



## URUGUAY

### Intended Nationally Determined Contribution

(unofficial translation)

Based on the assumption that there will be no structural transformations of the current production mix, Uruguay expects to make the following contributions to international mitigation efforts:

Gas	Sector/Activity		2030 Targets	
			Percentage emission reduction targets from <b>base year 1990</b>	
			With domestic resources	With additional means of implementation
CO <sub>2</sub>	<b>Net CO<sub>2</sub> removal by 2030 with domestic resources</b> by means of the targets listed to the right	<b>LULUCF</b>	Remove 13200 Gg annually	Remove 19200 Gg annually
		<b>Energy</b> (Accounts for 94% of CO <sub>2</sub> emissions in 2010)	Reduce emission intensity per unit of GDP by 25%	Reduce emission intensity per unit of GDP by 40%
			Keep power generation emissions below 40 gCO <sub>2</sub> /kWh	Keep power generation emissions below 20 gCO <sub>2</sub> /kWh
		<b>Industrial Processes</b> (Accounts for 6% of CO <sub>2</sub> emissions in 2010)	Keep the intensity of emissions per unit of GDP at the reference value	Reduce emission intensity per unit of GDP by 40%
CH <sub>4</sub>	<b>Beef Production</b> (Accounts for 78% of CH <sub>4</sub> emissions by 2010)	Reduce emission intensity per kilogram of beef by 33%	Reduce emission intensity per kilogram of beef by 46%	
	<b>Waste</b> (Accounts for 7% of CH <sub>4</sub> emissions by 2010)	Reduce emission intensity per unit of GDP by 44%	Reduce emission intensity per unit of GDP by 68%	
	<b>Other sectors and activities</b> (Accounts for 15% of CH <sub>4</sub> emissions by 2010)	Reduce emission intensity per unit of GDP by 45%	Reduce emission intensity per unit of GDP by 60%	
N <sub>2</sub> O	<b>Beef Production</b> (Accounts for 61% of N <sub>2</sub> O emissions by 2010)	Reduce emission intensity per kilogram of beef by 31%	Reduce emission intensity per kilogram of beef by 41%	
	<b>Other sectors and activities</b> (Accounts for 39% of N <sub>2</sub> O emissions by 2010)	Reduce emission intensity per unit of GDP by 40%	Reduce emission intensity per unit of GDP by 55%	

The ambition levels associated to each of these targets, as well as the undertakings necessary to achieve them, are explained in the accompanying information. An Annex is also submitted regarding Uruguay's total emissions and removals estimate by 2030, based on the above mentioned targets, for the UNFCCC Secretariat to prepare the synthesis report on the iNDCs.

Uruguay will communicate its definitive Nationally Determined Contribution once the UNFCCC has set forth the rules to apply and implementation agreements have been finalized.

## **On the presentation of Uruguay's iNDC**

Uruguay is a developing country, whose economy should continue to grow to ensure higher equity levels in its society. Therefore, the country's contribution to the ultimate objective of the Convention focuses on continuing its development with the lowest emission intensity possible while, at the same time, building resilience.

With regard to the main activities (power generation and beef production), Uruguay presents specific indicators that show the desired efficiency level for the development of the activity. These indicators are presented as emission intensity per product unit, as detailed below.

Uruguay sets forth specific targets for power generation, since it is considered the main emitting sector worldwide. These targets are presented as emission intensity per kWh produced.

Additionally, since Uruguay cannot mitigate climate change at the expense of food production, but rather work on improving the efficiency of the emissions per product in the sector, the country sets forth specific targets for beef production. This activity accounts for 78% of domestic CH<sub>4</sub> emissions (due to enteric fermentation) and 63% of domestic N<sub>2</sub>O emissions (due to manure left on pasture by grazing animals). These targets are presented as emission intensity per kilogram of beef (liveweight).

For all the other emitting sectors and economic activities, Uruguay presents aggregate indicators that show the desired efficiency level per GDP, except for the LULUCF sector, for which the iNDC presents the absolute annual CO<sub>2</sub> removal value by 2030.

Uruguay presents both the targets that could be achieved by means of the country's domestic resources, as well as those that could be achieved if additional means of implementation were to be provided by external sources, which would allow for an increase of mitigation capacities. Further on, the iNDC outlines the additional mitigation actions the country would like to undertake if granted access to the necessary means of implementation. There is also a list of the main adaptation actions the country has undertaken, and will continue to do so in parallel with mitigation actions, promoting synergy between the two. Having the necessary means of implementation to support adaptation actions will prove essential to meet the proposed mitigation targets.

Finally, in 2014 the IPCC pointed out<sup>1</sup> that *"the GWP metric is not directly related to a temperature limit, as the 2°C target, whereas some economic metrics and physical end-point metrics like the GTP may be more suitable for this purpose"*, thus calling upon further dialogue on the implications of the different metrics and to *"provide metrics that can be useful to the users and policymakers"*. Due to the significant impact this discussion could have on priority assignment concerning mitigation policies, especially with regard to the agriculture sector, Uruguay has decided to submit its contribution sorted by gases.

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<sup>1</sup> IPCC, AR5, 8.7.1.6.

## **National circumstances, global ambition and ambition levels by sector**

For the past 10 years Uruguay has grown at an average annual rate of 5.4%. During this period, energy demands from the industrial sector increased threefold and food production was three and a half times greater. This growth brought along a significant decline in poverty rates, from 39.9% to 9.7%, while extreme poverty was virtually eradicated, dropping from 4.7% to 0.3%, reaching a Gini Index of 0.38.

Uruguay's production is heavily dependent on food production, and this sector accounts for 70% of national exports. Uruguay's total agricultural sector currently produces food for 28 million people, while the country has a population of 3.3 million.

Uruguay's food production is expected to continue growing in the future, since the country has particularly fertile soils, global demand is on the increase and the country is 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: following the GWP<sub>100</sub> metric, this sector accounts for 76% of current emissions, and beef production accounts for three quarters of it.

The country was able to undergo such a dynamic growth while reducing emissions intensity in all sectors, and for some of those it has even reduced absolute emissions, thanks to strong public policies on climate change, a new institutional framework, both at national and departmental level and thanks to the design of a National Climate Change Response Plan (in 2009) and sector-specific policies.

Below the iNDC provides a brief description of the recent evolution of the GHG emitting and removing sectors and activities, following the implementation of early mitigation measures, as well as 2030 ambition levels for each of the targets mentioned above.

### **CO<sub>2</sub> Removal - LULUCF**

Uruguay is a country with no net deforestation; this is quite a unique attribute among developing countries. The total coverage of native forests has, actually, increased in the past 30 years, and it is now 752000 hectares. Carbon stocks in these forests have increased due to the expansion of the area and due to secondary growth, in about one third of the surface. This responds to legal regulations that ban native forest logging and to tax exemption incentives provided to registered areas with native forests, which amounts to approximately USD 5 million a year. By 2030 annual CO<sub>2</sub> removals from native forests by means of domestic resources are expected to be around 1300 Gg and up to 2500 Gg with additional means of implementation. Furthermore, between 1990 and 2010 Uruguay afforested 689000 effective hectares with tree plantations, which accounts for a 430% increase of the total surface planted in the period. Carbon sequestration levels in tree plantations and in growing native forests have determined that Uruguay, at the beginning of this century, behaved as a net CO<sub>2</sub> sink. Uruguay expects to contribute, from 2010 to 2030, by means of domestic resources, with an additional expansion of the total tree plantation area of about 300000 hectares, which will account for total annual removals of 11200 Gg of CO<sub>2</sub> in 2030.

In addition, within the REDD+ framework, Uruguay will be able to contribute by removing carbon and preventing emissions that could primarily be estimated in a further 2100 Gg of CO<sub>2</sub> in 2030.

The aggregate result for forestry removals supported by domestic resources amounts to

12500 Gg of CO<sub>2</sub> in 2030, which could, reach 15800 Gg if provided with additional means of implementation.

Additionally, Uruguay has a great carbon sequestration potential through soils under degraded grasslands and eroded croplands. With regard to degraded grasslands, removals by 2030 are estimated to be 600 Gg by means of domestic resources and a total of 3300 Gg with additional means of implementation. With regard to carbon in cropland soils, Uruguay has broadly introduced no till agriculture, and has recently implemented mandatory conservation policies that reduce erosion and will promote an increase in biomass supply to the soil. Moreover, it is fostering the use of irrigation. The net impact of these measures can initially be estimated at about 100 Gg CO<sub>2</sub> captured by 2030.

Uruguay would then remove, through carbon sequestration in soils, 700 Gg CO<sub>2</sub> annually in 2030 by means of domestic resources and a total of 3400 Gg CO<sub>2</sub> with additional means of implementation.

### **CO<sub>2</sub> Emissions - Energy** (94% of CO<sub>2</sub> emissions in 2010)

Uruguay has made great efforts within the framework of the "National Energy Policy 2005-2030", to achieve a clean energy mix: 59% of the global primary energy mix is currently renewable, which amounts to 83% for the total energy consumption of the industrial sector and 93% for power generation (2014). With regard to transport, the use of biodiesel accounts for 7% and bioethanol 10% of the total vehicle fleet, both with entire domestic production. Even though a lot of progress has been made in the past years, there are still many opportunities for action in this sector.

As a result, the total emissions of the country's energy sector per GDP are very low: the emission intensity of Uruguay's energy sector in 2014 was 111 g CO<sub>2</sub>/USD, one third of total global intensity (global CO<sub>2</sub> emissions of the energy sector vs. aggregate global GDP) and significantly lower than the average for OECD countries. Moreover, there is still an important reduction potential, especially in the transport sector (see below for list of additional mitigation measures), that the country is willing to implement if means of implementation were to be made available. Uruguay will continue to develop maintaining the currently low emission intensity level in the energy sector, and even achieving an intensity reduction of 25% from 1990 values by 2030, by means of domestic resources, and a potential 40% total reduction with additional means of implementation.

### **Power Generation**

Thanks to the ongoing structural transformation of the power generation mix, by 2017 Uruguay will achieve an absolute emissions reduction of 88% within this subsector compared to the annual average for the period 2005-2009, with a higher consumption. By 2017, emissions from the domestic power generation system will be 17 g CO<sub>2</sub>/kWh, which accounts for 3% of the global average. This will be achieved with 40% of non-conventional renewable energy sources (mainly wind, but also photovoltaic and biomass waste), in addition to 55% hydropower (estimating an average annual rainfall).

Although this figure would increase in the following decades after reaching the hydro-wind complementation threshold, it could remain close to 2017 value, if storage systems were to be incorporated through additional means of implementation (see below for list of additional mitigation measures).

**CO<sub>2</sub> Emissions - Industrial Processes** (6% of CO<sub>2</sub> emissions in 2010)

Uruguay produces CO<sub>2</sub> in industrial processes, mainly related to cement production. The emissions are low, even when compared to the energy sector's low emission levels. It is possible to maintain emission intensity close to 1990 values using the country's own resources, but it would be possible to reduce it by up to 40% with additional means of implementation.

**Net CO<sub>2</sub> Emissions**

Thanks to the removal increase by LULUCF and to low emissions by the energy sector **in 2030 Uruguay will be a net CO<sub>2</sub> remover**. (See Annex)

**CH<sub>4</sub> Emissions - Beef production** (78% of CH<sub>4</sub> emissions in 2010)

The singular biological origin of these emissions, in addition to the fact that the country cannot mitigate climate change at the expense of food production, poses a challenge to focus on emissions intensity reduction per product unit of food produced.

For the past 20 years Uruguay has significantly reduced such emission intensity. In particular, as a result of the 2010 Climate-Smart Agriculture Policy, Uruguay has made, and will continue to make, efforts to build a more efficient, resilient and low-carbon cattle farming sector, by introducing new technologies and incorporating successful experiences undertaken by other countries with similar characteristics.

As a result of these policies, by 2030 Uruguay expects to continue reducing emission intensity in beef production, expecting to reduce CH<sub>4</sub> emissions intensity per kilogram of beef (liveweight) by 33% from 1990 values, by means of domestic resources and a potential total reduction of 46% if adequate additional means of implementation were to be made available (see below for list of additional mitigation measures).

**CH<sub>4</sub> Emissions - Waste** (7% of CH<sub>4</sub> emissions in 2010)

With regard to the waste sector, even though different methane capture and flaring measures have been implemented in landfills (in some cases with power generation) and cogeneration from agroindustrial and forest waste, there is still an additional potential for mitigation. The continuation of these policies will allow for a reduction of the emission intensity of the sector per unit of GDP of 44%, from 1990 levels, by means of domestic resources, and a total 68% with additional means of implementation (see below for list of additional mitigation measures).

**CH<sub>4</sub> Emissions - Other sectors and activities** (15% of CH<sub>4</sub> emissions in 2010)

Even though the vast majority of CH<sub>4</sub> emissions from the agriculture sector in Uruguay respond to beef production, about 9% of domestic CH<sub>4</sub> emissions respond to other livestock and dairy productions, 5% to rice production and less than 1% are originated in the energy sector. It is possible to reduce aggregate emissions intensity in these sectors per unit of GDP by 45%, from 1990 levels, by means of domestic resources, and a total 60% with additional means of implementation (see below for list of additional mitigation measures).

**N<sub>2</sub>O Emissions - Beef production** (61% of N<sub>2</sub>O emissions in 2010)

For the same reasons set out above relating to CH<sub>4</sub> emissions in beef production, the efforts regarding N<sub>2</sub>O emissions generated by this activity have focused on the reduction of emissions intensity per kilogram of liveweight produced. Based on the actions already taken, and those which will be further developed, by 2030 Uruguay expects to continue reducing its emissions intensity levels in beef production, expecting to reduce N<sub>2</sub>O emission intensity per kilogram of beef (liveweight) by 31% from 1990 values, by means of domestic resources and a total potential reduction of 41% if adequate additional means of implementation were to be made available (see below for list of additional mitigation measures).

**N<sub>2</sub>O Emissions - Other sectors and activities** (39% of N<sub>2</sub>O emissions in 2010)

Even though the majority of N<sub>2</sub>O emissions in Uruguay come from cattle farming, a significant part is originated in other activities connected to food production. It is possible to reduce aggregate emissions intensity in these sectors per unit of GDP by 40%, from 1990 levels, by means of domestic resources, and a total 55% with additional means of implementation (see below for list of additional mitigation measures).

Uruguay understands that the targets proposed in this Intended Nationally Determined Contribution are ambitious according to its national circumstances, early mitigation efforts already undertaken and the characteristics of its economy.

## **Additional mitigation measures**

As can be seen from the above, in order to contribute to the implementation of a new model of resilient and low-carbon development, Uruguay has enforced in the past few years an ambitious set of early actions, particularly in several key sectors.

This was possible thanks to a large volume of investments promoted by public policies. For example, with regard to the energy sector, the transformation of the sector was possible through a public-private investment accumulated for several years which reached, on average, 3% of the GDP per year. The State also contributed to reducing the emissions of the economy by granting tax benefits to investments on low-carbon production capacities, particularly to promote afforestation. In the sector, half the plantation costs were subsidized for almost 15 years. In addition, in the cattle farming sector, dairy farming and rice production, public policies fostered large investments and technical change, which allowed for an increase in productivity and a reduction in emission intensity.

Additionally to the early actions already undertaken and the ones that will be implemented by means of the country's own resources, Uruguay is still willing and committed to developing and executing innovative approaches, especially in the transport, waste and land sectors, to continue making progress towards a low-carbon economy. However, in addition to what has been stated above, the country needs to take on a significant number of actions to adapt to the strong impacts that climate change and variability are having on our territory, economy and population, as described below. Therefore, in order to be able to implement the additional set of mitigation actions that have been identified, Uruguay needs further means of implementation to be provided by external sources.

Additional mitigation actions the country would like to undertake:

- Reduce emissions intensity by enhancing productivity and efficiency in beef, dairy and rice production.
- Reduce emissions intensity from manure left on pasture by grazing animals.
- Increase the total coverage of tree plantations.
- Increase the total coverage of native forests and reduce degradation.
- Increase carbon stocks in soils under natural grasslands.
- Increase land surface under irrigation.
- Reduce methane emission in rice production through flood management and other practices.
- Efficient use of nitrogen fertilizers.
- Incorporate energy storage systems to manage the wind power surplus.
- Implement BRT corridors for metropolitan public transport.
- Introduce electric and hybrid private and public vehicles.
- Increase the percentage of biofuels in gasoline and diesel oil blends.
- Introduce public and private vehicles that support a higher percentage of biofuel blends.

- Enhancement of the vehicle fleet through higher power efficiency standards and lower emissions.
- Improve cargo transport, through the incorporation of new multimodal systems, and increased use of railroad and inland waterway transport
- Introduce new technologies for emission reduction from cement manufacture.
- Improve treatment and final disposal systems of solid urban waste.
- Improve industrial wastewater treatment systems and effluent management in intensive animal farming establishments.
- Improve industrial and agroindustrial solid waste management

### **Adaptation actions required**

Uruguay's 2009 National Climate Change Response Plan states that adaptation is a strategic priority for the country. This is essential to be able to effectively respond to climate change and increased climate variability, especially, to reduce risks and damage from increasingly intense changes. Uruguay is highly sensitive to droughts, it has low-lying coastal areas, as well as areas which are prone to climate related disasters, such as floods. Adaptation becomes particularly important when it comes to food production, which is a core activity for the domestic economy and is highly sensitive to climate.

Within this context, Uruguay has, through the implementation of public policies, been addressing adaptation to climate change and variability and climate risk management for the different sectors, both at national and subnational levels of government by means of domestic and external resources.

In sectors such as cattle farming, agriculture and energy there has been a lot of progress in the implementation of specific adaptation measures. This makes it possible to begin the design of sector-specific National Adaptation Plans (NAPs) to identify adaptation needs in the medium and long term, and allowing for the development and implementation of strategies and programs, within the planning and development frameworks of these sectors.

The main adaptation actions undertaken were:

- Energy mix diversification to reduce vulnerability and cost overruns of the power system in case of hydropower generation deficits.
- Development of climate index insurances and other financial instruments for risk reduction in the power sector.
- Design and implementation of adaptation measures in cattle production, including water sources, feed and rangeland management measures.
- Development of soil use and management plans to reduce erosion and preservation of organic matter in croplands.
- Resettlement of population living in urban areas vulnerable to floods, and land-use planning



measures to reduce the risk of floods.

- Monitoring program and eradication campaigns for the *Aedes Aegypti* mosquito, strengthening of the National Immunization Program against diseases caused by climate sensitive vectors and other health communication and awareness raising activities.
- Development and strengthening of the National Protected Areas System, which contributes to the protection of climate change and variability vulnerable biodiversity and ecosystems.
- Restoration and maintenance of coastal ecosystems services that provide protection against extreme events and of ecosystems services that protect drinking water sources.
- Overhaul and maintenance of road infrastructure, especially in coastal/ flood sensitive areas, taking into account climate change and variability.
- Development of research and data collection programs and networks on the impacts and adaptation to climate change and variability.
- Development of information systems, climate services and monitoring programs, particularly for the environmental, agriculture and emergency sectors, and development of early warning systems, to support decision-making.
- Development, strengthening and decentralization of the National Emergency System.
- Strengthening of weather, climate and water services.
- Design and implementation of the National Climate Change Response Plan; the Metropolitan Climate Plan; Climate Change Adaptation and Development Project for the agriculture sector; Integrated Water Resources Management National Plan within the climate change and variability framework, Land-use Planning programs for vulnerable regions and Stormwater Management Plans; Emergency and Sudden-impact Disasters Response Protocol; identification of adaptation measures in the tourism sector and development of a National Adaptation Plan for the coastal sector.

Building on the experience and results of these undertakings, and incorporating new elements, by 2030 Uruguay expects to have accomplished the following adaptation actions, with the support of external means of implementation, which are necessary to ensure the fulfillment of mitigation targets:

- Development and implementation of national, regional and sector-specific participatory climate change and variability adaptation plans, and incorporation of monitoring and reporting systems on adaptation and loss and damage.
- Development of new early warning systems and new hydrometeorological insurances, within the disaster risk reduction framework for the agricultural, coastal and health sectors, and for flood sensitive urban areas, infrastructure and other vulnerable regions.
- Strengthen climate risk management against floods, through the enhancement of vulnerable population resettlement processes and the implementation of new land-use planning measures. Moreover, with regard to drought management, identification of new water sources, promote the construction of associative works, such as large reservoirs to serve various users, and improve efficiency in water use.
- Improve the protection of surface and underground water sources, such as aquifer recharge areas, through the promotion of good drilling practices, point source and non-point sources pollution control and the implementation of conservation and restoration measures for gallery forests.

- Promote ecosystem-based adaptation, strengthening ecosystem and biodiversity conservation strategies.
- Design, adapt and maintain a resilient infrastructure, considering the impact of climate change and variability.
- Articulate and develop new integrated climate services and information systems, for continuous monitoring, risk mapping and loss and damage evaluation, by strengthening academic, monitoring and observation institutions, such as The Uruguayan Institute of Meteorology and the National Water Management Service.
- Build research, development and innovation capacities to enhance domestic response to climate change and variability.
- Enhance visibility of climate change adaptation measures within the allocations of the national budget, including the development of a national system of environmental indicators.
- Implement education, training and awareness programs that address climate change response needs.

## **Information to facilitate clarity, transparency and understanding**

**Scope and coverage:** The contributions target all emitting sectors as acknowledged by IPCC inventory guidelines and are nationwide. They cover CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O gases, which collectively account for 99.7% of Uruguay's current CO<sub>2</sub>eq emissions, calculated as per GWP<sub>100</sub> metric.

**Methodological approach for estimating emissions and removals:** This Intended Nationally Determined Contribution was prepared using the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, 2000 Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2003 Good Practice Guidance for LULUCF, as well as 2006 IPCC Guidelines for National Greenhouse Gas Inventories for the waste sector.

**Time frame for the contributions:** Targets are set by 2030, thus considering for this purpose the annual average of the 2028-2030 timeframe.

**Base year:** Except for the LULUCF and power generation, the remaining targets take 1990 as reference values.

**Economic Data:** The current work was undertaken based on a country development model that does not entail significant structural transformations from the current productive mix, under the assumption of an average inter annual growth of 3% from 2014 to 2030.

## **Annex for the UNFCCC Secretariat:**

### **Total estimated emissions and removals per gas by 2030**

To facilitate the work of the Secretariat we communicate that, based on the assumptions considered for the development of this Intended Nationally Determined Contribution, it may be estimated that Uruguay's maximum emission levels in 2030, including only mitigation actions to be developed by means of domestic resources, would be:

Gas	(in Gg)
CO <sub>2</sub> emissions	10900
CO <sub>2</sub> removals	-13200
Net CO <sub>2</sub> removals	-2300
CH <sub>4</sub> Emissions	840
N <sub>2</sub> O Emissions	39

As can be observed, Uruguay expects to be a net CO<sub>2</sub> sink by 2030. In addition, based on these estimates, we expect to maintain relatively stable levels of non-CO<sub>2</sub> gases emissions by 2030 compared to current values, despite an expected growth in the economy for the period of 60%.

The figures in this Annex are presented as non-binding estimates, therefore, they shall not be construed as part of Uruguay's INDC. These are only presented to facilitate the work of the UNFCCC Secretariat in the preparation of the synthesis report on the aggregate effect of Intended Nationally Determined Contributions.