Uruguay's Sovereign Sustainability-Linked Bond (SSLB) Annual Report

May 2023

Table of contents

Chapter 1

Introduction

As Uruguay's first Sovereign Sustainability-Linked Bond Annual Report, this publication represents a milestone in Uruguay's action plan to deliver on its ambitious sustainability goals and timelines. It further enhances transparency and accountability on the country's progress towards its stated environmental commitments, with investors, multilateral institutions, civil society, and the global community.

Uruguay's Sovereign Sustainability-Linked Bond (SSLB), issued in October 2022, marked the country's entry into the world of sovereign sustainable finance. The SSLB directly links the government's financing strategy and cost of capital to the achievement of Uruguay's climate and nature-based goals set under the Paris Agreement.[1]

The SSLB embeds two Key Performance Indicators (KPIs): (i) reducing the intensity of Greenhouse Gas (GHG) emissions in the economy and (ii) preserving the area of native forests in the country. Together, they address two complementary environmental global public goods: mitigating global warming and preserving a key carbon sink. The Sustainability Performance Targets (SPTs) are based on quantitative goals set for 2025 and are in line with Uruguay's first Nationally Determined Contribution (NDC). The selected KPIs are core, relevant, and material to the country's sustainability objectives, and the SPTs are ambitious, according to the Second Party Opinion assessment.[2]

The bond introduces an innovative step-up/step-down interest rate structure, reducing the interest rate paid if Uruguay overperforms its NDC targets, or increasing the borrowing cost if the country does not deliver on its targets. Through this symmetric pricing structure, Uruguay aligns its national financing strategy with its sustainability efforts, creating a new financial mechanism that binds borrowers and investors together in the effort to provide global public goods.

All told, Uruguay's SSLB is designed to: (i) signal and reassert the country's commitments and action plan to deliver on an ambitious climate change and sustainability agenda, (ii) provide investors with enhanced transparency and accountability on Uruguay's progress towards its climate change goals and conservation of natural capital, (iii) broaden and diversify its bond investor base, particularly of ESG-dedicated funds, and (iv) foster innovation in the sovereign bond markets, creating financial incentives for sustainable policy-making in emerging markets.

[1] https://unfccc.int/sites/default/files/NDC/2022-06/Uruguay_First%20Nationally%20Determined%20Contribution.pdf
[2] http://sslburuguay.mef.gub.uy/30670/20/areas/second-party-opinion.html

This first SSLB Annual Report updates the performance of the KPIs through the year 2021. It provides detailed quantitative and qualitative information to allow investors and other stakeholders to track progress towards the SPTs, monitor their level of ambition, and track Uruguay's direct contribution to global climate efforts. The methodologies and data used to calculate the performance of the two KPIs are the same as those employed by Uruguay to report NDC progress data to the United Nations Framework Convention on Climate Change (UNFCCC).

To ensure timely and transparent disclosure, the reporting process underpinning the SSLB has gone beyond Uruguay's requirements under the UNFCCC and its Paris Agreement. For one, GHG emissions reporting has moved from biennial to annual frequency, in line with the standards of most developed economies. Additionally, Uruguay has used geospatial data and satellite-imaging mapping to estimate the native forest area, in line with international best practices.

The United Nations Development Program (UNDP) has provided an external, independent, and qualified review on both KPIs. The External Verification Report, published at the time of this SSLB Annual Report, concludes that the reported values for KPI-1 and KPI-2 adhere to the methodology and good practices established in the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines and the relevant provisions and guiding principles of the Methods and Guidance (MGD) of the Global Forest Observations Initiative (GFOI). It also states that the data and information used in this report comply with the quality principles in terms of Transparency, Accuracy, Consistency, Comparability and Completeness established by the IPCC.

The preparation of the SSLB Annual Report followed the International Capital Market Association's voluntary guidelines on post-issuance disclosure, reporting, and verification for sustainability-linked bonds.[3] Beyond those requirements, the Ministry of Economy and Finance (MEF, for its Spanish acronym) engaged with key stakeholders to factor in market expectations on the report's content. This involved an active dialogue with underwriting banks, the UNDP, the Inter-American Development Bank (IDB), the Emerging Markets Investors Alliance (EMIA), and the Assessing Sovereign Climate-related Opportunities and Risks (ASCOR) project group (led by asset owners, asset managers, and wider investor networks).[4]

[3] https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June-2020/Sustainability-Linked-Bond-Principles-June-2020-171120.pdf
[4] In 2023, ASCOR developed a framework and data tool assess countries' emission pathways, climate policy action and opportunities to finance the transition.

As was the case with Uruguay's SSLB Framework published in 2022, the SSLB Annual Report is the product of a "whole-of-government" approach.5 It is a public sector-wide effort jointly undertaken by the Ministry of Economy and Finance, the Ministry of Environment (MA, for it Spanish acronym), the Ministry of Industry, Energy and Mining (MIEM, for it Spanish acronym), and the Ministry of Livestock, Agriculture and Fisheries (MGAP, for its Spanish acronym), with the support of the Ministry of Foreign Relations (MRREE, for its Spanish acronym). Strong inter-ministerial coordination and collaboration is key to ensure a timely and reliable provision of data and communicating clearly and regularly on progress towards achieving sustainability targets. This report has also benefited from ongoing technical and financial assistance from the IDB.

Going forward, each year until the SSLB maturity, on or before the 31st of May, Uruguay will publish and keep readily available and accessible on its SSLB website an Annual Report with up-to-date information regarding the KPIs, as well as an External Verification Report – to evaluate the fulfillment of the 2025 targets and assess the KPIs trajectory during the lifetime of the SSLB.

[5] http://sslburuguay.mef.gub.uy/30690/20/areas/sslb-framework.html

Chapter 2

Overview and Summary of Key Results

The SSLB sets out goals for two KPIs. For each KPI, there are two SPTs. All SPTs refer to the same target year 2025.[6] These selected SPTs represent ambitious commitments aligned with the country's sustainability goals, as follows:

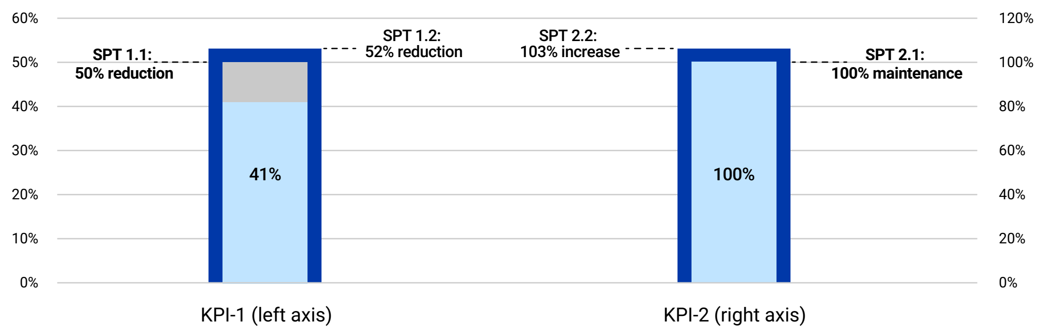
KPI-1: Reduction of aggregate gross GHG emissions (in CO_2eq) per real GDP unit with respect to reference year 1990 (in %)	
SPT 1.1	**NDC commitment:** Achieve at least 50% reduction in GHG emissions intensity by 2025, from the 1990 reference year.
SPT 1.2	**Outperformance compared to NDC commitment:**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

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 ("zero-deforestation" commitment).
SPT 2.2	**Outperformance compared to NDC commitment:** Achieve an increase higher than 3% of the native forest area compared to reference year 2012.

The most recent performance of the two KPIs is depicted in the chart below. By 2021, KPI-1 achieved a **41 percent reduction** in the intensity of aggregate gross GHG emissions per real GDP unit, with respect to 1990 levels. Compared with 2019, the value of KPI-1 retreated 7 percentage points (down from a 48 percent reduction by 2019). This is explained by a 10.7 percent increase in aggregate gross GHG emissions between 2019 and 2021 and a cumulated contraction of 1.3 percent in real GDP over the same period. Regarding carbon emissions, the key drivers were a significant increase during 2021 in (i) exported electricity to the region, given the droughts experienced in Argentina and Brazil, that were sourced with fossil fuels (leading to higher carbon dioxide emissions) and (ii) the use of synthetic nitrogen fertilizers tied to the strong expansion in the cultivated crop area of wheat, rapeseed, barley, corn, and rice in the country (resulting in higher levels of nitrous oxide emissions). With regards to real GDP, growth in 2021 bounced back 5.3 percent in 2021, but did not fully recover from the pandemic-induced contraction in 2020 (6.3 percent). As a result, real GDP in 2021 remained 1.3 percent below its 2019 pre-pandemic level. All factors considered, the most recent KPI-1 value is currently 9 percentage points short of SPT 1.1 set for 2025.

[6] The overachievement or failure to achieve the respective SPTs reported in the Annual Report for the target year 2025, which will be published in May 2027, will trigger the specified coupon rate changes, as detailed in the SSLB Framework.

KPI values by 2021, compared to SPTs



Methodology and calculation of KPI's, and values of SPT's, as established and documented in Uruguay's SSLB Framework.
Source: SSLB Open Source Database, as of April 2023.

On the other hand, KPI-2 reached a **100 percent maintenance** of native forest area by 2021, with respect to the baseline. Compared with 2016, the most recent available cartography, measured native forest cover increased 11,832 ha. (approximately 1.4 percent). This was mostly explained by natural regeneration, increased coverage, and restoration plans. In particular, native forest cover in Uruguay has increased in areas with low agricultural pressure such as the highlands (Serrano forest) and in places where the fluvial forest is fragmented and close to the transitions with the Park forest. Expanding the native forest area has helped protect water resources, reverse environmental degradation, and support biodiversity, while yielding benefits of greater carbon sequestration in the aboveground biomass as well as in forest soil carbon. All factors considered, the most recent KPI-2 value suggests that Uruguay is poised to reach the target outlined in SPT 2.1 by 2025.

The time series and underlying data for both KPIs between 1990 and 2021, can be found in the "Open Source Database" published in Uruguay's SSLB website.[7]

Uruguay is committed to continuing its transition toward a low-carbon, environmentally sustainable economy. Despite the sharp increase in fossil fuel-generated electricity in 2021 tied the region's weather conditions, Uruguay remains among the world leaders in large-scale wind power and production of other forms of clean electric energy. In 2021, more than 45 percent of Uruguay's electricity production was generated using wind and solar energy sources. The country also aims to reduce carbon dioxide emissions 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 and livestock production while reducing methane and nitrous oxide emissions and preserving its unique grassland ecosystem.

[7] http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html

The protection of native forests and the prevention of deforestation will continue to be 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. This has ensured that agricultural activity is not, as it is in much of the world, a driver of deforestation. Still, maintaining 100 percent of the native forest area by 2025, and even increasing it by more than 3 percent (SPT 2.2), will require significant efforts. Uruguayan native forests are exposed to degradation, deforestation, and biodiversity loss as a result of illegal logging for firewood (especially in areas adjacent to population centers), as well as changes in water regimes and runoff linked to production processes and increasing pressures from invasive alien species. Moreover, since the early 2000s, Uruguay has experienced steep growth in land used for agriculture and an equally important intensification of production activities. 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. Given these nature-based and economic pressures, actions must be sustained to preserve and further expand the country's native forest cover.

Chapter 3

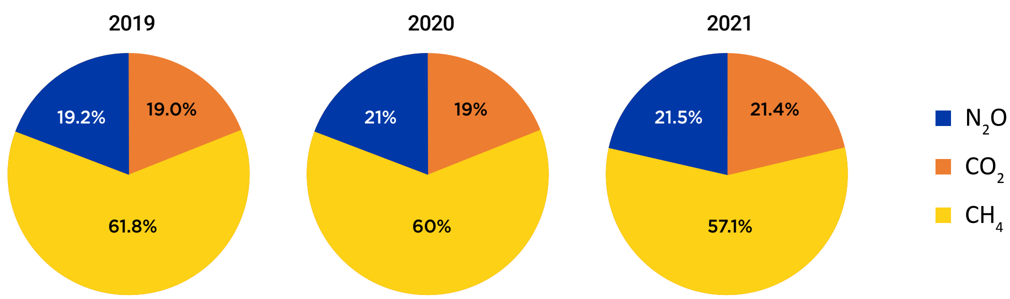
Descriptive Statistics on Greenhouse Gas Emissions and Native Forest Cover in Uruguay

Greenhouse Gas Emissions

As of 2021, Uruguay's emission profile continues to be strongly determined by non-CO_2 GHG emissions. CH_4 emissions represented 57.1 percent of aggregate gross national emissions, N_2O accounted for 21.5 percent, and CO_2 (carbon dioxide) emissions made up 21.4 percent of the total.[8]

The chart below shows the evolution of the composition of Uruguay's emissions profile between 2019 and 2021. Compared to 2019, in 2021 the proportion of N_2O and CO_2 in aggregate emissions has increased at the expense of CH_4 emissions.

Evolution of Uruguay's Gross Greenhouse Gas Emissions Profile
By type of gas, % of total each year



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_2eq, Metric GWP100 AR5. Source: SSLB Open Source Database as of April 2023.

In Uruguay, CO_2 emissions are generated mainly in the Energy sector, specifically from the burning of fossil fuels. In 2021, CO_2 emissions from the Energy sector represented 93.1 percent of total CO_2 emissions. Within the Energy sector, transport represents the main driver of CO_2 emissions. However, in 2021, there was a significant increase in CO_2 emissions tied to a surge in Uruguay's exports of electricity that were generated with fossil fuels, as discussed in the next section. Finally, the Industrial Processes sector represented 7 percent of CO_2 emissions (mostly related to cement production).

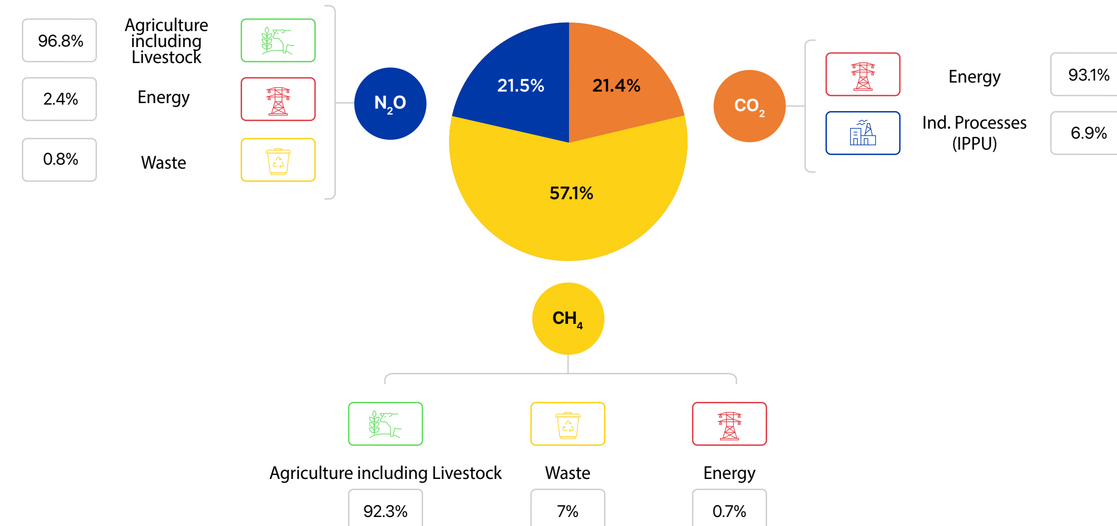
CH_4 emissions and N_2O emissions are generated almost entirely in the Agriculture (including livestock) sector, as methane and nitrous oxide greenhouse gases are strongly linked to primary food production (crops and beef).[9] This sector accounted for 92.3 percent of total CH_4 and 96.8 percent of total N_2O emissions in 2021. Finally, the Waste sector represented 7 percent of all CH_4 and 1 percent of N_2O emissions (mostly from disposal of solid urban waste).

[8] This section of the Report refers to gross GHG emissions categories considered in the definition of KPI-1, which are those set out in the 2017 NDC.
[9] Note that Agriculture, Forestry and Other Land Uses (AFOLU) sector does not account for Land Use and Land Use Change category (LULUCF) in KPI-1. Therefore, Agriculture (including livestock) is a synonym to AFOLU throughout the Report.

According to the latest available data for 2021, cattle raising continues to be the most carbon-intensive economic activity within the Agriculture (including livestock) sector. This activity accounts for 85 percent of CH_4 emissions (mostly due to enteric fermentation)[10] and approximately 61 percent of N_2O emissions (due to manure left on pasture by grazing animals).[11]

Uruguay's Gross Greenhouse Gas Emissions Profile, by Sector

% of total within each type of gas, 2021



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_2eq, Metric GWP100 AR5. Source: SSLB Emissions Report (EMR).

[10] Enteric fermentation accounts for methane generated during the digestive process of ruminants (i.e., cattle and sheep).

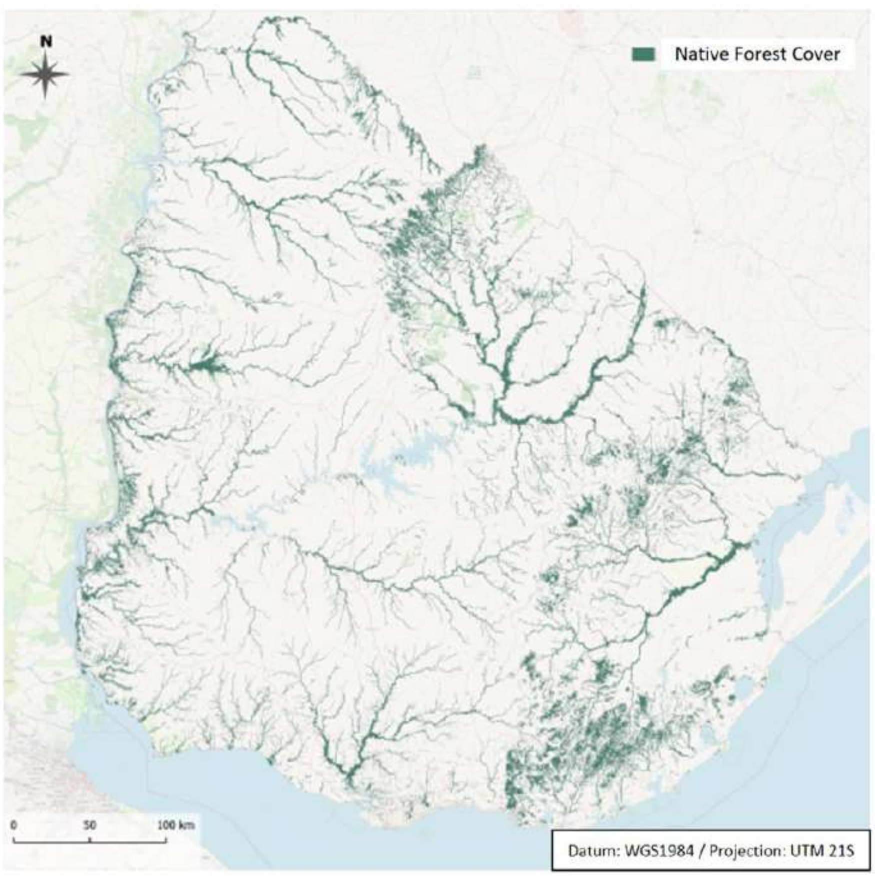
[11] Uruguay's food production is expected to continue growing in the future, since the country has particularly fertile soils, global demand is on the rise, and the country intends to continue to contribute to global food security. This means that Uruguay's GHG inventory is, and will continue to be, heavily influenced by the emissions from the agriculture sector.

Native Forest Cover

The estimated native forest area (measured in hectares) for 2021 was obtained through the application of satellite-mapping and remote sensing techniques, following the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance.

The map of Uruguay's native forest cover is presented below (highlighting its representation for better visualization). In 2021, native forests occupied an area of 847,181 ha, corresponding to approximately 4.84 percent of the total land area of the country.

Uruguay's Native Forest Cartography for 2021
Hectares, 2021



Source: Native Forest Report.

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.[12] 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.

Gross deforestation is monitored by the Ministry of Livestock, Agriculture and Fisheries' (MGAP for its Spanish acronym) General Forestry Directorate (DGF for its Spanish acronym) through field inspections of the mapped area for the purpose of control and monitoring. These instruments, together with stringent legislation and enforcement, have helped ensure that deforestation is not significant in Uruguay.

[12] 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

Chapter 4

Evolution of Key Performance Indicators through 2021

This section of the report refers to the estimation and reporting of the KPIs through the year 2021, as established in Uruguay's SSLB Framework. The detailed methodological reports for each KPI are published in Uruguay's SSLB website together with this Annual Report.[13] See the Methodological Annex for additional details.

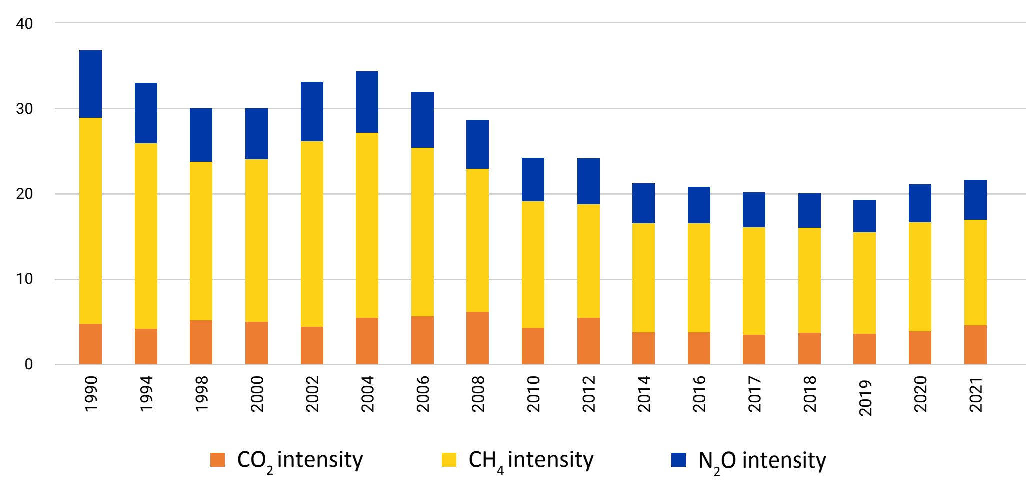
KPI-1: Reduction of aggregate gross GHG emissions (in CO_2 equivalent) per real GDP unit, with respect to 1990 (in %)

The KPI-1 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 first NDC, published in 2017). The estimates of gross emissions apply the IPCC 2006 Guidelines. To obtain the intensity measure, gross GHG emissions are normalized by real GDP.

Results

The most recent estimates for 2020 and 2021 show that the country has traced back some of the progress on emission intensity reduction, compared to pre-pandemic levels. The intensity of aggregate gross GHG emissions for the year 2020 was 21.1 Gg CO_2eq/billion Uruguayan pesos, while for the year 2021 it was 21.7 Gg CO_2eq/billion pesos. These values are higher than the GHG intensity in 2019 (19.3), as shown in the chart below.

Evolution of Uruguay's Intensity of Gross Greenhouse Gas Emissions
as a share of real GDP, by type of gas

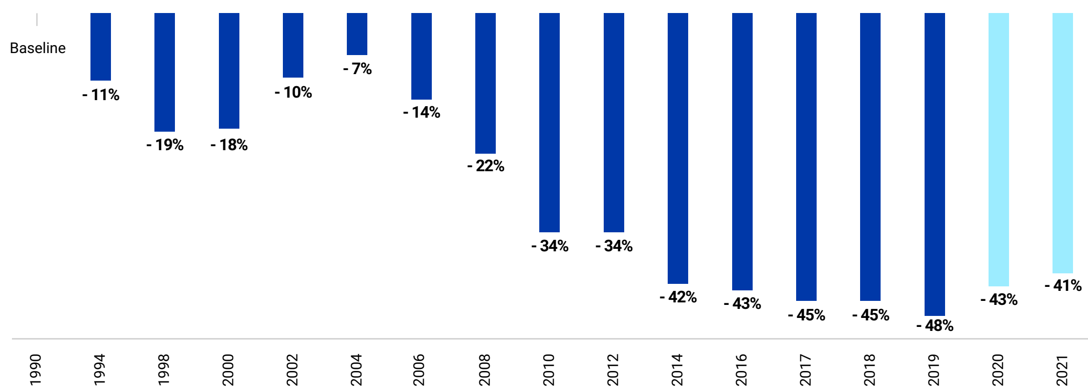


Considers the main sectors contributing emissions of each GHG, as set out in the 2017 NDC. Expressed in Gg CO_2eq, Metric GWP100 AR5. Real GDP measured in billions of pesos in 2016 constant prices. For the period 1990-2019, data is for years with official NGHGI publication and data for 2020 and 2021 was estimated for the SSLB Annual Report. Source: SSLB Open Source Database as of April 2023.

[13] In the "SSLB Annual Report" section of the SSLB website: http://sslburuguay.mef.gub.uy/30672/20/areas/sslb-annual-report-new.html

As a result, the KPI-1 indicator has receded to **-41 percent** by 2021, compared to -48 percent by 2019 as showed in the graph below.

KPI-1: Reduction of the Intensity of Aggregate Gross GHG Emissions per real GDP unit
change compared to 1990, in percent



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_2eq, Metric GWP100 AR5. Real GDP measured in billions of pesos in 2016 constant prices. For the period 1990-2019, data is for years with official NGHGI publication and data for 2020 and 2021 was estimated for the SSLB Annual Report. Source: SSLB Open Source Database as of April 2023.

This increase in the GHG intensity in Uruguay's economy (i.e., the retracement in the KPI-1 indicator) between 2019 and 2021 was driven by both an increase in the absolute gross GHG emissions and a contraction in real GDP over this period. Emissions increased significantly due to a rise in exported electricity generation sourced with fossil fuels, the use of synthetic nitrogen fertilizers, the increase in the non-dairy cattle herd, and an increase in consumption of fossil fuels in ground transportation. During 2021, Uruguay had a recovery of economic activity, but did not fully offset the recession experienced in the previous year.

To break down the factors in depth, the table below shows the evolution between 1990 and 2021 of the value of KPI-1 and its underlying drivers: (i) GHG emissions by type of gas, (ii) aggregate gross emissions in CO_2 equivalent terms, (iii) real GDP, and (iv) GHG intensity in the economy. As stated in the SSLB Framework, for the calculation of the KPI-1 value, and its assessment compared to SPTs, the resulting value of the percent change formula is rounded up or down to the nearest integer, consistent with the way the numerical goals were set under Uruguay's first NDC.

KPI-1 Disaggregated Historical Data

1990-2021 series

Year	CO_2 (Gg)	CH_4 (Gg, expressed in CO_2eq)	N_2O(Gg, expressed in CO_2eq)	GHG aggregated gross emissions (CO_2eq)	Real GDP (in billions of pesos at 2016 constant prices)	Intensity of aggregated gross GHG emissions per real GDP unit	KPI-1: Reduction of aggregate gross GHG emissions per real GDP unit, with respect to 1990 (in percentage)
1990	3,839	19,086	6,295	29,219	792	37	
1994	4,207	21,141	6,793	31,140	975	33	-11%
1998	5,858	20,752	6,850	33,460	1,114	30	-19%
2000	5,510	20,278	6,508	32,296	1,071	30	-18%
2002	4,327	20,683	6,447	31,456	950	33	-10%
2004	5,499	21,921	7,172	34,592	1,006	34	-7%
2006	6,451	22,053	7,372	35,876	1,125	32	-14%
2008	7,928	21,657	7,334	36,919	1,285	29	-22%
2010	6,365	21,388	7,226	34,979	1,444	24	-34%
2012	8,613	21,040	8,335	37,988	1,572	24	-34%
2014	6,601	21,659	7,845	36,105	1,699	21	-42%
2016	6,714	22,077	7,345	36,137	1,734	21	-43%
2017	6,297	22,080	7,320	35,698	1,764	20	-45%
2018	6,751	21,620	7,254	35,625	1,767	20	-45%
2019	6,543	21,245	6,607	34,395	1,780	19	-48%
2020	6,502	21,379	7,374	35,256	1,668	21	-43%
2021	8,141	21,745	8,174	38,060	1,756	22	-41%

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_2eq Metric GWP100 AR5. Real GDP measured in billions of pesos in 2016 constant prices. For 1994, 2016 and 2017, the GHG aggregated gross emissions column does not perfectly match the sum of the CO_2 , CH_4 and N_2O columns due to rounding. For the purpose of the calculation of the KPI value, the result of the formula is rounded up or down to the nearest integer, as established in the SSLB Framework and consistent with the way the numerical goals were set under Uruguay's 2017 NDC. For the period 1990-2019, data is for years with official NGHGI publication and data for 2020 and 2021 was estimated for the SSLB Annual Report. Source: SSLB Open Source Database, as of April 2023.

As shown in the table, the KPI-1 retreated 7 percentage points by 2021, compared to the 2019 value.[14] This is explained by a 10.7 percent increase in aggregate gross GHG emissions (from 34,935 Gg in 2019 to 38,060 Gg in 2021) and a cumulated contraction of 1.3 percent in real GDP over the same period.

[14] At the time of the publication of the SSLB Framework in October 2022, the 2019 value for KPI-1 was -47%, based on GHG estimates from the 2019 NGHGI and the real GDP series available at the time. However, with the update of both the 1990-2021 GHG emissions series and the real GDP series, the KPI-1 value for 2019 was revised from a 47 to 48 percent reduction, with respect to 1990. As noted in the Technical Data Sheets, the estimation of gross emissions may be subject to modifications or revisions due to improvements in estimation methodologies, the addition of new emission sources or data corrections, among other factors. Revisions to historical values of KPI1 in a given year can also occur due to changes in levels in the real GDP series, that imply changes in cumulative real growth in that year compared to 1990.

As for the change in the in the numerator of the intensity ratio (aggregate emissions measured in CO_2eq units), total gross GHG emissions increased 3,665 Gg between 2019 and 2021. The bulk of this increase is explained in almost equal shares by CO_2 and N_2O emissions (44 percent and 43 percent, respectively), while CH_4 explained only 13 percent of the overall increase over the two-year period.

Total CO_2 emissions increased significantly (1,599 Gg, or 24.4 percent) between 2019 and 2021. This was largely explained by a considerable increase in the proportion of electricity generation during 2021 that was exported to regional countries and sourced by fossil fuels (rather than using renewable energy sources). Indeed, CO_2 emissions derived from electricity generation increased from 192 Gg in 2019 to 1,445 Gg in 2021 (more than a six-fold increase) and explained almost 86 percent of the increase in overall CO_2 emissions from the Energy sector.

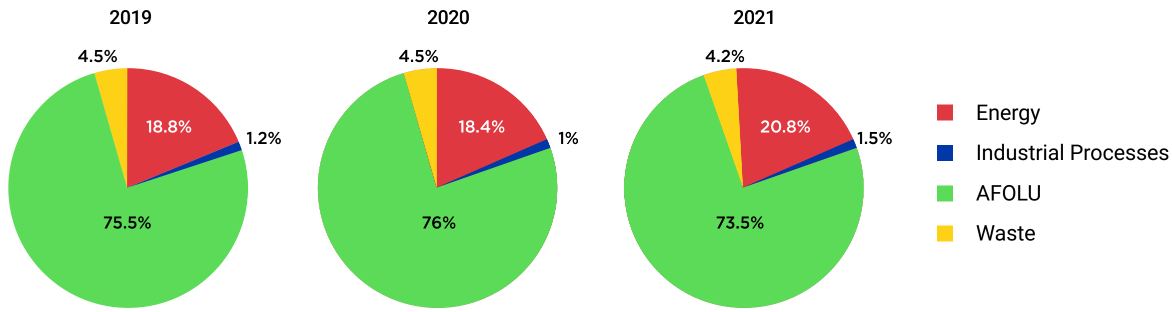
Total N_2O emissions also increased meaningfully (1,567 Gg in CO_2 equivalent, or 23.7 percent) between 2019 and 2021. Approximately 87 percent of that increase (1,359 Gg) was explained by GHG emissions from the increase in the use of synthetic nitrogen fertilizers. On the other hand, total CH_4 emissions increased 2.4 percent (499 Gg), mostly on account of non-dairy cattle emissions. Conversely, methane emissions from dairy cattle and sheep farming actually saw a decrease of 3 percent during this period.

Sector-wise, 55 percent of the increase in total gross GHG emissions between 2019 and 2021 was explained by the Agriculture, Forestry and Other Land Uses (AFOLU) sector (2,008 Gg of CO_2eq emissions), approximately 40 percent by the Energy sector (1,460 Gg of CO_2eq emissions), 4 percent by the Industrial Processes sector (142 Gg), and the remaining 1 percent approximately by the Waste sector (45 Gg of CO_2eq emissions).

This heterogenous contribution was reflected in the change in the country's emissions composition by sector, as shown below. The AFOLU sector decreased its contribution from 75.5 percent in 2019 to 73.5 percent in 2021 (and so did the Waste sector, from 4.5 percent to 4.2 percent in 2021). On the other hand, both the Energy and Industrial Processes sectors increased their participation, with Energy going from 18.8 percent to 20.8 percent and Industrial Processes from 1.2 percent to 1.5 percent.

Uruguay's Aggregated Gross Greenhouse Gas Emissions, by Sector

% of total for each year



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_2eq, Metric GWP100 AR5. Source: SSLB Open Source Database as of April 2023.

Key Drivers

The table below shows the main contributing categories to the absolute change in gross GHG emissions in Uruguay between 2019 and 2021:[15]

Main Contributing Categories to Change in GHG Emissions Between 2019 and 2021

Gross emission expressed in Gg CO_2eq

Sector	Source of emissions	2019 emissions	2021 emissions	Percentage variation 2019-2021
AFOLU	Use of synthetic nitrogen fertilizers	411	1,770	331%
Energy	Electricity generation	192	1,445	653%
AFOLU	Non-dairy cattle	21,833	22,574	3%
IPPU	Cement production	310	464	50%
Energy	Consumption of fossil fuels in ground transportation	3,770	3,914	4%
Energy	Fossil fuel consumption by manufacturing and construction industries	934	1,009	8%
AFOLU	Dairy cattle	1,289	1,247	-3%
AFOLU	Sheep farming	1,399	1,352	-3%

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_2eq, Metric GWP100 AR5. Main contributing categories are identified based on their percentage change in gross emissions between 2019 and 2021 and corresponding share in total gross GHG emissions in 2019. Source: Emissions Report (EMR).

[15] Main contributing categories are identified based on the combined effect of their percentage change in gross emissions between 2019 and 2021 and corresponding share in total gross GHG emissions in 2019.

Energy

Historically within the Energy sector, the category with the most interannual variability on CO_2 emissions is electricity generation. This is due to fluctuations on the consumption of fossil fuels associated with the hydropower availability tied to rainfall conditions.

During dry years with reduced hydropower, Uruguay relies on various instruments: the optimization of the water resources in the hydroelectric dams, increase in the use of wind and solar sources, and domestic generation of electricity from fossil fuels, and regional interconnection. Thermal sources provide, in addition to a back-up, sovereignty in the supply of electricity, and the interconnection contributes to the regional optimization of energy (and especially renewable) resources.

The causal relationship between renewable energy availability and carbon emissions from fossil fuel-generated electricity is shaped by Uruguay's energy dispatch policy, which aims to optimize the available resources under different circumstances. Solar and wind energy under existing "take or pay" contracts have a null variable cost, so, when available, they will be the first to be dispatched. On the other hand, hydropower cost depends on the opportunity cost of water, as higher water supply in basins translates to a lower cost. Lastly, fossil sourced energy, as well as imports, are used to meet electricity demand when the country faces a shortage of renewable energy due to unfavorable climate conditions.

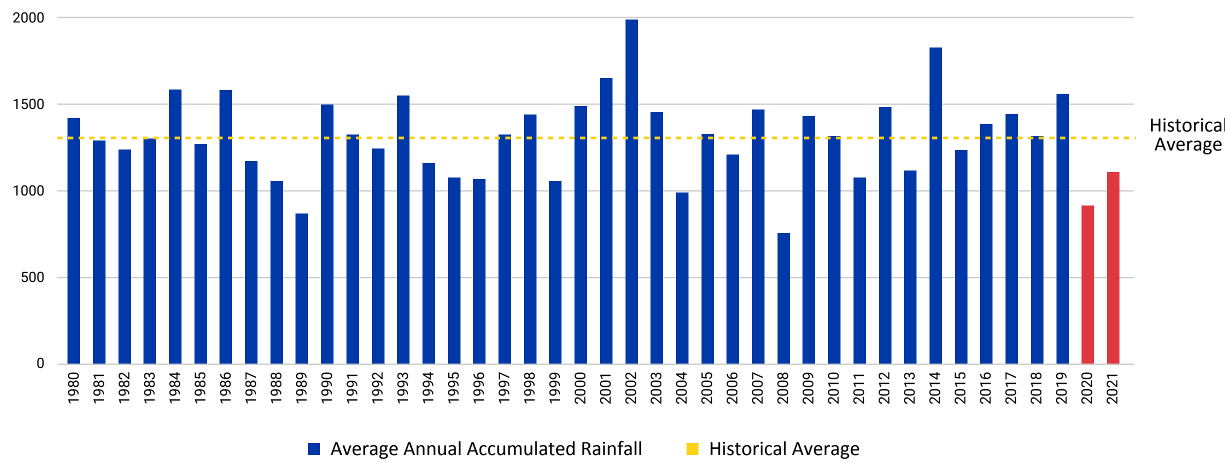
Uruguay has exported and/or imported energy to, and from, Argentina and Brazil for several decades. These exchanges are the result of a regional commitment to energy integration, as expressed in the Framework Agreement on Regional Energy Complementation between the Mercosur member states and associated states[16] and through bilateral agreements. In facilitating the exchange of electrical energy between countries, these links promote energy complementarity and support between systems in the event of deficit or emergency situations.

In 2020 and 2021, a severe drought in the region impacted this balance, with Brazil in particular needing to import electricity in light of its diminished capacity to generate hydroelectric power. Given its commitments to neighboring countries to increase its electricity exports to meet their needs, Uruguay's total electricity generation in 2021 increased by 17.7 percent compared to 2020, with a 148 percent growth in electricity exports with Brazil as the main destination.

[16] Law N°18012 dated of September 11th of 2006. Also available in: https://www.impo.com.uy/bases/leyes/18012-2006/1.

Uruguay's Average Annual Rainfall

Annual country average accumulated rainfall in mm, 1980-2021 series

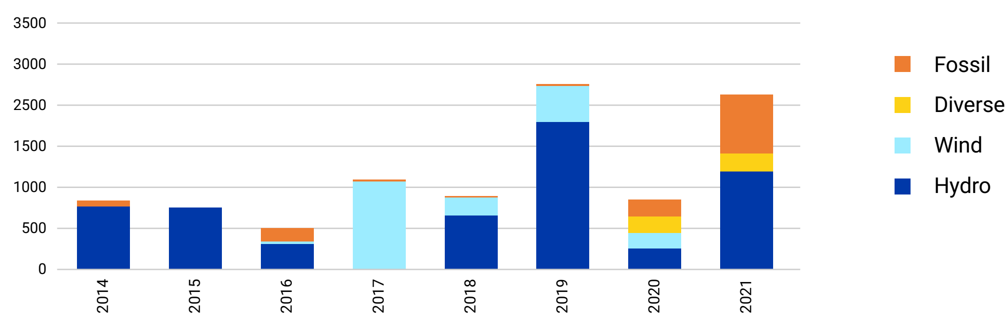


Source: Uruguayan Institute of Meteorology, 2023

Faced with similar climate challenges due to lower accumulated rainfall, Uruguay had to increase its use of fossil fuels in electric power generation to meet this external demand. The result was a considerable increase in the proportion of its power generation sourced by fossil fuels, and ultimately in its CO_2 emissions.[17]

Uruguay's Electricity Exports, by Source of Generation

Total thousands of MWh



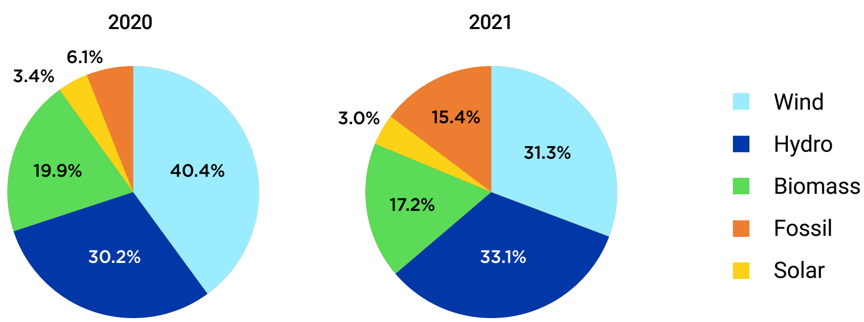
Diverse refers to surplus/overflows from renewable sources of wind, biomass, photovoltaic (under surplus conditions) and hydro (under overflow conditions) units. Source: National Administration of Electric Power Plants and Transmissions, 2023

As a result, in 2021 fossil fuels accounted for 15.4 percent of electricity generation (more than doubling the share in 2020), while renewables made up the remaining 84.6 percent.

[17] In 2019, Uruguay's electricity exports were also high but, because they preceded drought impacts on the generation capacity of its own hydroelectric dams, exports were based largely on renewable energy.

Uruguay's Electricity Generation, by Source

% of total each year

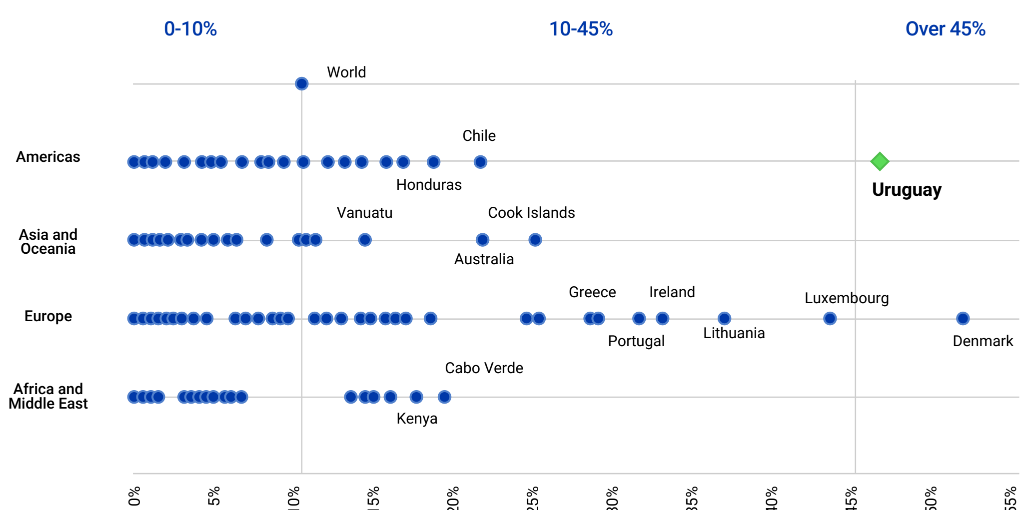


Source: National Energy Balance 2021

Despite the sharp and abnormal increase in fossil fuel-generated electricity in 2021, Uruguay remains among the world leaders in large-scale wind power and production of other forms of clean electric energy. In 2021, more than 45 percent of Uruguay's electricity production was generated using wind and solar energy sources.[18] As a result, Uruguay is second worldwide in EMBER's ranking on share of electricity generated from wind and solar sources, "leading the way on technology for high renewable grid integration."[19]

Electricity generated from wind and solar sources

as a percentage of total electricity generation from all sources, 2021 (else 2020)



Source: Global Electricity Review 2022, Ember.Total of 207 countries.

[18] This diversification of the electricity matrix improved the resilience of the system. There are 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.

[19] https://ember-climate.org/insights/research/global-electricity-review-2022/#supporting-material

Within the Energy sector, when considering the 2019-2021 period, the second source of emissions that has shown the greatest increase is the consumption of fossil fuels in ground transportation. This increase was caused by the significant growth of the vehicle fleet. However, it is worth mentioning that the increase in emissions was less than the increase in energy consumption, which could be explained by the improvements in efficiency and the diversification of the energy sources consumed in this category, among which are electricity and biofuels. In fact, in 2021, Uruguay reached a level mix of 9.8 percent of bioethanol and 4.4 percent of biodiesel.

Generally speaking, the latest combustion vehicles are becoming more efficient, making vehicle replacement a primary driver of efficiency improvements. In addition, even though it remained a minority, the demand for electric energy in transportation doubled from 2020 to 2021 due to an increase in the sales of electric and hybrid vehicles. [20]

On the other hand, the manufacturing and construction industry increased its greenhouse gas emissions by 8.03 percent during the 2019-2021 period, mainly because of the increase in energy demand due to the entry of a second pulp mill. Although the 2020-2021 rise in demand was the highest since 2016, the energy demand matrix for the Industrial Processes sector reached an all-time maximum percentage of renewable biomass origin (mostly from industrial wood waste from commercial forests) of 65 percent by 2021.[21]

[20] https://ben.miem.gub.uy/descargas/1balance/1-1-Libro-BEN2021.pdf
[21] Ibid.

Agriculture, Forestry and Other Land Uses

Emissions resulting from the use of synthetic nitrogen fertilizers experienced a significant increase during the period of 2019-2021, in line with the development of agricultural activities in the country. This rise in emissions can be attributed to the expanding cultivation of crops such as wheat, rapeseed, barley, corn, and rice, which are the primary drivers of nitrogen fertilizer usage, together with sorghum. Total cultivated area of the main crops utilizing nitrogen fertilizers amounted to 754.7 thousand hectares in the 2019-2020 season, increasing to 954.6 thousand hectares in the 2021-2022 (a 26.5 percent increase). Moreover, alongside the expansion of crops, during the same period there was an increase in perennial pastures and green fodder, which also rely on nitrogen fertilizers. The total area allocated to these pastures expanded from 1,818 thousand hectares in 2019 to 1,892 thousand hectares in 2022, representing a growth of 4.1 percent.[22]

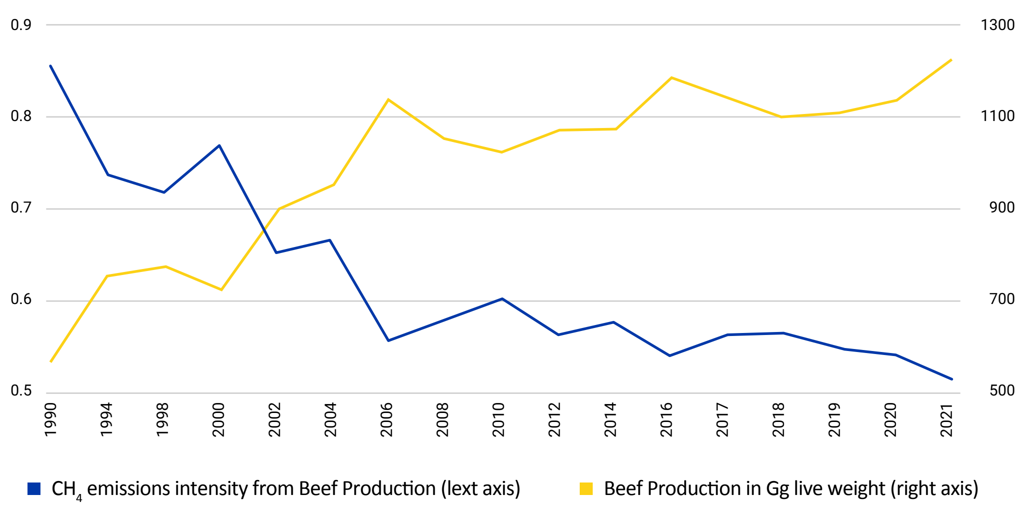
Within the AFOLU sector, the second category with the most impact on KPI-1's aggregate emissions change was non-dairy cattle farming, where emissions increased by 3.39 percent in the 2019-2021 period. However, the increase in emissions in the series was much lower than the growth in meat production, due to a sustained increase in productivity.

Regarding sheep farming, aggregate emissions decreased by 3.36 percent between 2019 and 2021, with a 3 percent reduction being observed between 2020 and 2021, as a consequence of an equivalent decrease in stock. Lastly, aggregate emissions from dairy cattle farming decreased 3.26 percent in the 2019-2021 period. However, commercial milk production grew significantly (7.5 percent in the period 2019-2021) due to an improvement in productivity made possible by continuous adoption of technical advances in pastures, livestock supplementation, machinery and equipment, and health and genetic improvement of the herd.[23]

[22] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/anuario-estadistico-agropecuario-2022
[23] https://www.uruguayxxi.gub.uy/uploads/informacion/b28305203e10f6d7bb3689eb619160dd922b2036.pdf

The introduction of innovative processes and technological advances has continued to drive a significant improvement in the climate efficiency of livestock production.[24] 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, 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. As a result of sustainable cattle raising practices and land management, Uruguay has significantly reduced the intensity of emissions in beef production. In fact, by 2020 the NDC indicator of methane emissions per unit of non-dairy beef produced had achieved a 29.5 percent reduction from 1990 levels, an improvement since its last measured value of 28 percent reduction by 2018.[25]

Evolution of Beef Production and Methane emissions per unit of Beef Produced



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 in the same year. For the period 1990-2019, data is for years with official NGHGI publication and data for 2020 and 2021 was estimated for the SSLB Annual Report. Source: SSLB Open Source Database as of April 2023 and official data provided by MGAP.

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.

[24] Approximately 60 percent of Uruguay's land area are natural pastures, which manage to feed 12 million head of cattle. The country exports 75 percent of its production, representing some 21 percent of its total exports and reaching nearly 50 markets, making the country one of the top 10 exporters of this product in the world.

[25] Uruguay's first NDC 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 (kilograms of beef cattle measured in live weight) by 2025 compared to 1990.

Industrial Processes

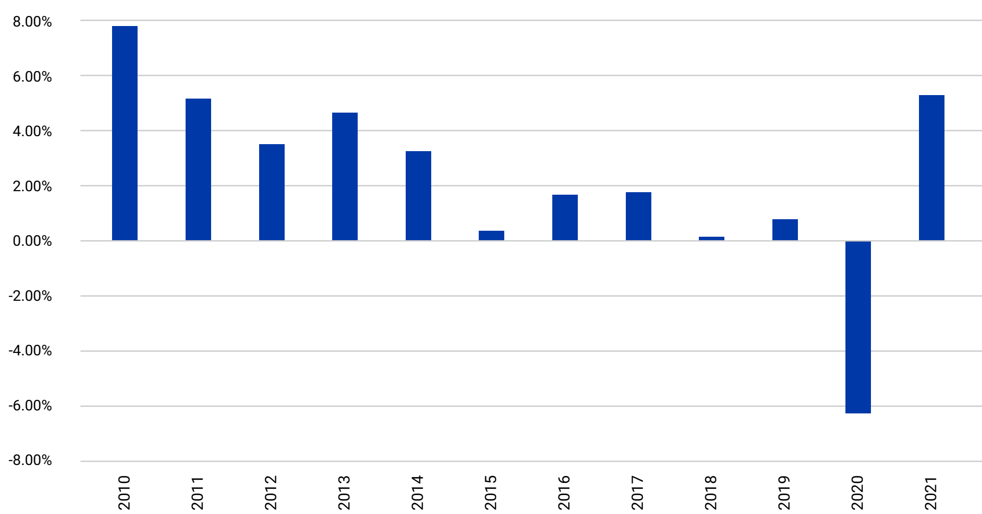
In the Industrial Processes sector, cement production is responsible for the largest increase in emissions. During the 2019-2021 period, emissions increased 49.7 percent due to the increase in the production of clinker – which is used to make cement – partly due to the entry into operation of a new production plant.

Real Gross Domestic Product

Due to the health crisis caused by the COVID-19 pandemic, Uruguay's GDP dropped 6.3 percent in 2020, according to the National Accounts with base year 2016. This was the largest contraction since the 2002 crisis. This decline was generalized among all sectors of activity, with the exception of Construction, which grew 2 percent, mainly because of the construction of the second pulp mill, the central railroad system, and related works.

Uruguay's Real Gross Domestic Product

Annual percent change



Latest official series published by the National Accounts System of the Central Bank of Uruguay, retropolated to the year 2010 using the variation rate method as a statistical splicing technique. Source: SSLB Open Source Database as of April 2023.

In 2021, GDP bounced back and grew 5.3 percent, reflecting an economic recovery underpinned by reopening of borders and a decrease in mobility restrictions. However, it did not fully recover from the recession experienced in the previous year.[26]

KPI-2: Maintenance of native forest area (in hectares), with respect to 2012 (in %)

KPI-2 refers to the maintenance of the native forest area, measured through a native forest cartography based on Sentinel 2 satellite images and applying remote sensing techniques.[27]

Results

By 2021, estimated native forest area shows a cumulative increase of 11,832 ha., compared to 2016. This was explained by natural regeneration, increased coverage, and restoration plans. In particular, native forest cover has increased in areas with low agricultural pressure such as the highlands (Serrano forest[28]) and in places where the fluvial forest is fragmented and close to the transitions with the Park forest.[29] Expanding the native forest area helps protect water resources, reverse environmental degradation, and support biodiversity, while yielding benefits of greater carbon sequestration in the aboveground biomass as well as in forest soil carbon.

Uruguay's historical data on estimated native forest area and associated KPI-2 are presented in the table below. As stated in the SSLB Framework, for the calculation of the KPI value, and its assessment compared to SPTs, the resulting value of the KPI-2 percent change formula is rounded up or down to the nearest integer, consistent with the way the numerical goals were set under Uruguay's first NDC. As a result, this implies a **100 percent** maintenance of native forest area estimated in 2021 with respect to the baseline 2012– implying that the country has achieved SPT 2.1 as of 2021.

[26] http://deuda.mef.gub.uy/innovaportal/file/30572/2/newsletter-may-2022.pdf

[27] More detail on the measuring methodology can be found in the Technical Data Sheet of KPI-2 in the "KPI Definitions and SPT Values" section of Uruguay's SSLB website: http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html.

[28] Serrano forests are characterized by a tree layer that can vary from a low percentage of ground cover to almost total ground cover. They typically occur in small, more or less circular groves formed by a few trees and shrubs, separated by herbaceous and/or subshrub vegetation. They occupy mountainous areas, generally with a high degree of rockiness and shallow soils, so the trees have shorter and more tortuous trunks, and more developed crowns than in the other canopies, due to the lower density. The advancing processes of the Serrano forest depend on pioneer colonizing species such as "Espina de la cruz" (Colletia paradoxa) and "Envira" (Daphnopsis racemosa), or arboreal species such as "molle ceniciento" (Schinus lentiscifolius). In the case of fragmented fluvial forests, species such as "Chal-chal" (Allophylus edulis), "Arrayán" (Blepharocalyx salicifolius) and "Coronila" (Scutia buxifolia) have made progress.
https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/manual-manejo-bosque-nativo-uruguay/3-tipos-bosque-uruguay/34-bosques

[29] Park Forest is characterized by the low density of individual trees when compared, for example, with the riparian forest. This characteristic allows the development of natural field pastures, which has been beneficial for cattle ranching and which is why it is believed to have evolved along with this production. This type of forest is found mostly in the west of the country in the coastal departments bordering the Uruguay River. In areas of transition to Park Forest, species such as the "Espinillo" (Vachellia caven) are also advancing.
https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/manual-manejo-bosque-nativo-uruguay/3-tipos-bosque-uruguay/32-bosque

KPI-2 Historical Data

Year	Native forest area (ha)	KPI-2: Maintenance of native forest area with respect to 2012 (in %)
2004	752,158	88 %
2012	849,960	Baseline
2016	835,349	98 %
2021	847,181	100 %

For the purpose of the calculation of the KPI value, the result of the formula is rounded up or down to the nearest integer, as established in the SSLB Framework and consistent with the way the numerical goals were set under Uruguay's 2017 NDC. Years with official Native Forest Cartography publication. Source: SSLB Open Source Database, as of April 2023

Key Drivers

The protection of native forests and the prevention of deforestation has 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. The Forest Act of 1987 prohibits logging native forests, with very few exceptions.[30] 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).

Between Uruguay's last Native Forest Cartography (2016) and the most recent cartography described in this Report (corresponding to 2021), three new public policies went into effect:

1. The National Strategy for Native Forests, launched in 2018, set out as national policy the conservation and enhancement of native forest carbon stocks, sustainable forest management, and the reduction of emissions from deforestation. This strategy addresses the key drivers of deforestation and degradation in Uruguay, including the expansion of the agricultural and forestry frontier, livestock management, illegal logging, and infrastructure projects.[31]

2. Uruguay adopted its National Biodiversity Strategy,[32] which established the national policy for the conservation and sustainable use of biological diversity. This is a basic instrument for the management of ecosystems, species, and genetic resources, as well as the goods and services derived from them.

[30] 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
[31] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/estrategia-nacional-bosque-nativo
[32] https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/estrategia-nacional-biodiversidad-2016-2020

3. The governments of Germany and Uruguay, through the German Federal Ministry of Food and Agriculture (BMEL for its German acronym) and the MGAP, signed an agreement for the implementation of a project during which the current Native Forest Strategy was reviewed and several consultations were held on the persistent challenges towards sustainable management of native forests. The outcome was the updating of the national strategy, a fundamental tool for maintaining the achievements obtained.[33]

Going forward, maintaining 100 percent and even increasing by more than 3 percent (SPT 2.2) Uruguay's native forest area versus the 2012 baseline, will require significant efforts. Uruguayan native forests are exposed to degradation, deforestation, and biodiversity loss as a result of illegal logging for firewood (especially in areas adjacent to population centers), as well as changes in water regimes and runoff linked to production processes and increasing pressures from invasive alien species. Moreover, most other countries in the region have had cumulative decreases in naturally regenerating forest area over the last two decades, driven by land-clearing for crop production (soybeans, palm oil) or land conversion to pasture for cattle farming.[34] 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.

[33] https://www.gub.uy/presidencia/comunicacion/noticias/uruguay-alemania-firmaron-convenio-cooperacion-para-proteger-area-bosque
[34] 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.

Chapter 5

External Verification of Key Performance Indicators

Credible and timely external verification are critical to Uruguay's SSLB. For that reason, Uruguay committed to have an external and independent review by UNDP on the estimated values of both KPIs, conducted annually and throughout the life of the bond.[35] The External Verification Report by UNDP assesses the consistency with international methodologies and standards for calculating the KPIs, and is published at the time of this SSLB Annual Report. See the Methodological Annex for further details.

The External Verification Report concludes: "In UNDP's opinion, KPI 1 and KPI 2 reported in the 2020-2021 Key Performance Indicators Report (KPIR) for the Sovereign Sustainability-Linked Bond have been prepared in accordance with the methodologies established in Uruguay's Sovereign Sustainability-Linked Bond Framework. KPI-1 and KPI-2 adhere to the methodology and good practices established in the 2006 IPCC Guidelines for the preparation of National Greenhouse Gas Inventories. KPI 2 is consistent with the relevant provisions and guiding principles of the Methods and Guidance (MGD) of the Global Forest Observations Initiative (GFOI). The Emissions Report, the Native Forest Report and the KPIs Report comply with the quality principles in terms of Transparency, Accuracy, Consistency, Comparability and Completeness established by the IPCC."[36, 37]

In addition, it notes: "Uruguay submitted the Emissions Report (EMR), the Native Forest Report (NFR) and the KPIs Report, complying with the frequency and timeliness established in the SSLB Framework.[38] The institutional arrangements for inter-ministerial coordination through the SSLB, pMRV and National Greenhouse Gas Inventory (NGHGI) Working Groups of the National Response System to Climate Change provide a robust design for the operationalization of Uruguay's Sovereign Sustainability-Linked Bond."

[35] More information on this agreement can be found in Uruguay's SSLB website: http://sslburuguay.mef.gub.uy/333/20/areas/external-verification.html.
[36] The External Verification Report can be found at: http://sslburuguay.mef.gub.uy/333/20/areas/external-verification.html.
[37] The Verification Report is also available in UNDP's website: https://www.undp.org/es/uruguay/projects/verificacion_externa_BIICC.
[38] http://sslburuguay.mef.gub.uy/30672/20/areas/sslb-annual-report-new.html

Chapter 6

Future Pathways: Actions to Drive Progress on KPIs

Policy Initiatives and Incentives to the Private Sector

Uruguay is committed to continuing its transition toward a low-carbon, environmentally sustainable economy. The country is working towards a clean energy future through policies that seek the decarbonization of key economic sectors (with a focus on ground transportation and industry). In the AFOLU sector, policies will be geared towards encouraging sustainable production, the protection, conservation, and regeneration of ecosystems, and the sequestration of carbon. This section lays out the different policy measures across a range of sectors that are expected to contribute to the fulfilment of the goals set for Uruguay's KPIs.[39]

Energy and Industrial Processes

Decarbonization of the transport sector. The MIEM continues to work on different strategies to decarbonize the sector, the main CO_2 emitter, seeking environmental but also economic and social sustainability.[40] It has advanced its Sustainable Mobility program and promoted it in an inter-institutional manner to include all actors and dimensions of the economy, integrating different levels of government, the private sector, academia, and civil society. The strategies include:

1. The expansion of electric mobility, including the charging infrastructure in key transportation corridors to support it.
2. Harnessing green hydrogen energy in heavy transportation, within the framework of the Green Hydrogen Roadmap.[41]
3. Greater energy efficiency in public and private transportation.

Regarding the first objective, Uruguay now has 176 electric vehicle public charging points throughout the country, installed by UTE, the state-owned power company. With the aim of densifying the electric route and achieving a charging point every 50 kilometers by 2023, UTE will invest around $5.5 million in 124 new electric vehicle charging points throughout the country, 100 of which will offer fast charging.[42]

[39] For additional information on these policies, please refer to the section Pathways to Environmental and Climate Progress in Chapter 3 of the SSLB Framework published in September 2022.
[40] The World Energy Council's Trilemma Index acknowledged Uruguay's performance on Energy Security, Energy Equity, and Environmental Sustainability of Energy Systems as the best in its region and 13th globally in 2021.
See: https://www.worldenergy.org/assets/downloads/WE_Trilemma_Index_2021_-_Executive_Summary.pdf?v=1634811254
[41] https://www.gub.uy/ministerio-industria-energia-mineria/sites/ministerio-industria-energia-mineria/files/documentos/noticias/Green%20Hydrogen%20Roadmap%20in%20Uruguay_0.pdf
[42] https://www.gub.uy/presidencia/comunicacion/noticias/ute-invertira-5-millones-dolares-nuevos-puntos-carga-para-vehiculos

Correspondingly, imports of electric vehicles, including purchases made by various public agencies and companies, point to greater dynamism.[43] During 2021, total value of imported electric vehicles rose from $5 million in 2020 to $30 million, and in the first eight months of 2022, the value of imported electric vehicles increased 11 percent with respect to the same period in 2021, achieving a total of $20 million.

The MIEM is also laying the foundations for the second energy transition in Uruguay. Through its H2U Program,[44] and in coordination with various government agencies, the private sector, academia, and civil society, Uruguay is implementing the actions proposed in the Green Hydrogen Roadmap. As an example, in February 2023, five pilot projects on transport of heavy cargo and the mixture of hydrogen with natural gas submitted bids to the Green Hydrogen Sector Fund. During May 2023, the evaluation committee, made up of national and foreign experts, selected a project known as H24U project to be financed with up to $10 million. This project foresees an investment of $43.5 million and addresses the development, engineering, and production of green hydrogen to be used in specially adapted trucks, which will be used for forestry transport and later in the existing Natural Gas network in the city of Paysandú.[45]

In addition Uruguay has recently agreed to work with Germany in technical groups to promote green hydrogen, energy efficiency, and battery storage. A steering committee comprising ministers from both countries will be created, allowing Uruguay to continue positioning itself as an attractive country for investment, expand its economic openness towards Europe in future energy markets, and consolidate its position as a global supplier of renewable energies.

Beyond the transport sector, the National Energy Efficiency Plan continues with its strategies to optimize the use of energy through regulations, economic incentives, energy efficiency certificates, technical assistance, education and promotion of cultural changes, labeling, and specific instruments to each sector that are revised and renewed. The program Efficient Localities has allowed to have small projects all around the country that, besides giving specific solutions, function as demonstrative projects.[46]

[43] https://www.uruguayxxi.gub.uy/uploads/informacion/1e66e8866c9664afbea708937041f70d3630cc50.pdf
[44] https://www.gub.uy/ministerio-industria-energia-mineria/politicas-y-gestion/programa-h2u
[45] https://www.elobservador.com.uy/nota/hidrogeno-verde-se-definio-que-empresas-haran-el-primer-piloto-en-uruguay-202351612432
[46] https://www.gub.uy/ministerio-industria-energia-mineria/node/6193

Considering that Uruguay has carried out a strong energy transformation in its electricity matrix, future decarbonization policies will focus on the consumption sectors, where there are greater technical and economic challenges associated with implementing emission reduction measures. In the Industrial Processes sector, measures are being implemented to address emissions from refineries, which almost doubled in the 1990-2021 period, mainly due to the need to meet the increasing demand of the ground transportation. MIEM is also working with the cement industry on emission reduction measures, both in the Energy and Industrial Processes sectors. For example, reducing clinker in cement reduces emissions associated with the energy consumption of kilns while also reducing chemical emissions from the burning of limestone.

Agriculture and Livestock Management

Reducing use of synthetic nitrogen fertilizers. Uruguay is introducing measures to incorporate slow-release fertilizers and/or adjustments in the timing of fertilizer applications.[47] The government also aims to promote technologies that improve efficiency in the use of nitrogen fertilizers in winter crops, corn, and sorghum to reduce nitrogen losses due to volatilization. More recently, since November 2021, specific agricultural inputs such as organic amendments, organic fertilizers, and organo-mineral fertilizers became exempt from the value-added tax (IVA for its Spanish acronym).[48] This exemption aims to incentivize the adoption of these environmentally-friendly fertilizers and promote sustainable practices in agriculture.

Promoting agroecological production. In 2022, Uruguay launched the "Agroecological and Resilient Systems in Uruguay" project (SARU for its Spanish acronym), with the objective of strengthening agricultural systems and capacity building of rural producers.[49] The project will carry out actions in line with Uruguay's national climate action policies, including climate change adaptation priorities outlined in the National Adaptation Plan for the Agriculture (including livestock and fisheries) sector.[50]

[47] Slow-release fertilizers allow the continuous supply of nitrogen throughout the crop's growing season and reduce nitrogen losses that occur through volatilization and denitrification. By adjusting the timing of application, the nutrients can be made available to the plants according their specific requirements, optimizing the quantity of nitrogen used. Such implementations serve as better practices in the utilization of synthetic nitrogen fertilizers, ultimately leading to a reduction of nitrous oxide emissions.
[48] https://www.impo.com.uy/bases/decretos/366-2021/1
[49] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/book/15603/download
[50] https://www.undp.org/es/uruguay/publications/plan-nacional-de-adaptaci%C3%B3n-la-variabilidad-y-el-cambio-clim%C3%A1tico-para-el-sector-agropecuario-pna-agro

Organic agricultural production has been adopted by groups of farmers in a certified process with industry. This practice avoids the use of synthetic fertilizers and chemicals and consumes less energy, reducing its carbon footprint and promoting practices that increase agricultural biodiversity and soil carbon. The MGAP has systematized the certification of organic and integrated agricultural and aquaculture production through a Presidential Decree in May 2022. This decree established the National Certification System for Organic and Integrated Production, in which producers can voluntarily participate, adapting to the new characteristics to these production systems and to a growing demand from consumers for organically grown products.

Sustainable livestock farming and production. Uruguay's first NDC included a comprehensive and ambitious plan for the mitigation of ruminant emissions and land use best practices. An important measure to mitigate emissions lies in the adoption of better agricultural practices for grasslands and herd management. 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 percent of the country's total pasture area. Activities in support of this target include improved practices and technologies such as better pasture management, strategic supplementary feeding, adequate animal health control, and genetic improvement of animals, all of which are geared towards improving livestock productivity and reducing emission intensity.

The 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. Uruguay is also 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).

Uruguay is also working on the following areas, in line with the measures established in Uruguay's second NDC:[51]

- Incorporate good practices in livestock and grassland management (including sown legumes with high tannins concentration) to reduce greenhouse gas emissions and enhance soil carbon sequestration.

[51] http://sslburuguay.mef.gub.uy/30726/20/areas/environmental-links-of-interest.html

- Develop an animal breeding platform with the objective of reducing methane emissions for cattle and sheep without losing sight of livestock productivity. This includes strengthening the incorporation of genomics into current animal breeding programs and estimating the potential impacts of genetic improvement on GHG emissions mitigation and its co-benefits with climate change adaptation.
- Generate science-based evidence on the applicability of methanogenesis inhibitors in livestock systems (dairy, confinement, and field) and assess their potential to mitigate GHG emissions and their impact on animal production.
- Estimate the potential impact of animal health issues on methane emission reductions for cattle and sheep and their co-benefits with climate change adaptation.
- Implement methane capture systems from effluent and/or organic waste management (conditional to means of implementation).

Waste Management

The MA has led the development of the National Waste Plan[52] in the framework of the Waste Law approved in 2019.[53] The National Plan was elaborated in a participatory way and has a series of principles and strategic lines that will be implemented in association with subnational governments and with the participation of the private sector. Then Plan has 10 global results which seek to show the main pathways of the Plan.

At the same time, the country has been working in strategic areas such as cattle and dairy, waste treatment, and energy generation from waste towards improving environmental performance and contributing to climate change mitigation. These efforts include methane capture in industrial wastewater treatment systems in two meat industries and capture and burning of methane in the Fray Bentos Landfill, which receives waste from the cities of Fray Bentos, Mercedes, Dolores, and Palmitas.

[52] https://www.ambiente.gub.uy/oan/residuos/
[53] Law N°19829 dated of September 18th of 2019. Also available in: https://www.impo.com.uy/bases/leyes/19829-2019

Forestry and Other Land Uses

Given that 98 percent of Uruguay's native forests are privately owned, agricultural producers should be considered as strategic partners in the care of native forests ecosystems.

First, the government took recent measures to enhance the incentives offered to promote the conservation of the native forest. The 2021 Budget Law introduced changes that expanded the criteria for the area occupied by natural forests when determining exemptions to the wealth tax and rural real estate contribution.[54] These incentives came into effect on January 1, 2023. Since registration of forests with the General Forestry Directorate (DGF) of the MGAP is necessary to gain these tax advantages under Uruguayan law, it is anticipated that this policy will lead to an increase in native forest voluntary registrations, as well as improve native forest management, reducing deforestation and degradation.

Second, Uruguay has made important efforts in the valorization of these ecosystems by the population in recent years. As examples of these efforts, within the framework of the National Plan for Gender in Agricultural Policies,[55] the MGAP has trained women in native forest management. In addition, MGAP's General Forestry Directorate has trained officials from the Ministry of the Interior, the National Directorate of Rural Security, and the Highway Police, among other institutions, on the implementation of policies to control the transport and commercialization of native forest firewood.[56]

During 2022, the DGF carried out a strong awareness and information campaign on the protection of native forests and the regulation in force, reaching not only producers but also the wider civil society. This program is ongoing and is expected to be expanded in the coming years.

As an example, UNDP's Small Grants Program has been supporting, for over a year, the forest restoration program on the Yí River. This program, among other objectives, seeks to enrich the forest through the reforestation of native species of the region while articulating training and awareness-raising actions, with key actors in the area and the wider community, on the ecological value of the forest and the importance of its conservation through sustainable use.[57]

[54] 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.
[55] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/plan-nacional-genero-politicas-agropecuarias
[56] https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/noticias/dgf-capacita-funcionarios-involucrados-contralor-del-bosque-nativo
[57] https://ppduruguay.undp.org.uy/portfolio-items/restauracion-de-bosques-en-el-rio-yi-reforestacion-investigacion-y-participacion-ciudadana/

The importance of native forests worldwide, and the pressure of the international community to reverse deforestation processes seen in other countries, presents an opportunity for Uruguay. The DGF, aware of this opportunity to valorize native forests, is developing a project for the certification of production chains together with the European Union. Its goal is to ensure the traceability of products from deforestation-free establishments, thus generating value in the production chain and the conservation and improvement of the native forest area.

Role of the Ministry of Economy and Finance in Driving Climate Action

The MEF is stepping up its role in addressing the nation's climate and biodiversity objectives by incorporating climate action and biodiversity conservation 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.[58] 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. It is also assessing the introduction of incentives that can promote public and electric transport in order to reduce GHG emissions, and ramping up work on development of green taxonomies for sustainable finance (together with the Central Bank of Uruguay). Two key initiatives, implemented in coordination with sectoral Ministries, are worth noting:

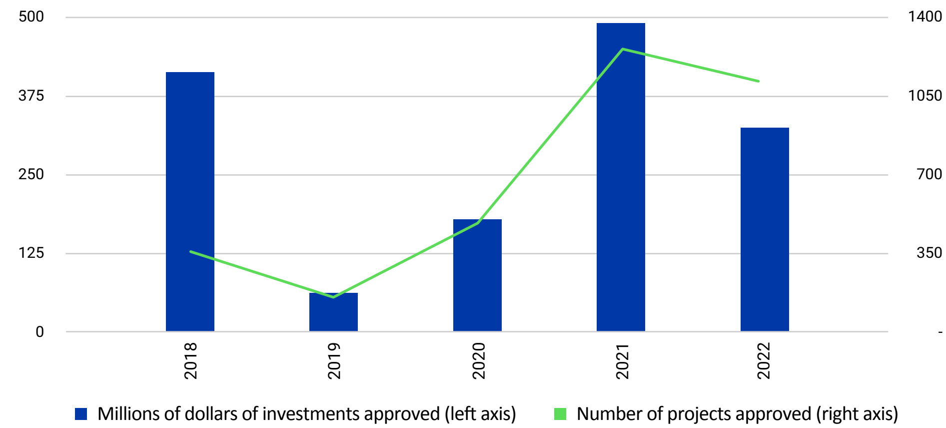
- Under the Investment Promotion Law, several incentives and tax benefits have been introduced for low-carbon productive investments that generate favorable environmental externalities.[59] Companies that qualify recover a percentage of the executed investment (between 30 percent and 100 percent) depending on the score obtained in the matrix of committed indicators, which is based on the uptake of clean technologies.[60] During the period 2020-2021, more than 1,700 projects were granted exemptions, resulting in a cumulative intended investment of approximately $670 million. This represents a 41 percent increase from 2018-2019. Further, in 2022 there were more than 1,100 projects approved under the Clean Technologies indicator, corresponding to an investment of around $325 million.

[58] In coordination with the Ministry of Environment, it is designing 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, or 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.

[59] http://www.inalog.org.uy/en/investment-promotion-regime/

[60] 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. It 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.

Investments and number of projects approved with Clean Techonology Indicator
2018-2022



Source: Ministry of Economy and Finance

- The government has engaged multilateral banks in developing loan instruments that link the cost of capital to the country's forward-looking environmental targets under the Paris Agreement. In the case of the World Bank, Uruguay is working on a Sovereign Sustainability-Linked Loan (SSLL), linking the loan's cost of borrowing with the country's success in meeting two economy-wide environmental indicators: reducing the intensity of livestock methane emissions and protecting native forests in the country. Together, these indicators demonstrate Uruguay's determination and ambition to pursue a sustainable development pathway that combines higher growth and productivity in the cattle sector (which is an integral part of the economic fabric of the country) with a commitment to zero deforestation. The use of methane intensity from livestock as an indicator, highlights the breadth of Uruguay's commitments to climate action and additionality to the SSLB, by employing another material and core KPI included in the NDC.

Chapter 7

Uruguay's Second Nationally Determined Contribution to the Paris Agreement

Uruguay submitted its second NDC to the Paris Agreement in December 2022.[61] It reinforces the country's commitment to addressing climate change and compliance with the Paris Agreement through an ambitious NDC, particularly for a country that is a major food producer and exporter.

The second NDC, setting targets for 2030, represents increased mitigation ambition compared to the goals set in the first NDC for 2025, in particular by: (i) setting more ambitious goals for the reduction of the methane and nitrous oxide emission intensity of beef production, thus contributing to the reduction of Uruguay's overall emission intensity; (ii) shifting from GHG emission reduction objectives based on emissions intensity per unit of real GDP in the first NDC, to ones based on absolute emissions, implying a commitment from the government to limit GHG emissions regardless of GDP performance; (iii) having a greater scope in terms of the GHGs considered, by adding a consumption reduction goal for hydrofluorocarbons (HFCs). In addition, the second NDC maintains the commitment to conservation by retaining the target of maintaining 100 percent of the 2012 area of native forests, implying zero deforestation.

The proposed policy measures in the second NDC are in line with Uruguay's recently approved Long-Term Climate Strategy. The gradual decarbonization of the economy, jointly with increased forest carbon sequestration, underpin the goal of achieving net-zero CO_2 emissions by 2050.[62] Measures in the second NDC have been being widely consulted with civil society and relevant stakeholders, including young people through workshops organized in collaboration with UNICEF.

The second NDC also broadens the range of 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.[63] The first NDC featured 38 specific adaptation measures, which included the elaboration and implementation of specific adaptation plans in agriculture, coastal zones, cities and infrastructures, and the energy and health sectors. The second NDC deepens measures in the main adaptation areas and adds transversal measures, such as strengthening systems of climate risk information, risk management, estimation of losses and damages, and analysis of the impacts of climate change on migration and displacement.

Taken as a whole, Uruguay's new objectives demonstrate an effort to increase its commitments over its previous NDC, while reflecting a greater ambition in its contribution to the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) and the objectives of the Paris Agreement, based on equity and the principle of common but differentiated responsibilities and respective capacities.

[61] http://sslburuguay.mef.gub.uy/30726/20/areas/environmental-links-of-interest.html
[62] https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/estrategia-climatica-largo-plazo-uruguay
[63] Climate change is expected to worsen risks from droughts, compounding water stress, while also bringing more frequent severe storms. 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.

Chapter 8

Case Studies

Uruguay’s Electricity Exports to the Region

Uruguay’s electricity grid has some characteristics that differentiate it from other systems. In particular, it has a significant installed capacity in hydroelectric generation plants and in non-conventional renewable energy sources, as well as strong regional electricity interconnection links with neighboring countries.

The electric system’s links with Argentina go back more than four decades, sharing infrastructure both in generation facilities (Salto Grande Binational Dam) and at the level of interconnection in extra high voltage lines. In some respects, the two countries are considered to have a single electric system.

Although Uruguay’s interconnection with Brazil is more recent, investments have been significant. The first frequency converter has been in operation since 2000, while a larger electric interconnection became operational in 2015 as part of an effort to promote and develop a greater interconnection of electric energy within the framework of the MERCOSUR Structural Convergence Fund.

In facilitating the exchange of electrical energy between countries, these links promote energy complementarity and support between systems in the event of deficit or emergency situations.[64]

Although Uruguay's exported electricity has historically come from renewable sources, recent episodes of deep droughts in the region have reduced hydroelectric power generating capacity in the three countries, thereby causing a shift toward Uruguay's greater reliance on fossil fuel to satisfy additional demand for imported electricity by its neighbors. In 2021, the government-owned power company, UTE, reached an agreement with authorities in Brazil and Argentina to increase its electricity exports (primarily to Brazil) and increased the use of fossil fuels to support the additional power generation required. Accordingly, from 2020 to 2021, Uruguay’s electricity power generation increased by nearly 18 percent, while the proportion of its electricity that was exported more than doubled (from 9.4 percent to 20 percent). At the same time, the share of exported power generated from renewables fell from 76 percent to 66 percent.

In 2022, climate conditions in the region changed and the ensuing cross-border flow of electric power reversed. While Uruguay's drought situation worsened, more frequent rainfall in Brazil allowed its own reservoirs to recover. As a result, during the first four months of 2023, the exchange of electric energy from Brazil to Uruguay increased.

The bottom line is that despite Uruguay’s success in achieving a high component of renewable sources in its energy mix, fulfilling its regional commitments to meet electricity needs can have sudden and consequential impacts on the country's GHG emissions.

[64] Law N°18012 dated of September 11th of 2006. Also available in: https://www.impo.com.uy/bases/leyes/18012-2006/1.

Uruguay's Livestock and Climate Project

Uruguay has made a firm commitment to comprehensively address the environmental challenges associated with the beef and dairy cattle industry. This encompasses productivity, sustainable land management, enhancing competitiveness, and adapting to and mitigating the impacts of climate change – all while maintaining a steadfast dedication to food security.

In this context, the MGAP is conducting a pilot project to develop climate-smart livestock practices and grassland restoration, named Livestock and Climate Project (GyC, for its Spanish acronym). 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, while simultaneously increasing productivity and net family income.

Since March 2020, the GyC project has been operational in four of Uruguay's agro-ecological zones. As part of the project, 11 technical advisors have been trained to collaborate with 60 livestock farms to achieve economic productivity and environmental sustainability. Its primary focus is to enhance grass and cattle management practices while closely monitoring economic, productive, social, and environmental factors. Under this program, MGAP monitors and estimates GHG emissions at the farm level and generates national information on carbon sequestration in pasture soils and rangelands.

To reduce methane intensity, the pilot's approaches have included different tools. They include improving diet in natural grasslands by improving grazing management; improving efficiency of the herd, such as higher pregnancy and weaning and younger slaughter age; and using feed supplements such as algae to reduce CH_4 emissions and prevent animal diseases, as well as endo and ectoparasites.

As a direct outcome of the project, participating farmers have experienced notable improvements in their livestock productivity and environmental footprint. Their beef production increased by 9 percent and sheep production rose by 16 percent. Concurrently, net farm income has surged by 31 percent at constant prices. These achievements are particularly noteworthy considering the challenging circumstances of a three-year drought that led to a national agricultural emergency.

Moreover, the project has successfully contributed to a reduction in GHG emissions per hectare at participating cattle farms. In the first year of implementation, emissions were reduced by 6.3 percent, further improving to 10.5 percent in the second year, primarily due to the implementation of practices such as reducing stocking rates. In addition, emissions intensity related to beef production experienced a decline of 16 percent in the first year and 23.5 percent in the second year, mainly because of the efforts in increasing productivity within the sector.

These encouraging results already play a crucial role in shaping public policy decisions. Uruguay is actively formulating a sustainable livestock strategy and a livestock emissions mitigation plan, considering the valuable insights gained from this project. These outcomes underscore that climate-smart agricultural strategies provide an opportunity for countries such as Uruguay to maintain economic viability while also reducing climate vulnerability in food systems.

SUBITE: Electric Vehicle Integration Program

Given Uruguay's high proportion of renewable sources in its power grid, electric mobility has become a clear objective for reducing carbon dioxide emissions. To accomplish this goal, Uruguay has implemented a comprehensive set of measures. These include regulatory reforms, tax incentives, the expansion of charging infrastructure, discounts on connection fees and electricity tariffs, capacity building initiatives, and the establishment of an Electricity Mobility Committee comprising the private sector and academia, as well as support programs for electric vehicle transportation. One such program is SUBITE, which aims to introduce electric vehicles in various subsectors of the economy.

The SUBITE program was designed to promote the initial adoption of electric mobility by offering initiatives for the acquisition of electric motorcycles, tricycles, buses, taxis, and vehicles for app-based or private services, with a demonstrative focus. The benefits granted vary according to the vehicle:

- SUBITE motorcycles and tricycles provides direct benefits for the acquisition of 1,000 electric motorcycles and 100 tricycles, following a decentralized territorial approach aimed at expanding their presence throughout the country.
- SUBITE buses offers financial support to the local governments that currently do not have electric buses, incentivizing them to acquire their first unit. This initiative aims to ensure every department in the country has access to this new technology, allowing them to experience its advantages and potential.
- SUBITE passengers (taxis, private services cars, and vehicles for ride-sharing apps) provides economic incentives for the acquisition of 100 electric vehicles in intensive public transportation activities. Through this initiative, the government offers a $5,000 subsidy per unit, which can be supplemented by Energy Efficiency Certificates.

Chapter 9

Methodological Annex: Reporting and External Verification

Reporting

The KPI-1 covers gross GHG emissions of CO_2, CH_4, and N_2O, corresponding to the gases, sectors, categories, and sources set out in the 2012 NGHGI, on which the 2017 Nationally Determined Contribution's emissions intensity reduction commitments were established.[65] The GHG emissions reported for 2020 and 2021 (estimated during 2022), as well as any adjustments made for the inclusion of additional data sources and recalculations due to methodological improvements or corrections, have been carried out according to the good practices and scientific standards of the 2006 IPCC Guidelines for the preparation of the NGHGI. The resulting historical series from 1990 to 2021 of GHG estimates are contained in the inter-ministerial Emissions Report delivered to the SSLB inter-ministerial Working Group in December of 2022.

The economy-wide emissions of these greenhouse gases are aggregated in CO_2eq units using the 100-year Global Warming Potential metric established in the Fifth Assessment Report (GWP-AR5) of the IPCC. To obtain the GHG intensity measure, aggregated gross emissions are normalized by real GDP (measured in billions of constant 2016 pesos). For these purposes, the latest official time series of the National Accounts System of the Central Bank of Uruguay is used (as published in March 2023), retropolated to 1990 using the variation rate method as a statistical splicing technique.

The KPI-2 is based on estimates of the native forest area (measured in hectares) for 2021, conducted in 2022 through the application of satellite-mapping and remote sensing techniques, following the relevant provisions of the 2006 IPCC Guidelines and the IPCC 2003 Good Practice Guidance. The estimated area of native forests in Uruguay for 2021 is contained in the Native Forest Report delivered to the SSLB Working Group in December of 2022.

Finally, to calculate the performance of each KPI with respect to the its baseline year, the 2020-2021 KPI Report contains the calculation of both KPIs following the formula established in Uruguay's SSLB Framework.[66] The KPIR was put together by the Programming, Monitoring, Reporting and Verification Working Group (pMRV) and the final version was delivered to the SSLB Working Group in April 2023.

[65] https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/inventarios-nacionales-gases-efecto-invernadero-ingei

[66] More information on the estimation methodologies for the KPIs and the time series for real GDP can be found in the Technical Data Sheets in the SSLB's website: http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html. vz tt

These three detailed methodological reports (EMR, NFR and KPIR) are published in Uruguay's SSLB website together with the Annual Report.[67] The underlying historical data for both KPIs between 1990 and 2021 can be found in the "Open Source Database" published on Uruguay's SSLB website.[68]

This reporting work was developed through close coordination between the four ministries involved and complying with the work schedule initially established, fulfilling the SSLB's reporting commitments, and further developing its already strong internal governance system.[69]

External Verification

UNDP has externally and independently verified the key performance indicators KPI-1 and KPI-2 included in the Sovereign Sustainability-Linked Bond (SSLB) Framework published in September 2022, as reported in the 2020-2021 KPIR prepared by the Government of Uruguay.[70]

For the KPI-1, the technical review of the EMR time series 1990-2021 of CO_2, CH_4, and N_2O from the Energy, Industrial Processes, Agriculture, and Waste Sectors was conducted according to the methodology contained in the UNFCCC Guide for Peer Review of National Greenhouse Gas Inventories. Since the KPI is an intensity metric, the denominator (the time series for real GDP) being used was also externally verified.

For the performance of KPI-2, the technical review was conducted on the 2021 NFR, verifying 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.

Uruguay and UNDP have innovated together, setting up an accelerated four-month external review process for both KPIs. In particular, despite the complexities of collecting and externally validating the country's annual emissions, Uruguay's publication of annual, externally verified GHG data, with a lag of approximately one year and five months from the end of the observation year (2021), enhances the current reporting and peer-reviewed verification process applicable to the country as established under the requirements of the UNFCCC.[71]

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[67] In the "SSLB Annual Report" section of the SSLB website: http://sslburuguay.mef.gub.uy/30672/20/areas/sslb-annual-report-new.html

[68] http://sslburuguay.mef.gub.uy/30671/20/areas/kpi-definitions-and-spt-values.html

[69] More information on the work-streams for the reporting of KPIs can be found at Uruguay's SSLB website section "Inter-Ministerial SSLB Governance": http://sslburuguay.mef.gub.uy/30720/20/areas/inter-ministerial-sslb-governance.html.

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

[71] These require – for non-Annex 1 countries such as Uruguay – biannual reporting and generally involve a lag of 3.5 years between the end of the observation year and when the final verified data is reported.