions, contributing to high levels of deforestation in some countries (NewClimate Institute, 2021).

Despite these challenges, there are also positive signs. As of November 2021, over 140 countries had announced or were considering net-zero targets, covering 90% of global emissions (Climate Action Tracker, 2021). While economic pressure to continue high carbon activities continues, it is important to highlight the transition risks associated with these investments, as well as noting the positive impacts of low-carbon development, such as the potential creation of 15 million net jobs by 2030 (NewClimate Institute, 2021).

2.2 Barriers to financing climate action in Latin America

Countries face a variety of barriers and challenges to investment in climate change-related actions. The challenges and barriers to mobilising finance for climate change mitigation and adaptation[1] vary markedly from country to country; between sectors within countries; and according to the source of financing: public or private, national or international. It is also important to distinguish between mitigation actions promoted by public policies, plans, programs and measures, and those corresponding to projects, programs and plans undertaken by private or public companies.

Identification and analysis of barriers to investment in mitigation action was the first step in designing policy proposals to improve the financing of mitigation actions in Argentina, Brazil and Peru[2].

Their research recognised that in developing countries the most fundamental barriers are inherited from historical processes. These types of structural barriers—usually known as the "political risks" of the country—include: political instability; macroeconomic conditions; currency risk (exchange rate fluctuations); inflation risk; public debt; external debt; fluctuation of interest rates; and legal insecurity among others. Objective indicators exist to measure these factors and are used, for example, by risk rating agencies in deciding to grant or deny the investment grade to governments, banks and companies from developing countries.

The structural/political risks of a country are not within the DecarBOOST programme's remit to address, and were generally considered as being boundary conditions in this project. The analysis focused instead on identifying barriers that potentially could be removed by specific public policy interventions and the use of policy and financial instruments. In other words, it focussed on non-structural barriers that can be addressed by targeted policy, regulatory interventions, and the design and adoption of financial and non-financial instruments.

It was intended that this would help in prioritising the sectors where mitigation actions, measures and investment opportunities and plans will be required to meet the country's decarbonisation goals. The analysis will also inform the specific needs of proposals of policy instruments to overcome the selected barriers, as well as identify sector-specific, Paris-compatible investment opportunities and investment plans. The current report provides preliminary findings from the barrier analyses and related outputs, and the country stakeholder dialogues. The next edition will provide further insights derived from the policy and investment opportunity analysis.

In the three countries, different types of barriers (structural, semi-structural and non-structural) were identified and each country prioritised sectors and/or topics. Brazil conducted its analysis based on work in six sectors: Land Use, Land Use Change and Forestry (USCUSS), finance, transport, industry, energy and waste; and classified the barriers as economic/financial (E/F) and regulatory/institutional (R/I). Argentina determined barriers in three sectors: energy and transportation (which were analysed jointly) and USCUSS, and classified five types of barriers: economic; financial; techniques; political and cultural; and legal and institutional. The Peruvian team oriented their identification of barriers based on potential GHG mitigation actions related to green economic recovery; and they were classified according to the type of failure to which they correspond (market failures, state, innovation, regulation and information).

[1] Adaptation finance is not a focal area of the DecarBOOST programme, even though it is closely interlinked with the LAC countries´ climate agendas, as well as mitigation considerations. Hence it is not discussed in this report in any depth.

[2] The research supporting this section was undertaken by the implementing partners in each country, viz. FTDT (Fundación Torcuato Di Tella) in Argentina, COPPETEC (part of the Universidade Federal Do Rio De Janeiro - Fundação Coordenação De Projetos, Pesquisas E Estudos Tecnológicos) in Brazil, and Libélula Comunicacion Ambiente y Desarrollo in Peru. The overview of their results reflects their individual voices and approaches.

The sections below detail these findings and insights per country.



ARGENTINA

An analysis was conducted to identify specific sectoral barriers to mitigation measures in the energy, transport and AFOLU sectors. It considered all the measures presented in the 3rd National Communication and involved a review of national documents and plans, internal team discussions, and stakeholder consultations (FTDT, 2021a).

Based on multi-stakeholders' dialogues held during 2020, the non-structural barriers are economic, financial, technical, political, cultural, legal and institutional in nature. These are mainly related to lack of support and of specific incentives for innovation and for innovative businesses; insufficiency of mechanisms suitable for long-term climate change-related investments; lack of technical skills; lack of awareness of low-carbon technologies benefits; out-of-date and unaltered regulatory schemes that do not capture sectorial transformations; lack of adequate regulation in some cases; and administrative complexity and excessive bureaucratic costs and delays (FTDT, 2020). Table 2 provides an overview of the key barriers identified for the three target sectors.

Table 2: Overview of key barriers to investment in mitigation measures per prioritised sector in Argentina

Energy	Transport	AFOLU
Economic: low energy prices and tariffs (in specific sectors) in a context of persistent inflation and fiscal deficits	Technical: penetration of new technologies, infrastructure, lack of scale and need to adapt facilities and value chains to manufacture new equipment and/or new parts domestically.	Technical: The adoption of new technologies and practices is progressive and regional adaptability is insufficient.
Technical: more robustness and flexibility in transmission and storage is needed for greater penetration of renewable energy sources.	Financial: measures are capital-intensive, infrastructure-intensive and/or large-scale. Poor access to credit at the consumer level, to access newer or more efficient units.	Economic: need for a macroeconomic environment that minimises entrepreneurial risk. Incremental costs of technologies that are not yet perceived as more profitable by producers.
Financial: development of capital-intensive infrastructure projects in an undeveloped financial sector with rising capital costs.	Political and cultural: Resistance to change by subsector lobbies. Inequalities and lack of adequate infrastructure in some regions.	Political and cultural: export controls and withholding taxes reduce the competitiveness of some regions. Lack of policies that encourage and provide incentives for producers to adopt innovative practices.
		Legal and institutional: legal framework not adapted to the reality of the average production systems. Insufficient or partially implemented legislation.

As Argentina is primarily an urbanised society, the daunting infrastructural modernisation and expansion needed at different levels, regions and economic sectors, should include investments in urban settlements at different scales. Social infrastructure deficits in cities are huge; these should be part of sustainable growth and equity narratives that showcase the multiple opportunities resulting from addressing climate change through mitigation, as well as reducing climate vulnerability. Territorial imbalances in infrastructure and connectivity should also be included in this infrastructure challenge.

Investment requirements should be part of a process to enhance competitiveness, modernise government at the three jurisdictional levels, and facilitate transparency. To achieve this, political decisions to remove the large and widespread infrastructural deficiencies by deploying carbon intensive technologies and processes should be avoided.

With regard to the decarbonisation challenge in the Energy and Transport sectors, some specific infrastructure limitations hinder the energy transition process. The intermittence and variability of wind and solar resources impose operating system restrictions that currently demand firm thermal (and/or nuclear) backup power, which increases overall energy provision costs. Significant investments are also needed to expand the electricity distribution infrastructure (high-voltage transmission system) and provide reasonable connecting costs for new renewable projects (FTDT, 2021a).

In the transport sector, more than 90% of freight transport in the country is by road and no modal alternatives (e.g., rail and/or canals) available in most parts of the territory. The extension of the railway and canal systems demands substantial investments and, besides, faces opposition from strong sectoral trade unions. With regard to electric mobility, as is already well known, technologies are not yet available at the scale and costs necessary to induce a massive migration at the local level. However, if this migration were to occur, urgent consideration would have to be given to the predicted increase in electricity demand and response of the electricity system—60% based on thermal power, mainly gas-fired plants— given that the system is already operating at its technical limits.

Nevertheless, the analyses undertaken and—especially—the interviews and dialogues held with stakeholders show that there are substantial opportunities to increase the scope of incentives within the analysed sectors, and at the national level. The following preliminary recommendations can be made, which will be explored further in subsequent analysis of policy instruments.

Table 3: Preliminary policy recommendations for Argentina

Energy	Transport	AFOLU
To fully decarbonize the various sectors of the economy profound transformations that will allow fossil fuels to be completely replaced by electricity, produced from non-GHG emitting sources, are essential. As of mid-2019, the economic situation made sustaining the incorporation of renewable sources into the power grid difficult for long-term contracts with the country's agency in charge of dispatch (CAMMESA).	Scaling up the penetration of electric vehicles will strongly contribute to transform the transport sector into a less GHG-intensive one. The construction of public charging infrastructure is a critical enabling condition to achieve this.	The use of inhibitors of urea volatilisation (known as Urea NBPT) is an existing technology to increase yields through increasing use of fertilizers without generating a proportional increase in emissions. Current barriers to the adoption and dissemination of this technology to promote the use of fertilizers at the national level could be lifted by using income tax relief mechanisms and its introduction into the "Good Agricultural Practices" (GAP)
The Renewable Energy Term Market (MaTER, in Spanish) constitutes an opportunity to make viable renewable energy projects, to be supported through specific financial instruments that improve their competitiveness		The NDC's emission reduction target by 2030 and achieving a carbon-neutral development by 2050 requires integrated policies, measures and actions. There is ample room to increase the consistency of incentives within the sectors analysed.
Energy efficiency measures have an important mitigation potential. Energy Services Companies **(**ESCOs) are key players in facilitating the necessary investments in energy efficiency, as it is a cross-cutting activity in all economic sectors and with a high atomisation of beneficiaries. In order for these companies to be established and developed, regulatory amendments are needed. Specific financial instruments should also be developed to encourage consumers to implement measures that, although convenient in a medium-term analysis, require initial investments that energy service users are often not able to make		Some of the means to improve the implementation potential of existing mitigation options include: having clear market signals; improving sectoral regulation and legal frameworks; designing and implementing innovative financial instruments to encourage long-term low-carbon investments; developing capacity building measures and plans (subsectors, activities, entrepreneurs, technicians and workers); simplifying administrative processes; simplifying administrative processes.

According to stakeholders, other means of improving the potential for decisive implementation of existing mitigation options are related to:

- Having clear market signals
- Improving data availability and quality
- Enhancing sectoral regulations and legal frameworks
- Designing and implementing innovative financial instruments for fostering low-carbon long-term investments

- Developing capacity building measures and plans targeted at specific subsectors, activities, entrepreneurs, technician and workers
- Simplifying administrative processes.



BRAZIL

The research carried out under the DecarBOOST programme identified a number of economic/financial and regulatory/institutional barriers to mitigation actions in five key sectors of the Brazilian economy: AFOLU, Transport, Industry, Energy Supply and Waste. A special cross-cutting analysis of financial barriers was also developed (La Rovere et al, 2021).

The Brazilian economy is currently in a dire state after five years of economic recession, worsened by the devastating effects of the COVID-19 pandemic in 2020. At the microeconomic level, different barriers to mitigation actions are found at each of the steps of the planning and implementation cycle, from the conception through to actual reduction of GHG emissions compared to a baseline, including: technical design; project finance; licensing; and monitoring and verification of GHG emissions reduction effectiveness, among others.

Technological barriers are very relevant, due to the innovation represented by many mitigation actions. The lack of proven historical performance and data records increases the technological risk and scares investors. Capacity building needs are important, both in terms of skilled labour and of the infrastructure related to new technologies. Technical change is mostly generated in developed countries, and access by developing countries to the most relevant mitigation technologies (e.g., solar and wind energy, electric vehicles) is often limited. The capacity to address the technological barriers in these cases is an exogenous factor for most developing countries. In the Brazilian case, nature-based systems (NBS) in the AFOLU sector and biofuels of second and third generations may be exceptions to this rule.

Many mitigation actions are not competitive in the marketplace yet. On one hand, innovations typically lack the scale required to reduce unit costs, in the initial phase of deployment. On the other hand, negative externalities of GHG emissions are not fully priced in the market. Subsidies to fossil fuel production and consumption are huge across the world, estimated by the IMF at USD 5.2 trillion (6.5% of GDP) in 2017 (Cody, et al, 2019). Carbon pricing policies are increasingly being applied, but pricing levels are insufficient to meet the Paris Agreement goals (Carbon Pricing Leadership Commission, 2017), and the coverage of GHG emissions by pricing schemes is limited to 20% of global GHG emissions (World Bank, 2018).

The economic competitiveness of mitigation actions is further hampered by the capital costs that they must face. The cash flow profile of these investments typically involves higher up-front costs than conventional technologies, to be recovered thanks to lower operating costs (e.g., with fossil fuels consumption). The time of return of investment is generally longer than for financial investments, and perceived risks are higher due to the novelty of technologies and often to the small and medium-size of proponents. Private financial institutions (e.g., commercial banks) are usually not able to set the complex contracting process leading to appropriate project finance. Credit for long-term investment is usually limited by imperfections of financial markets in developing countries, which do not perform the role of capital allocation and risk transfers efficiently. Brazil is heavily dependent on the public and multilateral development banks. Public financial institutions also lack the ability to foster public-private partnerships to undertake mitigation actions through smart financial mechanisms (e.g., public guarantee funds, green bonds). All these factors contribute to the difficulty of mitigation actions to access capital at required conditions i.e., reasonably low interest rates and long payback periods (La Rovere, Groterra & Wills, 2018).

Institutional barriers may arise from the inadequacies of the legal and regulatory framework for investing in mitigation actions and from the lack of capacity in institutions that support or regulate these investments. The combination of these factors can lead to the lack of coordination between different sectors (energy, transportation, agriculture, forestry, environmental licensing) and government levels (federal, state and municipal), and to administrative complexity and instability, increasing the cost of compliance with laws and regulations and causing unmanageable procedural delays.

Finally, cultural, social and political barriers to mitigation actions should not be underestimated, as illustrated by the "yellow vest" movement in France and the truck driver strikes in Brazil. These examples show that acceptability by local communities and public opinion are delicate issues; increasing energy prices are likely to disproportionately affect the lower-income households; and political opposition is able to force governments to take back mitigation policies and measures (La Rovere, 2019).

Two key high-level insights derive from the barrier analysis carried out by the DecarBOOST programme in Brazil:

- Current low enforcement of the Forest Code, its deforestation restrictions, and compensation requirements have to be reversed to reduce the annual deforestation rate and to foster forest restoration with native species. Law enforcement and strengthening of command-and-control strategies are the essential policy instruments to achieve these goals, depending upon a strong political will to support them in the first place. A complementary economic instrument (such as carbon pricing) that creates a demand for offsetting GHG emissions may supply the financial support to overcome the high upfront costs and long payback periods of forest restoration projects;
- Carbon pricing should be adopted in Brazil to foster low carbon investments in the productive sectors and help the country to meet its NDC goals. Carbon prices should start low and increase slowly; be as horizontal as possible, protect exposed sectors; allow offsets; and use carbon revenues to stimulate jobs creation and reduce poverty (fiscal neutrality). A Cap & Trade system is more applicable to industrial sectors, while a carbon tax is more recommended for the transport sector.

PERU

The DecarBOOST programme in Peru took a different focus than its partner countries. Rather than a sectoral approach as is the case in Argentina and Brazil, the efforts focussed on promoting green economic recovery, which contributes to mobilising climate finance. The green economic recovery approach seeks to significantly improve the resilience of economies and societies in the face of increasingly accelerating and challenging environmental issues. In addition, putting people at the centre of green recovery plans can lay the foundations to making the economy and society more resilient to other types of future shocks.

Green recovery can be understood as a set of economic stimulus packages and recovery plans that create opportunities for income, employment and growth while accelerating action on medium and long-term environmental goals, both national and global. Specifically, the DecarBOOST programme in Peru is helping identify and address key barriers for advancing green recovery and decarbonisation in Peru, from the perspective of analysing barriers to five prioritised measures:

- Incorporation of green criteria for public investment
- Incorporation of green criteria for private finance
- Internal carbon pricing
- Promotion of telework, and

- Promotion of renewable energy within the private sector.

These measures aim to create synergies between climate change benefits and post-Covid recovery. The analysis provides insights and preliminary recommendations for policy makers and private investors on how to address the key identified barriers, as shown in Table 4. These recommendations will be explored further in subsequent analysis of policy instruments.

Table 4: Overview of prioritised barriers and preliminary policy recommendations for Peru

Measure	Barriers	Recommendation
Green criteria for public investment	- Lack of market information - The delay in the development of a National Climate Finance Strategy for NDC implementation (as required under the National Plan for National Competitiveness and Productivity - PNCPN [2020-2030], Peru's post-pandemic economic recovery roadmap)	- Development of an environmental sustainability indicator in public investment projects, - Define a methodology for evaluation and monitoring of the implementation of green criteria in public investment projects - Finalisation of the National Climate Finance Strategy
Green criteria for private finance	- Lack of market information - The delay in the development of a national finance strategy for NDC implementation (as required under the PNCPN [2020-2030]	- Design financial instruments for municipal savings banks to finance low scale green projects - Finalisation of the National Climate Finance Strategy
Internal carbon pricing	Lack of an internal carbon price for private sector companies	Maximise the potential of MINAM´s carbon footprint tool, which gives recognition to corporate climate action, to promote the adoption of an internal carbon price by private companies
Promotion of remote working (telework)	- Lack of market information - Lack of clear regulations	- Changes in regulation (a new Teleworking Law is currently under construction) - The identification, development and dissemination of investment opportunities in areas such as decentralised coworking spaces
Promotion of renewable energy	- Lack of market information - Lack of guidelines for energy planning with an energy transition approach	- Changes in regulation; developing guidelines for energy planning - The identification, development and dissemination of investment opportunities in areas such as green hydrogen

In the case of promoting teleworking, the main barrier to this measure identified was that its regulations are not clear or attractive to employers. However, a new Teleworking Law is currently under construction. This has positive aspects, such as the right to digital disconnection, or compensation for the cost of internet and energy services by the employer.

In the case of the incorporation of green criteria in private financing, the main barrier to this measure identified was the lack of incentives in the market for the use of green instruments, both in banking – commercial and development – and in companies. If the "Green Financing Roadmap" and the "Green Protocol" of MINAM are

acknowledged as representing important advances for the promotion of the measure, developing incentives could contribute to boosting green private finance.

With regard to the incorporation of green criteria in public investment projects, the absence of a universal methodology for the formulation, evaluation, prioritisation and monitoring of the implementation of green criteria in public investment projects was identified as an obstacle to connecting the active investment projects with the NDC, as well as the prioritisation of projects that involve sustainability and eco-efficiency components in the public investment portfolio.

Finally, with respect to the promotion of the internal price of carbon, four main barriers were identified, with the lack of sufficient incentives for its adoption standing out. For this, multiple solution alternatives are recommended, such as the implementation of additional certificates in MINAM's Peru Carbon Footprint platform for companies that demonstrate the effective application of the internal price of carbon. Notwithstanding this, the internal carbon price should be considered as a transitional measure to continue with the carbon price agenda, until the structural barriers facing the carbon tax or emission cap mechanisms are resolved.

3 The Role of Long-Term Climate Strategies: Insights from Argentina, Brazil and Peru

The Paris Agreement requires countries to limit the increase in global temperature to well below 2ºC above pre-industrial levels, and pursue efforts to limit the temperature increase to 1.5°C. The IPCC's "1.5 degree" report (IPCC, 2018) suggests that to meet the 1.5 °C goal, and thereby avoid the worst climate impacts, the world will need global GHG emissions to drop by almost half in the next 10 years. Net carbon dioxide emissions need to reach zero around 2050, and total GHG emissions to reach net zero by between 2063 and 2068. The Agreement calls for making finance flows consistent with pathways towards low GHG emissions and climate-resilient development under Article 2.1I. This requires a radical and systemic transformation of countries' economies, and as such, strategic planning.

Moreover, Article 4 of the Paris Agreement called on Parties "to strive to formulate and communicate long-term low GHG emission development strategies" (LTS) and submit these to the UNFCCC by 2020, being mindful of Article 2, and taking into account their common but differentiated responsibilities and respective capabilities and different national circumstances.

A LTS should provide a framework for coordinating net-zero 2050 emissions targets and the role public and private sector stakeholders should play in decarbonising the economy. If robust and thorough, an LTS could provide market signals, support the necessary innovation, and spur private sector investment decisions, as well as realise economic and environmental public benefits as a result of decarbonisation.

As of November 2021, over 140 countries had announced or were considering net-zero targets, covering 90% of global emissions (Climate Action Tracker, 2021). However only 51 countries had submitted Long-Term Strategies, including three in the LAC region, viz. Chile, Colombia, and Uruguay. Although they have not (yet) submitted an LTS, Argentina, Brazil and Peru have announced net-zero targets, and Argentina and Peru are currently in the process of developing their LTS.

Most countries that submitted LTS addressed finance needs and finance sources one way or another. However, few countries shared a vision or strategy on how finance flows may be shifted away from brown to green investments to make them consistent with a pathway towards low GHG emissions and climate-resilient development, as required by Art. 2.1I (Pauw et al., 2021). The following section describes the current LTS development processes in the three target countries.



ARGENTINA

The DecarBOOST programme has contributed to the elaboration of the Argentinian LTS by improving rigour through providing an evidence base for the general feasibility of the planned decarbonisation pathways. This has been done by providing an overview of the elements and approach to the development of the Argentinian LTS; analysing the relationships between mitigation options and investment opportunities for climate action; exploring the potential barriers to investment within a long-term vision; and studying the means of implementation, particularly those related to finance (FTDT, 2021b).

To that end, a review of the mitigation options from the "Sectoral National Action Plans and Climate Change" was carried out for the Energy, Transport and AFOLU sectors (FTDT, 2021a; 2022a), along with the identification and

characterisation of the barriers that could delay or eventually prevent the implementation of said options (FTDT, 2021a). Subsequently, new mitigation options were proposed, to complement those identified by the national government, and all of them were grouped into coherent sets of mitigation options for which instruments, policies and measures were preliminarily identified to address the identified barriers (FTDT, 2022b).

A methodology to prioritise the sets of mitigation options based on three criteria (mitigation potential, transformation capacity and technical, economic and financial feasibility) to then carry out a preliminary feasibility analysis of the prioritised options was developed, and the DecarBOOST Argentinian team also built scenarios for the year 2050 for the prioritised sets of mitigation measures (Carlino & Caratori, 2021) for the purposes of evaluating the mitigation strategies for climate action for the energy and transport sector, on the one hand, and the AFOLU sector on the other, within the framework of the LTS.

The analysis revealed that it is possible to decarbonise all aforementioned sectors by 2050 with available mitigation and carbon capture technologies and the redirection of investment flows currently destined to expand carbon-intensive activities.

For the energy sector, although CAPEX requirements are challenging, the transformation would be largely linked to a “shift” of investments from one subsector to another, from carbon-intensive to net-zero oriented. In addition, the reduction of inefficient subsidies to fossil fuels that encourage excessive consumption (in terms of the Pittsburgh Leaders Declaration) and the redirection of the remaining mass to satisfy the needs of energy services through low-carbon sources represents an opportunity to strengthen the competitiveness of the latter. In 2021, approximately 35% of energy subsidies applied in Argentina correspond to fossil fuels (FTDT, 2021b).

However, regardless of the investments associated with the infrastructure, a critical dimension for the process are the instruments that the State will use to influence the evolution of the equipment stocks of residential users, owners of light vehicles with internal combustion engines, and, in particular, of the capital goods being used in industry.

In addition to the available mitigation measures, green hydrogen and blue hydrogen programmes could play a significant role in the national transition to net-zero carbon. Argentina has vast potential to develop hydrogen in combination with intermittent renewables or even by including carbon capture and storage.

Decarbonisation will require profound transformations. On the regulatory side, the energy transition implies strengthening the institutional inception of the Strategic Environmental Assessment process in the executive and legislative branches, establishing the mechanisms and procedures to evaluate to what extent the regulations and infrastructure investment decisions proposed by either of these branches are compatible or contrary to the efforts required for the execution of the Long-Term Strategy, and, in particular, to evaluate the robustness of these strategic decisions in the face of medium to high-risk scenarios of transition to a low-carbon economy (FTDT, 2021a).

Likewise, it is vitally important to calibrate the temporal dimension of actions to influence demand and those that affect supply, taking into account the inertia resulting from existing stocks. The temporary mismatch of the stocks of equipment detailed above and the inertial behaviour of demand, and the signals of investment in supply, can have a strong impact on the stability and cost of the gas-electricity system and fuel supply.

Public debate, particularly that to be developed within the framework of the National Congress, must support the evaluation of the economic and social impact of the required transitions, and the establishment of guidelines for just transitions (with an emphasis on mitigating the negative impacts while strengthening the positive impacts) that the required transformations could have on employment, energy access and affordability, the well-being of affected populations, and on the overall effect of policies on equity.

In particular, the concept of "carbon lock-in" stands out here as it describes the inertia of a set of facilities, technologies, institutions, policies and individual and collective behaviour concurring against the transformational changes required to develop a low-carbon economy such as the one imposed in the context of the LTS. In particular, complex systems such as the energy sector are strongly "path dependent", whereby the initial conditions (infrastructures, equipment stocks, legislation, institutional arrangements, economies of scale and vested interests) determine policy decisions and the development of new infrastructure, limiting the entry of new competition that materialises, for example, with new technologies or existing technologies in the decreasing section of its cost curve.

Regarding the AFOLU sector, the need of reallocating a significant portion of current investment flows was recognised. The identified transformations are challenging in terms of capital investment requirements and the development of appropriate financial and public policy instruments. The net carbon capture generated through the expansion of the cultivated forests could significantly reduce the emissions of a sector that is key for the generation of foreign exchange and employment in the country, if remaining challenges are overcome. At present activities in this sector are relatively erratic. Although tax benefits are available, restrictions in the public budget do not always allow for continuous coverage of the subsidies, delaying the expansion of investments in the sector that is key to capturing emissions to offset other sectors that are more complex or costly to abate. A consistent and persistent state policy over time would be required to generate a significant boost both to achieve the expansion of the forested area and that of consumption and demand for wood.

Implementation costs were estimated for cultivated forests: the annual implantation of 270,000 hectares would imply a total annual investment of around 380 million dollars, equivalent to 11 billion dollars after 30 years (2050). As the forest promotion law currently theoretically subsidises 80% of the present investment requirements only, the implications of future investment requirements will need to be considered in the national public budget, especially in light of current public budgetary challenges. Additionally, it is key to encourage the demand for forest products by the industry, which was identified as one of the substantive barriers for this value chain.

Among the multiple possible paths, those compatible with the well-being of society should be prioritised under criteria of sustainability, affordability, and equity.

For these reasons, it is recommended that the transition is organised through the development of a Comprehensive National Plan for Energy, Transport and Climate Change with clear, measurable and quantifiable objectives, which will guide policy decisions in these sectors within the period to be defined and which will provide signals (prices, vision, strategy) to investment and decisions to be taken by the private sector to ensure the adequacy of its own planning. This plan must reflect broad political, economic and environmental consensus, and preferably be approved by the National Congress in order to pave the way for the transformations required.



BRAZIL

In the absence of government action to launch a more ambitious NDC and a Long-term Strategy (LTS) process, as required by the Paris Agreement, other actors stepped up to put pressure on the government. On several occasions since the election of the current government[3], former ministers of Economy and of Environment, state governors and mayors, scientists and a significant number of large companies have made public statements, sent

[3] The current report was in final editing at the time of the October 2022 elections in Brazil, and results of the Second-Round Election of 30 October were not yet known.

letters and met the Presidency to demand a more environmentally friendly governmental policy, and sticking to the country´s commitment to the Paris Agreement.

In addition, civil society in Brazil is increasingly mobilised through environmental NGOs and this has led in 2021 to the preparation of a proposal *Climate and Development: Visions for Brazil 2030* (Unterstell & La Rovere et al., 2021) for a more ambitious NDC, through a stakeholder-driven process involving experts, NGOs and the business sector. The report was launched in Brazil before COP26 and presented in a number of side events during COP26. This was followed in 2022 by a round of discussions with presidential candidates about short-term priorities to achieve more ambitious NDC targets up to 2030, consistent with a LTS leading to net-zero GHG emissions by 2050.

The Climate and Development Initiative brought together experts and Brazilian political leaders in a participatory process to build desired futures for the decarbonisation and development of the Brazilian economy in this decade. These scenarios were seen as crucial to informing short- and medium-term decision-making of public and private stakeholders, using Brazilian climate change commitments to the Paris Agreement (new NDC and the LTS) as the framework for the preparation of a development plan encompassing economic, social and environmental dimensions. The Initiative presented the list of recommendations for government action to foster a climate-resilient green economy recovery to each candidate running in the 2022 elections for presidential and state government.

The main output of the Initiative was the Just Transition Scenario presented as a proposal from civil society for a more ambitious Brazilian NDC, with GHG emissions reduction of 66% (and even 82% if zero deforestation is achieved in the Amazon and Atlantic Forests up to 2030). Drawing on the DecarBOOST programme work in Brazil on barriers to the viability of these scenarios and instruments to overcome them (La Rovere et al., 2021; La Rovere et al., 2022a), priority actions were listed for each sector, and for the economy as a whole. It goes far beyond the new commitment of 50% reduction (all figures for 2030 compared to the base year 2005) presented by the Brazilian government at COP26. Moreover, it addresses a pathway eventually leading to deeper decarbonisation and net-zero GHG emissions in 2050, with higher GDP and employment levels, simultaneous with higher purchasing power of low-income households and better income distribution patterns (La Rovere et al., 2021).

PERU

Peru undertook a process to advance consultations around and subsequently develop a LTS for the country. The LTS will be part of the National Climate Change Strategy with a timeframe up to 2050, and will present a long-term vision and goals related to sustainable development, mitigation and adaptation priorities, with the vision being based on sectoral pathways that support Peru´s share of achieving the long-term objectives of the Paris Agreement.

The Long-Term Climate Strategy process in Peru has been conducted in various stages. The initial step executed in 2020 concerned the development of a concept note, a comprehensive document detailing (amongst others) the Peruvian context, a roadmap for the development of the LTS, the envisioned contents of the LTS document, a thorough analysis of international examples, and insights into how to finance the implementation of the LTS (MINAM, 2020).

This was followed by a fast-track approach that integrated the LTS process in the update for the National Climate Change Strategy (ENCC), to incorporate a vision until 2050 (MINAM, 2021a).

Next steps include executing an in-depth LTS process, projected to be finalised by mid-2022, which would provide the evidence-base. This process envisages developing an inclusive and science-based process that is relevant,

legitimate and credible to build a vision for 2050, gain broad ownership for this vision, and explore ways to integrate the vision into concrete implementation mechanisms such as sectoral and regional agendas, private standards and financial instruments.

Differentiating aspects of the Peruvian LTS is that it will include the element of resilience in a comprehensive manner, with the aim of facilitating the necessary investments for resilience over the long term. In addition, it proposes an inclusive process to collect visions in a diverse country such as Peru, incorporating experts from various disciplines from the most vulnerable (future generations, most affected communities), the most visionary (futurists, start-ups and the innovation community), and to implementers and designers of policies and standards (governments, private companies large and small). The process is following a participatory—rather than evidence-based—approach. The government conducted multi-stakeholder dialogue sessions to validate key issues including:

1. The public problem that climate change poses
2. The vision to the future
3. The means to address the vision.

Net-zero emissions are envisioned to be achieved through actions focused on proper management of forests to reduce deforestation and degradation, maximising the use of renewable energies, an emission-free transport system, with a circular economy with an efficient use of resources and an industry with low carbon technologies (MINAM, 2021b).

Peru is also developing a National Climate Finance Strategy. It will be important for government to make this strategy coherent with the National Climate Change Strategy by considering both the time frames 2030 and 2050, as well as regularly updating the strategy following technological and market developments.

4 Way Forward in the LAC Region

The objectives of the Paris Agreement require a low-carbon systemic transformation of the global economy. Climate finance therefore becomes a central cross-cutting issue through all sectors and subsectors of any economy. Redirecting investment flows towards climate action is critical for the region to achieve sustainable development over the medium- to long-term. LAC needs to balance economic development and growth aspirations, poverty-alleviation and pressing infrastructure gaps with rising debt levels and finance deficiencies, global economic slowdown, and increased action and risks related to climate change and the Sustainable Development Goals (SDGs). Meanwhile, the implementation of the Paris Agreement is threatened by a significant finance shortfall, and severe knowledge and capacity constraints with respect to climate finance in the public and private sectors. Since the scale of the climate finance needed to implement the current NDCs is vast, and will only increase over time, a holistic approach should be taken to enhance and better direct finance flows.

In this section we share a vision on what actions could or should be pursued in the region in general (and notably in Argentina, Brazil, and Peru), based on the preliminary insights from the research conducted in DecarBOOST. Proposed action areas include:

- Align national NDC and LTS processes with national finance processes or strategy
- Develop policy amendment proposals and Sector Investment Plans
- Develop national registries of mitigation measures
- Capitalize on current progress and institutional arrangements and regulations
- Engage the financial sector
- Incorporate agreements of COP26 (the Glasgow Climate Pact) into national decision-making processes
- Take advantage of the voluntary pledges and initiatives initiated around COP26 Glasgow.

The DecarBOOST programme will contribute to some—but not all—of these areas, as indicated in the sections below.

4.1 Align NDC and LTS processes with national finance processes

A key task for governments is to carefully assess the finance implications of NDC implementation, both for the unconditional and conditional commitments. Conditional NDC targets depend on the provision of international finance. LAC will need to compete with other developing countries to attract the international funds for NDC implementation. To address this challenge properly, as a first step each country in the region needs to develop a national climate finance strategy and a NDC investment strategy that must be agreed at the highest level among ministries.

This should start by developing a vision of how the NDCs and long-term plans will be financed over time. This is an indispensable step that forms the basis of the NDC financing process. For this, two components are crucial:

1. The entire investment value of NDC delivery must be estimated based on the budgetary investment analysis of the identified mitigation and adaptation measures.
2. The potential sources of finance should be (re)assessed and their potential share of funding per activity and sector should be estimated, where possible. Even if challenging to estimate, the assessments should provide basic indications of these potential sources and potential shares, to support the planning and implementation process.

Hence, it is important to estimate in absolute terms how much finance needs to be raised through the public sector, the private sector, and through international cooperation, and what the respective shares are of total NDC delivery. With this information the country can assess where the funding challenges lie per sector, and how they may be addressed through policies and incentive mechanisms.

Most countries have started this process, and it is important that it be carried out in a structured and comprehensive manner. This process should be a live one, as NDCs must be updated over time, and costs and macro- and microeconomic fundamentals will evolve. It should be done hand-in-hand with NDC cycles. Responsible ministries could jointly develop a road map and multiannual budgetary and investment plans towards financing the NDCs, outlining all the actions that need to be taken, their planned timelines, and their relation to other country processes.

The development of a national climate finance strategy that addresses the unconditional and the conditional part of the NDCs, should distinguish between the various sources of finance, and include a specific focus on the private sector, in particular the domestic financial sector, since private finance will be key for the long-term viability of climate goals. Such a strategy should be developed in cooperation and consultation with line ministries and the private sector to ensure understanding of opportunities, business risk perceptions, and identification of the enabling conditions and policies that will direct private investment towards climate action.

With respect to financing of LTS of countries, only basic assumptions can be made, as it is nearly impossible to assess future macro- and microeconomic fundamentals, and make estimates for technologies that are foreseen but not yet proven or implemented. The LTS can and should however inform the NDC financing strategy to assess how the next cycles of NDCs may be financed and which finance decisions and approach need to be taken in the short term.

With regard to DecarBOOST's focus countries, all three countries have net-zero commitments around which they are strategizing, including around finance considerations which are crucial. The DecarBOOST programme can contribute to the process of developing the Argentinian LTS by providing an evidence base for the general feasibility of potential decarbonisation pathways to increase rigour. This is being done by analyzing the relationships between mitigation options and investment opportunities for climate action, exploring the potential barriers to investment within a long-term vision, and studying the means of implementation, particularly those related to finance. The project is also supporting the Peruvian process of developing a National Climate Finance Strategy. In Brazil, although there is no official LTS process, and in the absence of strong climate governance under the current administration, the project petitioned presidential and state government candidates in the run up to national elections.

4.2 Policy amendment proposals and sector investment plans

Developing sectoral investment plans communicates long-term policy signals and provides the instruments and programmes to stimulate private sector financing of the NDCs. These plans should form the pillars of a national investment plan, embody a framework for mitigation and adaptation investment, and serve as the bridge between policy and implementation (SouthSouthNorth, 2019).

To stimulate private sector financing, it is important that specific policy instruments are developed. The policy amendment proposals may include financial instruments to stimulate investment, or broader policy interventions aimed at creating markets and jobs, such as carbon pricing proposals. This should lead to a portfolio of bankable mitigation and adaptation projects at sector level, which could lead to transformative public and private investment flows in LAC that support needed change in the financial system. Such sector investment plans should be subsets of, and coherent with, national development plans. However, since climate change is a cross-sectoral issue and measures for a particular sector will affect, or be dependent on, other sectors, multi-sectoral governance

at the national and international level is needed (COP21 RIPPLES Consortium, 2017). This would be an effective way to overcome economic, technical and political barriers, and could drive and coordinate mitigation and adaptation action within as well as across sectors. It would also enable governments to develop a robust national climate finance strategy to inform public spending planning, and to engage the private sector and international cooperation per sector. However, it should be noted that in some federal developing countries the discussion of (public) resource allocation at the federal level is part of a highly contentious debate, which affect climate action decisions and trade-offs.

In the DecarBOOST programme, in Brazil and Peru the identification and analysis of barriers that could potentially be removed by specific public policy interventions (such as the use of financial instruments) was the first step in the process of designing policy proposals to improve the financing of the implementation of NDCs. In Argentina, an exhaustive analysis of mitigation options, planned and newly identified, was conducted before barriers were identified. Section 3 discusses key insights and recommendations arising from the research and stakeholder dialogues.

Based on these approaches, opportunities for mitigation actions, including investment options in specific sectors, were analysed on the basis of predefined indicators, in order to design targeted policy amendment proposals to overcome the barriers, and increase the flow of financial resources to low-carbon investments in these sectors. Argentina and Brazil will develop sector investment plans that incorporate these policy proposals, as well as a portfolio of investment opportunities areas at the macro level; an economy-wide Green Recovery Investment Plan will be prepared for Peru. The next edition of this report series will cover insights obtained from the advanced research done on policy development, investment opportunities, and sector investment plans with respect to financing the implementation of NDCs in the target countries.

Although it is beyond the scope of the DecarBOOST programme, it is envisaged that the investment plans, if successful, could be used at a later stage as blue prints for other sectors, and the scope could be expanded to include development and equity factors, such as potential creation of jobs by 2030[4]. The investment opportunities concept notes could be used to build up, or expand, a national NDC investment portfolio, as explained in the next paragraph.

4.3 Development of a national NDC portfolio

Another important step is to develop a national NDC portfolio which translates and prioritises the identified mitigation and adaptation measures into feasible programmes and projects that can be digested and financed by the private sector. The NDC portfolio coupled with the improved policy framework and sectoral investment plans would ensure centralised, accessible and updated information for domestic and international stakeholders, and send a signal to the market place. This should lead to increased investment, innovation and replication models that contribute to the transformation of the country and positively influence the regional and global debate.

As part of the DecarBOOST programme a select number of mitigation action investment opportunities are being developed for various key sectors, which could contribute to such a NDC portfolio.

4.4 Capitalize on progress and institutional arrangements and regulations

[4] Global research points to the potential creation of 15 million net jobs by 2030 (Saget, Vogt-Schilb and Luu, 2020).

LAC countries have made significant advances on the governance, policy and institutional fronts, as explained in Section 2. It will be important to maintain momentum, and secure the basis for continued climate progress, through fast implementation of framework policies that will kickstart markets and climate action, so that in spite of political changes and future economic conditions, a policy base is embedded that steers country processes, and the climate-positive shift is incorporated within society and the private sector.

4.5 Engage the financial sector

The financial sector is critical as it enables other elements of the economy to function. The sector is also crucial for the implementation of the NDCs, with market rate debt being the largest financial instrument to channel climate finance during 2015/2016 (CPI, 2017). Indeed, provision for and conditions of debt are crucial components of financing climate projects. The credit impairment challenge in LAC countries forms an important barrier to climate action where, for instance in Peru, interest rates can vary between 16 and 65% depending on the size of the company (SBS, 2021). For clean energy projects, the average debt to equity ratio generally surpasses 50:50, and can be as high as 70:30 (CPI, 2017; WEF, 2013), denoting the importance of financial sector involvement.

Therefore, the financial sector also plays a pivotal role in the challenge of financing the NDCs. The local commercial banking sector should have a special focus both within the national climate finance strategy as well as the government's engagement plans with the private sector. Specific strategies for engaging the financial sector in the implementation of the NDCs could include capacity building activities and incentive frameworks for the sector to mainstream climate finance and improve financing conditions, for instance through interest rate softening or extending credit lines to local commercial banks to offer loans to climate-related projects at affordable interest rates (SouthSouthNorth, 2019). Such activities could be funded with international cooperation finance through the provision of blended finance. To provide scale, international climate finance commitments should be both fulfilled and increased.

A more ambitious plan to direct efforts at a systemic transformation of the financial sector is argued in the literature (The COP21 RIPPLES Consortium, 2018a; SouthSouthNorth, 2019). This entails treating the financial sector as a distinct, prioritised sector to support the radical and effective transformation of the productive sectors as required by the objectives of the Paris Agreement, with the end goal of transforming the global financial system. This transformation would ensure financial sector actors incorporate climate change risks into all their decision making. It would lead to investors and financial institutions no longer funding conventional energy projects; asset managers no longer managing such undertakings; and insurers no longer insuring them. Project finance for green technologies would be mainstreamed. The decision-making process for every stock, loan, bond or investment opportunity would be dependent on its assessed climate-change performance and impacts. This would be achieved through a new governance system supported by policies and sector standards (SouthSouthNorth, 2019).

Whichever approach is taken, it will be important to develop a strategy to engage the domestic financial sector in the financing of LAC NDCs. This would typically require coordination and collaboration between the Ministry of Finance and the ministries responsible for climate policy, usually the Ministry of Environment. As discussed in below, global initiatives such as the Glasgow Financial Alliance for Net Zero (GFANZ) signal that the financial sector is starting to work on contributing to the net-zero transition. It is now important that the relevant public climate governance authorities find ways to stimulate this engagement in the region and make sure other financial players follow suit.

In Argentina, the DecarBOOST programme examined—with an emphasis on considering the conditions prevailing in developing countries and in particular in Argentina—the issues related to climate finance, sustainable finance and structural changes that should allow for an appropriate financial transition to enable the full implementation of the Paris Agreement and the achievement of the SDGs.

4.6 The Glasgow Climate Pact and voluntary pledges

In this section we discuss the results of the Glasgow COP26 with an emphasis on climate finance, that have a potential impact on the climate agendas of LAC governments. We analyse the impact of climate finance announcements, commitments, official and voluntary agreements, and actions on the decarbonisation process in LAC countries. We also assess the actions that should be promoted in the short-term to generate greater climate investments in the LAC region.

We partially build on the work done by Fundación Torcuato Di Tella under DecarBOOST, who proposed a methodology to analyse climate negotiation events such as COP26 (Carlino & Caratori, 2021).

4.6.1 Incorporate Glasgow Climate Pact agreements into national decision-making processes

COP26 in Glasgow was anticipated to be a decisive test of the ability of the Paris Agreement architecture, that it established at its inception, to strengthen the dynamics for growing collective ambition and collaboration. The urgency of the climate crisis, as repeatedly highlighted through the IPCC Special Report on 1.5° and its updates, and the timelines of the Paris Agreement, caused COP26 to become one of the most important international summits since the signing of the Paris Agreement, when all countries promised to announce new and demanding emission reduction goals to close the 2030 emissions gap.

The most relevant topics discussed at COP26 in terms of climate finance that may have an impact on the LAC region include:

- Increasing ambition in mitigation (i.e., keeping alive the global goal of 1.5 degrees Celsius)
- Climate finance pledges (current and post-2025)
- The Paris Rulebook (specifically the reinforced transparency framework, and Article 6)
- Voluntary pledges and initiatives beyond the Glasgow Climate Pact.

4.6.1.1 Increasing ambition in mitigation

To reach net zero around mid-century the science requires carbon emissions to be reduced by 45%. A key outcome of COP26 is that countries are required to revisit and strengthen their 2030 targets to align them with the Paris Agreement's temperature goals by the end of 2022. In addition, with the goal of achieving a just transition to net-zero emissions around mid-century, the Glasgow Climate Pact also asks all countries that have not yet done so to submit LTS to 2050. The combination of stronger NDCs and LTS should drive ambition and help to align 2030 and net-zero targets. The COP26 decisions also ask countries to pursue efforts to limit the temperature increase to 1.5 degrees Celsius. To monitor progress in levels of ambition countries called on UNFCCC to prepare a periodic NDC Synthesis Report; COP27 in November 2022 will be an important marker in this respect.

Th Glasgow Climate Pact agreements mean that many LAC countries will need to update their NDCs in 2022, and, assuming they will do so, assess how to finance the new plans. Peru updated its NDC in 2020, increasing its ambition from 30% to 40% and translated this target into absolute goals. Likewise, Argentina submitted its Second NDC in 2020 that was subsequently adjusted in 2021 to increase climate ambition with a commitment to a 27.7% emissions reduction by 2030 (compared to the First NDC). Under the administration at the time of writing, Brazil does not show signs of raising ambition[5]. However Presidential elections are planned for late in 2022, and civil

[5] The current report was in final editing at the time of the October 2022 elections in Brazil, and results of the Second-Round Election of 30 October were not yet known.

society is lobbying Presidential candidates for a more ambitious NDC. The result could potentially change the current stalled climate policy landscape in the largest economy of Latin America. It remains to be seen which countries will further strengthen targets this year.

So far only three countries in the region (Chile, Colombia, and Uruguay) have submitted an LTS. Although Argentina, Brazil and Peru have all announced net-zero targets, they have not yet submitted their LTS; while Argentina and Peru are preparing these strategies, Brazil´s plans are currently unknown. The more countries in LAC who prepare and submit their LTS, the better they will be able to align these with the NDC cycles through peer learning and knowledge sharing, and assess the financial implications both for the short- and the long-term. The Glasgow Pact made future deadlines uniform, with countries invited to communicate their NDC in 2025 with a term until 2035 and every 5 years (e.g., 2030-2040). This provides LAC countries an opportunity to compare notes and plans within similar time frames.

Argentina and Peru are also developing National Climate Finance strategies, which provides an opportunity for strategic assessment if they fully align both processes. The added value of this process will depend in part on the scope and the level of detail assessed (including the number of sectors, technologies and measures, and corresponding time frames).

4.6.1.2 Climate finance pledges

The extent—and delivery of—climate finance pledges impact climate ambition in LAC countries. There is evidence of considerable inconsistencies between discourse, commitments and action.

The Copenhagen pledges made by wealthy countries in 2009 to deliver USD 100 billion per year to developing countries by the 2020 contribution have so far not been met. The OECD estimated that climate finance provided and mobilised by developed countries totalled USD 79.6 billion in 2019, up only 2% from 2018, and that the target is unlikely to be met in 2020 (OECD, 2021).

To address this, the UK COP26 Presidency published a Climate Finance Delivery Plan ahead of the COP to provide clarity on when and how developed countries will meet the $100 billion climate finance goal. The Plan sets out an estimated trajectory of climate finance promising to deliver by 2023 and exceed it post-2025, taking into account new climate finance pledges from individual developed countries and multilateral development banks. It also sets out principles on how to improve the delivery of climate finance. Countries will need to report on progress.

Nevertheless, the provision of international finance to achieve more ambitious objectives in terms of both mitigation and adaptation, remains insufficient both in terms of the commitments made and the effective disbursement of those promises. Developing countries require additional resources to allow them to adapt to the consequences of climate change. In addition, the discussion around loss and damage is still ongoing, with no real progress being made at COP26 apart from an agreement to discuss finance for loss and damage in the future. Outside the COP venue however, the Loss and Damage fund was created, with an initial donation from the Government of Scotland.

The financing gap thus consists of three parts:

1. Current commitments have not been met.

2. Research shows that even if the USD 100 billion per year by 2020 commitment were met, this would only cover a minor part of the NDC conditional financing needs[6].
3. Actual financing needs will exceed the estimates proposed in the current NDCs; this will need to be reflected in future NDC cycles.

COP26 outcomes require the renegotiation of a new—and larger—target on post-2025 climate finance by 2024, including a technical process to manage that. Strong disappointment among developing countries with what they perceive to be a meagre result on this crucial topic was manifest. Despite new announcements and promises, there was no evidence of actual progress to increase the magnitude of disbursements until 2023. This means that increased international finance has not been agreed upon, is delayed, and will thus not be a driving force for developing country NDCs in the near future.

The DecarBOOST programme does not address these issues. However, during the climate negotiations these issues were continuously raised by LAC country coalitions.

4.6.1.3 The Paris Rulebook

An important outcome of COP26 in terms of the Rulebook, is the change from the five-year cycle of raising ambition, to reviewing and reinforcing NDCs by countries as and when necessary, starting with an accelerated update in 2022. The adopted decision ensures that, starting in 2024, every two years countries present an emissions inventory and progress made in the implementation of their NDCs. This should strengthen the NDC cycles, and allow countries to monitor and assess the financial implications of their revised NDCs in terms of funding technologies, policies, actions and capacities. It will also enable them to update their climate finance strategies, monitor climate finance flows, and communicate their conditional and unconditional financing considerations at the international negotiations.

On transparency, countries agreed to submit information about their emissions and financial, technological and capacity-building support using a common and standardised set of formats and tables. This will make reporting more transparent, consistent and comparable, and provides the developing countries with the opportunity to hold developed countries accountable.

If developing countries also presented their progress in implementing their NDCs, this would enable them to assess and monitor the financial implications of NDC planning, implementation and raising ambition more carefully, taking into account market fundamentals and the microeconomic evolution and other financial implications.

4.6.2 Voluntary pledges and initiatives beyond the Glasgow Climate Pact

Some of the initiatives by countries and non-state actors launched during COP26 were unprecedented in terms of scope, ambition and relevance. While it remains to be seen how they will materialise, they sent a strong message globally. The most important deals that could have an impact on LAC include:

1. Glasgow Leaders' Declaration on Forests and Land Use
2. Aligning the finance sector with net-zero by 2050
3. The Global Methane Pledge
4. USA-China Joint Declaration

[6] The combined conditional financing needs from African countries already exceeds USD 100 billion per year (SouthSouthNorth, 2019).

5. Ending international financing for fossil fuels
6. Accelerating the phase-out of coal.

4.6.2.1 Glasgow Leaders' Declaration on Forests and Land Use

One-hundred-and-forty-one countries, accounting for more than 90% of the world's forests, committed to collectively ending forest loss and land degradation by 2030, while delivering sustainable development and promoting an inclusive rural transformation (UKCOP26, 2021b). Ten out of the 12 South American countries signed the Declaration, with only Bolivia and Venezuela not represented. In terms of the Global Forest Finance Pledge (UKCOP26, 2021c) 12 donor countries pledged USD12 billion of public climate finance from 2021 to 2025 to support action in developing countries including restoring degraded land, tackling wildfires, and advancing the rights of Indigenous Peoples and local communities. Separately, 14 country and philanthropic donors pledged at least USD1.7 billion over the same period to advance Indigenous Peoples' and local communities' forest tenure rights and support their role as guardians of forests and nature (UKCOP26, 2021d). At least USD7.2 billion of private sector funding was mobilised, and over 30 financial institutions with more than USD8.7 trillion in assets under management are committed to work on eliminating agricultural commodity-driven deforestation risks in their investment and lending portfolios by 2025 (Race to Zero/Race to Resilience. 2021). Twenty-eight governments, representing 75% of global trade in key commodities that could threaten forests, signed a new declaration on to actions designed to deliver sustainable trade and reduce pressure on forests, including support for smallholder farmers and improving the transparency of supply chains (FACT Dialogue, 2021). Additional initiatives were announced, including public-private efforts from multilateral development banks and multi-nationals (UK Government, Department of Environment, 2021). Given the importance of the forests, including the Amazon, in the LAC region, this Declaration could have a large impact on LAC and related financial flows. However, while promising, it is not yet clear how the goals of this Declaration are to be achieved, and it remains to be seen how some LAC countries will implement and enforce policies, especially in regard to illegal logging. Moreover, it remains to be seen whether the finance pledges of developed countries will be timely and adhered to, given the experience so far with the Copenhagen pledges.

The Glasgow Leaders' Declaration on Forests and Land Use could have a large impact on LAC and related financial flows. It will be important for LAC to follow up in subsequent international negotiation sessions to make sure substance is provided on how to achieve the goals presented in the Declaration, as well as follow up with additional domestic policies and actions that would enable this process.

4.6.2.2 Align the finance sector with net-zero by 2050

Section 4.5 discussed the pivotal role the financial sector plays in the challenge of raising the enormous capital required for the transition to net-zero economies in the long term, and for financing NDCs in the short term, since a crucial component of financing climate projects is the provision and conditions of debt.

The GFANZ was formed ahead of COP26, bringing together over 450 financial firms from across the global financial sector, representing more than USD130 trillion in assets under management and advice, to set robust, near-term, science-based targets to align their investment portfolios to net-zero by 2030, by using the most robust 1.5C pathways such as the IPCC and International Energy Agency.

This alliance unites financial market players such as commercial banks, financial services, asset managers, insurance companies, across the globe. Currently there are 10 members from four South American countries, another five members from Central America, and eight from Spain who are likely to have operations in South America. These institutions could play a pioneering role in the LAC region which should prompt a process of reducing "financing emissions" (greening finance portfolios), and increasing low-carbon investment through the debt components.

This initiative, and others such as the Principles for Responsible Investment (PRI) and Partnership for Carbon Accounting Financials (PCAF), signal that the sector is starting to work on contributing to the net-zero transition. It is now important that the relevant public climate governance authorities find ways to stimulate this engagement in the region and make sure other financial players follow suit.

4.6.2.3 The Global Methane Pledge

Over 100 countries signed up to the Global Methane Pledge, representing nearly 50% of global anthropogenic methane emissions. Participants joining the Pledge agree to take voluntary actions to contribute to a collective effort to reduce global methane emissions at least 30% from 2020 levels by 2030 (Global Methane Pledge, 2021).

Most South American countries (nine out of 12) signed the pledge, with only Bolivia, Paraguay, and Venezuela not represented. Among the signatories is Brazil, which is one of the world's five biggest emitters of methane. As methane has a global warming potential of 25 times that of CO_2 on average, and simultaneously an average lifetime of 12 years in the atmosphere (EPA, 2022), this provides a great opportunity to limit emissions in the region in the short term. It must be noted however, that China, Russia and India, who are also amongst the top-five methane emitters, have not signed on to the pledge, which may limit the success of the pledge. Nevertheless China has promised to collaborate with the US on reducing methane emissions through the China-US Joint Glasgow Declaration on Enhancing Climate Action (see Section 4.6.2.6). To seize the opportunity, it is important that the relevant public climate governance authorities follow up on this pledge with a road map and policy amendment proposals.

4.6.2.4 Accelerate the phase-out of coal

At COP26, a group of 46 countries, including the U.K., the EU and several of its larger countries, Chile, and Ecuador, made commitments to phase out domestic coal (UKCOP26, 2021a). Latin America is not a significant coal mining region nor a large coal thermoelectric producer, and most of the countries in the region have no coal dependency. However, countries such as Colombia export coal, and thermoelectric production forms a substantial part of Chile´s energy matrix, while Brazil and some others also generate electricity through coal combustion at a smaller scale. Only two countries, Chile and Ecuador, committed to phase out coal; however, with Chile being a large thermoelectric producer this will have some impact in the region in terms of shifting investments.

4.6.2.5 End the combustion engine

Over 100 national governments, cities, states and major businesses signed the Glasgow Declaration on Zero-Emission Cars and Vans to end the sale of internal combustion engines by 2035 in leading markets and 2040 worldwide. At least 13 signed a similar memorandum of understanding to end the sale of fossil fuel-powered heavy-duty vehicles by 2040 (UNFCCC, 2021). In LAC, only Chile, Paraguay, Uruguay, and a number of cities in Argentina, Brazil and Bolivia signed, while in Central America Mexico and El Salvador and the Dominican Republic committed. Latin American cities including Bogotá, Cuenca and Salvador committed to decarbonise their public transport fleets to zero-emission by 2035 (UNFCCC, 2021). As transport is one of the most significant emissions-intensive sectors in the region, this sets an important example for the rest of the region.

4.6.2.6 Importance of the Glasgow USA-China Joint Declaration

At COP26, China and the U.S. announced a plan to work together on cutting GHG emissions in the next decade. The China-U.S. Joint Glasgow Declaration on Enhancing Climate Action in the 2020s commits the two largest emitters to work together in key areas including regulatory frameworks and environmental standards related to reducing emissions of GHG in the 2020s, policies to encourage decarbonization and electrification of end-use sectors, circular economy, carbon capture, utilisation and storage (CCUS), and reducing methane emissions (U.S. Department of State, 2021). The agreement is quite high-level and does not provide much detail, but provides an

important message from these major emitters. Although this cooperation will likely not have a direct effect on the LAC region, there could be indirect knock-on effects in time through supply chain and trade implications, with both the U.S. and China having active interests in the region.

Next edition

The next edition of this report will cover insights from ongoing research undertaken within the DecarBOOST programme on policy development, investment opportunities, and Sector Investment Plans.

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