Annex 16

Annex 016

Uruguay's Sovereign Sustainability-Linked Bond (SSLB) Framework

FOR SUSTAINABILITY-LINKED BONDS FOCUSED ON CLIMATE AND NATURE-BASED TARGETS

September 2022

URUGUAY

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Chapter 1

Introduction

Executive Summary

This Sovereign Sustainability-Linked Bond (SSLB) Framework is meant to be the cornerstone of Uruguay's entry into the world of sovereign sustainable finance and, more broadly, looks to pioneer an alternative approach for sustainability-linked debt financing. Uruguay seeks to implement a two-way pricing structure, linking the country's cost of capital to the achievement of its climate and nature-based goals under the Paris Agreement. Through this mechanism, Uruguay intends to align its national financing strategy with its sustainability efforts, creating an innovative tool that binds borrowers and investors together in the effort to protect the planet. Underpinning this framework is the intention to focus sustainable finance on the delivery of specific, material, and visible climate performance objectives anchored on a robust reporting and verification system, and driven by the actions, policies, and investments required to fulfill them. This approach generates enhanced accountability for the government around climate action and outcomes, embracing the country's environmental agenda and further promoting shared global public goods.

Over the past 30 years, Uruguay has substantially reduced its Greenhouse Gas (GHG) emissions while taking steps to preserve its natural capital. As a result of these efforts, Uruguay has reduced the GHG emissions intensity of its economy by well over 40 percent and is now one of the world's leading countries in sustainable electricity generation. In other key economic sectors, most notably beef production, public policies coupled with strong public and private investments in technological changes have reduced the intensity of methane emissions per product unit while increasing productivity. Concurrently, Uruguay has made protection of natural ecosystems a key part of the country's environmental strategy, ensuring that agricultural activity is not, as it is in much of the world, a driver of deforestation.

In addition to these large strides in the reduction of the carbon intensity in both energy generation and livestock management, Uruguay plans to take additional steps necessary to tackle climate change. The country aims to accelerate decarbonization in hard-to-abate sectors – such as heavy transportation – by promoting electric mobility, developing green hydrogen production, and harnessing its abundant renewable energy sources such as water, wind, and biomass. As a food supplier for an increasing world population, Uruguay intends to meet the challenge of increasing agricultural production while reducing methane and nitrous oxide emissions, preserving its unique grassland ecosystem, and protecting its native forests.

Building on its strong track record on climate action policies, Uruguay will further commit to its sustainability agenda by linking its bond financing strategy to climate and nature targets as established under the Paris Agreement. This SSLB Framework describes Uruguay´s sustainable strategic priorities and sets out goals with respect to two Key Performance Indicators (KPIs): reduction of aggregate gross GHG emissions per real GDP unit with respect to a reference year (KPI-1) and maintenance of native forest area with respect to a reference year (KPI-2). Together, they address two different, but complementary, environmental global public goods: mitigating global warming and preserving a key carbon sink. In turn, the Sustainability Performance Targets (SPTs) are based on quantitative goals set for 2025 as established in its Nationally Determined Contribution (NDC). These targets imply making additional strides to achieve Uruguay's commitment to cut its aggregate gross GHG emissions intensity by half and maintain 100 percent of its native forest cover ("zero-deforestation" commitment). Connecting debt funding with the objectives of tackling climate change and biodiversity conservation is evidence of Uruguay´s commitment and action plan to deliver on its ambitious sustainability goals and timelines, enhancing its accountability with investors, civil society, and the global environmental community.

In addition, Uruguay seeks to implement an incentive-compatible financing mechanism, linking the country's cost of capital to the achievement of its climate and nature goals. It incorporates a two-way pricing structure with a coupon step-up, which would compensate investors on Uruguay's inability to deliver on its commitments, as well as a step-down trigger that similarly rewards the country by lowering borrowing costs if it outperforms on its already-ambitious NDC targets. Through this innovative mechanism, Uruguay intends to align its financing and sustainable policies and, most importantly, create incentives for over-performance, helping foster the country's connection with its climate agenda and further promoting the benefits associated with it.

The reporting and verification approach underpinning this Framework will be enhanced to go beyond Uruguay's requirements under the Paris Agreement. Accurate reporting, timely availability, transparent disclosure, and credible external verification of the KPIs are critical components of the Framework and the efforts in achieving these environmental goals. For these purposes, reporting of GHG emissions will move from biennial to annual frequency, in line with the standards of the most developed economies. Additionally, Uruguay will use geospatial data and satellite-imaging mapping to estimate the native forest area every four years, in line with international best practices. Finally, Uruguay commits to have an external, independent, and qualified review conducted by the United Nations Development Program on both KPIs throughout the life of the SSLBs.

This SSLB Framework is the product of a "whole-of-government" approach. It is an economy-wide effort jointly undertaken by the Ministry of Economy and Finance, the Ministry of Environment, the Ministry of Industry, Energy and Mining, and the Ministry of Agriculture, Livestock and Fisheries, with the support of the Ministry of Foreign Relations. Strong inter-ministerial coordination and governance arrangements will be critical to ensure a timely and reliable provision of data and for communicating clearly and regularly on progress in achieving sustainability targets.

More generally, conditioning the financial terms of a sovereign bond on the achievement of a country's forward-looking NDC objectives could help build nature and climate outcomes into sovereign bond markets. By mainstreaming Paris-aligned KPIs embedded in SSLBs, it could help sharpen the credibility in the NDC system as material and binding commitments and provide financial incentives for countries to improve on their sustainability performance and contribute to global public goods. From the demand side, a private sector that is increasingly focused on a net-zero carbon future should welcome instruments that incorporate NDCs compliance and are directly tied to measurable sustainable impacts, aligning financial flows with the goals of the Paris Agreement. This Framework is thus intended as a contribution to the development of the sustainable finance asset class and towards improving environmental outcomes beneficial to all.

Chapter 2

Vision for Climate Action and Nature Conservation

Uruguay's proactive approach to environmental progress is rooted in the country's 1967 Constitution. The Uruguayan Constitution enshrines the right to access clean water and the duty of every citizen to avoid any action that exploits, destroys, or pollutes the environment.[1] It lays the foundation for the actions that drive Uruguay's leadership in addressing climate issues and underpins its support of United Nations initiatives to address climate change. Uruguay ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994, the Kyoto Protocol in 2001,[2] and the Doha Amendment in 2012. In 2016, it ratified the Paris Agreement adopted during the UNFCCC's 21st Conference of the Parties (COP21), and in 2017 published its First NDC. The NDC set forth ambitious targets on GHG emissions intensity reduction, as well as sector-specific objectives on carbon intensity of food production and native forest area conservation.[3]

At a national level, Uruguay has created institutions and implemented a series of strategies and policies to protect the environment and meet its international climate commitments. The 2008 Environmental Act makes environmental protection, biodiversity preservation, management of hazardous waste, and the formulation and implementation of national environmental and sustainable development policies a national priority.[4] In 2009, the National Climate Change and Climate Variability Response System was established to implement a whole-of-government approach to coordinating and designing public sector actions to address climate change and environmental adaptation. In 2017, it developed the National Climate Change Policy as a long-term strategic framework to guide the country's transformation to addressing challenges associated with climate change and climate vulnerability, including its commitments under the Paris Agreement. Building on this, in 2018, Uruguay published its National Strategy for Native Forest for the 2018-2030 period, which focuses on the sustainable management of native forests and their biodiversity.

Successive governments have introduced policies to reduce GHG emissions intensity while supporting economic growth. To contribute to the implementation of a sustainable development model that is resilient and low-carbon, Uruguay deployed an ambitious set of early actions and transformed its energy matrix by increasing and diversifying its renewable sources of electricity generation. Likewise, in the beef cattle, dairy, and rice production sectors, updated public policies accompanied by strong investments and technological changes have allowed an increase in productivity and a reduction in the intensity of GHG emissions per product unit.

[1] Constitución de la República (2004), Article 47. Available at: https://parlamento.gub.uy/documentosyleyes/constitucion
[2] The Kyoto Protocol aims at reducing emissions of six gases generated by human activity that cause global warming (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride).
[3] IMPO – Centro de Información Oficial (2016) Law N° 19439. Available at: http://www.impo.com.uy/bases/leyes/19439-2016
[4] Parliament of Uruguay (2008) Ley Nº 17.283. Available at: https://www.impo.com.uy/bases/leyes/17283-2000

Uruguay has almost no net deforestation of its native forest. This has not only helped protect water resources, reverse environmental degradation, and support biodiversity, but it has also yielded benefits of greater carbon sequestration in the aboveground biomass as well as in forest soil carbon, thereby making the country a net-negative carbon dioxide (CO_2) emitter. Uruguay's favorable management of GHG emissions and natural resources was possible due to the convergence of national, sectorial, and departmental public policies related to climate change, as well as awareness actions promoted by the private sector, academia, and civil society.

As a result of its steadfast commitment to sustainability and environmental progress, Uruguay has distinguished itself among developing nations for its environmental and climate change achievements. It ranks first in the MSCI Environmental Pillar Index[5] among all emerging countries, and first among all emerging and developing countries in the World Economic Forum's 2021 Energy Transition Index.[6] Uruguay also holds the 12th position in MIT's 2022 Green Future Index among the 46 emerging economies. Uruguay's high rankings on sustainability are supported by its especially strong performance in access to clean and sustainable energy, along with its commitment to supporting socioeconomic development.[7]

Uruguay is committed to continuing its transition toward a low-carbon, environmentally sustainable economy. It intends to accelerate its shift towards sustainable production and consumption methods, while at the same time generating high-quality jobs. To support the achievement of these targets, in December 2021 the country published its Long-Term Climate Strategy 2020-2050 (LTS), which sets trajectories and scenarios for emissions reductions and carbon sequestration through 2050 and aims to be the basis for future NDCs.[8]

[5] MSCI ESG Government Report as of May 2022. See:
https://www.msci.com/documents/10199/5c0d3545-f303-4397-bdb2-8ddd3b81ca1b

[6] World Economic Forum (2021) Energy Transition Index. Available at:
https://www.weforum.org/reports/fostering-effective-energy-transition-2021/in-full/rankings

[7] According to the 2022 Environmental Performance Index (EPI), Uruguay ranks first among Latin American countries in the Environmental Health category (which includes indicators on air quality, waste management, water and sanitation, and heavy metals). However, according to this study, Uruguay earns lower marks in the Ecosystem Vitality indicator (which includes biodiversity and habitats and ecosystem services). See Wolf, M. J., Emerson, J. W., Esty, D. C., de Sherbinin, A., Wendling, Z. A., et al. (2022) 2022 Environmental Performance Index. New Haven, CT: Yale Center for Environmental Law & Policy. Available at:
https://epi.yale.edu/epi-results/2022/component/hlt

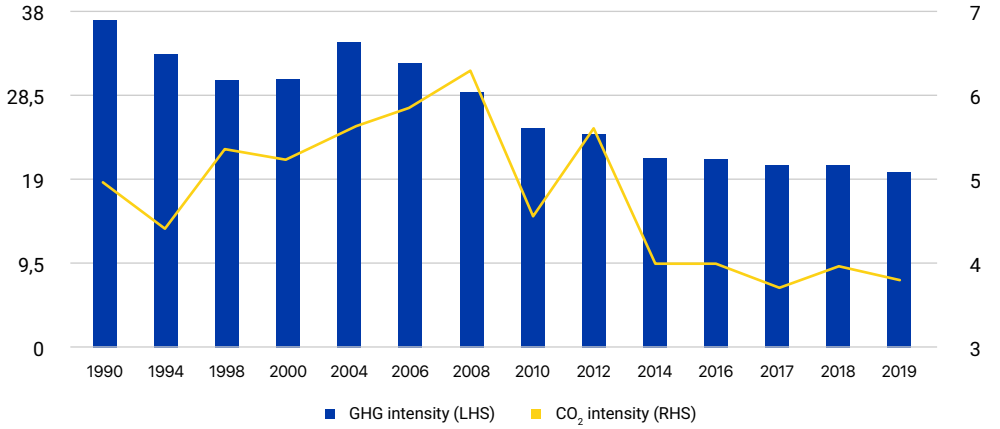
[8] Ministry of Environment (2021) Estrategia Climática de Largo Plazo de Uruguay. Available at:
https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/estrategia-climatica-largo-plazo-uruguay?msclkid=b8-3c27bfcf7a11ecb77292489471362e

Sustainability Performance, Strategies and Policies

Uruguay has grown its economy while significantly reducing the intensity of GHG emissions across key economic sectors. Absolute emissions in some key activities, such as electricity generation, have been reduced, driven by a significant shift to renewable sources. Public policies have also prompted substantial investments and technological changes in the beef, dairy, and rice production sectors, increasing productivity and reducing the intensity of methane and nitrous oxide emissions. Along with a supportive regulatory environment and a strong partnership between the public and private sectors, the government has also contributed to emissions reduction by granting tax benefits to investments deemed to result in carbon capture, such as in forestry.

Evolution of Gross GHG Emissions as a share of real GDP

Period 1990-2019[1]



[1] "Gross Emissions" refers to the fact that it does not account for CO_2 removal by carbon sinks. "Aggregate GHG" refers to the three main economy wide GHGs and all sectors contributing emissions of each GHG, except for Land Use and Land Use Change and Forestry (LULUCF).
Expressed in Gg (1000 metric tons) of CO_2eq, metric GWP100 AR5.
Real GDP measured in billions of pesos in 2016 constant prices.
Source: 2019 National Greenhouse Gas Inventory (NGHGI), Central Bank of Uruguay and Ministry of Economy and Finance. Data corresponds to years with official NGHGI publication.

Uruguay is achieving climate transition through a three-pronged approach that addresses its most relevant GHG emission sectors:

Energy and Transportation

Uruguay has undertaken a remarkable energy transition, propelling the country into world leadership in renewable electricity generation. Uruguay transformed its energy matrix by increasing and diversifying its sources of renewable electricity generation[9] and is now a global leader in large-scale wind power and production of other forms of clean energy. In 2020, for example, 94 percent of Uruguay's electricity production was generated using diverse renewable sources (40 percent wind energy, 30 percent hydroelectric, 20 percent biomass and 4 percent solar energy), a significant increase from 64 percent in 2012.[10] This diversification of the electricity matrix improved the resilience of the system and has mitigated the fiscal risks tied to fossil fueled energy generation tied to droughts that affect hydro-power generation.

The strategy for this transition was laid out in the country's National Energy Policy for the 2005–2030 period, which emerged from a broad multi-party agreement.[11] The National Energy Policy outlines a strong commitment to renewable energy and energy efficiency. It seeks to decarbonize the energy matrix through the incorporation of wind, biomass, and solar photovoltaic energy capacity. Under this policy, strong institutional dialogue and coordination across different key ministries and stakeholders (including public utilities) has led to a transformation of the energy sector. It was underpinned by legislation and incentives that prompted public-private investments of more than US$8 billion since 2010 (with over half the amount coming from private financing).[12] This convergence of national public policies and private sector involvement was reinforced through consistent communication of the shared objectives of the private sector, academia, and civil society.

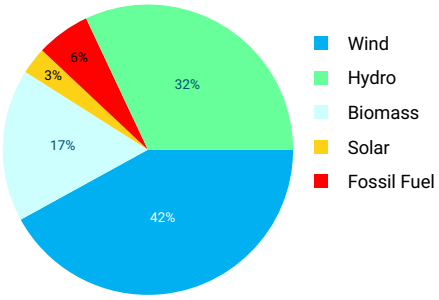
[9]This means that there are no longer large thermal power stations but rather hundreds of wind turbines and solar panels connected to the grid in different parts of the country. If a wind turbine breaks down, it does not destabilize the system: it is just another point in the entire grid. If wind power goes down at midday, solar power goes up, and the opposite happens at night.

[10]Ministry of Industry, Energy and Mining (2020) National Energetic Balance. Available at: https://ben.miem.gub.uy/descargas/1balance/1-1-Libro-BEN2020.pdf

[11]The strategy was approved by the Council of Ministers in 2008. See: http://www.eficienciaenergetica.gub.uy/politica-energetica and http://www.eficienciaenergetica.gub.uy/documents/20182/22528/Pol%C3%ADtica+Energ%C3%A9tica+2005-2030/841defd5-0b57-43fc-be56-94342af619a0.

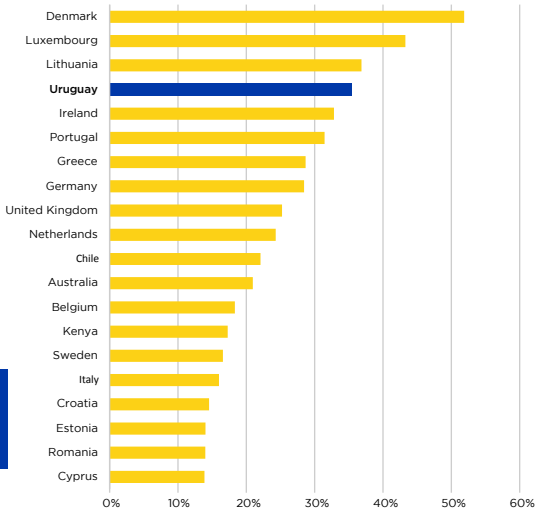
[12] Uruguay XXI (2022) Renewable Energies in Uruguay. Available at: https://www.uruguayxxi.gub.uy/uploads/informacion/df0a21ae89dff9e9729dd824da45eede094ef414.pdf

Electricity generation by source
as % of total, average 2017-2021[1]



Uruguay ranks #4 in the world in share of electricity production from wind and solar sources in 2021[2]

Share of electricity production from wind and solar sources (top-20 countries worldwide)
% of total generation, year 2021[2]



[1] Source: National Energetic Balance, 2021[13]
[2] Source: Ember's Global Electricity Review, 2022[14]

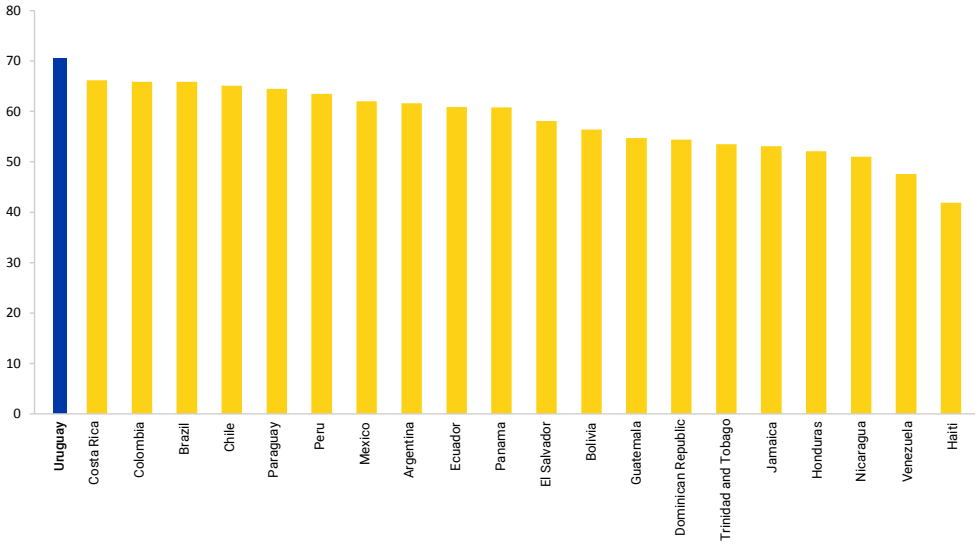
Uruguay, along with Denmark, Luxembourg, and Lithuania, is recognized as a world leader in the percentage of wind and solar generation in its electricity generation matrix. According to the Energy Transition Index 2021, published by the World Economic Forum[15] Uruguay ranks atop the Latin America and Caribbean region on transition to renewable energy sources and ranks 13th globally.[16] The increased participation of renewable energy in the country's primary energy matrix, which jumped from 38 percent in 2012 to almost 58 percent by 2020, has also contributed to the improvement of the renewability index of the energy sector.[17]

Uruguay has also implemented a Biofuels Law establishing a renewable fuels standard, requiring the blending of biofuels (ethanol and biodiesel) with automotive gasoline and diesel fuel.[18] The legislation mandates that biofuels account for a minimum of 5 percent of total gasoline and diesel fuel. Increased biofuel consumption displaces fossil-based fuels, thereby reducing carbon dioxide emissions. Starting in 2022, the biofuel requirement was increased to 8.5 percent and the mandatory minimum for biodiesel was repealed.

[13] Ministry of Industry, Energy and Mining (2021) National Energetic Balance 2021 - BEN 2021. Available at: https://ben.miem.gub.uy/balance.php
[14] Ember (2022) Yearly Electricity Data. Available at: https://ember-climate.org/data-catalogue/yearly-electricity-data
[15] World Economic Forum (2021) Fostering Effective Energy Transition. Available at: https://www.weforum.org/reports/fostering-effective-energy-transition-2021/in-full/rankings
[16] World Economic Forum, 2021. This index provides a data-driven framework of performance and readiness of the countries to perform energy system transition and considers two subindices: the energy system performance and the enabling environment for the transition.
[17] World Economic Forum, 2021. This index reflects the share of renewable energy with respect to total primary energy.
[18] In 2007, Law N° 18195 on Agrofuels was enacted for the purpose of promoting and regulating the production, trade, and use of agrofuels, these being defined as any renewable liquid fuel of agricultural or agro-industrial origin. See: IMPO – Centro de Información Oficial (2007) Law N° 18.195. Available at: https://www.impo.com.uy/bases/leyes/18195-2007/6

Energy Transition Index

Latin America and the Caribbean, year 2021



Source: WEF, 2021.

Due to this energy transition, as of 2019, Uruguay had among the lowest CO_2 emissions per capita among countries with comparable economic development. Thanks to these measures, total emissions from the energy sector in relation to the country's nominal Gross Domestic Product (GDP) are relatively low when compared to world averages. In 2019, the intensity of emissions from fuel combustion was 0.1 ($kgCO_2$/GDP in 2015 dollars), the fourth lowest intensity among the 63 countries, and the lowest in the continent.[19] Between 2012 and 2019, gross CO_2 emissions from the energy sector fell 25 percent (from 8.191 Gg to 6.170 Gg), over a period where real GDP grew 17 percent.[20]

More recently, Uruguay has begun exploring innovative energy solutions for a renewable-powered future.[21] Electrification and promotion of electric mobility are seen as a cost-effective policy to steer the country towards carbon dioxide-neutral economic development. Several measures have been introduced to promote sustainable mobility systems fostering electrification, both in public transport (buses and taxis) and in utility and private vehicles.

[19] IEA Atlas of Energy (2020) CO_2 Emissions from Fuel Combustion. Available at: http://energyatlas.iea.org/#!/tellmap/1378539487/2

[20] Ministry of Industry, Energy and Mining (2021) National Energetic Balance 2021 - BEN 2021. Available at: https://ben.miem.gub.uy/balance.php

[21] International Renewable Energy Agency (2019) Innovative solutions for achieving 100% renewable power systems by mid-century, Workshop minutes. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Events/2019/Jul/2019-07-17-Workshop-Minutes-Uruguay.pdf?la=en&hash=B5CE4AF4958D3424241E6B37B111B3C833B53AD1

In 2019, the Executive Branch issued decree 165/019 to support the replacement of up to 4 percent of the total fleet of diesel public transportation buses in the country.[22] Measures aimed at improving urban mobility while fostering the use of public transport have also been instrumental.[23] As part of this effort, "electric corridors" have been established to increase the number of battery charging stations and thereby enable broader access by electrical vehicles to large areas of the country.[24]

Agriculture and cattle raising

Uruguay has undertaken an equally ambitious transition in the agricultural sector. Since Uruguay's economy is primarily based on the agricultural sector, it has focused on mitigating the environmental impact of food production through Climate-Smart Agricultural (CSA) policies.[25,26] These policies have fostered the adoption of technologies for pasture management and increase quality feeding in the phases of cattle breeding and rearing (based on natural grasslands feeding), as well as cattle management measures, that have improved the efficiency of beef production while preventing carbon losses from soils. New technologies have also been introduced in the finishing phase, such as high-quality pasture and feedlots, that have a significant impact in reducing the age of slaughter steers.

The introduction of innovative processes and technological advances has led to a dramatic improvement in the climate efficiency of livestock production. As a result of sustainable cattle raising practices and land management, Uruguay has significantly reduced the intensity of emissions in beef production.[27] Between 1990 and 2019, the intensity of methane emissions derived from cattle as a share of total beef production dropped 35 percent.

To achieve decarbonization of the agricultural sector, the country has implemented public policies that support the private sector in adopting productivity-enhancing technologies, emulating successful strategies undertaken by other countries with similar characteristics. Uruguay has thus mitigated GHG emissions in one of its core economic sectors while "not threatening food production," as enshrined in the Paris Agreement.

[22] The decree establishes a subsidy to cover the difference in costs between the purchase of a combustion bus and an electric bus. See: IMPO – Centro de Información Oficial (2018) Law N° 19670. Available at: https://www.impo.com.uy/bases/leyes/19670-2018 and https://www.impo.com.uy/bases/decretos/165-2019

[23] Ministerio de Industria, Energía y Minería (n.d.) Proyecto MOVÉS: Movilidad eficiente y sostenible. Available at: https://www.gub.uy/ministerio-industria-energia-mineria/politicas-y-gestion/proyectos/proyecto-moves-movilidad-eficiente-sostenible

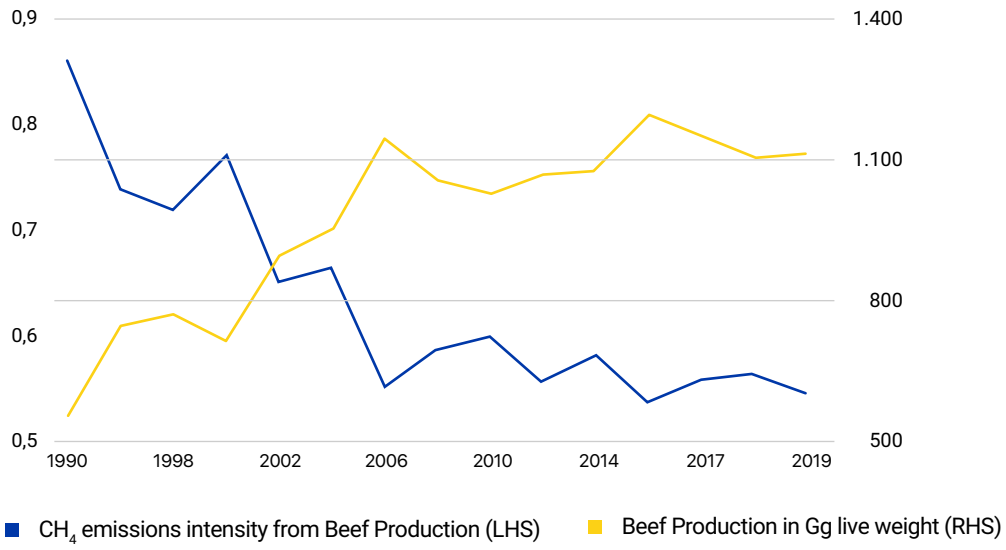
[24] In 2018, the Electric Route connecting the cities of Colonia and Chuy was the first electric corridor in Latin America and the Caribbean. The country is using its network of state-owned fuel stations to install charging points every 60 kilometers. There are currently 142 chargers across the 19 departments of Uruguay.

[25] Approximately 60% of Uruguay's land area are natural pastures, which manage to feed 12 million head of cattle. The country exports 75% of its production, representing some 21% of its total exports and reaching nearly 50 markets, making the country one of the top ten exporters of this product in the world.

[26] https://climateknowledgeportal.worldbank.org/sites/default/files/2019-06/CSA%20in%20Uruguay.pdf

[27] When referencing beef production intensity of emissions, Uruguay refers to bovine beef production.

Evolution of Beef Production and Methane emissions (CH_4) per unit of Beef Produced
Period 1990-2019[1]



[1] CH_4 emissions intensity from beef production (LHS) is calculated as CH_4 emissions (Gg) from beef production as a share of beef production in Gg live weight.
Years with official NGHGI publication.

Source: NGHGI and Ministry of Livestock, Agriculture and Fisheries.

Native forest conservation and land use

Native forests provide ecological and climate benefits, yet they are constantly threatened by deforestation as well as the impacts of climate change. Forests are the planet's largest terrestrial carbon sink,[28] helping to regulate climate at both the regional and global level.[29] They also play a vital role in sustainable development and human well-being. They regulate water, nutrients, and the planet's carbon cycle, as well as support roughly 80 percent of all species living on land. Forests are therefore critical for meeting Paris Agreement commitments on mitigation and adaptation and many of the Sustainable Development Goals – including those related to halting deforestation and loss of biodiversity, fresh water, and sustainable livelihoods for local communities.[30] Yet native forests are constantly threatened both by deforestation as well as the impacts of climate change, which can increase the frequency and intensity of droughts, flood events, pest outbreaks, and wildfires. These extreme events of nature can have major consequences for forests, releasing their stored stocks of carbon and stalling their ability to absorb carbon dioxide from the atmosphere.

[28] Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (2018) Montanarella, L., Scholes, R., and Brainich, A. (Eds.) The IPBES assessment report on land degradation and restoration. Bonn, Germany: Science-Policy Platform on Biodiversity and Ecosystem Services.
[29] FAO (2020) Global Forest Resources Assessment 2020: Main report. Rome. https://doi.org/10.4060/ca9825en.
[30] Additionally, native forests provide enhanced climate resiliency because they are typically less susceptible to fire in comparison to exotic, (i.e., non-native plantations). See: PROFOR (2017) How Forests Enhance Resilience to Climate Change. Available at: https://www.profor.info/knowledge/how-forests-enhance-resilience-climate-change

The protection and restoration of forests has thus been a top environmental priority in many international agreements, pledges, and partnerships. Given their impact on climate change mitigation, biodiversity, and natural resource preservation, protecting native forests has been endorsed by the UN Framework Convention on Climate Change, the Paris Agreement, the Convention on Biological Diversity, the UN Convention to Combat Desertification, the UN Global Forest Goals, the Sustainable Development Goals, the New York Declaration on Forests (NYDF), the United Nations Convention on Biological Diversity (CBD), and, most recently, at UN Climate Change Conference in Glasgow (COP26).

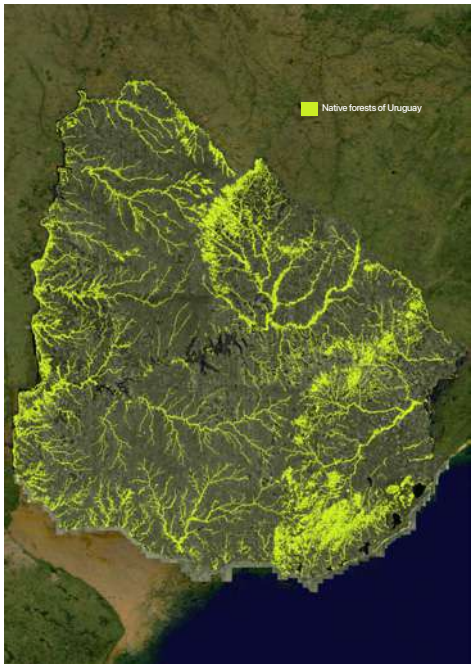
As of 2016, native forests in Uruguay occupied an estimated 835.349 hectares, covering 4.8 percent of the national territory.[31] Six forest cover types are recognized in Uruguay: riparian or gallery forests are the most extensive, followed by hillside forests, ravine forests and wooded savannah, and, to a lesser extent, "psammophilous" forests and palm forests, distributed unevenly across seven ecoregions.[32] Between 98 percent and 99 percent of native forest area is on private property.

In Uruguay, native forests are essential for biodiversity conservation and the control of ecosystems. Native forests in Uruguay comprise 302 woody species, forming a system of corridors and patches that support avian and mammalian biodiversity and protect stream integrity. Almost half of the bird species and of the mammals in Uruguay inhabit the native forests[33]. Along rivers, streams, estuaries, lagoons, and shorelines, Uruguayan native forests provide buffering capacity during floods. They are also an effective filter that mitigates the entry of nutrients and pollutants into the aquifer. Given the risk of pollution from agricultural runoff, native forests provide substantial ecological benefits, particularly regarding the purity of the drinking water.

To enhance soil conservation and promote soil management, Uruguay implemented a fully automated system that requires producers to submit a crop rotation plan to prevent erosion[34]. Using a simulation model, agronomists work with farmers to define a crop rotation system that ensures soil erosion minimization. Thereafter, using satellite images, experts at the Ministry of Agriculture can monitor the proposed crop rotations and contact the producers in cases where they were not successfully implemented. This is a crucial process that ensures sustainability of crop production given the high risk of soil erosion in Uruguay due to the characteristics of rainfall. Adequate crop rotations help to reduce runoff, reduce soil erosion risk, and maintain soil quality.

[31] Ministerio de Ganadería, Agricultura y Pesca (2020) Superficie efectiva en hectáreas por uso forestal y especies por departamento (2018). Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/2020-01/Datos%20de%20superficie%20forestal%20al%202018.pdf
[32] Brazeiro, A. (2015) Eco-regiones de Uruguay: biodiversidad, presiones y conservación. Aportes a la Estrategia Nacional de Biodiversidad. Montevideo, UY: Facultad de Ciencias de la Udelar. Forests in Uruguay are classified as semi-deciduous seasonal forests, characterized by the senescence of 30–60 percent of foliar biomass during winter.
[33] Ministerio de Ganadería, Agricultura y Pesca (2018) Estrategia Nacional de Bosque Nativo – ENBN. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/documentos/publicaciones/estrategia_nacional_de_bosque_nativo.pdf
[34] IMPO – Centro de Información Oficial (2020) Ley N° 15239. Available at: https://www.impo.com.uy/bases/decretos-ley/15239-1981

Uruguay's Native Forest Cartography



Source: Courtesy of MGAP and ESA, Copernicus Sentinel-2 telemetry

The protection of native forests and the prevention of deforestation have been a key part of Uruguay´s environmental strategy. The country has made significant investments in the management of its native forests, which are protected by law and subject to tax exemptions.[35] The Forest Act of 1987 prohibits logging native forests, with very few exceptions. It provides exemptions on national and local land taxes as incentives to register areas with native forests (registration in the National Forestry Directorate is voluntary). The law also prompted an increase in the area of commercial forestry plantations, significantly improving Uruguay's CO_2 sequestration. The National Strategy for Native Forests (Estrategia Nacional de Bosque Nativo), launched in 2018, sets out as national policy for the conservation and enhancement of native forest carbon stocks, sustainable forest management, and the reduction of emissions from deforestation.[36] These strategies also highlight the importance of promoting synergies between forest lands and livestock that will enhance and improve animal welfare and adaptation to climate change.

[35] Public Law N° 15939 of 1987 and its regulatory decrees (Forestry Law). IMPO – Centro de Información Oficial (1987) Law N° 15939. Available at: https://www.impo.com.uy/bases/leyes/15939-1987

[36] Ministry of Livestock, Agriculture and Fisheries (2018) Estrategia Nacional de Bosque Nativo. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/documentos/publicaciones/estrategia_nacional_de_bosque_nativo.pdf

This national strategy is underpinned by the REDD+ program, which guides the conservation of ecosystem services and aims to reduce emissions from deforestation and forest degradation.[37] In 2016, Uruguay launched the Program to Reduce Emissions Caused by Deforestation and Forest Degradation (REDD+), based on a REDD+ framework developed for Uruguay in coordination with all relevant stakeholders,[38] which aims to address climate change through incentives designed to prevent deforestation and to protect the quality and integrity of forests. The program identifies causes of native forest deterioration and outlines action plans to mitigate them and conserve and enhance forest sinks, prioritizing those areas with water basins as well as those adjacent to livestock and agriculture production areas.

As a result of these policies, Uruguay has managed to ensure that agricultural activity is not a driver of deforestation. Existing policies, in combination with the oversight of the Ministry of Livestock, Agriculture and Fisheries (Ministerio de Ganadería, Agricultura, y Pesca, or MGAP for its Spanish acronym), have led to the preservation of the country's total native forest cover over the last decades.

Institutional and Legal Framework for Climate Action

Uruguay has made substantial efforts to strengthen its institutional capacity and policy instruments to meet its climate change commitments and to ensure the preservation of natural resources. It established a unique institutional framework for climate change in 2009, called the National Response System to Climate Change and Variability (Sistema Nacional de Respuesta al Cambio Climático y Variablidad, or SNRCC for its Spanish acronym). Through the SNRCC, each ministry and respective government agency has defined and committed to specific measures within its respective jurisdictions, thus generating strong ownership and accountability mechanisms. The SNRCC is led by a rotating group of Ministers and articulated by the Ministry of Environment's National Directorate for Climate Change (DINACC, for its Spanish acronym).

In June 2016, Congress enacted legislation creating the National Environmental System (Sistema Nacional Ambiental, or SNA, for its Spanish acronym). It is tasked it with articulating all public policies related to the environment, water, and climate change.[39] It aims at shaping, coordinating, and strengthening environmental, water, and climate change policies, as well as fostering sustainable environmental development that preserves ecosystems and promotes the protection and rational use of water sources.

[37] Ministry of Livestock, Agriculture and Fisheries (2020) REDD+. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/politicas-y-gestion/redd
[38] Uruguay has already completed and reported its progress in the REDD+ Readiness Phase, supported by the FCPF (Forest Carbon Partnership Facility)
[39] IMPO – Centro de Información Oficial (2016) Decreto N° 172/016. Available at: https://www.impo.com.uy/bases/decretos/172-2016

These efforts were further advanced with the development and adoption in April 2017 of Uruguay's National Climate Change Policy (NCCP).[40] It sets forth a long-term strategic framework to forge a growth model based on resilient and low-carbon development, guiding the reforms to mitigate climate change and meet the obligations assumed under the Paris Agreement. The NCCP establishes 20 strategic priorities and 72 lines of action spanning five dimensions: governance, knowledge, social, environment, and production.[41]

Successive governments have carried forward biodiversity and ecosystem conservation. In December 2018, Uruguay approved the National Environmental Plan for Sustainable Development, with targets for 2030 as well as intermediate benchmarks.[42] It is a medium and long-term strategic planning instrument that encompasses the dynamics of technological and social changes and incorporates actions to promote environmental public policies to advance the country's sustainable development.

Another key framework adopted by Uruguay is the National Biodiversity Strategy, which sets out national policy for the conservation and sustainable use of biological diversity, including adaptation elements and measures through conservation plans for protected areas, which also generate climate change emission reduction (mitigation) co-benefits.[43] In 2018, Congress unanimously approved the Law for Agroecological Production,[44] which consolidates previous steps for mitigation along with conservation through improved soil management, runoff control, forest plantation certification, and watershed planning.

Climate change is a critical issue for Uruguay due to the country's high vulnerability to climate risks. Uruguay has promoted a series of national plans to adapt to and to mitigate the effects of climate change, such as the 2019 National Adaptation Plan to Variations and Climate Change in the Agricultural Sector (Plan Nacional de Adaptación a la Variabilidad y el Cambio Climático para el Sector Agropecuario), the 2020 National Adaptation Plan for the Coastal Zone (Plan Nacional de Adaptación para la Zona Costera), and the 2021 National Adaptation Plan for Cities and Infrastructure (Plan Nacional de Adaptación en Ciudades e Infraestructuras).

[40] IMPO – Centro de Información Oficial (2016) Decreto N° 310/017. Available at: https://www.impo.com.uy/bases/decretos/310-2017/1
[41] Ministry of Housing, Land-Use Planning and Environment (2019) Fifth National Communication to the Conference of the Parties to the United Nations Framework Convention on Climate Change – Uruguay, 2019. Available at: https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/63801597_Uruguay-NC5-1-20191231%20URUGUAY%20NC5%20EX%20SUM%20ENG.pdf
[42] The National Environmental Plan for Sustainable Development was approved by the National Environmental Cabinet in December 2018. See: Ministerio de Ambiente (2019) Plan Nacional Ambiental para el Desarrollo Sostenible. Available at: https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/plan-nacional-ambiental-para-desarrollo-sostenible
[43] The National Biodiversity Strategy is part of the fulfilment of Uruguay's commitments as a State Party to the United Nations Convention on Biological Diversity (CBD). See: Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente and Ministerio de Relaciones Exteriores (2016) Estrategia Nacional para la Conservación y Uso Sostenible de la Diversidad Biológica del Uruguay. Available at: https://www.gub.uy/ministerio-ambiente/sites/ministerio-ambiente/files/documentos/publicaciones/estrategia_nacional_deZ_biodiversidad_2016_2020.pdf
[44] Law No. 19717 declares of general interest and creation of a national honorary commission and national plan for the promotion of production with agroecological bases. See: IMPO – Centro de Información Oficial (2018) Law N° 19717. Available at: https://www.impo.com.uy/bases/leyes/19717-2018

Several incentives and tax benefits have been introduced for low-carbon productive investments. Under the Investment Promotion Law,[45] the government grants tax exemptions to private investments that generate certain favorable externalities. Companies that qualify recover a percentage of the executed investment (between 30 percent and 100 percent) depending on the score obtained in the matrix of committed indicators, which is based on usage of clean technologies. This indicator covers investment in those goods that contribute to environmentally sustainable production, either through efficiency in the use of resources such as raw materials, inputs, water, and energy, the substitution of fossil fuels for renewable ones (solar thermal, wind, waste-to-energy, and photovoltaic renewable energy generation), or through positive environmental impacts such as those derived from biogas purification, internal water recycling, and reduction in the generation of waste, effluents, and polluting emissions.[46]

Recent policies and developments (2020-2022)

The government is committed to climate action. As the country moves from pandemic response to economic recovery, the Government of Uruguay is committed to making economic growth consistent with a pathway towards low greenhouse gas emissions and a climate-resilient economy through a holistic combination of macroeconomic, fiscal, and financing policies.

In July 2020, the government created the Ministry of Environment (Ministerio de Ambiente, or MA for its Spanish acronym and formerly the Ministry of Housing, Zoning and the Environment). It is tasked with formulating, executing, supervising, and evaluating national policies for the protection of the environment. Advancing climate policies, along with those for clean water and sanitation, biodiversity and environmental services, environmental impact, and solid waste programs, is closely aligned with the SDG 2030 goals.

The Ministry of Economy and Finance (Ministerio de Economía y Finanzas, or MEF for its Spanish acronym) is also stepping up its role in addressing the nation's climate and biodiversity objectives by incorporating climate action into the design of financial and public policies. As part of this effort, MEF is developing a roadmap for mainstreaming climate within all relevant areas of economic policy.[47] Among other initiatives, the MEF is working on developing modeling tools to assess the macroeconomic and fiscal impact of climate change and environmental policies on the economy.

[45] IMPO – Centro de Información Oficial (1998) Law N° 16906. Available at: https://www.impo.com.uy/bases/leyes/16906-1998
[46] Also provides incentives for investments in electric vehicles, renewable energies, LEED (Leadership in Energy and Environmental Design) certified buildings and adaptation to climate change in the agricultural sector.
[47] In coordination with the Ministry of Environment, this expanded participation includes the current development and implementation of a specific MEF Climate Action Plan, which includes all of the divisions within the ministry that have a role in mainstreaming climate policy, whether in resource allocation, macroeconomic studies, tax policy, debt issuance and budgetary allocation. The MEF will inform the rest of the government and the society about the economic impacts of alternative emissions´ paths, collaborate in the design of economic incentives and assess the fiscal impact and macroeconomic implications of the alternative climate policies.

With these goals in mind, in October 2020, Uruguay joined the Coalition of Finance Ministers for Climate Action Ministerial Forum. Subsequently, the country incorporated the 2019 "Helsinki Principles" in the 2020-2024 Budget Law to reaffirm the notion that climate change considerations are at the center of the planning and design of economic policies.[48] On a regional scale, Uruguay is also playing an active leadership role within the Inter-American Development Bank's (IADB) Climate Change Platform for Finance Ministries which supports the development and implementation of policy solutions adapted to countries of the Latin American and Caribbean region.

The Government of Uruguay has formulated its Green Hydrogen Roadmap with a vision of becoming a producer and exporter of green hydrogen in the medium term by harnessing its abundant renewable energy sources such as water, wind, and biomass.[49] As a first step in this process, in April 2021, the Ministry of Industry, Energy and Mining (MIEM, Ministerio de Industria, Energía y Minería for its Spanish acronym) launched a data room for its H2U pilot project, with the aim of developing the country's first green hydrogen endeavor through the coordinated efforts of public and private stakeholders. As a second step in the process, in the first quarter of 2022 the government launched a public request for proposals for the construction of a facility to produce and distribute green hydrogen. Simultaneously with that legislation, the government approved new air pollution regulations, including the establishment of air quality objectives to reduce risks to human health and ecosystems.[50]

Congress has also passed legislation to implement a tax on carbon dioxide emissions from the use of gasoline, effective from January 2022. Under the previous law (N° 19996), fuels with CO_2 emissions were taxed with an Internal Specific Tax (IMESI) that was applied per liter of fuel.[51] Under the new law, which recognizes that various types and grades of vehicle will emit differing levels of CO_2, the combustion of gasoline is taxed through a partial substitution of the IMESI for another tax based on CO_2 emissions per liter of gasoline. The government will adjust the amount of the tax per liter of gasoline on an annual basis, according to the information (on CO_2 emissions) provided by the MIEM to the MEF and based on the updated Consumer Price Index.

In May 2022, the MA and the MGAP established an inter-ministerial taskforce to prepare a joint report on the environmental footprint of livestock production in Uruguay. This will serve as a national roadmap toward further reducing that footprint and thereby confirm Uruguay's global leadership as an environmentally responsible beef producer.[52]

[48] IMPO – Centro de Información Oficial (2020) Ley N° 19996. Available at: https://www.impo.com.uy/bases/leyes/19924-2020/533
[49] Ministerio de Industria, Energía y Minería (2022) Green Hydrogen (English). https://www.gub.uy/ministerio-industria-energia-mineria/green-hydrogen
[50] IMPO – Centro de Información Oficial (2021) Decreto N° 135/021. Available at: http://www.impo.com.uy/bases/decretos/135-2021
[51] IMPO – Centro de Información Oficial (2021) Ley N° 19996. Available at: https://www.impo.com.uy/bases/leyes/19996-2021
[52] Ministero de Ambiente (2022) La Huella Ambiental. Available at: https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/huella-ambiental

Chapter 3

The Path Ahead

Environmental Commitments under the Paris Agreement and COP26 Pledges

NDC commitments

In November 2017, Uruguay submitted its First Nationally Determined Contribution. This is Uruguay's only currently binding NDC.[53] The NDC is the intended central policy-planning instrument through which countries define specific actions for the achievement of the Paris Agreement's objectives.[54] The NDC also highlight climate actions, including climate-related targets, policies, and measures that governments aim to implement in response to climate change and as a contribution to global climate action. NDCs are submitted every five years to the UNFCCC according to the provisions in the Paris Agreement.

Uruguay's NDC sets ambitious targets on climate change and conservation of natural capital by 2025. It sets forth goals to achieve a significant reduction of the economy's GHG intensity as a share of real GDP: 24 percent reduction in CO_2, 57 percent reduction in CH_4 (methane), and 48 percent reduction in N_2O (nitrous oxide) emissions by 2025 compared to 1990. Beyond economy-wide intensity-reduction targets, the NDC also defines sector-specific objectives on carbon intensity of food production and for the land use sector, among other measures.[55]

Uruguay's first NDC also included a comprehensive and ambitious plan for the mitigation of cattle-driven emissions and adoption of land use best practices. It set a 32 percent reduction in CH_4 and a 34 percent reduction in N_2O emissions intensity per product unit (gigagrams of beef cattle measured in live weight) by 2025 compared to 1990. An important measure to mitigate emissions lies in the adoption of good agricultural practices for grasslands and herd management. Specifically, by 2025 the country has committed to avoiding CO_2 emissions from soil organic carbon in 1 million hectares of grassland (10 percent of the total grassland area) by incorporating good practices in pasture and herd management.

[53] United Nations Climate Change, Nationally Determined Contributions Registry (2017) REPÚBLICA ORIENTAL DEL URUGUAY Primera Contribución Determinada a nivel Nacional al Acuerdo de París. Available at: https://unfccc.int/sites/default/files/NDC/2022-06/Uruguay_Primera%20Contribuci%C3%B3n%20Determinada%20a%20nivel%20Nacional.pdf

[54] The document outlines more than 100 adaptation, mitigation, and cross-cutting measures.

[55] The NDC presents three types of mitigation objectives: (i) global objectives for GHG emissions intensity regarding the evolution of the economy; (ii) specific objectives for GHG emission intensity regarding food production and (iii) specific objectives for the Land Use, Land-Use Change and Forestry (LULUCF) sector. The objectives submitted by Uruguay are cast in unconditional and conditional terms. The unconditional ones imply that Uruguay commits to achieving those goals with its own means. The objectives submitted by Uruguay in conditional terms are of such ambition that demand additional means of implementation from external sources, which would allow for an increase of mitigation capacities. Uruguay will comply with them conditional "...on additional specific means of implementation the country may receive, through funding, technology development and transfer and capacity building" (NDC 2017).

The NDC also included quantitative goals for improved dairy farm practices (covering 40 percent to 75 percent of all dairy farms) to decrease methane from farm effluent, as well as the implementation of soil conservation practices, crop rotation, cover crops, and the use of native grasses on up to 95 percent of all agricultural areas. Consistent with these commitments, Uruguay continues to make progress towards its goal of becoming one of the world's leading players in low-emissions food production.

Uruguay has demonstrated its commitment to forest preservation by instituting targeted policies on native and planted forests, as well as on soil preservation. The country has committed to retaining, by 2025, 100 percent of the native forest area identified as of 2012. Its commitment also includes specific forest managements targets. The first measure complements good practices related to cattle management by maintaining the total forest area used for shade and shelter. A second measure focuses on reversing the negative consequences of land degradation by maintaining constant the total area of primary woodlands. Finally, Uruguay is committed to the development of sustainable silvo-pastoral opportunities through the integration of trees and grazing livestock operations on the same land – this will help monetize the natural economy and its bio-services, most notably carbon sequestration. As such, a specific target has been designed to maintain 100 percent of total forest areas dedicated to economic activity in 2015. Accordingly, within this integrated strategy, the country expects not only to increase carbon stocks through the restoration of degraded areas, but also to identify opportunities to enhance carbon capture.

The NDC also includes adaptation measures to address climate change, a material issue due to the country's high vulnerability to physical climate risks. These include droughts, floods, heatwaves, strong winds, hail, frost, and severe storms.[56] Because of this vulnerability, strengthening adaptation and resilience capacity has long been a high priority for the country. Uruguay identified 38 specific adaptation measures in its first NDC, which include the elaboration and implementation of specific adaptation plans in agriculture, coastal zones, cities and infrastructures, and the energy and health sectors.

The mitigation targets and adaptation measures included in the NDC were defined through a highly consultative, whole-of-society process. The NDC is not just a policy document, but an important platform from which to engage society. Under the guidance of the SNRCC, there was a process to both define objectives and design specific measures for each objective from within all relevant sectors of the economy. The entire exercise took a holistic approach, focused on the consideration of economic, technological, and social constraints that had to be overcome to deliver an NDC that was as ambitious as realistically achievable.

[56] Climate change is expected to worsen risks from droughts, compounding water stress, while also bringing more frequent severe storms. Periodic droughts disrupt water availability for agriculture in northern areas of the country. Agricultural-based activities are particularly vulnerable to climate variability and extreme events, as the increased frequency of drought and floods generates significant losses, especially for small producers with insufficient risk-coverage alternatives. See: Ministerio de Ambiente (2019) Quinta comunicación nacional. Available at: https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/quinta-comunicacion-nacional

Following this design process, public presentations of the goals and measures were held in Montevideo as well as in major cities around the country, involving government agencies, civil society, research institutions, vulnerable populations, and the private sector. To further promote citizen engagement, these presentations were complemented by an online consultation, through a web page that was opened to collect inputs and contributions from the public.

Uruguay tracks progress towards these targets through the programming, Measurement, Reporting and Verification (pMRV) system. It employs rigorous, internationally agreed-upon scientific and methodological standards to monitor progress and track implementation towards these NDC targets, thus contributing to the Paris Agreement's Enhanced Transparency Framework (ETF). Through its pMRV tool, Uruguay keeps readily available and easily accessible up-to-date information on all indicators set in the 2017 NDC and assesses progress towards targets and measures. Uruguay is one of the few emerging market countries that has an NDC tracker online ("Visualizador de Avances de la Contribución Determinada a nivel Nacional y otros Indicadores Vinculados").[57]

Uruguay is poised to adopt more ambitious targets over time, backed by growing scientific evidence, declining technology costs, and rising citizen engagement with climate change action. Uruguay is currently preparing its second NDC, which will cover the 2025-2030 period. That process will also seek buy-in from the relevant stakeholders, as well as estimate and disseminate a clear understanding of the costs and expected benefits of this transition. The next NDC, expected by the end of 2022, is bound to further accelerate the country's climate adaptation and emissions mitigation with targets that are increasingly ambitious, as required by the ratchet mechanism in the Paris Agreement (which sets increasing levels of ambition over time with each successive NDC).

Uruguay's Long-Term Climate Strategy (LTS) and recent commitments under COP26

Increasing its efforts to address climate change, Uruguay launched a long-term climate strategy (LTS) in December 2021, as part of its commitment to the Paris Agreement goals. It lays out Uruguay's long-term vision for combating climate change and the goal of CO_2 neutrality by 2050.[58] Uruguay's LTS states the country's contribution to meeting the objectives of the Paris Agreement and the external support required to do so. Priorities include climate adaptation and resilience, as well as GHG emissions and removals, based on technologically feasible scenarios, to underpin the country's contribution to the fulfillment of the agreement's objectives.

[57] The government has developed a web-based, open-data platform to report on the progress of its NDC economy-wide and sector-specific targets. Available at: Ministerio de Ambiente (2022) Visualizador de avances de la Contribución Determinada a nivel Nacional y otros indicadores vinculados. Available at:
https://visualizador.gobiernoabierto.gub.uy/visualizador/api/repos/%3Apublic%3Aorganismos%3Aambiente%3Avisualizador_cdn.wcdf/generatedContent

[58] Sistema Nacional de Respuesta al Cambio Climático – SNRCC (2021) Estrategia Climática de Largo Plazo de Uruguay. Available at:
https://unfccc.int/sites/default/files/resource/URY_LTS_Dec2021.pdf

In this document, Uruguay once again reaffirms its commitment to act responsibly, in coordination with the international community, to confront the challenges of climate change. The LTS aims to reduce GHG emissions without threatening food production (based on the principle of common but differentiated responsibilities and respective capabilities).[59] To contribute to the Paris Agreement goal of tempering the increase in global average temperature to 2ºC above pre-industrial levels, Uruguay's strategy contemplates its own CO_2 neutrality by 2050 as well as stabilization in CH_4 and N_2O emissions. The LTS is a guide for the formulation of the next NDC, particularly for the second contribution that Uruguay will submit to the UNFCCC in 2022, which will set forth 2030 objectives and measures to meet them.

Additional indications of this commitment are seen in Uruguay joining three initiatives at COP26 in 2021, along with more than 100 countries:

- The Global Methane Pledge, a collective effort to reduce global methane emissions by at least 30 percent from 2020 levels by 2030.
- The Glasgow Leaders Declaration on Forest and Land Use (including, a "zero-deforestation" commitment by 2030).
- The declaration on accelerating the transition to 100 percent zero emission cars and vans.

Given the weight of agricultural methane emissions in Uruguay´s GHG inventory, joining the Methane Pledge is a strong testament to the country's strong stand in its commitment to fight the causes of climate change.[60] Similarly, by endorsing the Glasgow Leaders' Declaration, in which signatories vowed to end forest loss and land degradation by 2030, Uruguay has committed to strong action to reverse the deforestation processes that are causing the disappearance of large carbon reservoirs around the world – demonstrating the relevance of forest preservation and biodiversity conservation to its own national goals.[61]

[59] Uruguay's commitment to civil society participation and government transparency was also reflected in the elaboration of its long-term strategy, which includes open, transparent, public consultations. The country enabled a dedicated web page, along with an on-going open dialogue with stakeholders, at:
https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/consulta-publica-estrategia-climatica-largo-plazo.

[60] The Pledge aims to catalyze global action and strengthen support for existing international methane emission reduction initiatives to advance technical and policy work that will serve to underpin participants' domestic actions. The Pledge also recognizes the essential roles that the private sector, development banks, financial institutions, and philanthropy play to support implementation of the Pledge and welcomes their efforts and engagement.

[61] Uruguay has made several international commitments to preserve its native forests and its biodiversity, such as the United Nation Convention to Combat Desertification (1998); Montreal Process (1995); United Nation Convention on Biological Diversity (1993); Convention of Wetlands – RAMSAR (1984); Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975).

Pending Challenges

Energy and transportation

There is a need to bring the transport sector, now largely dependent on carbon-based fuels, in line with the country's climate-related decarbonization targets. While in Uruguay there has been progress in moving away from fossil fuels in the electricity generation matrix, the primary energy matrix remains about 42 percent fossil fuel based, given that the transport and industry sectors (which together account for over 71 percent of Uruguay's energy consumption) still rely extensively on fossil fuels. In particular, the transport sector still largely depends on oil and is the largest CO_2 emitter in Uruguay, as economic growth has led to an increase in internal combustion engine vehicle acquisition and use. Emissions from transport have grown from 3.101 Gg of CO_2 in 2010 to 3.871 Gg of CO_2 in 2021.[62]

Renewable supply/demand imbalances in the power network affect the quality and availability of energy. While Uruguay's increased power generation capacity has led to an energy surplus, most of that surplus is in non-dispatchable renewable electricity produced outside peak consumption times; that is, it comes from sources (such as wind and solar) that cannot be controlled or adjusted to meet fluctuating demand. This creates inefficiencies for business and prompts them to rely on more CO_2 intensive sources.

Food production

As a food supplier for an increasing world population, Uruguay is challenged to increase production volumes while preserving its unique grassland ecosystem and protecting its native forests. Uruguay is one of the few countries in the world where the livestock production system for beef and dairy is based on natural grassland ecosystems. Uruguay's robust agriculture and cattle raising sector has historically driven land-use change and led to economic pressures for deforestation. While improved efficiency and production intensity have reduced this demand for expansion of pasture lands, higher commodity prices and increases in the value of land increase the opportunity cost of the soil occupied by native forests, thereby requiring greater efforts to ensure that progress on afforestation persists even while the Uruguayan economy continues to grow. Meanwhile, national efforts to mitigate climate change have the additional challenge of not compromising food production, as Uruguay is determined to continue to provide food security to its citizens while contributing to ending world hunger as the global population grows.[63]

[62] Ministry of Industry, Energy and Mining (2021) National Energetic Balance 2021 - BEN 2021. Available at: https://ben.miem.gub.uy/balance.php
[63] In 2005, Uruguay was producing food for 9 million people. In 2016 this number had grown to 28 million people. Uruguay XXI, Uruguay, A World Reference in Food Security (English). Available at: https://www.uruguayxxi.gub.uy/en/news/article/uruguay-un-referente-mundial-en-seguridad-alimentaria/

In a world with a changing climate, the vulnerability of food systems to climate impacts poses an additional challenge that should be tackled through strategies focused on building resilience and adaptive capacities. Uruguay has been working to mainstream climate-smart agri-food systems and to implement food production practices that support its international standing as a country that advances clean, green, and responsible agriculture, generates safe products of high intrinsic quality, and respects animal health and welfare.[64] That way, the country continues to meet stringent market demands while adapting to evolving consumer preferences regarding environmental sustainability.

Native forests

Globally, climate change poses a significant risk to native forests. Although not the sole driver, one key challenge is increased heat waves and fires. These new risks confirm the challenge and ambition of Uruguay's commitment to preserve and maintain its native forests and to secure and dedicate more resources to meet this objective.

Increasing economic pressures at the national level have exacerbated climate-related challenges in agriculture. Since the early 2000s, Uruguay has experienced steep growth in land used for agriculture and an equally important intensification of production activities. While this has resulted in the economic growth necessary to improve the population's quality of life, the advancing crop production area led to some loss of natural grasslands and wetlands. From an economic point of view, expanding crop yields per hectare also increased the price of the agricultural land in several regions of the country, which in turn increased the opportunity cost of not exploiting the soil occupied by native forests. Notwithstanding this, Uruguay has taken measures to ensure the conservation of the native forest area through prevention and control of illegal logging and by granting tax exemptions for the conservation of the native forest.

Unlike other countries in the region and elsewhere, 97 percent of Uruguayan land is private property.[65] While this constitutes an additional challenge for Uruguayan policy makers seeking to preserve native forests, to date it is one that they have overcome, largely through the levying of substantial fines and robust monitoring to support enforcement of the countries forest conservation regulations. While improved efficiency and production intensity have reduced the demand for private expansion of pasture lands, higher commodity prices and increases in the value of land require heightened efforts to ensure that progress on afforestation is not lost while the Uruguayan economy continues to grow. Because these efforts entail substantial resources, conserving native forests in Uruguay will continue to be challenging and highly ambitious in the years to come.

[64] Ministry of Livestock, Agriculture and Fisheries (2017) Uruguay Agrointeligente. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/2019-12/libro%20completo%20con%20hipervinculos.pdf
[65] Ministerio de Ganadería, Agricultura y Pesca y el Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (2020) Tenencia de Tierra y Bosque Nativo en Uruguay: Proyecto REDD+. Table 27 "Land and Native Forest: summary of the information collected," p. 81. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/documentos/publicaciones/9.%20Tenencia%202020-07-29%20FINAL_con%20autorias.pdf

Pathways to Environmental and Climate Progress

Uruguay is focused on achieving inclusive economic growth while mitigating the impacts of climate change, remaining a steward of its natural resources, and protecting biodiversity. The country is working towards a clean energy future through policies that seek the decarbonization of key economic sectors (with a focus on transportation and industry). In the agricultural, forestry and other land use sector, policies will be geared towards encouraging sustainable production, protection, conservation, regeneration of ecosystems, and the sequestration of carbon. The country will strive to attract investments in clean transport, agriculture, and sustainable construction to continue building upon the substantial progress already made in recent years.

Energy and transportation

Over the coming decade, the Government of Uruguay aims to realize a second energy transition in line with the objectives of the country's Long-Term Strategy (LTS), which calls for CO_2 neutrality by 2050. To move quickly and decisively toward the decarbonization of the transport sector, the government has taken steps to accelerate the adoption of zero-emission vehicles, offering policy incentives such as lowered import duties and income tax deductions for businesses using zero-emission fleets, and financial incentives to encourage the uptake of zero-emission buses. The MIEM has set electric vehicles technology tests for transport, delivery, and last mile logistics operations. Uruguay is also developing a green hydrogen roadmap and national strategy, initiating a pilot project based on public-private partnerships.[66] Preliminary studies show green hydrogen derived from water electrolysis can be cost competitive for internal use, as well as exported to create a sizable revenue stream.

Decarbonizing the industrial sector will require improving the efficiency of the power system, combined with energy-demand management and the development of storage systems. Regarding efficiency improvements within the electric system, UTE, the public electricity company, is promoting demand-side management through the implementation of dynamic electric tariffs ("smart tariffs") and the installation of smart meters. UTE is also developing a storage pilot project within the sub-transmission network that will contribute to test the benefits of including renewable battery storage technologies for use during demand peak-hours, to address surges or otherwise prevent black-outs, and for improving the quality of electricity to final users.

[66] Ministerio de Industria, Energía y Minería (2022) Green Hydrogen Roadmap in Uruguay. Available at: https://www.gub.uy/ministerio-industria-energia-mineria/comunicacion/noticias/green-hydrogen-roadmap-in-uruguay

This objective will promote strategies to maintain the participation of renewable energies in the electric energy matrix through the incorporation of energy storage systems in the variable power source management.[67] Improved use of surplus energy that incorporates storage, Power-to-X technologies,[68] and demand management solutions enabled by smart grid technologies can lead to further socio-economic and environmental benefits. Shifting power demand to different times of the day can reduce demand peaks, which in turn can mitigate the need for investments in additional transmission and distribution capacity, while also reducing the thermal generation used to meet demand peaks.

The pathway towards the second energy transition is not without challenges. The key is to identify which subsectors will offer the most cost-effective interventions. One of the principal constraints under this perspective is related to technological maturity and the costs of implementation for newer, yet-to-be-proven technologies. For example, there is high potential for the electrification of the short and medium-distance transport sector through highly proven electric vehicle technologies. On the other hand, the decarbonization of industrial processes is highly conditioned to the maturity of new technologies like green hydrogen, for which Uruguay is developing pilot programs and a national plan.[69]

Agriculture and cattle raising

Reconciling environmental preservation and agricultural and livestock production requires stepped-up productivity. This is an environmental priority and one that is also important to long term economic competitiveness of the agricultural sector.[70] Uruguay is therefore pursuing technologies that lead to productivity increases while reducing emissions, through methods such as increasing the quality of bovine diets based on improved management of natural grasslands (higher digestibility leads to a reduction in the methane emission rate per unit of food ingested). Technological breakthroughs, as well as the adoption of better land-use practices by all actors, will be critical to the initiative's success.

[67] Uruguay has unparalleled conditions for an ET2, including its structural renewable energy surplus, a strong ICT sector underpinned by a very high level of digital connectivity (Uruguay is the only LAC country member of the Digital 9), strong government support (including from the government-owned power company) and private sector appetite for clean-tech investment.

[68] Power-to-X technologies are processes incorporating electricity conversion and storage and/or energy reconversion, based on electricity surplus, which allow energy to be decoupled from the electric sector and used in other sectors such as transport or chemical production.

[69] Other subsectors may have some potential for decarbonization but their contribution to the country's emissions is limited or is impractical (the latter is the case of the agricultural sector, where machinery is mostly diesel-operated and no mature technology allows for cost-effective substitution strategies).

[70] Uruguay will maintain its differentiating profile as a "natural-meat" producer. That is, meat from free-range livestock raised on the natural grasslands of the Pampas Biome, and in strict compliance with animal welfare regulations. The country is a world leader in cattle-traceability systems: it is 100 percent mandatory by law for all beef stock and all slaughterhouses and meat processing and packing plans. The tracking system allows the individual identification of each animal by means of electronic ear tags. Thus, it is possible to track and identify the cut from the store shelf back to the rural establishment the animal came from.

Uruguay has incorporated the concept of sustainable intensification as one of the strategic lines of the MGAP.[71] These include adopting land-use optimization strategies, planning land-use and watershed protection, making regulatory adjustments for the responsible use of agrochemicals, proposing national policies on the conservation and use of natural grasslands and native forests, valuing natural grasslands for their productive attributes, and promoting good agricultural practices. The ongoing implementation of climate-smart agricultural policies has promoted the adoption of improved forage management in cow-calf operations and on the finishing phase of livestock production, which, at the same time, prevents carbon loss from soils. In the beef, dairy, and rice production sectors, implementing public policies that support private investment in productivity-enhancing technologies has led to increased productivity with emissions intensity stabilization.

The country is also conducting a project for climate-smart livestock practices and grassland restoration with the support from the Global Environment Facility (GEF). The pilot seeks to promote the adoption of sustainable livestock practices with a focus on small-scale production to mitigate GHG emissions and restore degraded grasslands in cattle ranching.[72] The main objective of this program is to reduce GHG emissions per unit (Gg) of beef and to monitor carbon sequestration in pasture soils when good livestock farming practices are implemented. Under this program, MGAP monitors economic-productive and social variables, estimates GHG emissions at the farm level, promotes the efficiency of livestock systems, and generates national information on carbon sequestration in rangelands.[73] To reduce methane intensity, the pilot's approaches include:

- Improve diet in natural grasslands by improving grazing management.
- Improve efficiency of the herd, such as higher pregnancy and weaning, younger slaughter age, etc.
- Improve efficiency of conversion (genetics): breeding for animals with higher efficiency.
- Using feed supplements such as algae to reduce CH_4 emissions.
- Prevent animal diseases, endo and ectoparasites.

[71] For further information see: Ministerio de Ganadería, Agricultura y Pesca (2021) Plan estratégico. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/institucional/plan-estrategico Uruguay Agrointeligente. Los desafíos para un desarrollo sostenible. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/sites/ministerio-ganaderia-agricultura-pesca/files/2019-12/libro%20completo%20con%20hipervinculos.pdf

[72] Starting in 2019, this program has been implemented by MGAP, with the collaboration of MA, technical support from FAO and funding from the Global Environment Facility (GEF). It is supported by the Climate and Clean Air Coalition (CCAC) for aspects related to the monitoring of methane emissions on farms and the evaluation of the impact of changes in practices and technologies on gross emissions and per kg of meat. See: CCAC (2020) Producción ganadera climáticamente inteligente y restauración de suelo en pastizales uruguayos protocolo de monitoreo del metano. Available at: https://www.ccacoalition.org/en/node/3573

[73] The majority of Uruguay's land cover is comprised of natural pasture. Insufficient forage availability and quality has been shown to be a major factor in reduced reproductive efficiency (as the soils under grazing have generally lost some of their organic carbon content, particularly the slow carbon fraction of soil organic carbon). The mitigation option proposes to change the management of natural pasture such that the average height of forage available to livestock is increased. The increase in leaf area (and availability) will increase net primary productivity, improving weight gain and consequently the productive and reproductive indicators for the cattle inventory. This would reduce emissions and also contribute to a higher level of soil carbon sequestration.

In parallel, the National Agricultural Research Institute (INIA for its Spanish acronym) has been applying genomic techniques to cattle breeding to select animals with increased feed conversion efficiency resulting in lower GHG emissions.[74]

One type of agroforestry that may be promising for Uruguay is silvo-pastoral systems, combining livestock pasture with trees and shrubs. The idea behind this measure is to help make extensive livestock production more efficient with a higher animal carrying capacity per hectare, providing shade and shelter (from heat and storms) for livestock while sequestering carbon[75]. Silvo-pastoral systems also provide a more sustainable land-use for livestock production: in addition to shade, properly selected leguminous trees and forage species and certain other species provide higher quality nourishment to livestock. They also help to reduce methane emissions from ruminant livestock and provide nutrients to the soils and pastures. This approach also reduces the need for nitrogen fertilizers, which is another source of GHG emissions.

Moreover, the development of a National Agroecology Plan (NAP) further supports these efforts. The NAP comprises two fundamental dimensions: agricultural activity and environmental protection, including climate change mitigation[76]. Among many objectives, the NAP includes measures for the promotion of associative processes among farmers to improve sustainable agricultural production, actions that lead to reduction of the impacts of extreme weather events and support for participatory certification processes for organic production[77]. The NAP is coordinated by INIA as well as MGAP's Office for Agricultural Policy and Programming (OPYPA for its Spanish acronym).

Native forest conservation and land use

Uruguay will continue to pursue its National Strategy for Native Forest to guide the conservation of ecosystem services that forests provide during the period. The strategy encompasses:

- Establishment of management plans for native forest.
- Institutional capacity building.
- Development of protection and control systems.

[74] INIA (2013) Evaluaciones Genéticas Bovinas Uruguay. Available at: https://www.geneticabovina.com.uy/eval_raza.php?r=1&i (see more updated quote-PDF)
[75] In 2022, Uruguay became the first country in South America to export certified carbon neutral meat.
[76] IMPO – Centro de Información Oficial (2019) Law N° 19717. Available at: https://www.impo.com.uy/bases/leyes/19717-2018
[77] Ministerio de Ganadería, Agricultura y Pesca (2019) Plan Nacional Para el Fomento de la Producción con Bases Agroecológicas. Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/plan-nacional-para-fomento-produccion-bases-agroecologicas/plan-5

- Promotion of research into management techniques and production levels.
- Promotion of native forest conservation management financing.

Moreover, a national strategy within the framework of the REDD+ project is currently being developed for sustainable management of native forest ecosystems and their restoration, which will allow for both carbon sequestration and the conservation of biodiversity and quality of water, among other adaptation measures.[78]

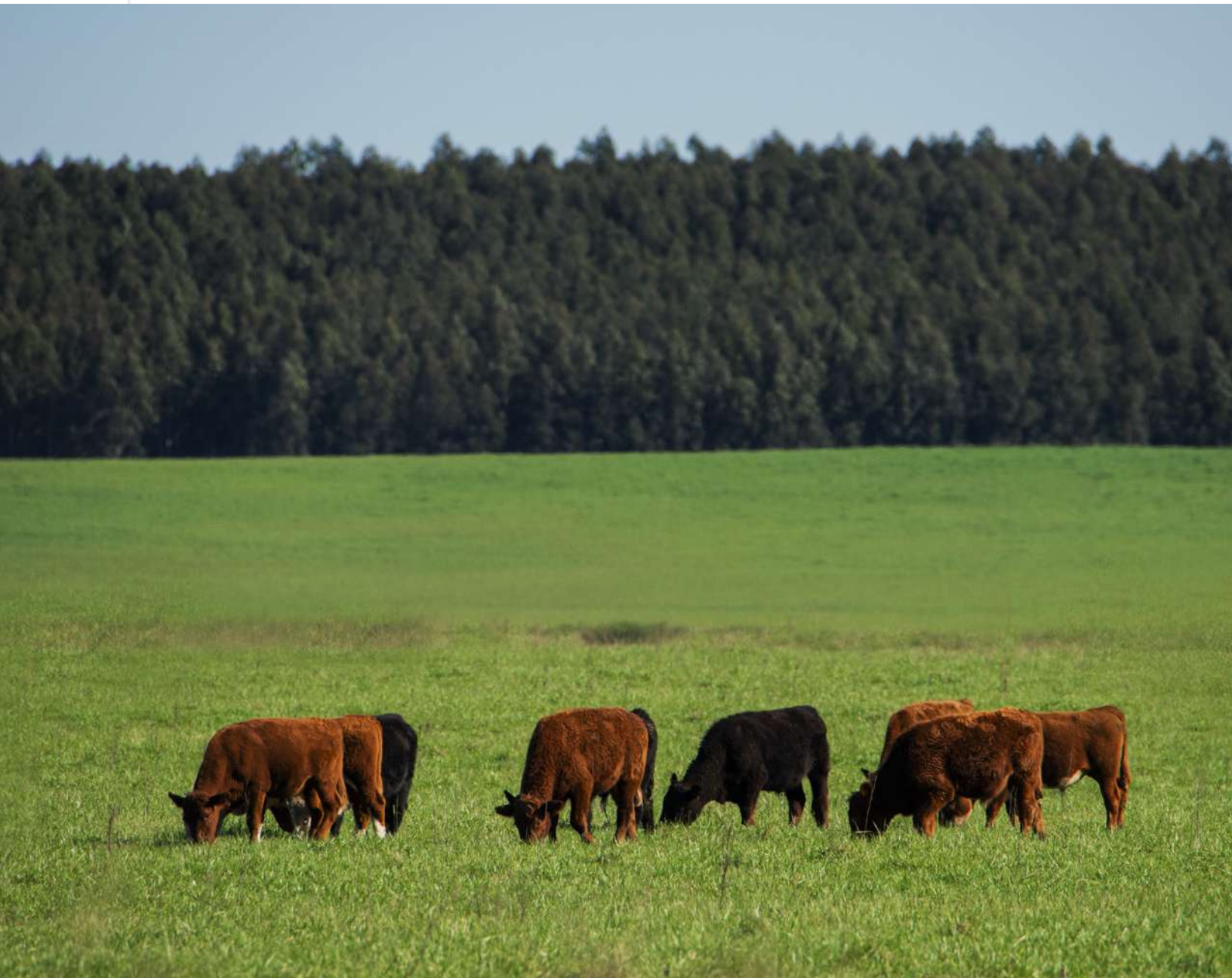
The government also took recent measures to enhance the incentives offered to promote the conservation of the native forest. The 2021 Budget Law proposes the modifications that expand criteria for the area occupied by natural forests when determining exemptions to the wealth tax and rural real estate contribution.[79] These incentives are proposed to take effect on January 1, 2023.

[78] In addition, the GEF project "Consolidating biodiversity and land conservation policies and actions as pillars of sustainable development" proposes for the period 2021-2026 to support the restoration of 2,000 ha of forest and forest land and mitigate greenhouse gas emissions. Plantatón, an initiative of the MA, MGAP, Network of Environmental NGOs and UNDP, works on the restoration of the native forest and in the coming years it would define the target area of forest to be restored. See: GEF (2018) Consolidating biodiversity and land conservation policies and actions as pillars of sustainable development. https://www.thegef.org/sites/default/files/web-documents/10081_PIF.pdf

[79] See articles 418, 419, and 429 of the 2021 Budget Law, at: https://medios.presidencia.gub.uy/legal/2022/proyectos/06/cons_min_641.pdf.

Chapter 4

Rationale for SSLB Issuances



Goals and Purpose

Through the issuance of SSLBs, Uruguay intends to harness its environmental track record and ambitious commitments under the Paris Agreement to achieve strategic sustainability goals that are relevant, core, and material to the country. The structuring and issuance of the SSLBs to be issued pursuant to this Framework is anchored in Uruguay's demonstrated commitment and continued dedication to combating climate change and preserving nature and biodiversity. Uruguay's SSLB Framework is designed to underscore and raise the profile of the country's commitments and action plan to deliver on an ambitious climate change agenda and provide investors with enhanced transparency and accountability on Uruguay's progress towards its environmental goals.

In terms of government financing strategy, the structuring and issuance of SSLBs addresses the scale liquidity challenges that the Use of Proceeds model may represent for smaller countries like Uruguay (or even recurrent green bond issuers) participating in the sustainable finance market.[80] It also seeks to broaden and diversify the country's investor base and to foster innovation in the sovereign bond markets. The government believes that these instruments can help advance Uruguay's sustainable finance agenda and result in a catalytic effect, encouraging other market players (sovereigns, financial institutions, and public and private corporates) to play a more active role in promoting Environmental, Social, and Governance (ESG)-linked investments.[81]

In addition, this Framework will allow the government to link its cost of capital to its success in meeting Uruguay's international environmental commitments. By tying the SSLB interest rate payments to achieving its targets as specified in its NDC, Uruguay seeks to implement a contingent financing mechanism that enables investors to reward countries by lowering borrowing costs if they exceed ambitious targets, while demanding a compensation by raising the interest rate if they do not deliver, thereby creating symmetrical financial incentives for sustainable policymaking in emerging markets (see the "Bond Characteristics" section for further details of the financial mechanism).

This Framework, along with any SSLB issuance pursuant to its terms, is one of many measures that could contribute to enhancing Uruguay's development as an ESG financial hub.

[80] In February 2022, Chile became the first sovereign to issue a sustainability-linked bond, with a coupon step-up feature.
[81] Bocquet, R., Braly-Cartillier, I., Pombo, M., and De Salins, A. (2021) Sustainable Issuer versus Sustainable Issuance: Providing Public Issuers of Sustainable Bonds in Latin America and the Caribbean with insight into the Nascent Universe of ESG Ratings, Inter-American Development Bank. Available at: http://dx.doi.org/10.18235/0003350.

The government sees strategic value in developing innovative financial instruments to support faster progress on the climate change agenda. In addition to this Sovereign Sustainability-Linked Bond Framework, the MEF and the Central Bank of Uruguay (BCU) – with support from the IADB Group and the United Nations Development Program (UNDP) – in September 2021 invited entities from across the financial system to create a permanent space for dialogue to collectively define and implement the country's Agenda for Sustainable Finance.[82] This agenda will serve as a public-private roadmap for the integration of sustainability criteria in investment, credit, and regulatory decisions of all actors in the financial market in Uruguay.

Uruguay's proposed SSLB mechanism implies broader incorporation of NDCs commitments into financial instruments for sovereign funding. By mainstreaming Paris-aligned KPIs embedded in SSLBs, it could help strengthen NDC systems as more sovereigns utilize this funding instrument in the market. In turn, this could pave the way for KPI standardization and could help scale up the integration of climate and nature considerations into sustainable finance instruments, for at least four reasons:

- Most countries partake in the reporting process of national climate efforts to the UNFCCC and follow the Modalities, Procedures, and Guidelines (MPGs), which establish the rules of reporting under the Paris Agreement.
- Methodologies for the estimation of GHG emissions (reported in the National GHG Inventories) are universally accepted and developed by the world's foremost scientific authorities at the Intergovernmental Panel on Climate Change (IPCC).
- National Communication submissions to the UNFCCC and the UNFCCC and the National Greenhouse Gas Inventory (NGHGI) by each country follow a regular pattern and undergoes a rigorous data assurance process. [83]
- Climate ambition is written in the rules of the Paris Agreement with ever-more ambitious NDCs, generating positive incentives to achieve the long-term goals.

This SSLB Framework is in line with, and builds on, several international policy and academic initiatives to develop markets for debt instruments linked to climate and nature-related indicators. Chamon et al (2022) review recent proposals to link the financial terms of sovereign bonds to climate KPIs, and discuss the role for multilateral institutions in developing a consistent and harmonized set of climate disclosure standards.[84]

[82] Banco Central del Uruguay (2021) El BCU promoverá un compromiso para llevar adelante una agenda de finanzas sustentables. Available at: https://www.bcu.gub.uy/Comunicaciones/Paginas/El%20BCU%20promover%C3%A1%20un%20compromiso%20para%20llevar%20adelante%20una%20agenda%20de%20finanzas%20sustentables.aspx

[83] The UNFCCC ensures transparency and reliability in the reporting of a country's greenhouse gas emissions data using a combination of measures that include reporting requirements; submission processes; national communication and biennial reports; international assessment and review processes; GHG inventory review processes; report reviews; and multilateral assessments.

[84] Chamon, M., Kolk, E., Thakoor, V., and Zettelmeyer, J. (2022) Debt-for-Climate Swaps: Analysis, Design, and Implementation. International Monetary Fund, Working Paper WP/22/162. Available at: https://www.imf.org/en/Publications/WP/Issues/2022/08/11/Debt-for-Climate-Swaps-Analysis-Design-and-Implementation-522184

The World Bank has proposed a framework for designing and assessing sovereign bonds with payments linked to the performance of key national climate and nature objectives and discuss implementation challenges (see Flugge and others 2021, Silva and Stewart 2021).[85] In particular, Elwin et al. (2021) propose a forestation-link sovereign bond.[86] Cárdenas et al (2021) illustrate how new financial instruments such as sovereign SLBs play a role in transforming NDCs into economic policy instruments to deliver on Paris Agreement objectives by adding a financially-binding policy dimension to climate policy, often understood solely as an environmental policy concern.[87] Steele et al. (2021) provide a detailed outline of the process to develop KPIs of climate and nature activities for a sovereign bond, with a focus on the coordination among government stakeholders and engagement with civil society.[88] Ferreira et al. (2021) point to a role for multilateral institutions in promoting international coordination to address gaps in the climate information architecture.[89] In particular, the Finance for Biodiversity Initiative (F4B) proposes the development of a Nature and Climate Sovereign Bond Facility that would establish guidelines for issuers and investors to design nature and climate indicators, providing a platform for monitoring and verification of performance outcomes (F4B, 2021).[90]

The F4B report sets out the case for greater use of performance-linked instruments to deepen creditor and debtor sharing of associated risks and opportunities. Cheng et al (2022) discuss the importance of embedding material financial incentives in the design of these instruments to encourage issuers to meet sustainability targets.[91] In this vein, Giraldez and Fontana (2021) argue that scaling up the sovereign SLB market will likely require coordination between debt management offices, industry groups, as well as market participants.[92]

[85] Flugge, M., Mok, R., and Stewart, F. (2021) Striking the Right Note: Key Performance Indicators for Sovereign Sustainability-Linked Bonds. World Bank, Washington, DC. Available at: https://openknowledge.worldbank.org/handle/10986/36805 ; and Silva, A.C., and Stewart, F. (2021) My Word is my Bond: Linking Sovereign Debt with National Sustainability Commitments. World Bank Blog, Washington, DC. Available at: https://blogs.worldbank.org/climatechange/my-word-my-bond-linking-sovereign-debt-national-sustainability-commitments

[86] Elwin, P., Robins, N., Willis, J., and Cozzolino, G. (2021) A deforestation-linked sovereign bond. Available at: https://planet-tracker.org/wp-content/uploads/2021/08/2.-Brazil-DLSB.pdf

[87] Cárdenas, M., Bonilla, J.P., Brusa, F., (2021) Climate Policies in Latin America and the Caribbean - success stories and challenges in the fight against climate change. IDB Monograph 929. Available at: http://dx.doi.org/10.18235/0003239.

[88] Steele, P. and Dauchy, J. (2021) Linking sovereign debt to climate and nature outcomes: a guide for debt managers and environmental decision makers. IIED and Potomac Group LLC. Available at: https://potomac-group.com/wp-content/uploads/2021/11/Linking-Sovereign-Debt-to-Climate-and-Nature-Outcomes.pdf

[89] Ferreira, C., Rozumek, D. L., Singh, R., and Suntheim, F. (2021) Strengthening the Climate Information Architecture. IMF Staff Climate Note 2021/003, International Monetary Fund, Washington, DC. Available at: https://www.imf.org/en/Publications/staff-climate-notes/Issues/2021/09/01/Strengthening-the-Climate-Information-Architecture-462887

[90] Finance for Biodiversity - F4B (2021) Greening Sovereign Debt: Building a Nature and Climate Sovereign Bond Facility London. Available at: https://www.f4b-initiative.net/publications-1/greening-sovereign-debt%3A-new-paper%3A-building-a-nature-and-climate-sovereign-bond-facility

[91] Cheng, G., Ehlers, T. and Packer, F. (2022) Sovereigns and sustainable bonds: challenges and new options. BIS Quarterly Review. Available at: https://www.bis.org/publ/qtrpdf/r_qt2209d.htm

[92] Giraldez, J., and Fontana, S. (2021) Sustainability-Linked Bonds: The Next Frontier in Sovereign Financing. SSRN Working Paper, Rochester, NY. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3829946

They also discuss the design of a sovereign framework for a credible and market-accepted verification of the KPIs performance. Recently, the launch of the "Sovereign Sustainability-Linked Sovereign Debt Hub" has added a new platform to provide support to build nature and climate outcomes into sovereign debt.[93] The Hub aims to create an inclusive cooperative space which brings together the actors from the entire spectrum of the sovereign sustainability-linked bonds universe. Finally, an emerging academic literature looks at the theoretical and practical issues in structuring a sovereign SLB (Bouzidi and Papaioannou, 2021 and Vulturius et al, 2022) and provide a framework to bridge the gap between corporate and sovereign SLBs and a mathematical framework for SLB pricing (Bouzidi and Papaioannou, 2021). [94,95]

[93] Reshaping Sovereign Debt Markets to Deliver a Sustainability Dividend. Available at: https://uploads-ssl.webflow.com/6304b688a389d80520fb16c4/6321e757fa42346e51a6984d_220914_Sustainability-linked-Sovereign-Debt-Hub_Prospectus.pdf

[94] Bouzidi, A., and Papaioannou, D. (2021) Sovereign Sustainability-Linked Bonds—Opportunities, Challenges and Pricing Considerations. SSRN Working Paper, Rochester, NY. Available at: http://dx.doi.org/10.2139/ssrn.3919159

[95] Vulturius, G., Maltais, A., & Forsbacka, K. (2022) Sustainability-linked bonds – their potential to promote issuers' transition to net-zero emissions and future research directions. Available at: https://www.tandfonline.com/doi/pdf/10.1080/20430795.2022.2040943

Chapter 5

Sovereign Sustainability-Linked Bond (SSLB) Framework

Alignment with Sustainability-Linked Bond Principles

SSLBs are financial instruments for which the financial and/or structural characteristics may vary depending on whether the sovereign issuer achieves previously defined sustainability objectives. In this sense, the issuer of an SSLB explicitly commits to improve, within a set period, certain sustainability outcomes that are relevant, fundamental, and material. Unlike a green, social, or sustainable bond issuance that focuses on the use of proceeds, the funds raised with SSLBs will not necessarily be directly allocated to finance green, social, or sustainable projects.

This Sustainability-Linked Framework (the "Framework") outlines the key elements of the SSLB issuance program of the Government of Uruguay. This Framework is jointly prepared by the MEF, the MA, the MIEM and the MGAP, with the support from the Ministry of Foreign Relations (Ministerio de Relaciones Exteriores or MRREE, for its Spanish acronym), and technical assistance and expertise from the IADB and UNDP. It is designed to reinforce and raise the profile of the country's commitments related to the climate change agenda and protection of the natural environment. The Framework also aims to provide investors with enhanced transparency and accountability regarding the country's environmental goals.

According to Sustainalytics US, Inc's Second Party Opinion, this SSLB Framework is aligned with the 2020 Sustainability-Linked Bond Principles (SLBPs), as administered by the International Capital Market Association (ICMA).[96] The SLBPs are voluntary process guidelines that outline best practices for financial instruments to incorporate forward-looking ESG outcomes and promote integrity in the development of the SLB market by clarifying the approach for issuance of SLBs.[97]

This Framework is aligned with the five components of the SLBPs:

1. **Selection and Definition of Key Performance Indicators (KPIs)**
2. **Calibration of Sustainability Performance Targets (SPTs)**
3. **Bond Characteristics**
4. **Reporting**
5. **Verification**

[96] See: http://sslburuguay.mef.gub.uy/30670/20/areas/second-party-opinion.html
[97] ICMA (2020) Sustainability-Linked Bond Principles 2020. Available at: https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/sustainability-linked-bond-principles-slbp/

Through reliance on the IPCC's methodological framework for reporting to the UNFCCC, used by all countries globally, Uruguay's KPIs are measurable, robust, and comparable internationally. The country's strong institutional climate governance framework guarantees that the NDC-linked KPIs are both aligned with the country's context and properly interpreted. Uruguay's strong pre-existing institutional capacities, coupled with its decision to increase its reporting frequency on GHG emissions beyond that required in the Paris Agreement, will allow the country to meet the criteria for a transparent monitoring process and for reference to robust, existing, and published historical data. The fact that Uruguay already meets all these criteria, combined with the fact that the country is committing to further improve its ability to meet ICMA best practices, can be viewed alongside its excellent historical track record.

The following sections illustrate alignment of the Framework with the five components of the SLBPs, providing a context for the structure of KPIs related to reduction of aggregate gross GHG emissions per real GDP unit and maintenance of native forest area.

1. Selection and Definition of KPIs and Consistency with Sustainability Strategies

Uruguay has aligned the KPIs of the SSLB to be issued pursuant to this Framework with its international commitments under the Paris Agreement and its strategic focus on climate and nature considerations, and consistent with relevant ICMA requirements. The Framework sets out goals with respect to two Key Performance Indicators (KPIs): Reduction of aggregate gross GHG emissions per real GDP unit with respect to reference year (KPI-1) and maintenance of native forest area with respect to reference year (KPI-2). Together, they address two different, but complementary, environmental global public goods: mitigating global warming and preserving a key carbon sink. Both are part of the NDC document submitted by the country to the UNFCCC. They represent two different, but complementary, environmental goals, thereby demonstrating the country's holistic climate transition strategy. By selecting these two KPIs, which are both core, relevant, and material to the country's sustainability objectives, Uruguay reasserts its commitments to achieving its NDC goals and driving forward several of the United Nations Sustainable Development Goals.

Descriptive statistics on greenhouse gas emissions and native forest cover

In 2021, Uruguay presented its latest National Greenhouse Gas Inventory, corresponding to 2019 data. The NGHGI provides the economy-wide inventory of total anthropogenic emissions by sources, and removals by sinks of all GHGs.[98] Uruguay's emissions are almost entirely determined by three global GHGs: CH_4, N_2O, and CO_2, which make up 99 percent of the total (measured by global warming potential). Key contributing sectors of CO_2 emissions were energy (including transport) and industrial processes and product use (IPPU). In the case of CH_4 and N_2O emissions, contributing sectors were agriculture (including cattle raising), waste and IPPU.

Uruguay's emission profile is strongly determined by non-CO_2 GHG emissions. According to the NGHGI 2019, CH_4 emissions represent 61 percent of aggregate national emissions, N_2O emissions correspond to 20 percent and those of CO_2 at 19 percent (without considering the mitigation provided by the land use and land use change and forestry category).[99,100]

In Uruguay, CO_2 emissions are mainly generated in the energy sector, specifically from the burning of fossil fuels. In 2019, CO_2 emissions from the energy sector represented 92 percent of total CO_2 emissions. Uruguay has no proven hydrocarbon reserves; it imports oil, which is refined by a state-owned company, and has a low consumption of imported natural gas. Electricity generation has historically been carried out with hydroelectric plants and supplemented with thermoelectric plants based on liquid fossil fuels.

Within the energy sector, transport represents the main driver of CO_2 emissions. The transport category has been surpassed only by electricity generation industries in years of low levels of hydraulic energy, requiring greater consumption of fossil fuels for generating energy. According to NGHGI 2019, the IPPU sector represented 7 percent of CO_2 emissions (mostly related to cement production), while agriculture and cattle raising represented 1 percent of total CO_2 emissions.

The agriculture, forestry and other land use (AFOLU) sector represents 76 percent of the country's total emissions.[101] Methane and nitrous oxide greenhouse gases are strongly linked to primary food production (crops and beef). The AFOLU sector accounted for 93 percent of total CH_4 and 96 percent of total N_2O emissions in 2019. Finally, the waste sector represented 7 percent of all CH_4 and 1 percent of N_2O emissions.[102]

[98] Ministerio de Ambiente (2020) Inventarios Nacionales de Gases de Efecto Invernadero (INGEI). Available at: https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/inventarios-nacionales-gases-efecto-invernadero-ingei

[99] LULUCF, along with agriculture and cattle raising, make up the agriculture, forestry and other land use (AFOLU) that is referenced by the IPCC.

[100] CO_2eq is a unit of measurement that is used to standardize the climate effects of various greenhouse gases. The GWP100AR5 metric is used to compare the three gases on a common basis. This metric involves a linear transformation by multiplying the absolute non-CO_2 emissions in Gg by a constant value. These values are called GWP factors and represent the heat-trapping ability of each GHG relative to that of CO_2.

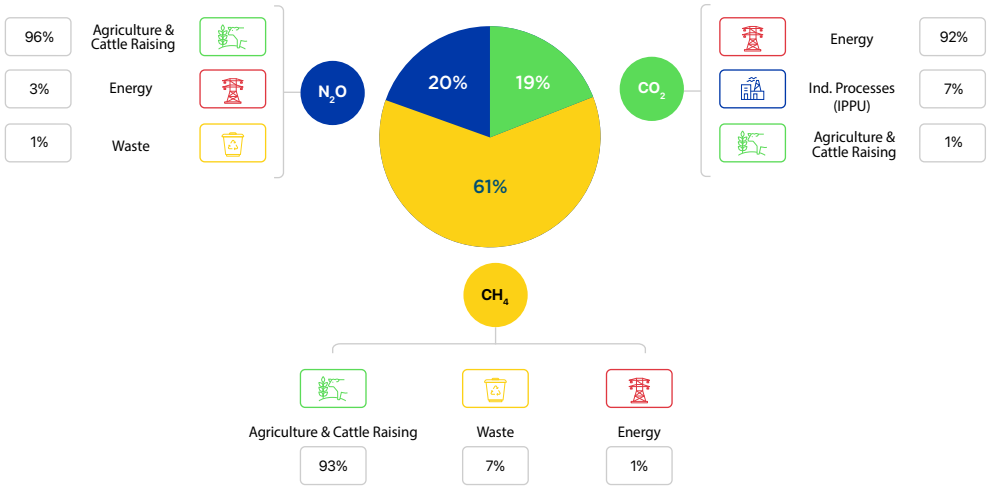
[101] National GHG Inventory, 2019.

[102] National GHG Inventory, 2019.

Cattle raising is the most carbon-intensive economic activity within the agricultural sector. CH_4 derived from beef cattle farming represents the main GHG emitting economic activity in the country. This activity accounts for 85.1 percent of CH_4 emissions (mostly due to enteric fermentation)[103] and approximately 81 percent of N_2O emissions (due to manure left on pasture by grazing animals) in 2019.[104]

Gross GHG Emissions Profile in Uruguay

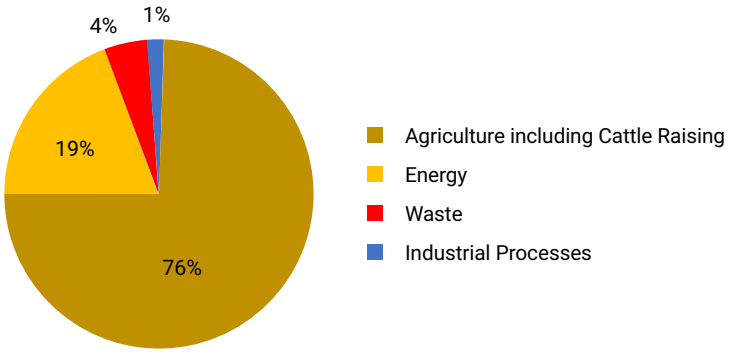
by type of gas, % of total, year 2019[1]



[1] Considers the three global GHGs and all sectors contributing emissions of each GHG, except for LULUCF.
Expressed in Gg CO_2 eq, Metric GWP100 AR5.
Source: 2019 NGHGI.

Gross GHG emissions

Contribution by sector, in % of total, year 2019[1]

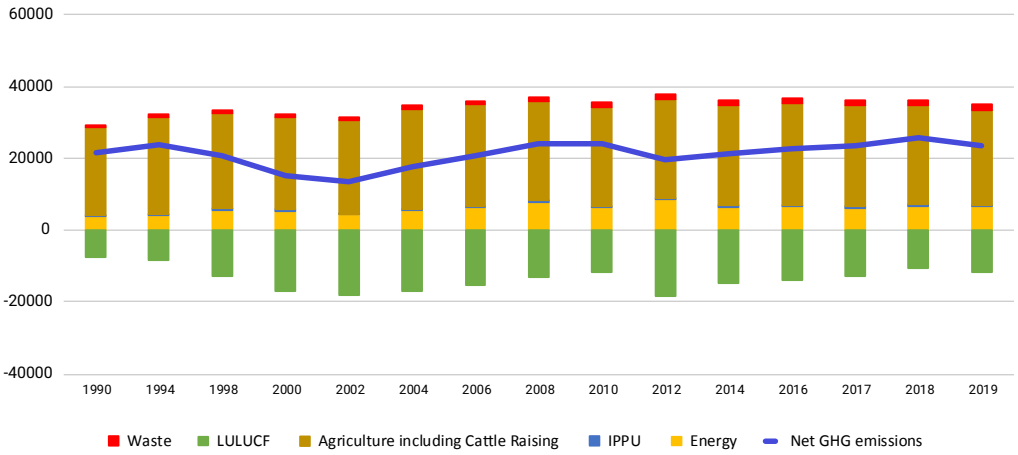


[1] Considers the three global GHGs and all sectors contributing emissions of each GHG, except for LULUCF.
Expressed in Gg CO_2eq, Metric GWP100 AR5.
Source: 2019 NGHGI.

[103] Enteric fermentation accounts for methane generated during the digestive process of ruminants (i.e., cattle and sheep).
[104] Uruguay's food production is expected to continue growing in the future, since the country has particularly fertile soils, global demand is on the rise, and the country intends to continue to contribute to global food security. This means that Uruguay's GHG inventory is, and will continue to be, heavily influenced by the emissions from the agriculture sector.

Evolution of Aggregate Gross and Net GHG Emissions

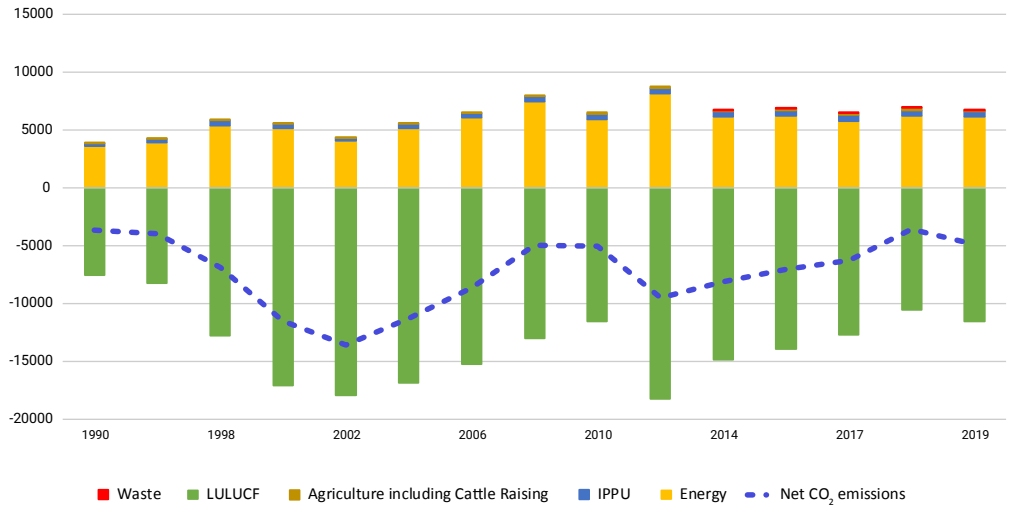
Contribution by sector, period 1990-2019[1]



[1] Considers all sectors.
LULUCF stands for Land Use and Land Use Change and Forestry. This category, with the Agriculture and Cattle Raising category conform the AFOLU sector.
This category (LULUCF net emissions) is represented here separately to better show carbon sequestration.
Years with official NGHGI publication.
Source: 2019 NGHGI.

Evolution of Gross and Net CO_2 Emissions

Contribution by sector, period 1990-2019[1]



[1] Considers all sectors.
LULUCF stands for Land Use and Land Use Change and Forestry. This category, with the Agriculture and Cattle Raising category conform the AFOLU sector.
This category (LULUCF net emissions) is represented here separately to better show carbon sequestration.
Years with official NGHGI publication.
Source: 2019 NGHGI.

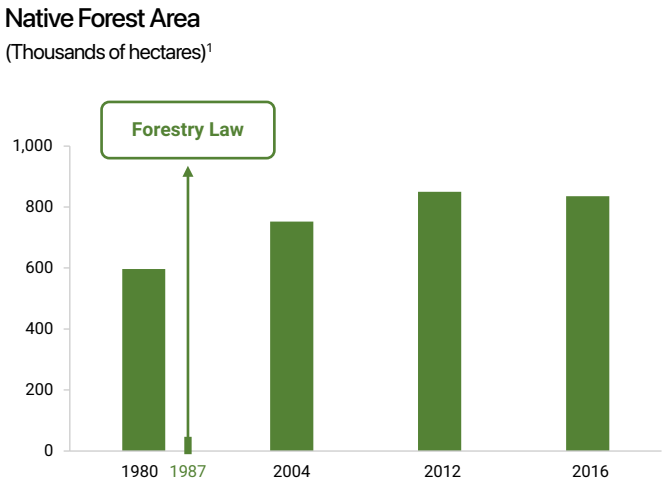
The Land Use, Land Use Change and Forestry (LULUCF) sector is the only one removing GHG in Uruguay and is consequently recorded as a sink in the emissions registry data. Carbon sequestration levels in tree plantations and in growing native forests mean that Uruguay behaves as a net CO_2 sink. The increase in the area of native and commercial forestry plantations that took place since the approval of Forestry Law led to negative net CO_2 emissions during the 1990-2019 period. The current forested area offers a gross carbon sequestration (including all three reservoirs of biomass, soil organic matter, and dead organic matter) of approximately 39,201 Gg of CO_2. When the LULUCF category's emissions are considered, the current forested area offers a net carbon sequestration of 14,792 Gg of CO_2.[105]

Uruguay has a robust time series of official forest cartographies. To date, official cartographies available at the national level are for the years 1980, 2004, 2012 and 2016, and are available at the General Forestry Directorate's (DGF, for its Spanish acronym) official website.[106]

The DGF, which is part of MGAP, monitors the status of native forest in Uruguay utilizing two instruments: the Native Forest Mapping (Cartography) and the National Forest Inventory.[107] Gross deforestation is monitored by DGF through field inspections of the mapped area for the purpose of control and monitoring. These instruments, together with stringent legislation and enforcement, has helped ensure that deforestation is not significant in Uruguay.

Maintaining the native forest cover allows the conservation of its living biomass carbon stocks and guarantees the preservation of the ecosystem. CO_2 removals from native forest, within removals from living biomass in the forest land (both forest land maintained as forest land and land that became forest land) are 1.125,36 Gg, which amounts to 3.07 percent of the total CO_2 removals from living biomass in the forest land (36.644,36 Gg).[108]

[105] Carbon sequestration from all three reservoirs (biomass, soil organic matter, and dead organic matter). NGHGI 2019 information.
[106] Link: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/native-forest
[107] These tools are complementary: the cartography provides information on the amount of surface covered by native forest, while the inventories collect information on the state, volume, species, and other qualitative characteristics of the ecosystem. Currently 580,000 hectares of native forests are registered under the National Forestry Directorate (DGF-MGAP) (registration is voluntary).
[108] These removals include: (i) increases in carbon stocks from biomass growth in forest plantation and native forest areas, (ii) increases in carbon stocks in dead organic matter in forest land, and (iii) increases in carbon stocks in soil organic matter (soil organic carbon) in land converted to forest land (mostly grassland converted to forest land, grassland remaining grassland, land converted to grassland and, to a lesser extent, in land converted to settlements and other land).



[1] Source: Dirección General Forestal, 2022.

KPI-1: Reduction of aggregate gross GHG emissions (in CO_2eq) per real GDP unit with respect to reference year (in %)

KPI-1 measures economy-wide emissions for Uruguay. This all-encompassing KPI monitors the state of Uruguay's transition towards a decarbonized economy, in accordance with the country's NDC targets.[109]

[109] The NDC includes individual goals for key greenhouse gases; this indicator on aggregate GHG emissions and its target (see section below) are included in the NDC as a "...non-binding interpretation of the three individual global mitigation objectives presented in CO_2 equivalent" (see V.viii of the NDC document).

KPI-1	Reduction of aggregate gross GHG emissions (in CO_2eq) per real GDP unit (in %)[110]
Reference year/ baseline	1990
SDG Alignment	SDG 13 Climate Action - Target 13.3: "Integrate climate change measures into national policies, strategies and planning." 
Indicator and Methodology	**Formula[111]:** $\left[1 - \frac{\left(\frac{CO_2 + \alpha1 \times CH_4 + \alpha2 \times N_2O}{GDP}\right)_t}{\left(\frac{CO_2 + \alpha1 \times CH_4 + \alpha2 \times N_2O}{GDP}\right)_{1990}}\right] * 100$ **Variables:** - GHG emissions (CO_2, CH_4, and N_2O) in Gg, in CO_2 equivalent units (Gg CO_2eq). [112] - GDP: Real Gross Domestic Product in billions of Uruguayan pesos at constant prices.[113] - α1 and α2: Values corresponding to the 100-year GWP AR5 of CH_4, and N_2O, respectively, relative to the global warming potential of carbon dioxide.[114]

This KPI aggregates the three main GHGs (CO_2, CH_4, and N_2O) and the main sectors contributing emissions of each GHG (as set out in the 2017 NDC). The GHG emissions sectors included in Uruguay´s 2017 NDC are energy, industrial processes and product use (IPPU), agriculture including cattle raising and waste, but excluding land use, land-use change, and forestry (LULUCF).[115]

Estimation of gross aggregate GHG emissions and equivalence calculations are performed following robust, peer-reviewed, scientific standards set in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006). Calculation of the KPI is to be done as per institutional arrangements made for the SSLB.

In order to aggregate the three gases on a common basis, the international standard is to use the Global Warming Potential 100 metric (where "100" stands for "100 years"). This metric involves multiplying the absolute emissions in Gg of each of the non-CO_2 GHG by a constant parameter, and then adding them up together with absolute CO_2 emissions. These parameters are called GWP factors and represent the heat-trapping ability of each GHG relative to that of CO_2 over a 100-year timeframe. Uruguay will apply GWP factors as contained in inventory reporting guidelines, currently IPCC Fifth Assessment Report 100-year GWPs (AR5), or as otherwise agreed by the CMA (Conference of the Parties serving as the meeting of the Parties to the Paris Agreement).

[110] The technical data sheet for KPI-1 is available at: http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html

[111] For the purpose of the calculation of the KPI value, and its assessment compared to SPTs, the result of the formula is rounded up or down to the nearest integer, consistent with the way the numerical goals were set under Uruguay's 2017 NDC.

[112] CO_2 eq is a unit of measurement that is used to standardize the climate effects of various greenhouse gases.

[113] The technical data sheet for GDP is available at: http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html

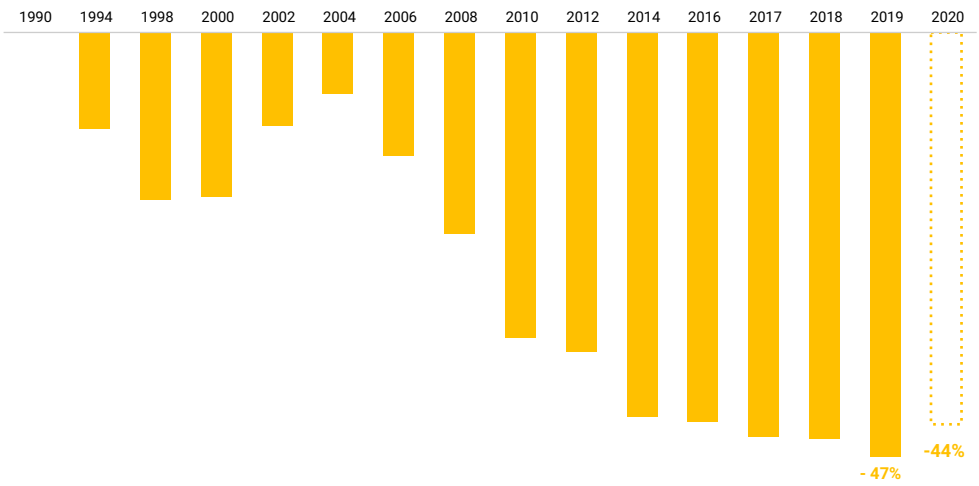
[114] According to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), the value of α1 is 28, and the value of α2 is 265.

[115] This addresses all emitting sectors as acknowledged by IPCC inventory guidelines. See: IPCC (2019) Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Available at: https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

While the country is on course towards meeting its NDC objectives, the COVID-19 pandemic traced back some of the progress on emission intensity reduction. Uruguay has been implementing a strong and progressive decarbonization of its economy and by 2019 had achieved a -47 percent reduction compared to the baseline year of 1990.[116] As result, Uruguay's GDP emissions intensity decreased by an average rate of 2.2 percent per year (from 36.85 Gg CO_2eq/UYU billion in 1990 to 19.45 Gg CO_2eq/UYU billion in 2019). However, the COVID-19 pandemic (and the ensuing real GDP contraction of 6.1 percent) led to significant increase in GHG emissions intensity (to a projected 20.78 GgCO_2e/UYU billion in 2020). This had a material adverse effect on the performance of Uruguay's GDP emissions intensity reduction, setting back the KPI-1 by close to 3 percentage points by 2020 (to a projected -44 percent).

KPI-1: Reduction of aggregate gross GHG emissions per real GDP unit

% Change compared to 1990[1]

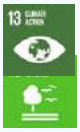


[1] Considers the three global GHGs and the main sectors contributing emissions of each GHG, as set out in the 2017 NDC.
Expressed in Gg CO_2 eq, Metric GWP100 AR5.
Real GDP measured in billions of pesos in 2016 constant prices.
Years with NGHGI publication, except for 2020 which is an official projection as of April 2022.
Source: http://sslburuguay.mef.gub.uy/30668/20/areas/kpi-1:-reduction-in-aggregate-gross-ghg-emissions-per-real-gdp-unit.html

[116] Between 1990 and 2019, real GDP grew by a cumulative 124 percent, while aggregate gross GHG Emissions increased by 25 percent over the same period.

KPI-2: Maintenance of native forest area (in hectares) with respect to reference year (in %)

KPI-2 complements KPI-1's focus on gross emissions by addressing carbon sinks. It measures native forest area cover in Uruguay, in hectares. The data used for the indicator comes from the official cartography of native forest available at the national level.

KPI-2	**Maintenance of native forest area (in hectares) with respect to reference year (in %).** [117]
Reference year/ baseline	2012 Native forest area of 849,960 ha.
SDG Alignment	SDG 13 Climate Action - Target 13.3: "Improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning." SDG 15[118] Life on land - Target 15.2: "Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally." 
Indicator and Methodology	**Formula[118]:** $\left(\frac{area\ of\ native\ forest\ in\ year\ t}{area\ of\ native\ forest\ in\ base\ year\ 2012}\right)*100$ **Variables:** - Total area of native forest in year t. - Year *t*: Year in which the area is estimated.[119] - Total area of native forest in 2012.
	The data used for the indicator comes from the official cartography of native forest area available at the national level. Uruguay defines native forest in the public law N°15939, 1987, and its regulatory decrees (Forestry Law): "Forests are plant associations in which trees of any size, exploited or not, predominate, and which are in a position to produce wood or other forest products or to exert some influence on soil conservation, on the hydrological regime or on the climate, or that provide shelter or other benefits of national interest. Based on the Decree N°452/988 that regulates the application of Law N°15939 and the methodological and operational criteria used for satellite imaging (cartographies), forests are considered to be those plant associations which, in addition to the characteristics established in Article 4 of the aforementioned law, have a minimum surface area of 0.25 hectares and a tree crown cover (canopy cover) of at least 30% of the area." [120]

[117] The technical data sheet for KPI-2 is available at http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html

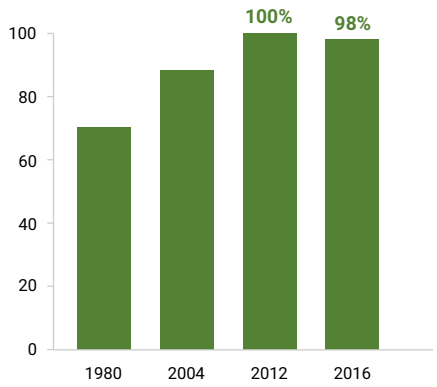
[118] SDG 15 aims to "promote the sustainable use of terrestrial ecosystems, combat desertification, halt and reverse land degradation and halt biodiversity loss."

[119] For the calculation of the KPI value, and its assessment compared to SPTs, the result of the formula is rounded up or down to the nearest integer, consistent with the way the numerical goals were set under Uruguay's 2017 NDC.

[120] Uruguay's definition of native forest, based on forest canopy structure and area extent, is stricter than the one used by FAO, along two dimensions. First, the minimum mapping area established in Uruguay's definition is a quarter of a hectare (2500 m2), half the minimum area in FAO's definition. Second, Uruguay´s operational definition establishes that forest is land with a canopy cover (or its equivalent degree of thickness) of more than 30 percent of the area, i.e., three times the one suggested by FAO.

KPI-2: Native forest area (in hectares) with respect to reference year 2012

% of native forest area compared to 2012[1]



[1] Source: Dirección General Forestal, 2022.

Data, metrics, calculation, and methodology

The methodologies used to calculate the performance of the SSLB's KPIs will be consistent with those employed to report NDC progress data to the United Nations. These are the Paris Agreement reporting standards as defined by the Modalities Procedures and Guidelines (MPG) of the Paris Agreement Enhanced Transparency Framework (ETF). The methodology of Uruguay's NGHGI will be the basis for data in relation to KPI-1, while satellite imagery and GIS-based analysis, in line with the international best practice for estimation of forest area change over time, particularly on the application of remote sensing techniques, as contained in the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance, will be the basis for data related to KPI-2.

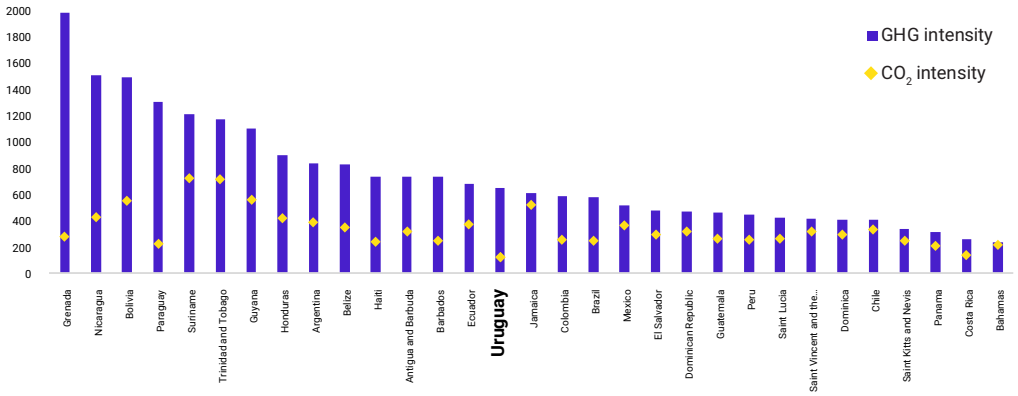
Benchmarking

KPI-1: Reduction of aggregate gross GHG emissions per real GDP unit

As of 2019, Uruguay had the lowest CO_2 emissions as a share of nominal GDP among Latin American and Caribbean countries. While the energy sector remains a relatively smaller contributor to total emissions in Uruguay, the relatively large carbon footprint from agriculture and cattle raising implies that Uruguay's total GHG intensity is approximately the median across Latin America and the Caribbean.

Gross GHG Emissions as a Share of GDP

Latin American and Caribbean countries, year 2019[1]



[1] GHG expressed in tons of CO_2eq.
Nominal GDP measured in million U.S. dollars.
Source: CAIT, Climate Watch, GHG per GDP and CO_2 per GDP in tCO_2e/ million USD GDP, for Latin America and the Caribbean countries, in 2019.

KPI-2: Maintenance of native forest area with respect to reference year

As part of the country's international commitment, Uruguay reports periodically to the Global Forest Resources Assessment (FRA) led by the Food and Agriculture Organization of the United Nations (FAO).[121] The latest assessment examines the status and trends of more than 60 forest-related variables in 236 countries and territories in the period 1990–2020 (FRA 2020).[122] The data submitted to the FRA report corresponds to the Extent of Native Forest Land (surface area measured in hectares). Data submitted to FRA also includes area of Planted Forest, also known as "Forest with exotic (i.e., non-native) species."

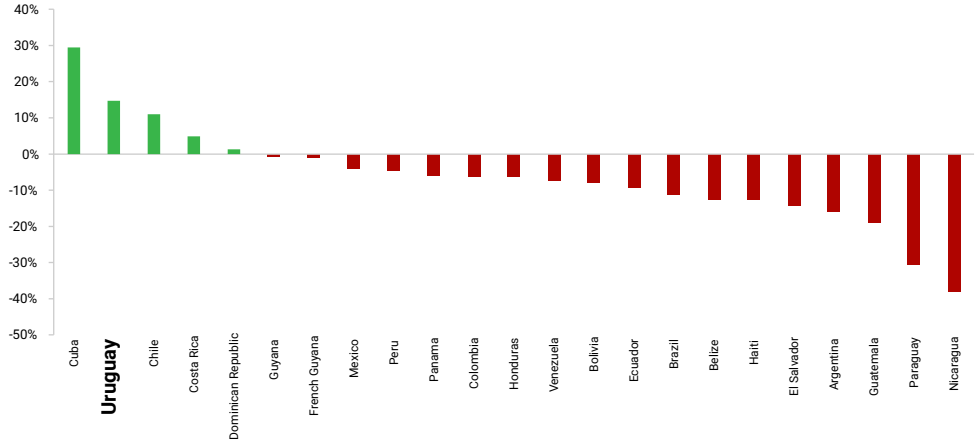
Uruguay's strong historical efforts are reflected in this most recent survey, which shows a cumulative increase in Uruguay's native forest area during this period. Measured native forest area has grown due to natural regeneration, increased coverage, and restoration plans. This trend diverges strongly from most of the countries in the region, where deforestation is driven by land-clearing for crop production (soybeans, palm oil) or land conversion to pasture for cattle farming.[123]

[121] FAO (2020) Global Forest Resources Assessments. Available at: https://www.fao.org/forest-resources-assessment/en/
[122] FAO (2020) Global Forest Resources Assessment 2020: Main report. Rome. Available from: https://doi.org/10.4060/ca9825en
[123] It is worth noting that, in the region, naturally regenerating forest cover has decreased an average of 6.4 percent, while the biggest loss recorded represents close to 38 percent.

Uruguay's current situation must therefore be viewed in this context, as similar pressures that have led to deforestation regionally exist within Uruguay and ongoing and additional actions must be taken to preserve or further expand the country's native forest cover. Maintaining 100 percent (SPT 2.1) and increasing by 3 percent (SPT 2.2) Uruguay's native forest area versus the 2012 baseline will require extraordinary effort, as other countries in the region have had cumulative decreases in naturally regenerating forest area (ranging from -5 percent to -30 percent) and the average cover across the region has decreased an average of 6.4 percent.

Change in the Area of Naturally Regenerating Forest

Selected Latin American countries, period 2000-2020 (or latest available)[1]



[1] Naturally regenerating forest is defined by FAO as forest predominantly composed of trees established through natural regeneration. In Uruguay´s case, it corresponds entirely to the native forest area and the latest official data available is for 2016.
Source: FRA, 2020.

2. Calibration of Sustainability Performance Targets (SPTs) and Consistency with Climate Change Commitments

Uruguay has established two SPTs for each KPI. All SPTs refer to the same target year 2025. These selected SPTs represent ambitious commitments aligned with the country's sustainability goals, as detailed below.

SPT 1.1 is aligned with Uruguay's NDC targets under the Paris Climate Agreement. SPT 1.2 goes beyond the NDC, representing an overachievement of Uruguay's NDC through an additional 2-percentage point reduction in total GHG emissions per unit of real GDP over the baseline 1990.

KPI-1: Reduction of aggregate gross GHG emissions (in CO_2eq) per real GDP unit with respect to reference year 1990 (in %)	
SPT 1.1	**NDC commitment[124]:** Achieve **at least 50%** reduction in GHG emissions intensity by 2025 from the 1990 reference year.
SPT 1.2	**Outperformance compared to NDC commitment:** Achieve **more than 52%** reduction in GHG emissions intensity by 2025 from the 1990 reference year.

Achieving the targeted 50 percent reduction in CO_2eq intensity by 2025 will require accelerating the rate of reduction compared to recent years. From 2014 to 2019, Uruguay's GDP emissions intensity decreased by an average annual rate of -1.6 percent. Given the projected emissions intensity for 2020, in order to achieve SPT 1.1 Uruguay will be required to accelerate the annual reduction of its gross emissions intensity between 2021 and 2025, to -2.4 percent– a much higher rate in comparison to the previous five years of reported emissions data.[125] This is a material challenge given that Uruguay has already completed its first energy transition and emissions are nowadays primarily CH_4 and N_2O, which are more difficult to abate than CO_2. With the electricity-generation mix already being predominately renewables-based and the global demand for food sources (including beef and similar protein-rich alternatives) expected to continue to grow, the additional effort to decrease emissions in the case of Uruguay will therefore require significant public and private investments and policy interventions across multiple sectors.

KPI-2: Maintenance of native forest area (in hectares) with respect to reference year 2012 (in %)	
SPT 2.1	**NDC commitment:** Maintain **at least 100%** of the native forest area compared to reference year 2012.
SPT 2.2	**Outperformance compared to NDC commitment:** Achieve an **increase higher than 3%** of the native forest area compared to reference year 2012.

SPT 2.1 is aligned with Uruguay's NDC target to maintain 100 percent of the native forest by 2025 compared to a 2012 baseline. SPT 2.2 goes beyond the NDC target representing an overachievement of Uruguay's NDC under the Paris Climate Agreement through a 3-percentage point increase in Uruguay's native forest area in comparison to the 2012 baseline year (which represents approximately 5 percent increase with respect to the latest official estimate for 2016).

[124] The target value presented in Uruguay's first NDC for this indicator was a reduction of 49 percent compared to 1990 (see page 26 of the NDC document). The value was set using the GWP100 AR2 metric, which was the one applied and accepted by the Intergovernmental Panel on Climate Change back in 2017 (where "2" stands for the "IPCC 2nd Assessment Report"). Since then, the international standard has evolved, and the target value presented for the purpose of this KPI (a reduction of 50 percent) corresponds to the mathematical equivalent in AR5 of the one originally presented in AR2 terms.

[125] The further reduction required to move from SPT 1.1 to SPT 1.2 is equivalent to an estimated 1,500 Gg CO_2eq lower emissions (representing approximately 4.3 percent of all CO_2eq emissions in Uruguay projected for 2025 under a scenario of achieving SPT 1.1).

Factors and Policies that Support the Achievement of Commitments

The Government of Uruguay is committed to integrating climate change mitigation and environmental protection objectives into its economic policy decisions, and intends to achieve the SPTs through the following strategies:[126]

SPT 1.1 / SPT 1.2

- **Decarbonization of the transport sector.** In prioritizing this sector, Uruguay is supporting the development of energy efficiency and renewable energy projects for its transportation system. An inter-institutional group on energy efficiency in transport as well as a working group on sustainable urban mobility have been established, and their recommendations are being implemented. Uruguay is also expanding the charging infrastructure for electric vehicles in key transportation corridors.

- **Efficiency in energy use.** Uruguay is continuing to test new energy sources and technologies with a view to achieving optimum levels of energy generation. It is executing strategies to improve the use of surplus energy including improving storage, "Power-to-X" technologies, and demand management solutions enabled by smart grid technologies that maximize the use of energy produced from renewable sources, particularly in off-peak hours.

- **Sustainable Livestock Farming and Production.** Under Uruguay's NDC, the country is committed to achieving 1,000,000 ha of livestock production under improved land management practices by 2025. This goal is guided by the Strategic Plan for Livestock Farming on Natural Pastures and will account for approximately 10% of the country's total pasture area. Activities in support of such a target include improved practices and technologies such as better pasture management, strategic supplementary feeding, adequate animal health control, and genetic improvement of animals, geared towards improving livestock productivity and reduce emission intensity. Strong focus and support for the adoption of specific land management practices, as well as to the identification of potential new avenues to reduce GHG emissions in the agricultural sector in the pursuit of low-carbon beef production, including through the management of soil organic carbon stocks.

[126] Uruguay reports information on the objectives of the mitigation actions, steps taken or envisaged to achieve those actions, and progress of implementation of the actions in the latest BUR submitted and in the online MRV visualizer.

SPT 2.1 and SPT 2.2

- **Safeguarding forest ecosystems through regulation and strong monitoring and enforcement.** Commitment to continue to support the forestry policy with the needed resources, including:
    - Development of methodologies for georeferenced mapping that will enable forest monitoring at higher frequencies.
    - New norms to foster the incentives of landowners to conserve native forests, such as the most recent Budget Law submitted to Congress in June 2022, which contains additional tax incentives and budgetary resources to promote reforestation.
    - Reforestation efforts and incentives to expand the protection of primary growth woodlands in coordination with NGOs and civil society.
    - Measures to support climate adaptation in Uruguay's forest and land use sectors, for example to address the risk of wildfire in the face of climate change-driven increase in extreme events.
    - Supporting the offsetting of CO_2 emitting sectors by promoting carbon sequestration in agricultural and land-use sectors. This strategy is focused mainly on maintaining the coverage of native forests, shelter and shade forests for livestock, and forest plantations for sawmill timber and other industrial uses. [127]
    - Enhancement of native forest carbon stocks and promoting native forest management on a landscape scale by strengthening and adapting the forest reference level and the measurement, reporting, and verification system (MRV) and safeguards information system.

3. Bond Characteristics

Uruguay will link financial characteristics of the SSLBs to the achievement of, or failure to achieve, one or more of the SPTs defined in this Framework. The achievement or failure to achieve of the respective SPTs will trigger the specified coupon rate changes, as detailed below. Such financial characteristics, including the amount, timing, and mechanism for triggering financial implications to the achievement or failure to achieve SPTs, will be included in the legal documentation of each SSLB, which may be in line with the features described also below.

[127] In the agricultural and livestock sector, mitigation efforts resulting from an expansion of commercial forestry may involve trade-offs with other environmental aspects, such as natural field substitution. These will be considered when defining concrete short- and medium-term actions.

Step-up/step-down financial mechanism linked to climate and nature-based targets

The financial characteristics of the sustainability-linked instruments issued under this Framework will be individually linked to each of the KPIs. In other words, the effects of satisfying, or failing to satisfy, their respective SPT are independent of each other.

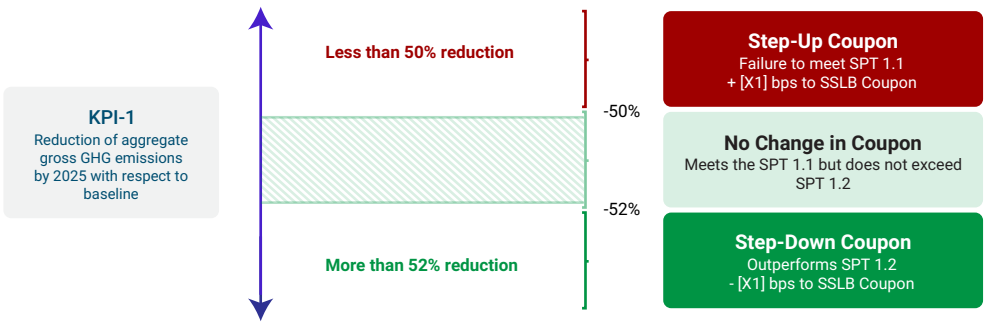
For each KPI:

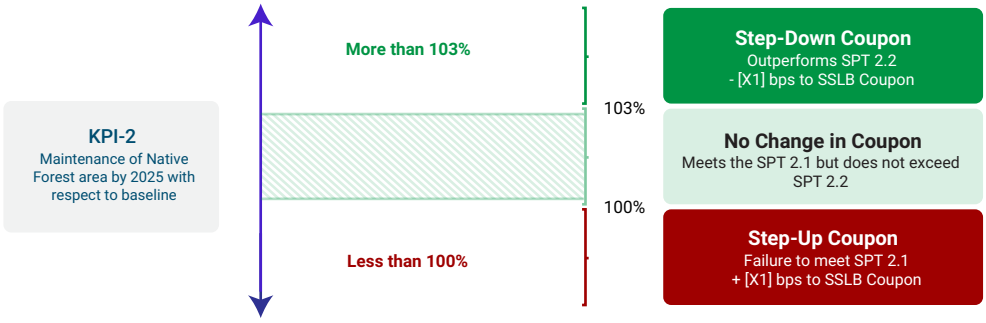
- A one-time coupon step-up will occur if Uruguay fails to achieve its NDC commitment (SPTs 1.1 for KPI-1, SPT 2.1 for KPI-2) by 2025.
- A one-time coupon step-down will occur if Uruguay overperforms on its NDC commitment (SPTs 1.2 for KPI-1, SPT 2.2 for KPI-2) by 2025.
- No change in the coupon will occur if Uruguay meets its NDC commitments but falls short of exceeding the overperformance targets (i.e., when the performance of both KPI falls on, or in between, the two targets outlined its respective SPTs).

The magnitudes of the potential coupon step-up and step-down will be the same (denoted in basis points by X1) and will apply equally to KPI-1 and KPI-2. Note that no change in the instrument's coupon rate will occur if a coupon step-up is triggered for one of the KPIs and a coupon step-down is triggered for the other, such that they cancel each other out.

See below the Summary Contingent Payoff Structure for each KPI, and the table exemplifying the possible variations (compared to the initial interest rate) on interest payable on the SSLB for the combination of scenarios.

Summary of Contingent Payoff Structure for each KPI





Possible Variations on Coupon in Basis Points under Different Scenarios

		KPI-2 Maintenance of Native forest area by 2025 with respect to baseline		
		Less than 100%	Between 100% and 103%	More than 103%
KPI-1 Reduction of aggregate gross GHG emissions per real GDP unit by 2025 with respect to baseline	Less than 50%	+(2*X1) bps	+X1 bps	No change
	Between 50% and 52%	+X1 bps	No change	-X1 bps
	More than 52%	No change	-X1 bps	– (2X*1) bps

The coupon structure proposed by the Framework is incentive compatible. That means embedding a contingent payoff structure that will reward countries by lowering borrowing costs if they meet the targets or increasing them if they do not deliver. This will help bind issuers and investors together and incentivize countries to make the targets a strategic priority. By conditioning the bond on the achievement of the country's economy wide NDC objectives, and particularly by incorporating rewards and compensation mechanisms into its environmental performance, it places fiduciary duty at the heart of climate policymaking. It seeks to generate incentives for countries to fully comply with the Paris Agreement and represents an opportunity for countries transitioning to a sustainable path to make progress towards an inclusive and low-carbon economy while tackling other climate and environmental challenges and risks.

The issuance of SSLBs is consistent with Uruguay's international agenda advocated in multilateral forums. During its term as the Presidency of the World Bank-IMF Development Committee in 2022, Uruguay has called for new sovereign lending instruments that link the loan terms to a country's performance against climate change commitments.

To do so, Uruguay's Minister of Finance has proposed to explicitly incorporate forward-looking environmental commitments into loans from multilateral institutions and to link the cost of borrowing of countries with their success in meeting climate targets under the Paris Agreement. Countries that live up to their commitments set out in their NDCs and show good environmental performance metrics, should pay lower interest rates. This is also aligned with the United Nations Secretary General Report, Our Common Agenda,[128] which affirms that finance flows must be consistent with a pathway towards low GHG emissions and climate-resilient development. Simply put, Uruguay aims to differentiate lending conditions based on the contribution to global public goods and Paris Agreement alignment.

Taken together, these innovative approaches to sovereign climate finance could generate positive incentives to achieve impactful progress in ensuring the fair and affordable transition to a low-carbon global economy. Uruguay is of the view that commitment and conviction to addressing climate change (from countries, multilateral lenders, market investors and donors) needs to be demonstrated and environmental progress needs to be rewarded. Announcements and commitments should go hand in hand with credible action and accountability.

4. Reporting

Robust and timely data are at the core of establishing a market for SSLBs and are critical to this Framework. Uruguay has an internal governance system that is already in place to ensure the timeliness and quality of data reported to the UNFCCC. The UN-Global Support Program already recognizes Uruguay's emissions-driven MRV system as an international best practice.[129]

Timeframes for reporting and verification agreed under the UNFCCC, however, are typically longer than ICMA's suggested annual calendar. To provide investors with even more timely reporting and in alignment with best practices in the SLB corporate market, Uruguay will adapt, where possible, private-sector standards in data reporting frequency and transparency to the SSLB, using the principles of the ICMA as guidance. Below is a description of the current reporting framework for each KPI under the NDC, and a description of the enhanced reporting framework that has been put in place for the SSLBs.

[128] United Nations (2021) Our Common Agenda – Report of the Secretary-General. Available at: https://www.un.org/en/content/common-agenda-report/assets/pdf/Common_Agenda_Report_English.pdf

[129] UN GSP (n.d.) Best practices on MRV: The case of Uruguay. Available at: https://www.un-gsp.org/sites/default/files/documentos/best_practices_on_mrv_monitoring_ndc_in_uruguay_spanish_0.pdf

Current reporting framework under international commitments

The National GHG Inventory provides an estimate of the quantities of GHG emitted and captured in the country. Estimation of GHG emissions and equivalence calculations are performed following robust, peer-reviewed, scientific standards set in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC 2006).[130]

Uruguay currently follows the UNFCCC's reporting guidelines for Non-Annex I Parties, which require biennial update reports (BURs) of national GHG inventories.[131] The submission has the following features:

- **Frequency:** every two years, the country reports two NGHGIs through the BUR.
- **Publication Timing:** two years post-data collection (for example, the 2021 BUR published by end-December 2021, included data on the 2019 and 2018 NGHGI).[132]

On the other hand, as part of the country's international commitments, Uruguay reports periodically to the Global Forest Resources Assessment (FRA), which is carried out by the Food and Agriculture Organization of the United Nations (FAO).[133] The Native Forest Mapping (Cartography) tool provides information on the amount of total surface covered by native forest in the country. It uses satellite imagery and GIS-based analysis, in line with the international best practice for estimation of forest area change over time.

Enhanced reporting framework for the SSLB

Building on the country's reputation for transparency and institutional credibility, and its strong track record for publishing timely data that can be monitored, Uruguay will further enhance the reporting and verification process for the purpose of the SSLBs to provide further assurance to investors:

[130] More information on the inventory and inventory development process is available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/application/pdf/final_guide_for_peer_review_report_final_webupload.pdf.

[131] As per the Kyoto Protocol of 1992, Parties (signatory States) are determined to be either Annex I, non-Annex I, or Annex II. Annex I Parties group "industrialized countries and economies in transition" while non-Annex I are mostly developing countries of which Uruguay is part of. More information is available at: https://unfccc.int/process/parties-non-party-stakeholders/parties-convention-and-observer-states.

[132] Since 1997, and until 2015, non-Annex I countries were required to report their NGHGI through so-called National Communications (NC), which occurred every four years. Since 2015, they have been substituted by biennial update reports. As of the date of this Framework, Uruguay has submitted 11 NGHGI reports through five National Communications and four biennial update reports. Under the ETF, countries will replace BURs with more ambitious Biennial Transparency Reports (BTRs) by December 31, 2024. As a result, all countries will need to compile NGHGI annually and report biennially. This enhanced Framework's main improvement is in the definition of common methodologies through the application of standardized guiding principles, which reflect the latest robust scientific evidence, applicable to all parties to the Paris Agreement and allow better comparability of countries' commitments and results. More information is available at: https://unfccc.int/national-reports-from-non-annex-i-parties.

[133] These assessments provide an essential tool for evaluating the condition of natural forests around the world, using commonly agreed-upon terms and definitions through a transparent, traceable reporting process and a well-established network of officially nominated national correspondents that covers 187 countries and territories.

KPI-1. The methodologies used to calculate the performance of the KPI-1 will be the same as those employed by Uruguay to report NDCs progress data to the United Nations. This KPI aggregates the three main GHGs (CO_2, CH_4 and N_2O) and the main sectors contributing emissions of each GHG (as set out in the 2017 NDC). The estimates of emissions will apply the IPCC 2006 Guidelines, or subsequent version or refinement as agreed by the CMA, and nationally appropriate methods consistent with that guidance.[134] The methodologies used to calculate the real GDP series from 1990 onwards, in billions of pesos in constant prices, are detailed in the annex.

The reporting of the aggregate GHG emissions KPI will be annual, implying that the required reporting of CO_2, CH_4, and N_2O gross emissions will move from biennial to an annual frequency. This goes above and beyond current United Nations reporting requirements for the Paris Agreement (given that, currently, only Annex I countries are required to submit greenhouse gas inventories on an annual basis).

KPI-2. As part of the country's engagement for enhanced climate transparency, Uruguay's DGF will commit to carry out a satellite-imaging mapping (cartography) of the native forest area, every four years (corresponding to the years 2021, 2025, 2029, and 2033).[135] The reporting of KPI-2 for those years will be conducted with a one-year lag, in line with best practices in the sector, to evaluate both the fulfillment of the 2025 target and evolution during the lifetime of the bond. It will be based on the application of remote sensing techniques, as contained in the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance. For the years in which the cartography is not carried out (i.e., when KPI-2 is not calculated), Uruguay will provide an intermediate update on any actions, policies, regulations, and/or changes in the normative framework for conserving native forest.

The historical values and underlying data for KPI-1 and KPI-2 from 1990 to 2019 can be found in the open-source data available in available in Uruguay's Sovereign Sustainable-Linked Bonds website:[136]

5. Verification

Credible, independent, and timely external verification are critical to this framework. To provide investors with even more timely verification and in alignment with best practices in the SLB corporate market, Uruguay will adapt private-sector standards in data verification frequency and transparency to the SSLB, using the principles of the ICMA as guidance.

[134] See: Decision 18/CMA.1 Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement. Available at: https://unfccc.int/sites/default/files/resource/cma2018_3_add2_new_advance.pdf.

[135] Given the particular dynamics of the native forest, assessing the pace of material change of the native forestry mass requires certain timeframes, usually several years, in order to capture through images possible changes in the area coverage.

[136] Link: http://sslburuguay.mef.gub.uy/30668/20/areas/kpi-1:-reduction-in-aggregate-gross-ghg-emissions-per-real-gdp-unit.html

Below is a description of the current review process under the NDC, and a description of the enhanced external verification framework that has been put in place for this Framework.

Current Technical Review Process under the Paris Agreement

Under the UNFCCC, biennial update reports from developing countries are subject to the International Consultation and Analysis (ICA) process.[137] The first stage of the ICA process is a technical analysis of the BUR by a team of experts, including the technical analysis of the NGHGI reported under the BUR. The ICA process for Uruguay's Third BUR submitted in December 2019 (including 2017 and 2016 NGHGIs) concluded in December 2021.[138] In addition, beginning with the 2010 NGHGI, an external technical review of Uruguay's inventory has been carried out by UNDP coordinated through the UNDP/UNEP Global Support Program (GSP) for National Communications (NC) and the BURs.

Enhanced Verification Process for the SSLB: the Role of the United Nations Development Program

Building on its experience with the NGHGI technical review, UNDP will provide an independent external verification of the KPIs for Uruguay's SSLB on an accelerated timetable. Uruguay and UNDP will innovate together, setting up a four-month external review process, as per the description below.[139] See Annex III for details and workflow process.

KPI-1. Progress on KPI-1 will be reviewed and verified annually according to the methodology contained in the UNFCCC's Guide for Peer Review of National Greenhouse Gas Emissions Inventory. Since the KPI is an intensity metric, the denominator (the time series for real GDP) being used will also be externally verified.

Despite the complexities of collecting and externally validating the country's annual emissions, Uruguay's intention to publish annual, externally verified GHG data with a lag of approximately one year and five months from the end of the observation year enhances the current reporting and peer-reviewed verification process applicable to Uruguay as established under the requirements of the UNFCCC. These require – for non-Annex 1 countries such as Uruguay – biannual reporting and generally involves a lag of 3.5 years between the end of the observation year and when the final verified data is reported. Improving the frequency and timeliness of GHG emissions data brings their publication to par with the general pattern in macroeconomic statistics.

[137] More information on the International Consultation and Analysis Process is available at: https://unfccc.int/ICA.
[138] Uruguay's latest technical analysis is available at: https://unfccc.int/documents/279117.
[139] Link: http://sslburuguay.mef.gub.uy/333/20/areas/external-verification.html

KPI-2. The technical review of KPI-2 will be conducted every four years after the cartography implementation and will verify the adherence to international best practice for estimation of forest area change over time, particularly on the application of remote sensing techniques, as contained in the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance.

Each year until bond maturity, by May 31st, and in any case for any period relevant for assessing the trigger of the SPTs performance, Uruguay will publish and keep readily available and accesible on Uruguay's SSLB website:

1. An SSLB Annual Report, with the KPI levels at the observation year against each SPT, with updated information on the performance of the selected KPI, including baselines. It will also contain any additional quantitative and/or qualitative information that allows investors to monitor or approximate progress towards the SPTs and beyond. The report will be provided annually on Uruguay's SSLB website no later than May 31st of the subsequent year to the one following the relevant observation year for the KPIs.[140]

2. An External Verification Report by UNDP of the consistency with international methodologies and standards for calculating the KPIs (to be published by UNDP and in the SSLB's website at the time of the SSLB Annual Report). The external assurance will be conducted for each KPI at the reporting date, throughout the lifetime of the SSLBs to be issued pursuant to this Framework.

If, for any reason, the performance of the KPI or satisfaction of the SPTs cannot be calculated, reported, or verified in a satisfactory and timely manner by the relevant SPT observation date pursuant to the terms described in the legal documentation for each SSLB, a step-up to the coupon will apply as if the relevant SPT had not been achieved.

[140] That means, for example, that by May 31, 2023, Uruguay will publish the SSLB Annual Report containing the externally verified values for KPI-1 and KPI-2 corresponding to year 2021. By that same date, UNDP will publish the External Verification Report containing the verification analysis for KPI-1 and KPI-2 corresponding to year 2021. By May 31, 2024, Uruguay will publish the SSLB Annual Report containing the externally verified value for KPI-1 and an intermediate update on the policies, regulations and/or changes in the normative framework destined to the promotion and conservation of the native forest. By May 31, 2024, the External Verification Report published by UNDP will include the verification KPI-1 corresponding to 2022.

Chapter 6

Second Party Opinion

Uruguay's MEF intends to obtain and publicly disclose a Second Party Opinion (SPO) provided by Sustainalytics US, Inc. , an internationally recognized firm with environmental and social expertise, on the sustainability benefits of Uruguay's Sustainability-Linked Bond Framework, as well as alignment with the SLBPs. The SPO will be readily available and easily accessible on Uruguay's SSLB website.[141]

The SSLB Framework has been developed to be aligned with best sustainable practices and has been favorably evaluated by an independent and corporate governance research, ratings, and analytics firm. Sustainalytics US, Inc. has indicated in a report delivered to Uruguay that the SSLB Framework is aligned with the International Capital Market Association's Sustainability-Linked Bond Principles published in June 2020.

[141] Link: http://sslburuguay.mef.gub.uy/30670/20/areas/second-party-opinion.html.

Chapter 7

Amendments to this Framework

The MEF may review this Framework from time to time and update it as necessary, including to align it with any updated versions of the relevant principles, with the aim of adhering to best practices in the market. The MEF will also review this Framework in case of material changes in the perimeter, methodology, and KPIs and/or the SPT's calibration. Such review may result in this Framework being updated and amended. The updates, if not minor in nature, will be subject to the prior approval of Sustainalytics US, Inc. or any such other qualified provider of Second Party Opinion. Any future updated version of this Framework will either keep or improve the current levels of transparency and reporting disclosures, including the corresponding review by an external verifier. The updated Framework, if any, will be published on Uruguay's SSLB website and will replace this Framework. Notwithstanding the foregoing, no revisions to this Framework will affect the terms and conditions of any SSLB issued prior to such revision.

Chapter 8

Legal Considerations

This Sustainability-Linked Bond Framework (the "SSLB Framework" or the "Framework") contains certain statements about future events and circumstances that may constitute forward-looking statements. The words "believe," "may," "will," "aim," "estimate," "continue," "intend," "target," "expect" and similar words are intended to identify forward-looking statements. These statements are based on the Republic of Uruguay's (the "Republic" or "Uruguay") current plans, estimates, assumptions, and projections, and speak only as of the date they are made. Further, these statements might not occur and are not guarantees of future performance. Therefore, you should not place undue reliance on them and should not make any investment decision based upon these estimates and forward-looking statements.

The Republic, advisors and agents and their respective officers, affiliates, agents, directors, partners, and employees shall not have any obligation, for any reason, to update or revise this Framework in accordance with international best practices or in accordance with Uruguay's international commitments. The Republic assumes no responsibility or obligation to update or revise any such statements, regardless of whether such statements are affected by the results of new information, future events or otherwise. This SSLB Framework is provided for informational purposes only and does not constitute or should not be construed as an offer, solicitation, or sale of securities in the United States or any other state or jurisdiction, and there shall be no offer, solicitation, or sale of securities in any state or jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such state or jurisdiction. This material is not intended for distribution to or use by any person or entity in any jurisdiction or country where such distribution or use would be contrary to law or regulation. Any decision to purchase securities should be made solely based on information contained in the debt securities documentation.

Annex

Annex I

Background and Underpinnings: Uruguay's Enduring Commitment to Sustainability and Environmental Progress

Uruguay is recognized as a bastion of political, social, and institutional stability. It has strong democratic institutions[142] and respect for the rule of law,[143] legal security, judicial independence, ample freedom,[144] and an unwavering commitment to international agreements and norms. It stands out in Latin America for being an inclusive and egalitarian society and for its high income per capita,[145] low level of inequality[146] and poverty, and the almost complete absence of extreme poverty.[147] According to World Bank data, more than 60 percent of Uruguayans are middle class, the largest proportion of middle-class citizens of any country in the Americas.[148] It has inclusive social policies, with 87 percent of the population aged 65+ covered by the pension system. More recently, Uruguay has preserved macroeconomic and social stability in the wake of the COVID-19 pandemic, with no civil unrest.

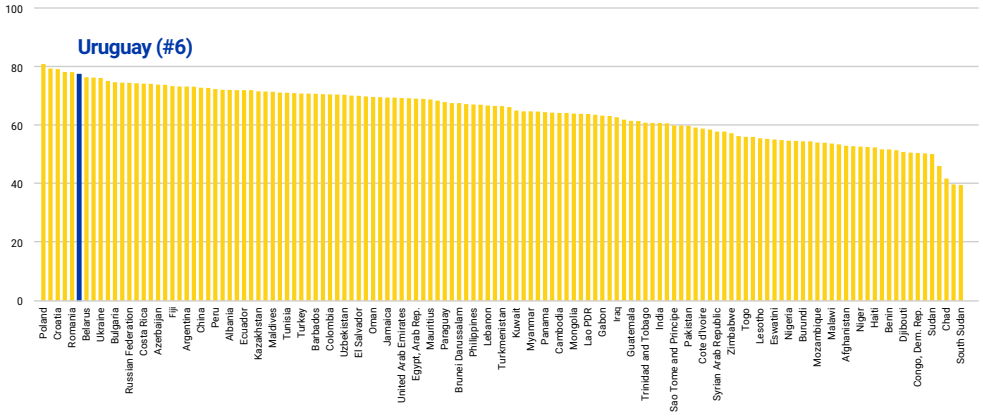
Uruguay remains at the forefront of environmentally friendly policies and is a sustainability-focused country. Over the past decade, Uruguay has transformed its energy matrix by increasing and diversifying its renewable sources of electricity generation. At present, Uruguay is one of the leading countries in the world in terms of clean energy and wind energy production.

Uruguay is committed to the United Nations 2030 Agenda for Sustainable Development. For the 2021-2025 period, the Uruguayan government has established four strategic priorities in the United Nations Strategic Cooperation Framework (UNSDCF), which aligns with the 2030 Agenda.[149] These strategic guidelines are founded on economic innovation, institutional transformation, social development, and the principle of leaving no one behind.

[142] World Bank (2021) and The Economist Intelligence Unit (2022) Worldwide Governance Indicators. Available at:
https://databank.worldbank.org/source/worldwide-governance-indicators#
[143] World Justice Project (2021) WJP Rule of Law Index - Uruguay. Available from:
https://worldjusticeproject.org/rule-of-law-index/country/Uruguay
[144] Freedom House (2022) Freedom in the World report – Uruguay. Available from:
https://freedomhouse.org/country/uruguay/freedom-world/2022
[145] The World Bank (2022) Where We Work / Uruguay. Available at:
https://www.worldbank.org/en/country/uruguay/overview#1
[146] Gender Inequality Index is a composite measure reflecting inequality in achievement between women and men in three dimensions: reproductive health, empowerment and the labor market. See: United Nations Development Program – UNDP (2020) Human Development Reports 2020.
https://hdr.undp.org/system/files/documents//hdr2020pdf.pdf
[147] United Nations, ECLAC (2022) Cepalstat. Available at:
https://statistics.cepal.org/portal/cepalstat/dashboard.html?lang=en
[148] The World Bank (2022) Where We Work / Uruguay. Available at:
https://www.worldbank.org/en/country/uruguay/overview#1
[149] The UNSDCF is a key instrument for planning and implementation of the UN development activities at country level. Available at:
https://min-io.dev.devqube.io/uninfo-production-main/a728fe19-e903-40d2-b1c7-aab057bb8e0d_Uruguay_UN-SDCF_2021_2025.pdf

Uruguay's progress on the achievement of its SDG agenda compares favorably at both international and regional levels. In the last edition of the SDG Index & Dashboards, Uruguay ranks 31st among 163 countries (and 6th among 129 emerging market and developing countries) when considering all the 17 SDGs on a global scale.[150] With an overall score of 77.0, Uruguay ranks just above of the United States and Australia, above the regional average (69.5), and slightly below the average of OECD countries (78.7). According to the Sustainable Development Report, Uruguay is the Latin America and Caribbean region's best performer regarding achieving the SDGs.[151]

SDG Index & Dashboards: Uruguay Positioning among Emerging Market and Developing Countries, 2022



Source: SDG Index & Dashboards.[152]

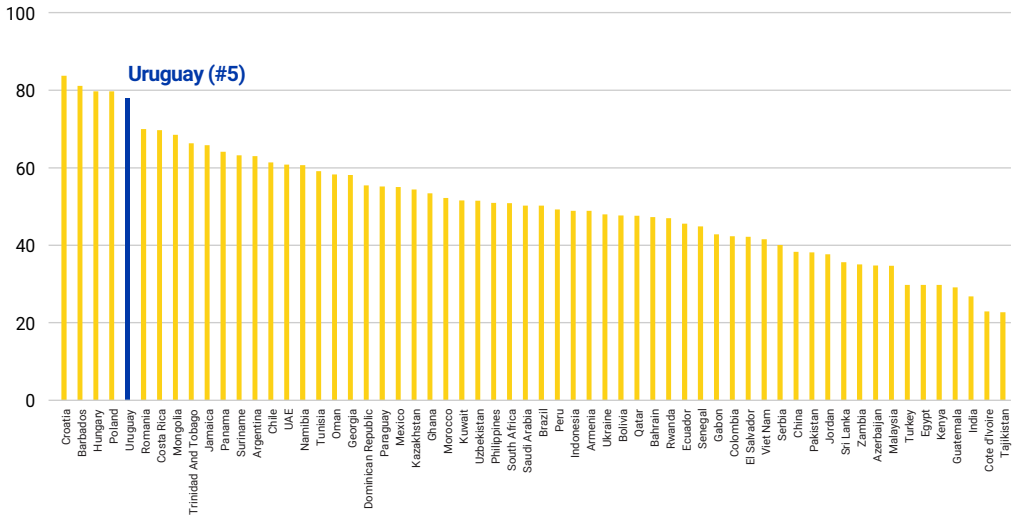
The country has strong Environmental, Social, and Governance credentials among emerging market countries.[153] As of August 2022, Uruguay ranked in the top tier of the ESG ranking in the J.P. Morgan ESG EMBI Global Diversified Index (JESG EMBIG),[154] and scored highly in other global unsolicited ESG ratings providers, such as MSCI and Sustainalytics.

This is explained by the country's environmental initiatives, the reduction of carbon intensity of both energy generation and livestock management, and strong indicators regarding poverty eradication, gender equality, social protection, and institutional stability.

[150] Sustainable Development Report (2021) Uruguay. Available at: https://dashboards.sdgindex.org/profiles/uruguay
[151] IDB & SDSN (2021) Uruguay Sustainable Development Report 2021. Inter-American Development Bank and Sustainable Development Solutions Network: Washington, D.C. and Paris. Available at: https://www.sustainabledevelopment.report/reports/uruguay-sustainable-development-report-2021/
[152] Sachs et al. (2021) From Crisis to Sustainable Development: the SDGs as Roadmap to 2030 and Beyond. Sustainable Development Report 2022. Cambridge: Cambridge University Press. Available at: https://s3.amazonaws.com/sustainabledevelopment.report/2021/2021-sustainable-development-report.pdf
[153] A summary of Uruguay´s ESG fundamentals is available at: http://deuda.mef.gub.uy/29602/12/areas/esg-fundamentals.html.
[154] The JESG applies a multidimensional approach to ESG investing for fixed income investors. It incorporates ESG score integration and positive screening (e.g. green bonds) as well as exclusions of controversial sectors and UN Global Compact violators. More information available at: https://www.jpmorgan.com/content/dam/jpm/cib/complex/content/markets/composition-docs/pdf-30.pdf.

Emerging Markets' ESG Score (60 countries)

Index, 100 = best performance as of August, 2022



Source: J.P. Morgan Chase & Co. using data from RepRisk, Sustainalytics, and the Climate Bonds Initiative. Information has been obtained from sources believed to be reliable, but J.P. Morgan does not warrant its completeness or accuracy. The index is used with permission. The index may not be copied, used, or distributed without J.P. Morgan's previous written approval. Copyright 2022 J.P. Morgan Chase -6 Co. All rights reserved.

Uruguay's high rankings on sustainability are supported by its especially strong performance in access to clean and sustainable energy and commitment to supporting socioeconomic development. The 2021 National Voluntary Review[155] praised the country's determination to accelerate its shift towards an economy that is based on sustainable production and consumption methods, built on the incorporation of knowledge, and able to generate high-quality jobs.

[155] As part of its commitment to the 2030 Agenda, Uruguay has submitted four voluntary national reviews to the UN High Level Political Forum (2017, 2018, 2019, and 2021). Each one of them reports on the country's progress on the 17 SDGs, as well as the policies developed to address remaining challenges and further accelerate progress. In particular, the most recent review presents promising gains in eliminating extreme poverty, implementing a strong social welfare system, increasing energy access, and closing the gender gap, among other initiatives taken in spite of the effects of the COVID-19 pandemic. More information can be found at: https://sustainabledevelopment.un.org/memberstates/uruguay.

Annex II

Institutional Arrangements for Reporting and Coordinating External Verification

This SSLB Framework is the product of a "whole-of-government" approach and Uruguay has developed the necessary institutional structure to assure a robust design and operationalization of SSLBs. It is an economy-wide effort jointly undertaken by the Ministry of Economy and Finance, the Ministry of Environment, the Ministry of Industry, Energy and Mining, and the Ministry of Agriculture, Livestock and Fisheries, with the support of the Ministry of Foreign Relations. It comprises three essential elements: a strong collaboration through an effective whole-of-government approach, commitment to transparency and accountability, and dedication to the achievement of the country's current climate objectives.

Strong inter-ministerial coordination and cooperation will be critical for the preparation, marketing, execution, and post-issuance disclosure commitments tied to the SSLBs. This will require vigorous institutional and technical efforts to articulate and match the requirements established under the UNFCCC with those of the ICMA principles and contractual terms of the SSLBs. Building on robust data collection and governance structures, the government convened a new inter-ministerial task force, the SSLB Working Group (BIICC, for its Spanish acronym).[156] The group is composed of representatives from five ministries – Economy and Finance, Environment, Industry, Energy and Mining, and Livestock, Agriculture and Fisheries, with the support of the Ministry of Foreign Relations – and is tasked with ensuring coordination among them, setting concrete and measurable goals, deadlines, and responsibilities, and ensuring that the targets are communicated and understood across the entire public-sector system throughout the lifetime of the bond.[157]

Workflow for reporting, external verification and publication of the SSLB Annual Report

The SSLB Working Group will oversee the progress regarding estimation, monitoring, and timely reporting and external verification of the KPIs for the SSLBs. The SSLB Working Group will operate within the framework of Uruguay's SNRCC and will liaise with other working groups within the SNRCC and ministry divisions, as well as UNDP, as described below per each KPI.

[156] The responsibilities, deadlines, and accountability across participants of this task force will be agreed-upon and laid out in a Memorandum of Understanding, ensuring necessary capabilities and resources to carry out each task. In addition, the work of the working group will be empowered politically by an executive decree executed by all five ministries involved in the work related to this Framework to collectively share this responsibility throughout the life cycle of each SSLB.

[157] Available at: http://sslburuguay.mef.gub.uy/333/20/areas/external-verification.html

The schematic Flowchart below describes the work-streams, data compilation process, deadlines and responsible teams involving the four ministries in charge of providing environmental and activity data for the preparation and final publication of the SSLB Annual Report and External Verification Report. The Ministry of Foreign Relations will provide support in coordinating with multilateral organizations and public and private institutions towards the achievement of international commitments under the Paris Agreement.

KPI-1.

To report on the KPI for a given year t, the inter-ministerial NGHGI Working Group will provide an estimate of the quantities of gross GHG emitted following the standards and methodologies established by the IPCC in 2006 (the "2006 IPCC Guidelines") or subsequent version or refinement of such guidelines as agreed by the CMA, as well as methods developed by Uruguay consistent with such guidance.[158] Based on the generated data, the NGHGI Working Group will prepare an annual Emissions Report (EMR) by the last quarter of year t+1.

The MEF will provide the time series for real GDP data starting in 1990 and using the latest available figures for year t. Given that the published real GDP series by Banco Central begins in 2016, the MEF conducted a back-casting of GDP series back to 1990 using the rate of change as a statistical back-casting technique. That technique, which is part of the so-called "indicator method," consists of applying the rates of change of the GDP calculated with the old base to the level of the GDP calculated with the new base. The source for the back-casting technique is the National Accounts Statistics prepared and published by the Central Bank of Uruguay (BCU) for previous years.[159]

The pMRV Working Group of the SNRCC will then compile the EMR and using the time series for real GDP data provided by the MEF will perform the KPI calculation and produce the Key Performance Indicators Report (annual KPI Report, KPIR). The KPIR will be submitted to UNDP for external review, by the end of year t+1.

The external verification process conducted by UNDP for KPI-1 for year t will consist of the following stages:

[158] The NGHGI Working Group was formed in 2006 by three ministries (MA, the MGAP and the MIEM) under which each ministry reports greenhouse gas estimates for their specific sectors, as well as their evolution. Under this working arrangement, the MGAP estimates and reports on greenhouse gas emissions and their evolution in the AFOLU sector and the MIEM estimates and reports on greenhouse gas emissions and their evolution in the Energy sector. MA is responsible for the estimation of emissions and their evolution for the IPPU and Waste sectors. It also reviews and compiles the sectoral information submitted by the other ministries and prepares the general emissions overview from the sectoral reports. The Ministry of Environment is the competent national authority for the implementation of the Convention and, therefore, is responsible for the preparation and submission of the NGHGI.

[159] Details on the methodology and construction can be found in the Open Source Data. Available at:
http://sslburuguay.mef.gub.uy/30668/20/areas/kpi-1:-reduction-in-aggregate-gross-ghg-emissions-per-real-gdp-unit.html

1. Technical review of the Annual Emissions Report

The technical review of the Annual EMR will be conducted annually, starting in 2023, according to the methodology contained in the UNFCCC's Guide for Peer Review of NGHGI.[160] The analysis will be based on the IPCC software databases and the auxiliary data spreadsheets and will determine:

- The adherence to the 2006 IPCC Guidelines for NGHGI, or any subsequent version or refinement of the IPCC guidelines as agreed by the CMA. Nationally appropriate methodologies consistent with IPCC guidelines may be used if they better reflect the national circumstances.[161]
- Fulfillment of the fundamental requirements for the NGHGI.[162]
- The quality of the Annual EMR, through the examination of the TACCC principles (transparency, accuracy, consistency, comparability, completeness) established in the 2000 and 2003 IPCC Good Practice Guidelines and also incorporated in the 2006 IPCC Guidelines.
- Assessment of any revisions of historical values on GHG emissions arising from inventory adjustments, including additional sources and recalculations resulting from methodological improvements or updates to the CO_2 equivalent metrics (to standardize the climate effects of various greenhouse gases) as contained in inventory reporting guidelines.

2. Technical review of the Annual KPI Report

- Since KPI-1 is an intensity metric, the time series for real GDP since 1990 will also be externally verified.
- The application of the calculation formula established in the KPI technical sheet of Uruguay will also be reviewed.

UNDP will submit the External Verification Report to Uruguay, before May 15th of year t+2.

KPI-2.

Uruguay will report on the area of native forests every four years. For those purposes, the DGF will conduct a satellite-imaging mapping (cartography) of Uruguay's native forest surface corresponding to years 2021, 2025, 2029, and 2033.

To report on KPI-2 for year t, it will conduct the cartography during t+1. It will then prepare a Native Forest Report (NFR) with the evolution of KPI-2.

[160] UNFCCC (2017) Guide for Peer Review of National GHG Inventories. Available at: https://unfccc.int/files/national_reports/non-annex_i_natcom/application/pdf/final_guide_for_peer_review_report_final_webupload.pdf

[161] (Dec. 18/CMA.1). See: https://ledslac.org/wp-content/uploads/2020/09/e.-Decision-18-cma.1.pdf.

[162] Contained in Decisions 17 / CP.8 and 2 / CP.17.

For the years in which no satellite-mapping will be conducted, the NFR will provide an intermediate update on the actions of policies, regulations, and/or changes in the normative framework for conserving the native forest. In the years in which an intermediate update is made, the NFR will follow the same work-stream and timelines, except for external verification.

The verification for KPI-2 will be conducted every 4 years following the cartography implementation, and will consists of the following :

1. Technical review of the Annual Native Forest Report

The technical review of the Native Forest Report will be conducted according to the following criteria:

- The adherence to international best practice for estimation of forest area change over time, particularly on the application of remote sensing techniques, as contained in the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance.
- Consultation with a secondary source of best practice, the Global Forest Observations Initiative (GFOI) Methods and Guidance (MGD). The application of the methodology should be consistent with the guiding principles for remote sensing data sources and methods contained in the GFOI guidance document and the relevant provisions on forest area change detection and accuracy assessment.
- The quality of the report on native forest area will be assessed within the framework of the TACCC principles, as established by the IPCC.
- Assessment will include consistency in methodology, definitions, and comprehensiveness between the base year native forest area calculation and the years within the reporting period put forward in the bond report undergoing verification.
- In terms of accuracy, the sources of the estimated confidence interval of estimation will be assessed, as well as the process implemented to minimize systematic and random errors.

The technical review of the Native Forest Report will conclude on:

- The adherence to international best practice for estimation of forest area change over time, particularly on the application of remote sensing techniques and satellite images, as contained in the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance.
- The consistency with the relevant provisions and guiding principles of the Global Forest Observations Initiative (GFOI) Methods and Guidance (MGD).

- The quality of the report, through the examination of the TACCC principles as established by the IPCC.

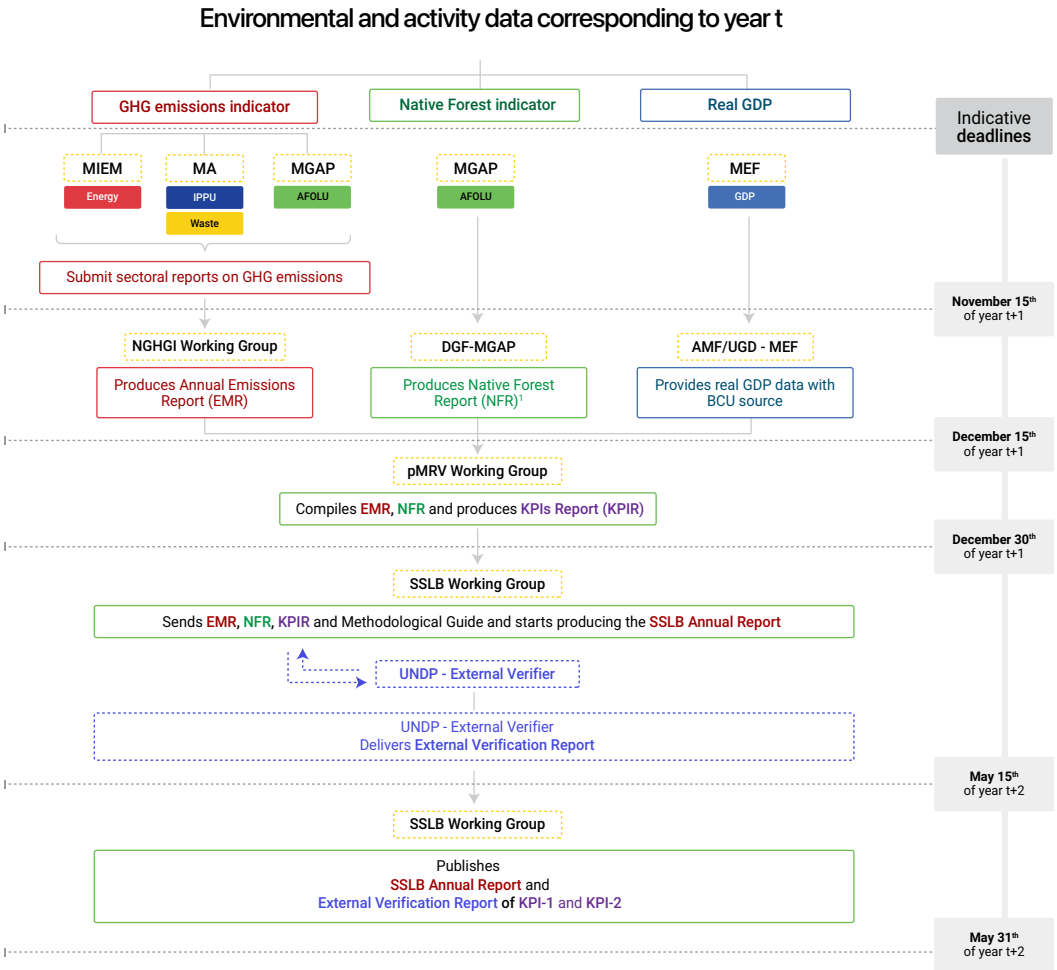
2. Technical review of the Annual KPI Report

Regarding the technical review of the calculation of KPI-2, the application of the calculation formula established in the KPI factsheet of Uruguay will be reviewed.

UNDP will submit the External Verification Report to Uruguay, before May 15th of year t+2.

Flowchart for reporting, external verification and publication of the SSLB Annual Report

Work-streams, data compilation architecture, and key milestones and responsible teams for the preparation publication of the SSLB Annual Report



Glossary (for the Spanish acronym)

AMF-MEF	Macroeconomic and Financial Advisory Unit of the MEF
SSLB	Sovereign Bond Linked to Climate Change Indicators, SSLB (Bono Indexado a Indicadores de Cambio Climático)
DGF-MGAP	General Forestry Directorate of the MGAP
DINACC-MA	National Directorate for Climate Change of the Ministry of Environment
NFR	Native Forest Report for the SSLB
EMR	Annual GHG Emissions Report for the SSLB
KPIR	KPI Report for the SSLB
SSLB W. Group	Inter-ministerial working group for the SSLB within the SNRCC
NGHGI W. Group	Working Group of the NGHGI within the framework of the SNRCC
pMRV W. Group	Working Group of pMRV within the framework of the SNRCC
MA	Ministry of Environment of Uruguay
MGAP	Ministry of Livestock, Agriculture and Fisheries of Uruguay
MEF	Ministry of Economy and Finance of Uruguay
MIEM	Ministry of Industry, Energy and Mining of Uruguay
NGHGI	National Greenhouse Gases Inventory
OPYPA-MGAP	MGAP Office for Agricultural Policy and Programming
pMRV	Programming, Monitoring, Reporting and Verification
SNRCC	National Response System to Climate Change and variability
UGD-MEF	Debt Management Unit of the MEF

Annex 17

[Unofficial Translation]
Annex (17)

Ministry of Livestock, Agriculture, and Fishing

Livestock and Climate Change

Uruguay presented in Rome the document: “Methane emissions in livestock and rice”.

https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/noticias/uruguay-presento-roma-documento-emisiones-metano-ganaderia-arroz

28/09/2023

Within the framework of the Global Conference on Sustainable Livestock that is being carried out at the FAO headquarters in Rome, the document “Methane emissions in livestock and rice: Quantifications, mitigations and metrics” was officially presented. This document was prepared by the Alliance for the Evaluation of the Environmental Performance of Livestock Farming (LEAP), where more than 300 experts from academia, governments, industries and international non-governmental organizations participate.

Methane is a powerful greenhouse gas that is characterized by having a very short half-life in the atmosphere (approximately 10 years). It is decomposed by natural sinks such as the atmosphere itself, where between 90-96% is degraded, while 4 to 10% of methane is degraded in the soil.

This document explores more than 30 methane emissions mitigation strategies, as well as a broad discussion of the metrics for measuring them, as each metric has different interpretations and can be linked to specific environmental objectives.

Among the decisions that must be chosen correctly is the measurement time horizon (10 years, 20 years, 100 years), as well as the metrics (GWP, GTP and CGTP and GWP*), all depending on the objectives set by each country. since each of these metrics answers different questions.

During the presentations, the representative of Australia Nicola Hinder, Deputy Secretary Department of Agriculture, Fisheries and Forestry, mentioned some of the mitigation strategies that are being carried out in her country with the objective of having carbon neutral livestock

farming by 2030 as This is the genetic selection of more efficient animals, studies of additives and animal supplements, facilitating the adoption of practices that generate carbon sequestration.

New Zealand, through the representation of John Roche, Chief Science Adviser, Ministry for Primary Industries, New Zealand, commented on a multidimensional approach where methane is one more part of the focus where the ecosystem services provided by livestock farming must also be taken into account. account.

On behalf of Uruguay, Gianni Motta from the INAC Strategy and Innovation Management highlighted that livestock farming is a fundamental part of the country's economy and social development.

Uruguay has a low population and a very high agricultural surface area, which positions the country as an agro-exporting country, where 75% of exports come from the agricultural sector and vertically represents around 25% of GDP. Given that the agricultural sector is the driving force of Uruguay's economy, its emissions profile is reflected in this, where 50% of the country's emissions come from enteric methane from livestock farming.

In this sense, Uruguay has committed to reducing the intensity of methane emissions by 32% by 2025. Livestock production is largely carried out on non-arable lands where our natural pastures are located; in this sense, livestock farming is essential in the protection of this natural resource, avoiding its degradation, conserving biodiversity and soils, being an essential part of the natural cycle of the Uruguayan pampas biome. At the same time, Uruguay is working on projects where it has been demonstrated that with good grazing management and load management in out-of-balance systems there are opportunities to reduce methane emissions.

The document published by FAO-LEAP on Methane Emissions in Livestock is a tool that is of great help to technicians and public policy advisors in making decisions related to mitigating the effects of this greenhouse gas. Towards the close of the panel, Frank Mitloehner, Professor and Air Quality Specialist, University of California Davis closed the panel with a message regarding communication, given that, although excellent documentation has been done on the effects of methane on the environment, If there is a failure in communication, this document would be the same as not having made it.

Uruguay has been on the LEAP steering committee for 10 years now through the representation of INAC. At the same time, it provides technical knowledge in the development of technical guides with the support of the INIA where 12 guides have been developed to determine the environmental impact of livestock farming in various areas such as evaluation of the use of additives, quantification of biodiversity, use of water by livestock, modelling of soil carbon stocks, nutrient flow, evaluation of environmental performance of pig, poultry and large ruminant chains, among others.

These guides help standardize quantification methods, which makes it possible to manage comparable metrics between countries and production systems in a technical and internationally agreed language.

Annex 18

[Unofficial Translation]
Annex (18)

Ministry of the Environment

Creation and Historical Evolution

https://www.gub.uy/ministerio-ambiente/institucional/creacion-evolucion-historica#:~:text=El%20Ministerio%20de%20Ambiente%20fue,competencias%20exclusivamente%20en%20materias%20ambientales

Creation

The Ministry of the Environment was created by Article 291 of Law No. 19,889, of July 9, 2020, as the Secretary of State with powers exclusively in environmental matters.

Uruguay has had environmental organizations since the creation of the National Institute for the Preservation of the Environment (INPMA) by Law No. 14,053 of December 30, 1971, although the first ministry in charge of the subject was the Ministry of Housing, Territorial Planning and the Environment. (MVOTMA), created by Law No. 16,112, of May 30, 1990.

The environmental powers assigned by law to the MVOTMA were transferred to the Ministry of the Environment by the law that created it.

Annex 19

Annex 019

LA ECONOMÍA DEL CAMBIO CLIMÁTICO EN EL URUGUAY

Síntesis

NACIONES UNIDAS

CEPAL

PRESIDENCIA
REPÚBLICA ORIENTAL DEL URUGUAY

This study was based on the estimate made by Costanza (Costanza et al., 1997; Costanza and Folke, 1997) of the total economic value of the ecosystem services of different types of soil and vegetation, using various methods of economic valuation at the global level: 7,835 million dollars in 2008, or slightly more than 25% of the country's overall GDP, which highlights their importance. The values used by Costanza were updated to 2008 prices and the value of wetlands was replaced by a local estimate made by Campanella and Lanzilotta (2002) for the St. Lucie River wetlands.

In the future scenarios, the economic impact of changes in biodiversity was estimated from the difference between the current economic value and the corresponding estimated values for 2020, 2050 and 2080.

TABLE IV.6
BIODIVERSITY: ECONOMIC IMPACTS, BY SCENARIO

Period	Dynamic scenario with climate change (A2)	Differences with respect to the dynamic scenario without climate change		
	Per year	In annual cost (in 2008 dollars)	Percentage of the value of the 2008 biodiversity	As a percentage of GDP of 2008
Current	7 836			
2020	4 780	-3 056	-39,0	-9,5
2050	5 798	-2 037	-26,0	-6,4
2080	6 582	-1 254	-16,0	-3,9
Period	Minimum scenario with climate change (B2)	Differences with respect to the minimum scenario without climate change		
Current	7 836			
2020	7 860	24	0,3	0,1
2050	4 879	-2 957	-37,7	-9,2
2080	5 692	-2 144	-27,4	-6,7

Source: Own elaboration based on available data.

Table IV.6 shows that the impact of climate change on biodiversity will be very significant for Uruguay: after a favorable effect at the beginning of the period, its cost will range between 4% and 10% of GDP in the dynamic scenario with climate change (A2) and will have similar consequences in the minimum scenario with climate change (B2).

E. Coastal resources and sea level rise

This study took into account a coastal area of 680 km: 452 km on the Río de la Plata and 228 km on the Atlantic Ocean. The coastal plain extends over five geomorphological regions: (i) the southwestern sedimentary basin, of small territorial extension and sediment potential; (ii) the Santa Lucía River tectonic trench, the most important of the Cretaceous trenches in the continental zone of the Uruguayan territory; (iii) the Eastern Sierras del Este, a complex of emerged folds that constitutes the landscape with the highest existing relief energy; (iv) the Eastern hills and ridges, of crystalline base, located between the Eastern Sierras; and (v) the tectonic trench of the Merín Lagoon.

Sandy beaches are the dominant form on the coast, with the presence of bars, coastal strands and dunes, sectors with slopes and ravines on various geological formations and, in many cases, large sectors of beach in front. The coast of Uruguay is greatly affected by the dynamics of the sea and is susceptible to modification by atmospheric processes associated with climate change (López and Perdomo, 1999).

This study applied the methodological guide developed by the Centro Agronómico Tropical de Investigación y Enseñanza for the economic valuation of ecosystems and carried out the necessary analyses and calculations to approximate an economic valuation of the impacts on coastal resources and ecosystems in various climate scenarios that assume a rise in sea level by 2100 (Sención, 2002). For this purpose, a maximum hypothesis was used where the mean sea level would rise by one meter off the Uruguayan coast up to 2100, which was assigned to the intermediate dynamic socioeconomic scenario associated with climate scenario A2. A flooding area was also defined and the capital that could be affected by the erosion caused by the phenomenon and the uncertainty associated with this type of event were taken into account.

The study began by estimating the potential impacts of flooding, using a digital elevation model and analyzing secondary c o a s t a l data - economic, social and infrastructure data - and expert opinions on the likely impacts .[1]

The methodology consisted of obtaining a result from contour lines and a reference for the coastline that would then allow the calculation of the contour line corresponding to one meter[2] .

Once the curve was obtained, the area affected by sea level rise in urbanized and undeveloped coastal areas was determined using digital information from the National Institute of Statistics, for which the impacts on surface area, populations, infrastructure and housing were calculated.

Then, official data and market information on real estate prices - land, housing, public works and infrastructure - were consulted to value losses in urban and non-urban coastal areas, which were estimated at nearly $1.6 billion[3] .

In addition, the effects on communication routes, ports, especially in Montevideo, and the major sanitation works in Montevideo and Punta del Este were analyzed, with a loss of assets estimated at more than US$400 million.

Second, the impact of the erosion process caused by the higher sea level was estimated using previous data calculated with Brunn's rule and the dynamic equilibrium model developed by Andrés Saizar (CNCG, 1997) in scenarios with a sea level rise of 0.30 m to 1 m, which would correspond to the dynamic scenario with climate change (A2), and which would affect more than 11,000 hectares, with an estimated loss of 1,194 million dollars.

On the other hand, the impact on tourism was also taken into account, given that 80% of tourism income is generated on the coast: the loss of beaches due to flooding and erosion would determine a lower income -438 million dollars accumulated to 2100- in the scenario of greatest impact, based on the calculations presented below when analyzing this sector.

---

1 Digital elevation model elaborated with ILWIS 3.31 Academic software, based on contour lines every 10 m for the coast and every 2 m for Montevideo.

2 The software packages gvSIG 1.1.2 (http://www.gvsig.gva.es/), ILWIS 3.31 Academic (http:// www.ilwis.org/) and Kosmo 1.2 (http://www.opengis.es/) were used.

3 Average prices per square meter for the purchase and sale of horizontal property in 2008 (Dirección Nacional de Catastro de Montevideo).

Finally, a possible impact on coastal ecosystems was added, based on the results of the biodiversity study, and the value of ecosystem services corresponding to the area lost due to sea level rise was assigned as the impact, which will reach US$75 million in the prognosis period.

In summary, the total impacts from mean sea level rise would amount to nearly 4 billion, cumulative to 2100, under the dynamic scenario with climate change (A2), which represent slightly more than 12% of GDP in 2008.

TABLE IV.7
COASTAL RESOURCES: ECONOMIC IMPACTS OF CLIMATE CHANGE IN THE DYNAMIC SCENARIO WITH CLIMATE CHANGE (A2), 2100

Concept	Cost (in thousands of 2008 dollars)	In percentages	As a percentage of 2008 GDP
Flooding			
Urbana	1 114 922	28,70	3,46
Non-urban	469 230	12,08	1,46
Ports	342 000	8,80	1,06
Sanitation	60 000	1,54	0,19
Transit routes	189 500	4,88	0,59
Population	3 252	0,08	0,01
Subtotal	2 178 904	56,08	6,77
Erosion	1 193 969	30,73	3,71
Tourism	437 601	11,26	1,36
Ecosystems	74 646	1,92	0,23
Totals	3 885 120	100,00	12,07

Source: Own elaboration based on available data.

Flooding costs are equivalent to 56% of the total value calculated and urban impact is the largest contributor to this group. Of the total, the two largest impacts are caused by erosion (31%) and flooding of urban areas (29%). In order of relative importance, they are followed by non-urban flooding, port impacts and tourism.

These impacts were distributed in the dynamic with climate change (A2) and minimum with climate change (B2) scenarios, with time horizons in 2030, 2050, 2070 and 2100, according to the probability of their occurrence for different elevations in mean sea level, as described below (see Table IV.8).

In the minimum scenario with climate change (B2), the impacts of elevation levels of 0.2 m and 0.3 m in 2030 and 2050 -including tourism and ecosystems- were taken into account. Urban and non-urban coastal zones and population in 2070 were also added, as well as the other impacts in 2100, except for some effects of flooding and erosion processes and a minor impact on the port of Montevideo.

TABLE IV.8
COASTAL RESOURCES: TOTAL IMPACT, BY SCENARIO, 2010-2100
(In meters and 2008 dollars)

A. Dynamic scenario with climate change (A2)

Year	Mean sea level rise	Cost
2010	0,1	0
2030	0,2	72 005 231
2050	0,4	760 590 141
2070	0,6	1 182 854 794
2100	1,0	1 869 670 175
Total		3 885 120 340

B. Minimum scenario with climate change (B2)

Year	Mean sea level rise	Cost
2010	0,1	0
2030	0,2	24 623 709
2050	0,3	334 818 995
2070	0,5	851 445 442
2100	0,7	1 632 080 670
Total		2 842 968 815

Source: Own elaboration based on available data.

This includes both the estimation of climate change impacts on tourism and the effects of sea level rise.

Over the last 20 years, Uruguay has experienced considerable variations in visitor arrivals, since the growth of the 1990s was followed by a decline caused by the 2002 crisis. Since then, and despite the blockage of the Fray Bentos-Puerto Unzué bridge, the figures have improved, reaching almost 2 million tourists and revenues of US$ 1,029 million in 2008.
-3 percent of GDP.

The scenarios without climate change for tourism were based on an equation linking tourist arrivals to Argentina's GDP and the exchange rates of both countries, based on the socioeconomic scenarios developed with the coordination of the equivalent study for Argentina. In the case of the scenarios with climate change, another equation was used that calculated the elasticity of tourist arrivals as a function of temperature and assumed an increase in tourists as the temperature rose, a logical situation in the sun and beach tourism that characterizes Uruguay. Annual tourist expenditures were extracted from the work done by the Planning and Budget Office.

TABLE IV.9
TOURISM SECTOR: TOTAL CLIMATE CHANGE IMPACTS, 2006-2100
(In number of visitors and millions of dollars)

Dynamic scenario with no climate change

Year	Visitors	Revenues
2008	1 815 281	704
2030	2 889 826	1 445
2050	3 565 219	1 783
2070	4 271 215	2 136
2100	5 009 173	2 505

Minimum scenario with no climate change

Year	Visitors	Revenues
2008	1 815 281	704
2030	2 259 509	904
2050	2 757 030	1 103
2070	3 364 101	1 346
2100	4 104 843	1 642

(Continued)

Annex 20

Who We Are | GEF

thegef.org/who-we-are

Who We Are

The Global Environment Facility (GEF) is a family of funds dedicated to confronting biodiversity loss, climate change, and pollution, and supporting land and ocean health. Its multilateral financing enables developing countries to address complex challenges and work towards international environmental goals. The GEF partnership includes 186 member governments as well as civil society, Indigenous Peoples, women, and youth, with a focus on integration and inclusivity. Over the past three decades, the GEF Trust Fund has provided more than $24 billion in financing and mobilized another $138 billion for more than 5,700 national and regional projects, in addition to support provided through the Small Grants Programme. The GEF family of funds includes the Global Environment Facility Trust Fund, Global Biodiversity Framework Fund (GBFF), Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF), Nagoya Protocol Implementation Fund (NPIF), and Capacity-building Initiative for Transparency Trust Fund (CBIT).

CEO and Chairperson

Internally recognized conservation expert Carlos Manuel Rodriguez was elected as CEO and Chairperson of the Global Environment Facility by its governing body, the GEF Council, in June 2020. He previously served as Costa Rica’s Minister of Environment and Energy.

GEF Council

The Council, the GEF's main governing body, comprises 32 members appointed by constituencies of member countries.

Organization

The GEF's governing structure is organized around an Assembly, Council, Secretariat, 18 implementing agencies, a Scientific and Technical Advisory Panel, and the Independent Evaluation Office.

What is the GEF?

[redacted]

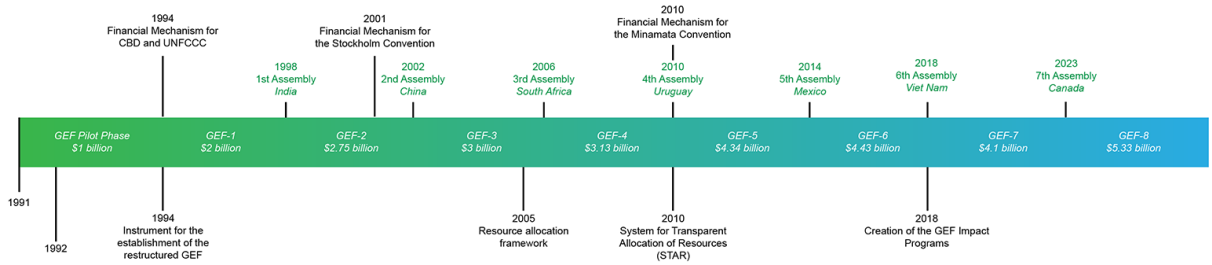
[redacted]

Watch Video At: https://youtu.be/_H-P3VTjo1E

Funding

GEF funds are available to developing countries seeking to meet the objectives of international environmental agreements. Support is provided to government agencies, civil society organizations, private sector companies, research institutions, and other partners to implement projects and programs related to environmental conservation, protection, and renewal.

GEF Timeline



Annex 21

Governance - Adaptation Fund

adaptation-fund.org/about/governance/

Governance

Overview

The Adaptation Fund was established to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change. Since 2010, the Adaptation Fund has committed more than US$ 850 million for climate change adaptation and resilience projects and programmes, including more than 123 concrete, localized projects in the most vulnerable communities of developing countries around the world with 28 million total beneficiaries. It also pioneered Direct Access, empowering countries to access funding and develop projects directly through accredited national implementing entities.

Please see our activities at a glance in our infographic.

Governance and Administration

The Adaptation Fund is supervised and managed by the Adaptation Fund Board (AFB). The Board is composed of 16 members and 16 alternates and holds periodic meetings throughout the year.

The Adaptation Fund Board Secretariat provides research, advisory, administrative, and an array of other services to the Board.

The World Bank serves as trustee of the Adaptation Fund on an interim basis.

Resources

Under the Clean Development Mechanism (CDM), emission-reduction projects in developing countries can earn certified emission reduction (CER) credits. These credits can be traded and sold by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol. Financing for the Adaptation Fund comes mainly from sales of certified emission reductions. The share of proceeds amounts to 2 percent of the value of CERs issued each year for CDM projects.

The fund also receives contributions from governments, the private sector, and individuals.

Legal Capacity of the Adaptation Fund Board

The Adaptation Fund Board has had legal capacity in the Federal Republic of Germany since 1 February 2011. Please see Act to establish the legal capacity of the Adaptation Fund Board in Germany (66.3 KB, PDF).