Technical Data Sheet

GROSS AGGREGATE GHG EMISSIONS INTENSITY/GDP

KPI-1 Definition:

Reduction in aggregate gross greenhouse gas (GHG) emissions per unit of real GDP, compared to 1990, in %.

Reference Year: 1990.

Last available reduction value: 41% (2021)

Sustainability Performance Targets (SPT) up to 2025:

Performance Target 1.1: 50% reduction compared to 1990.

Performance Target 1.2: 52% reduction compared to 1990.

Indicator Definition:

Percentage reduction in of aggregate gross GHG emissions (sum of CO_2, CH_4 and N_2O emissions, measured in the CO_2 equivalent under the GWP metric $GWP_{100\,AR5}$) per unit of real GDP of year t, with respect to 1990.

Indicator Unit: percentage (%).

Formula for calculating the indicator:

% of aggregate gross GHG emissions reductions (in CO_2eq GWP $_{100\,AR5}$) / GDP =

$$1 - \left[\frac{\left(\frac{CO2 + \alpha 1 \times CH4 + \alpha 2 \times N2O}{GDP} \right) t}{\left(\frac{CO2 + \alpha 1 \times CH4 + \alpha 2 \times N2O}{GDP} \right) 1990} \right] * 100$$

For the purposes of calculating the value of KPI-1 and comparing it to the values of the performance targets, the result of the formula will be rounded (up or down) to the nearest whole number, consistent with the way the numerical targets were expressed in the 2017 NDC.

Indicator Variables:

(CO_2) t: CO_2 emissions from the Energy and Industrial Processes and Product Usage Sectors in year t, in Gg.

(CO_2) 1990: CO_2 emissions from the Energy and Industrial Processes and Product Usage Sectors in 1990, in Gg.

(CH_4) t: CH_4 emissions from the Energy, Agriculture, including Livestock (AFOLU[1] without UTCUTS), Waste and Industrial Processes and Product Use in year t, in Gg.

(CH_4) 1990: CH_4 emissions from the Energy, Agriculture, including Livestock (AFOLU without UTCUTS[2]), Waste and Industrial Processes and Product Use in 1990, in Gg.

(N_2O) t: N_2O emissions from the Energy, Agriculture, including Livestock (AFOLU without UTCUTS), Waste and Industrial Processes and Product Use in year t, in Gg.

(N_2O) 1990: N_2O emissions from the Energy, Agriculture, including Livestock (AFOLU without UTCUTS), Waste and Industrial Processes and Product Use in 1990, in Gg.

$\alpha 1$: Corresponds to the 100-year global warming potential of methane relative to the global warming potential of carbon dioxide, according to the most recent Assessment Report of the Intergovernmental Panel on Climate Change. Its current value is 28, according to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, pg. 87)[3].

$\alpha 2$: Corresponds to the 100-year global warming potential of nitrous oxide relative to the global warming potential of carbon dioxide, according to the most recent Intergovernmental Panel on Climate Change Assessment Report. Its current value is 265, according to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, Pg. 87)[4].

GDP: Real Gross Domestic Product, annual series since 1990 in billions of Uruguayan pesos at constant prices (currently based on 2016).

Methodology for calculating the indicator:

CO_2, CH_4 y N_2O emissions for the sectors and years indicated are compiled by the National Greenhouse Gas Inventory Group (NGHGI Group) in accordance with the 2006 IPCC Guidelines approved under the United Nations Framework Convention on Climate Change (UNFCCC).[5] Specifically, emissions are estimated for the categories included in the definition of the global emissions intensity targets of Uruguay's first Nationally Determined Contribution.

For GDP, the latest official series published by the National Accounts System (*Sistema de Cuentas Nacional*, SCN) of the Central Bank of Uruguay (*Banco Central de Uruguay*, BCU) is used, retropolated

[1] AFOLU: From the Spanish, "Agricultura, Ganadería, Forestación, y otros Usos del Suelo," meaning "Agriculture, Likestock, Forestry, and other land uses."
[2] UTUCUTS: From the Spanish, "Uso de la tierra, Cambio del Uso de la Tierra y Sivicultura," meaning "Land uses, Change in land uses, and Siviculture."
[3] Climate Change 2014, Synthesis Report. See: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf
[4] Climate Change 2014, Synthesis Report. See: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf
[5] NGHGI: https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/inventarios-nacionales-gases-efecto-invernadero-ingei

to 1990 using the variation rate method as a statistical splicing technique. The methodology for the GDP series construction is described in detail in the GDP Data Sheet.

Note: In estimating CO_2 emissions, in the event that in year t hydroelectric generation falls outside the range between 4,900 and 8,300 GWh, the estimate will be adjusted for average hydraulicity.[6] In this case, the adjustment will consist, first, in simulating the electricity dispatch for domestic demand supply assuming a scenario of average hydroelectric generation. After that, the emissions of the Electricity and heat production category (1A1a of the NGHGI), and therefore the emissions of the Energy sector, would be recalculated. The adjusted estimate of CO_2 emissions will be the one used in the calculation of the indicator in that year.

Data Frequency:

Indicator Estimate: annually
CO_2, CH_4 y N_2O emissions estimates: annually
Estimated GDP in Uruguayan pesos at constant prices: annually

Data collection process:

For details on data collection for GHG estimates, it is recommended to access the NGHGI System coordinated by the Ministry of Environment (*Ministerio de Ambiente*, MA)[7]. For details on data collection for GDP estimates, it is recommended to access the System of National Accounts coordinated by the BCU.[8]

Data Sources:

CO_2, CH_4 y N_2O emissions estimates: NGHGI Working Group
GDP series in Uruguayan pesos at constant prices: BCU/MEF

Responsible for the development/estimation of the indicator: Ministry of the Environment (MA)

Comments:

- The GHG emissions intensity reduction target per unit of real GDP to 2025 was put forward in the 2017 NDC as a non-binding interpretation of the individual mitigation targets for each of the gases relative to GDP.

- At the time of publication of the NDC, the metric used to aggregate CO_2 equivalent emissions was the $GWP_{100\ AR2}$. Following this, the Conference of the Parties acting as the meeting of the Parties to the Paris Agreement (CMA) held in December 2018, established that for reporting aggregate

[6] The range defined for the correction is based on the analysis of the historical series of domestic demand and hydroelectric generation. The average generation for the 110 years of the series is 6,600 GWh and its standard deviation is 1,700 GWh. The range encompasses the values of the mean +/- one standard deviation (6.600 ± 1.700 GWh).
[7] Methodology, page 7: https://www.gub.uy/ministerio-ambiente/sites/ministerio-ambiente/files/2022-01/NIR%201990%20-%202019.pdf
[8] https://www.bcu.gub.uy/Estadisticas-e-Indicadores/Paginas/Cuentas-Nacionales-e-Internacionales.aspx

GHG emissions and removals, expressed in CO_2 eq., in the biennial Transparency reports, each Party shall use the global warming potential values for a 100-year time horizon contained in the IPCC–Fifth Assessment Report or those contained in subsequent IPCC assessment reports adopted by the COP/RA (decision 18/CMA.1, paragraph 37 of the Annex). Therefore, the objective of the intensity reduction indicator under the metric of GWP $_{100AR5}$ (out of 50%) is the mathematical equivalent of the goal formulated in the NDC 2017 (-49%) which was formulated on the basis of the metric GWP $_{100\ AR2.}$

- 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 changes in international equivalency parameters in CO_2. When a change in estimates is made for a given year, GHG emissions and removals must be recalculated for the entire series to obtain a consistent time series.

- Additionally, National Accounts statistics may also be subject to revisions. In this regard, the compilation of the NDC (year 2017) was carried out using the GDP series reported by the BCU in Uruguayan pesos (UYU) at constant 2005 prices. However, as of December 2020, the BCU began publishing a GDP series in UYU at constant 2016 prices, so it updated the indicator incorporating the retropolation of the latter series.