

Argentina: information on national emissions, population and GDP, and mitigation targets

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TODO

- Table with info on target (main and reclass; emissions from NDC; target quantis + plot).
- GWP: NDC emissions converted from AR2 to AR4 by national conversion factor (2010–2017, PRIMAP-hist v2.1).
- References!

1 Non-LULUCF emissions and socio-economic data

With national emissions of 348.2 Mt CO₂eq, Argentina contributed 0.7% to global emissions in 2017, and in 2030 its share is estimated to stay at a similar level (Table 1). The estimates for 2030 are based on the downscaled SSP2¹ Middle of the Road marker scenario (dmSSP2), in which Argentina is estimated to emit 403.7 Mt CO₂eq in 2030. That change in emissions would constitute a substantial increase of 15.9% compared to 2017. The pathways dmSSP1–5 show a range of 384.9–486.7 Mt CO₂eq in 2030, and 414.0–570.6 Mt CO₂eq in 2050. The country's global rank in terms of total emissions per unit of GDP² was 87 in 2017, and 59 regarding the per-capita emissions (84 and 52 in 2030). In terms of accumulated historical emissions, Argentina contributed to the global 1850–2017 emissions by 0.7%. When only accounting for the years 1990–2017, its contribution increases to 0.8%. All of the emissions are presented

¹**SSPs:** Shared Socio-economic Pathways. Narratives and challenges to mitigation and adaptation: SSP1: Sustainability, Taking the Green Road (low / low); SSP2: Middle of the Road (medium / medium); SSP3: Regional Rivalry, A Rocky Road (high / high); SSP4: Inequality, A Road Divided (low / high); and SSP5: Fossil-fuelled Development, Taking the Highway (high / low).

²**GDP:** Gross Domestic Product. Throughout this document the GDP is given as GDP PPP, with PPP being the Purchasing Power Parity.

following GWP AR4³, and exclude emissions from LULUCF⁴ (exclLU), and bunkers fuels⁵ emissions (exclBunkers).

Table 1: National emissions (dmSSP2), GDP and population for Argentina, together with the emissions per unit of GDP and per capita emissions (all for 2017 and 2030). Additionally, the global share and its rank are displayed.

	Year	Total	Unit	Glob. share	Rank
Emissions	2017	348.2	Mt CO ₂ eq	0.7%	26
	2030	403.7	Mt CO ₂ eq	0.7%	28
GDP	2017	0.7	Trillion 2011 GK\$	0.7%	29
	2030	1.2	Trillion 2011 GK\$	0.6%	31
Emissions per GDP	2017	0.4	t CO ₂ eq / Thousand 2011 GK\$	0.4%	87
	2030	0.3	t CO ₂ eq / Thousand 2011 GK\$	0.4%	84
Population	2017	43.9	Million Pers	0.6%	32
	2030	47.5	Million Pers	0.6%	35
Emissions per capita	2017	7.9	t CO ₂ eq / Pers	0.5%	59
	2030	8.5	t CO ₂ eq / Pers	0.6%	52

For Argentina, in 2017 the main emissions share on sectoral level (Fig. 1) came from the Energy sector (56.7%), followed by Agriculture (32.8%), and IPPU (5.2%). The Kyoto GHG⁶ with the highest emissions in 2017 was CO₂, constituting 58.7% of the national emissions. Second largest contributor was CH₄ (27.8%), followed by N₂O (13.3%). The total of F-gases⁷ only represented 0.2%. The trend in total emissions is mostly driven by CH₄ and N₂O emissions from the Agriculture sector, which contributed 20.4% and 12.2% to Argentina’s 2017 emissions.⁸ The total CO₂ emissions are expected to be 63.1% of the national Kyoto GHG emissions in 2030 (dmSSP2).

The national GDP increased in recent years, and the emissions per unit of GDP had a similar trend (Fig. 2). The population increased, and the per capita emissions were on the rise. Following dmSSP2, the GDP is projected to increase towards 2050. The emissions per GDP are estimated to decrease towards 2050. Argentina’s population is assumed to grow towards 2050, and the per capita emissions are expected to increase after 2017 but to decline again before 2050.

³**Global Warming Potential (GWP)**: we use GWP values from the IPCC 4th Assessment Report (AR4). They reflect the forcing potential of one kilogram of a gas’ emissions in comparison to one kilogram of CO₂ (GWP_{CO2} = 1). The GWPs correspond to a 100-yr period and are for CH₄: 25, for N₂O: 298, for SF₆: 22800, and for NF₃: 17200. For the basket of HFC-gases the GWPs from AR4 are in the range 4–14800, and for PFCs 7190–12200. To assess emissions of several GHGs, their emissions are weighted by their respective GWPs and presented in CO₂ equivalents (CO₂eq).

⁴**LULUCF**: Land Use, Land-Use Change and Forestry. Emissions from LULUCF are excluded throughout the document, unless stated otherwise.

⁵**Bunkers fuels**: emissions from international aviation and shipping.

⁶**Kyoto GHG** (Greenhouse Gas) basket: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).

⁷**F-gases** (fluorinated gases): basket of HFCs, PFCs, and the gases SF₆ and NF₃. Some F-gases have very long atmospheric lifetimes and high Global Warming Potentials.

⁸Analysis based on the correlations between total national emissions (exclLU) versus the emissions of the combinations of main-sectors & the gases CO₂, CH₄, N₂O and F-gases. Only data from 2010 to 2017 are assessed. The (up to) three gas & sector combinations are chosen for which the slope of the regression line to the correlated values exceeds 0.2.

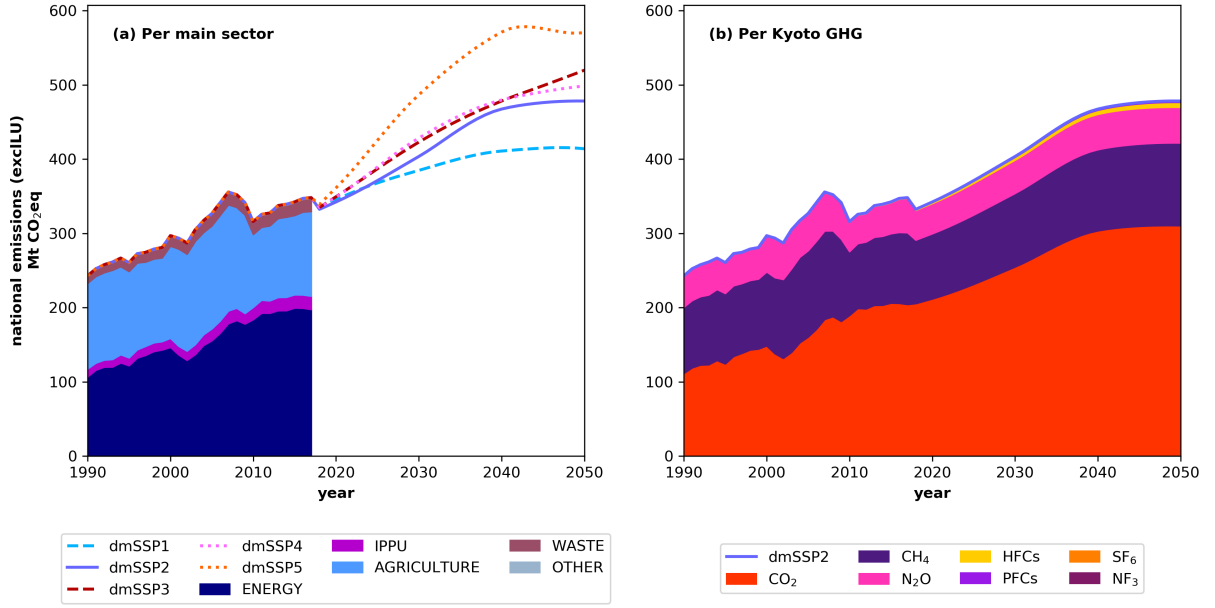


Figure 1: 'Stacked' timeseries of national emissions (exclLU) per main-sector (a) and Kyoto GHG (b). No information available on the sectoral contributions after 2017.

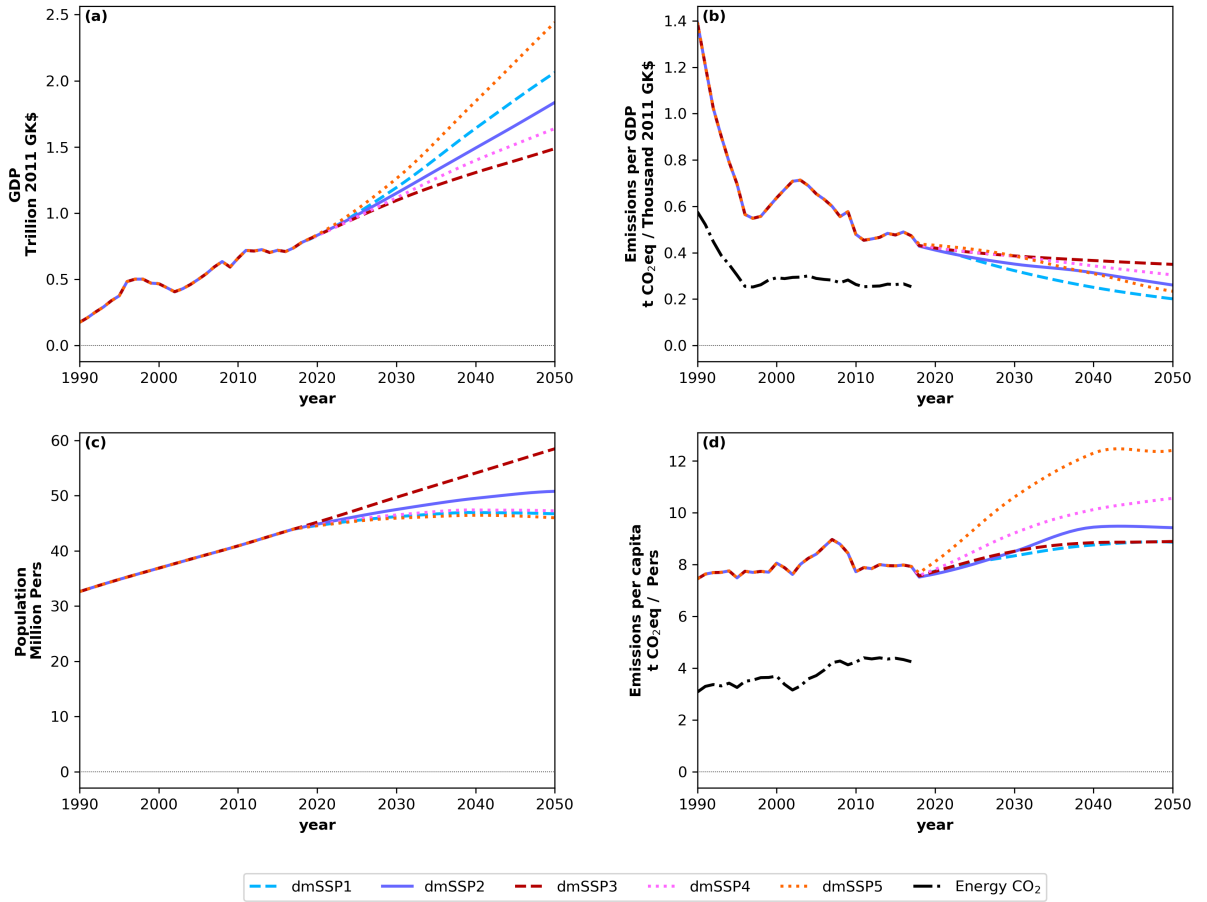


Figure 2: Timeseries of national GDP (a) and population (c), and Kyoto GHG emissions (exclLU, exclBunkers) per unit of GDP (b) or per capita (d).

2 LULUCF emissions

LULUCF emissions data for Argentina are available from the following sources (Fig. 3): BUR (2nd), UNFCCC (2019), FAO (2019).

High fluctuations? Data gaps? Difference between sources?



Figure 3: Timeseries of emissions from LULUCF (CO₂ plus CH₄ and N₂O) as available from different data-sources. Indicated in pink are the 'chosen' data, as used in our assessment of Argentina's NDC (if needed). The pink timeseries was inter- and / or extrapolated (interpolation: linear, extrapolation: constant).

3 Mitigation targets (NDC)

Argentina has an NDC, with a GHG mitigation target of the type ABS (absolute emissions target; main target type). The reclassified⁹ target type equals the main target type.

Table 2: Information on Argentina's GHG mitigation target(s).

type	condi.	range	value	tarYr	LU
ABS	uncondi.	best	483 Mt CO ₂ eq SAR	2030	inclLU
ABS	condi.	best	369 Mt CO ₂ eq SAR	2030	inclLU

4 Data sources and references

PRIMAP-hist v2.1: emissions from PRIMAP-hist are data from the country reported data priority scenario (HISTCR).

⁹**Reclassification:** when a country has, e.g., an RBU target (relative reduction compared to Business-As-Usual), and the BAU emissions are provided, it can be quantified based on the given emissions, and is reclassified from type_main RBU to type_reclass ABS (absolute emissions target). Additionally, 'NGT' targets can be reclassified as 'ABU' (absolute reduction compared to Business-As-Usual) if absolute mitigation effects due to planned policies and measures are provided.

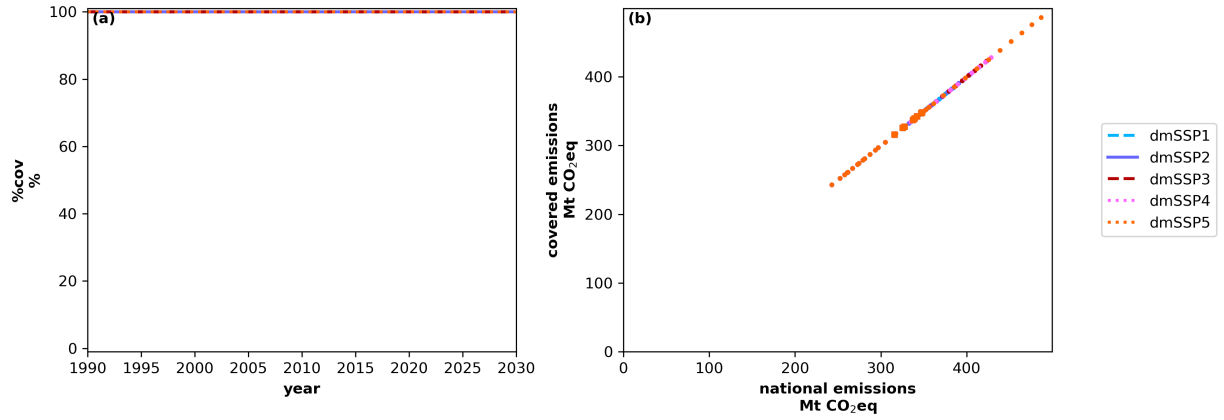
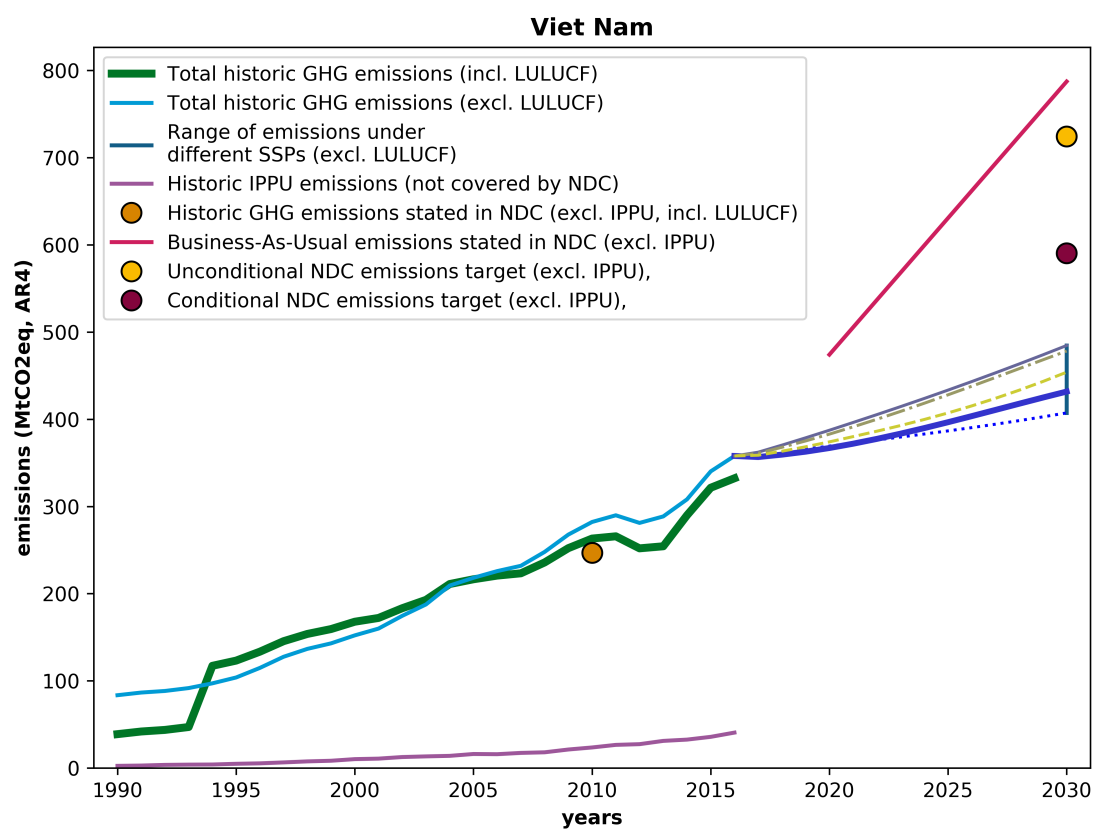


Figure 4: Timeseries of Argentina’s national emissions (exclLU) and the share of emissions that is assumed to be covered by Argentina’s mitigation target.

Table 3: Information on covered sectors and gases as retrieved from NDC and adapted (‘Adap.’: used to calculate %cov), and their shares in Argentina’s 2017 emissions (exclLU, exclBunkers; total 348.2 Mt CO₂eq). If either the sector or gas is assessed as ‘not-covered’, the emissions from this sector-gas combination are counted as not-covered (–). Else the emissions are counted as covered (+; covered shares given in bold). (/) means that no information is available. LULUCF: NDC ‘+’ and adapted ‘+’ (estimated as a net source of 70.4 Mt CO₂eq in 2017; based on the ‘chosen’ LULUCF emissions).

	NDCs	Adap.	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	NF ₃	Total
NDCs			+	+	+	+	+	+	/	
Adap.			+	+	+	+	+	+	–	
Energy	+	+	53.6%	2.6%	0.5%	/	/	/	/	56.7%
IPPU	+	+	4.8%	0.02%	0.03%	0.2%	0.05%	0.0%	/	5.2%
Agri.	+	+	0.2%	20.4%	12.2%	/	/	/	/	32.8%
Waste	+	+	0.0%	4.8%	0.2%	/	/	/	/	5.0%
Other	/	+	/	/	0.3%	/	/	/	/	0.3%
Total			58.7%	27.8%	13.3%	0.2%	0.05%	0.0%	/	100.0%



Sources:
 Historic emissions from PRIMAPHISTv2.0 HISTCR.
 SSPs: SSP1BLIMAGE (dotted), SSP2BLMESGB (thick solid), SSP3BLAIMCGE (thin solid),
 SSP4BLGCAM4 (dashdotted), SSP5BLREMMMP (dashed).
 Emissions needed for NDC calculation not stated in NDC, taken from CRF data.

Figure 5: Example Viet Nam.