**CAETS WORKING GROUP** 

### ENGINEERING FOR UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

PRESENTATION

### National Academy of Engineering - Argentina C. F. Arias

V - 3

TERCER INFORME BIENAL DE ACTUALIZACIÓN DE LA REPÚBLICA ARGENTINA A LA CONVENCIÓN MARCO DE LAS NACIONES UNIDAS SOBRE EL CAMBIO CLIMÁTICO

### THIRD ARGENTINE ACTUALIZATION REPORT TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

# MAIN SOURCE OF INFORMATION



Secretaría de Ambiente y Desarrollo Sustentable República Argentina



# **POSITION AND SIZE**



# Total surface area of Argentina is 3.8 million km<sup>2</sup>. Continental: 74% Antarctic and southern islands: 26%

# *largest countries in the world by total area (in square kilometers)*



# **ARGENTINA GOVERNMENT**

# REPUBLICAN REPRESENTATIVE FEDERAL

# **23 PROVINCIES AND ONE AUTONOMOUS CITY**



# **ARGENTINA GOVERNMENT**

### **EXECUTIVE POWER**

The President is head of State and head of Government

### **LEGISLATIVE POWER**

Vested in National Congress.

# JUDICIARY POWER Independent from Executive and Legislative powers.







**ARGENTINA POPULATION:** 

**ANNUAL POPULATION GROWTH:** 

**AVERAGE POPULATION DENSITY:** 

#### **POPULATION DITRIBUTION:**

Around 4 % of Population Is foreign born

#### 43,6 Millions (2016)

slightly over 1 %

11 inhabitants/km<sup>2</sup>

- 91% in urban centers
- 32 % in the Metropolitan
  Area of Buenos Aires
  (City of Buenos Aires and sourrandings).



### 1400 km



### 3700 km



# CLIMA

- Is very diverse because of the vast territory :
- Arid and cold in the West and South
- Template and warm in its Central and Northern portion.
- Humid regions, in the Northeast
- The main dominant factors of the climate system are the Andes Mountains, the latitude and the influence of oceans.



# Argentina Mapa físico



o m

-200 m

-500 m

-1.000 m

-2 500 m

-5.000 m

-10,000 m

500 Km

BOLIVIA

Cartografia: Abel Gil Jobo (2021)

# Natural Energy Resources in Argentina

### **ARGENTINA SOURCES OF ENERGY**

NATURAL ENERGY RESOURCES

Hydrocarbons, Hydraulic Wind, Solar Uranium

Energy resources are mostly located far away from consumption centers.

Therefore, significant infrastructure is needed for energy TRANSPORT



# **TOTAL DOMESTIC ENERGY offer: 84 Mtoe**

1 [Mtoe] = 11630 gigawatt-hora [GW•h] = 1,328 GWaño

Fossil Fuel :	88 %						
		(31 % Oil and by-productsMineral Coal)					
		(56 % Natural G	as)				
		(1% Mineral C	oal)				
Hydraulic :	5 %		Nuclear :	3 %			
-							

### Non-conventional Renewables : 4 %

Biomass Small Hydroelectric power developments Wind Solar



### **ENERGY FOR TRANSPORTATION IN ARGENTINA**

T	Total pr otal 340	imary )2 207	ener TJ	gy sup (26	ply : Mtoe	)	
Diesel Oil	:	4	44 %				
Motor Ga	soline :		38 %	(Biofue	el blend	include	ed)
Comprese	ed Natural	Gass:	14 %				
R	OADS:	Nationa	al:	40.000	Km		

luonai.	40.000		
ovincial:	190.000	Km	
cal:	285.000	km	
	ovincial: cal:	ovincial:40.000ovincial:190.000cal:285.000	AdvisorAdvisorAdvisorovincial:190.000Kmcal:285.000km

The transport sector of Argentina is the biggest final energy consumer in the country, with almost 31% of total primary energy in 2017. It is responsible for almost 14% of total national greenhouse gas emissions.

### Radiación solar directa normal (anual)





Fuente: National Renewable Energy Laboratory



### TOTAL INNER OFFER OF PRIMARY ENERGY



# **CROP PRODUCTION:**

In the 2015/2016 campaign, 39 million hectares were sown, with soybean as the main crop.

In 2016, exports of oilseed and cereal compounds reached 49% of economic value of the exports,

Primary production of cereals, seeds and oil fruits accounted for 19% of the exported value.

# LIVESTOCK:

# Livestock farming is mainly developed in the vast grasslands of the Pampas, Espinal and humid Chaco regions.

In 2016, the livestock of cattle was 53 million heads, and approximately 12 million livestock heads were slaughtered, mainly for internal consumption.

# FOREST LAND: NATIVE FOREST

Argentina has a vast area of NATIVE forests, with approximately 54 million hectares of registered native forests. In 2016, around 156 thousand hectares were deforested, mostly, due to the expansion of the agricultural frontier

# FOREST LAND: CULTIVATED FOREST

Argentina has a CULTIVATED forest area of approximately 1.4 million hectares.

In 2016, Misiones, Corrientes and Entre Ríos provinces had approximately 80% of the total forested area of the country.

# Cultivated species in the country are mainly fast-growing exotic species.

# About 95% of the wood used in the forestry industry comes from these cultivated forests.

Some of the main uses of the obtained wood are as input for building houses, to manufacture of furniture, for production of paper and for energy generation.

# WASTE

An average of approximately 1 kg/day of solid urban waste is generated per habitant. The highest volume is produced in the Province of Buenos Aires.

Urban solid wastes are disposed

through the country on uncontrolled open-air dumps without sanitary treatment.

The most relevant cities usually have controlled waste dumps, while large urban centers have landfills.

The main landfills have implemented systems

to destruct or use collected biogas.

# MANUFACTURING AND BUILDING INDUSTRY

The industrial sector cover a wide variety of activities, businesses and scales. The most relevant are: Manufacturing food products and beverages: 31%, Manufacturing chemical substances and products: 10%. Building sector: 14%, Others: 45 %

In 2016, the industrial sector was the second largest consumer of natural gas, after electric power plants.

Unlike the residential sector, gas consumption in the industrial sector does not present seasonality behavior.

The UK will host the <u>UN Climate Change Conference</u> (Cop26) in November, where world leaders will gather to discuss steps to achieve a zero-carbon future by 2050.

Taking place in Glasgow, Scotland, the meeting was described by summit president Alok Sharma as humanity's "last hope" of avoiding catastrophe from climate change.

The event is being held in Glasgow from November 1 to 12, after last year's scheduled summit was cancelled because of the Covid-19 outbreak. Under the 2015 Paris Agreement on climate, 197 signatory countries agreed to limit the rise in global temperatures to 1.5°C above pre-industrial levels and cut fossil fuel emissions

to become carbon neutral by 2050.

Discussions will address three main aims: reducing emissions, strengthening efforts to combat climate change and mobilising financial support. For the first time, countries will be required to outline realistic targets for achieving a cleaner future, such as phasing out coal, curtailing deforestation and switching to electric vehicles.

It is expecting that the International Monetary Found and the World Bank will present options to improve payment conditions for those countries that accept the compromise of reconverting their energy matrix into sustentable models. Argentina should reduce its emissions to below 205 MtCO2e by 2030 and to below 55 MtCO2e by 2050 to be within its fair-share range compatible with global 1.5°C IPCC scenarios. El conjunto de las NDC presentadas por cada país debería contribuir con el cumplimiento de los objetivos del Acuerdo de París de "mantener el aumento de la temperatura media mundial muy por debajo de 2°C con respecto a los niveles preindustriales, y proseguir los esfuerzos para limitar ese aumento de la temperatura a 1,5°C con respecto a los niveles preindustriales".

NDC: Nationally Determined Contributions

# **ARGENTINE CLIMATE CHANGE CABINET**

To facilitate the adoption of policies related to climate change and fulfillment of commitments arising from the UNFCCC and the Paris Agreement, the Argentine National Executive Branch created in July 2016 the National Climate Change Cabinet (NCCC),

under Executive Branch decree No. 891/2016.

The NCCC is composed by government ministries and secretariats responsible for sectoral mitigation and adaptation policies. It is chaired by the Chief of the Cabinet of Ministers and it is technically coordinated by the Secretariat of Climate Change and Sustainable Development through the NCCD (National Climate Change Directorate), under the authority of Secretary General

of Environment and Sustenaible Development (SGAyDS).

# ARG

In order to implement the Nationally Determined Contributions (NDC) by 2030, the NCCC National Climate Change Cabinet provides the framework for the creation of climate change sectoral plans, which are part of the National Climate Change Adaptation and Mitigation Plan (NCCAMP), consisting of the National Adaptation and Mitigation Plans. The Climate Change Sectoral Plans contain the strategy on climate change of each government agency, according to their competence.

In 2019, a Climate Change Law was approved by National Congress with the aim of institutionalized the work carried out by the NCCC since 2016.

### **International Reports Presented to the UNFCCC**

Illustration 1 below shows a timeline with the presentations submitted to the UNFCCC.



Source: Adapted from official data

The NCCC acts as Coordinator of the National GHG Inventory and Mitigation System, and thus is responsible for managing the funding for the preparation of Biennial Update Reports (BUR) and National Communications. Additionally, it coordinates the preparation of the National GHG Inventory, including its compilation, and generate all the communication activities.

**United Nations Framework Convention on Climate Change (UNFCCC)** 

**NC National Communications** 

**BUR Biennial Update Reports** 

EXECUTIVE SUMMARY IBA 3

# **ARG**

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# **GREEN HOUSE GASS INVENTORY**



Source: Adapted from official data

Results and Trends – Geen House Gass Inventory for the Year 2016 The GHG inventory of emissions and removals of the year 2016 are organized into the different sectors and categories, including the precursors, and are presented in Table 2. The total of net emissions for the year 2016 were estimated at 364,436 GgCO2e.

			Table 2: N	z <mark>/</mark> ional G	GHG Inve	entory 20	)16 emis	sions by	sector	and category	/				
	Id#	Categories	Total	C02	CH4	N20	HFC	PFC	SF6	Other halogenated gases with CO <sub>2</sub> equivalent conversion factors	Other halogenated gases without CO <sub>2</sub> equivalent conversion factors	NOx	со	COVDM	SO2
			(GgCO2e)	(GgCO2e)	(GgCO2e)	(GgCO2e)	(GgCO2e)	(GgCO2e)	(GgCO2e)	(GgCO2e)	(GgCO2e)	(Gg)	(Gg)	(Gg)	(Gg)
,		Total National Emissions and Removals	364.412,94	231.906,33	79.118,10	47.847,22	5.528,99	11,85	•	-	0,45	879,67	4.488,58	637,03	100,83
	1	Energy	193.418,89	185.442,12	6.664,29	1.312,48						825,11	2.458,05	527,43	74,75
	1A	Fuel combustion activities	182.900,88	180.959,26	637,18	1.304,43	NA	NA	NA	NA	NA	825,11	2.458,05	432,64	74,75
	18	Fugitive emissions from fuels	10.518,01	4.482,85	6.027,11	8,05	NA	NA	NA	NA	NA	NE	NE	94,79	
<b>,</b> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	10	Carbon dioxide transport and storage	NO	NO	NO	NO	NA	NA	NA	NA	NA	NO	NO	NO	NO
	2	Industrial processes and product use	20.028,59	14.320,44	120,09	46,78	5.528,99	11,85	-		0,45	2,16	236,92	109,61	26,09
	2A	Mineral industry	7.028,51	7.028,51			NA	NA	NA	NA	NA	NE	NE	NE	3,27
	2B	Chemical industry	2.625,98	1.851,28	116,13	46,78	611,79			-		0,22	6,38	13,76	3,62
	2C	Metal industry	5.280,02	5.264,21	3,95	-	-	11,85	-	-		1,08	227,39	0,12	6,60
	2D	Non-energy products from fuel and solvent use	176,44	176,44			NA	NA	NA	NA	NA	0,02	0,01	70,20	
	2E	Electronics industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	2F	Product uses as substitutes for ozone depleting substances	4.917,64	-		•	4.917,19				0,45	-	•	•	
	2G	Other product manufacture and use	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	2H	Other	-	-	-	-	-	-	-	-		0,84	3,15	25,52	12,59
	3	Agriculture, forestry and other land use	135.526,66	32.110,19	57.834,13	45.582,34	NA	NA	NA	NA	NA	52,39	1.793,60	-	-
	3A	Livestock	55.970,75	NA	55.335,89	634,86	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3B	Land	31.068,44	31.068,44	-	-	NA	NA	NA	NA	NA	-	-	-	
	зc	Aggregate sources and non-CO <sub>2</sub> emission sources on land	48.487,48	1.041,75	2.498,24	44.947,49	NA	NA	NA	NA	NA	52,39	1.793,60	-	-
	3D	Other	NE	NE	NE	NE	NA	NA	NA	NA	NA	NE	NE	NE	NE
	4	Waste	15.438.78	33,58	14.499,59	905,62	NA	NA	NA	NA	NA	NE	NE	NE	NE
	4A	Solid wast disposal	9.025	NA	9.024,94	NE	NA	NA	NA	NA	NA	NE	NE	NE	NE
	4B	Biological treatment of solid waste	58.76	NA	27,89	30,87	NA	NA	NA	NA	NA	NE	NE	NE	NE
	4C	Incineration and open burning of waste	33.58	33.58	NE	NE	NA	NA	NA	NA	NA	NE	NE	NE	NE
	4D	Wastewater treatment and discharge	6.321.51	NA	5,446.77	874.74	NA	NA	NA	NA	NA	NE	NE	NE	NE
	4E	Other (please specify)	NF	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
-	5	Other	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
		Indirect N-O emissions from the atmospheric													
	5A	deposition of nitrogen in NO <sub>x</sub> and NH <sub>3</sub>	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	5B	Other (please specify)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
		Memo items													
	1A3ai	International aviation	2.506,80	2.484,88	0,36	21,55	NA	NA	NA	NA	NA	8,69	-	-	1,58
	1A3di	International water-borne navigation	2.253,31	2.230,89	4,30	18,12	NA	NA	NA	NA	NA	43,43	28,95	5,79	5,28
	S/N	Multilateral operations	IE	IE	IE	IE	NA	NA	NA	NA	NA	NE	NE	NE	NE
		CO. emissions from biomass	0.046.06	0.046.06	AL A	AL A	ALC.				81.8				



#### **ENERGY SECTOR**



Fuente: Elaboración propia

#### **Sector : Industrial Proceses and Products Uses**

#### Sector Procesos Industriales y Uso de Productos (PIUP)

#### Figura 21: Evolución de las emisiones del Sector PIUP



Fuente: Elaboración propia

#### Sector : Agriculture Livestock Forestry and other Land Uses



#### Figura 24: Evolución de las emisiones del Sector AGSOUT

Fuente: Elaboración propia



#### Table 3: Key categories in National GHG Inventory 2016 – Level assessment

Céclipo de la catagoria del INCC	Conceptión del IPCC	Tipo de Combustible	Ges de efecto Invernadero	Estimatón del ditimo elle Est (OgiCC2eq)	Valor ebeciuto de la estimación del Gitimo effo I Dut (GgCO2eq)	Destantion de nivel taux (24)	Total ecumulativo de la Emiluación de nivel 154
141	Energy Industries	Cas	C02	46.385	46.385	12%	12%
341411	Enteric fermentation Other cattle	N/A	CH4	44.748	44,748	1.256	24%
1A35	Transport road transportation	Liquido	C02	38.834	38.634	10%	35%
144	Other sectors	Cas	C02	31.310	31.310	85	43%
142	Manufacturing industries and construction	Gas	CO2	26.631	26.631	7%	50%
3635	Land converted to grassiand	N/A	CD2	21.182	21.182	635	56%
141	Energy Industries	Liguido	CO2	16.135	16.135	4%	60%
3C4c	Direct Urine and dung deposited on pasture Other cattle	N/A	N20	13.342	13.342	45	63%
3C4e	Direct Crop residues	N/A	N0:0	10.499	10,499	3%	66%
48	Solid waste disposal	N/A	CHA	9.025	9.025	2%	65%
3.67	Soll organic matter change (carbon)	N/A	CD2	8.593	8.593	2%	71%
3825	Land converted to cropland	N/A	CD 2	7.463	7,463	2%	73%
1.42	Manufacturing industries and construction	Liquido	C02	6.531	6.531	2%	75%
381.8	Forest land remaining forest land	N/A	CD 2	-6.170	6.170	2%	76%
3AL d	Enteric fermentation Dairy cattle	N/A	CH4	5.630	5.630	1%	78%
1A35	Transport road transportation	Gas	C02	5,510	5.510	18	79%
1825	Natural gas	N/A	014	5.251	5.251	18	80%
201	Iron and steel production	N/A	CO2	4.487	4.437	1%	83%
304a	Direct Synthetic N fertilizers	N/A	N0:0	4.425	4,425	1%	83%
261	Regrigeration and air conditioning	N/A	HFC/PFC	4.314	4.314	1%	34%
281	Cenent production	N/A	C02	4133	4.133	15	85%
144	Other sectors	Liquido	C02	3.297	3.297	18	86%
3A16-j	Enteric fermentation Other (non callie)	N/A	CH4	3.292	3.292	1%	87%
401	Domestic wastewater	N/A	014	3.032	3.032	1%	88%
1825	Natural gas	N/A	C02	3.001	3.001	1%	38%
3C5c	Indirect Urine and dung deposited on pasture Other cattle	N/A	N20	2.948	2,948	15	87%
402	Industrial wastewater	N/A	014	2.415	2.415	1%	90%
3CSe	Indirect Crop residues (lesching)	N/A	N2:0	2.362	2.362	1%	91%
3CM	Direct NyO emission from managed soils - unine and dung deposited on pasture (other)	N/A	N20	2.356	2.356	1%	91%
3045	Direct Urine and dung deposited on pasture Diary cattle	N/A	N20	2.228	2.228	1%	92%
242	Line production	N/A	C02	2.159	2.159	18	92%
301	Biomess burning	N/A	CH4	2.113	2.113	1%	93%
1A3a	Domestic avlation	Liquido	C02	1.862	1.862	0%	93%
acef	Direct N trogen mineralization associated with loss of soil organic matter	N/A	N2:0	1.852	1.852	0%	94%
143e	Other transportation	Gas	C02	1.713	1.713	0%	\$4%
141	Energy Industries	Sólido	002	1.622	1.622	0%	<b>55%</b>
182a	OII	N/A	CO2	1.482	1.482	0%	95%

Source: Adapted from official data

# Mitigation actions and their effects

Within the country's mitigation commitments, in accordance with decisions 1/CP.19 and 1/CP.20, the Argentine Republic submitted to the UNFCCC, on October 1st of 2015, its intended Nationally Determined Contributions (NDC). The latter, automatically became Argentina's NDC, following the ratification of the Paris Agreement in September 2016. That same year, during the twenty-second Conference of the Parties, the country presented an update on its NDC. In it, Argentina established an absolute target not to exceed the net emission of 359 million tons of carbon dioxide equivalent (MtCO2e) in 2030.

The adopted target is valid for the whole of the national territory and will be achieved through the implementation of a series of economy-wide measures focusing on the sectors of energy, agriculture, forestry, transport, industry and infrastructure (including waste).

Since 2016, the NCCC has provided the framework for the development of climate change sectoral plans. These sectoral plans are dynamic documents which are constantly evolving. The sectoral plans include the strategy on climate change for each government agency, according to its jurisdiction. In addition, they have roadmaps for each of the mitigation and adaptation measures planed.

### **Measures under Implementation**

**Mitigation measures included in Climate Change Sectoral Plans** 

Sectoral Plan	Point of intervention	Measure				
		Generation of electricity from non-conventional				
		renewable sources connected to the grid				
		Distributed generation of electricity				
Energy	Supply of energy	Biofuels blending				
		Hydroelectric generation				
		Nuclear generation				
		Off-grid electricity generation				
	Demand for energy	Public lighting				
	Demand for energy	Residential lighting				
Transport	Urban passenger transport	Implementation of Bus Transit Rapid System				
Agriculture	Forestry	Afforestation				
	Land management	Avoided deforestation of native forests				
Forestry	Sustainable management of native	Sustainable management, preservation,				
	forests – Preservation in productive	restoration and recovery of native forests and				
	landscapes – Restoration and recovery –	prevention of forest fires				
	Prevention of forest fires					

# Esquema de gobernanza

ambiente

Argentina unida

Gabinete Nacional de Cambio Climático (GNCC) Reunión de Ministros

Mesa de Puntos Focales

Mesa de Articulación Provincial

Mesa Ampliada

Coordinación técnica administrativa

Consejo asesor (a definir) Científicos Universidades ONG Comunidades y Pueblos Originarios Partidos políticos Sindicatos Sector empresario

# NATIONAL CABINET ON CLIMATE CHANGE



The Argentine Republic is committed to an absolute, economy wide and unconditional goal of not exceeding the net emission of 359 million tons of carbon dioxide equivalent (MtCO2 e) in 2030.

This new goal is ambitious, since it is equivalent to a total decrease in emissions of 19% by 2030, compared to the historical peak reached in 2007, and a reduction of 25,7% compared to the previous NDC submitted in 2016.

Furthermore, the proposed goal is absolute, economy wide and unconditional, in compliance with article 4.4 of the Paris Agreement. It is also fair and equitable, with its fulfillment, Argentina would hold a participation of 0.9% with respect to global emissions.

#### **NUCLEAR ENERGY IN ARGENTINA**

**3** Nuclear reactors in operation:

CN Atucha 1 :	362 Mwe
CN Atucha II :	745 Mwe
CN Embalse :	653 Mwe

Total : 1760 MWe

**1** Small Nuclear Reactor (In construction) Reactor CAREM : **35** Mwe

1 Nuclear Reactor (Planned ) Reactor Wang Long 1000 Mwe 1 Nuclear Reactor (Planned ) Argentina Reactor 1000 Mwe

# THANK YOU !!