

ICTP Summer School:
“Modelling Tools for Sustainable Development ”
June, 2017, Trieste, Italy



INECC

INSTITUTO NACIONAL
DE ECOLOGÍA
Y CAMBIO CLIMÁTICO

Mexico



The **National Institute of Ecology and Climate Change (INECC)** has been preceded by the National Institute of Ecology (INE), created in 1992 as an agency of the Ministry of Social Development, with technical and regulatory powers in ecology.

The INECC was created in accordance with Article 13 of the new General Law on Climate Change, published on June 6, 2012. It is a public agency of the Federal Public Administration, legal personality, its own assets and management autonomy, sectorized in Secretary of the Environment and Natural Resources (SEMARNAT)

Research Institute of the Mexican state,
aimed at coordinating and conducting
studies and projects of scientific and
technological research with public or
private, national or foreign academic
institutions on climate change

Mission

The generation of scientific and technical information on environmental issues and the training of human resources, in order to inform society, support decision making, encourage the protection of the environment, promote the sustainable use of natural resources, and support the Secretary of the Environment and Natural Resources (SEMARNAT) in reaching its goals.

Vision

To be a leader agency in applied environmental research, that develops and promotes scientific cooperation projects that contribute effectively to resolve the major environmental problems of Mexico, and support the conservation and restoration of the environment in the whole country.

BASIC INFORMATION



GDP 1st Qtr 2017: 20,604 billion pesos or 1,027 billion dollars

Average GDP growth rate 2012-2017: 2.07%

GDP per capita 2017: 8,315 dollars

2015 Population: 119.5 million inhabitants / 58 million men and 61.5 million women

Employment rate: 96.54%

Average Gini coefficient 2015: 0.433

Poverty 2014: 46.2% Extreme poverty 2014: 9.5%

Location: 19.4326° N, 99.1332° W

CLIMATE AND GEOGRAPHY

Surface area
1.964
million km²

**Political
division**

32 states

2 457
municipalities
and delegations

57.0%

of the population is concentrated
in metropolitan areas

59

metropolitan areas
in Mexico in 2015



SEMARNAT-CONAGUA (2016)

INEGI: <http://cuentame.inegi.org.mx/mapas/default.aspx?tema=M>

WATER

Water that may be
feasibly and sustainably
used in a region

Mexico in 2015

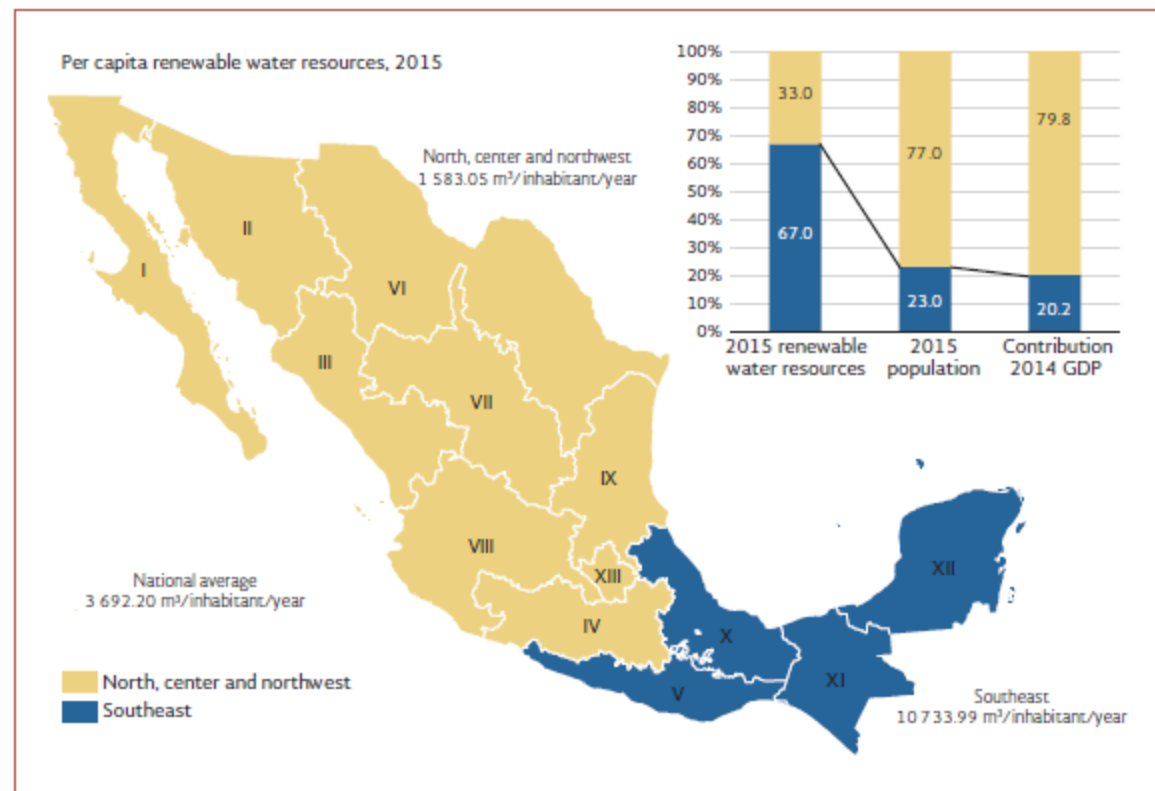
446 777

hm³ per year

The per capita renewable
water resources were
estimated in 2015 at

3692

m³/inhabitant/year



Source: Produced based on CONAPO (2012), INEGI (2008), INEGI (2016j), CONAGUA (2016b).

USES

Variation between regions



Classification

Offstream

Difference between the volume extracted and the discharge once an activity has been completed

Instream

The activity does not modify the volume

Offstream water sources

Surface water:
61.1%
of offstream
uses



Groundwater:
38.9%
of offstream
uses



Grouped offstream uses



Degree of water stress

Sources of offstream uses

Regions

Higher than

40 %

is considered
high or very
high water stress

Mexico

19.2%
(low)

Highest stress

XIII Waters of
the Valley of Mexico

138.7%
(Very high)

Lowest stress

XI Southern Border

1.7 %
(no stress)

WATER

Coverage 2015

Access to services

Tap water

95.3%

97.8%
urban
87.0%
rural

Sewerage and basic sanitation

92.8%

97.4%
urban
77.5%
rural

CONAGUA

Drinking water

92.5%

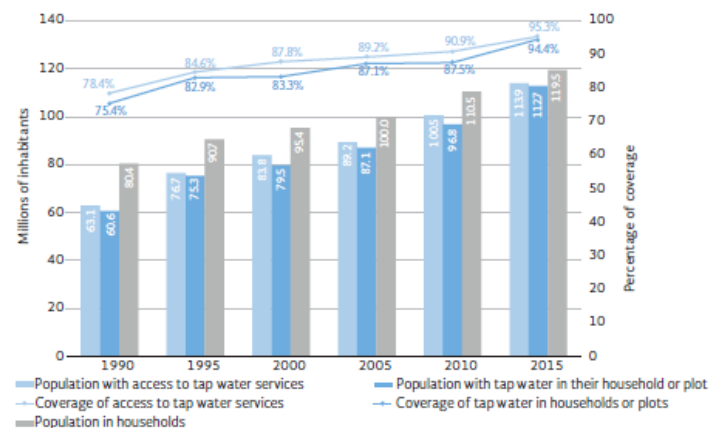
95.7%
urban
81.6%
rural

Sanitation

91.4%

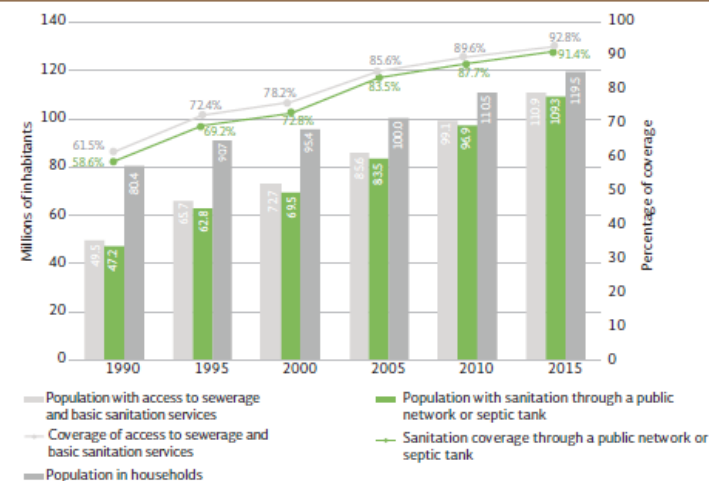
96.6%
urban
74.2%
rural

National population with tap water coverage



Source: Produced based on CONAGUA (2007), CONAGUA (2016k), INEGI (2016c), INEGI (2016d).

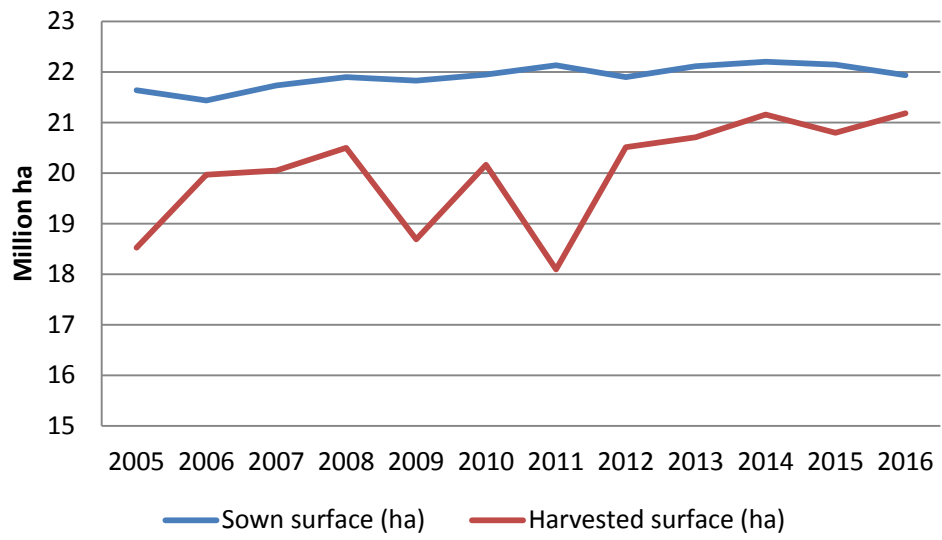
National population with sanitation coverage



Source: Produced based on CONAGUA (2007), CONAGUA (2016k), INEGI (2016c), INEGI (2016d).

Land Use, Agriculture & Animal Husbandry

Sown and harvested surface



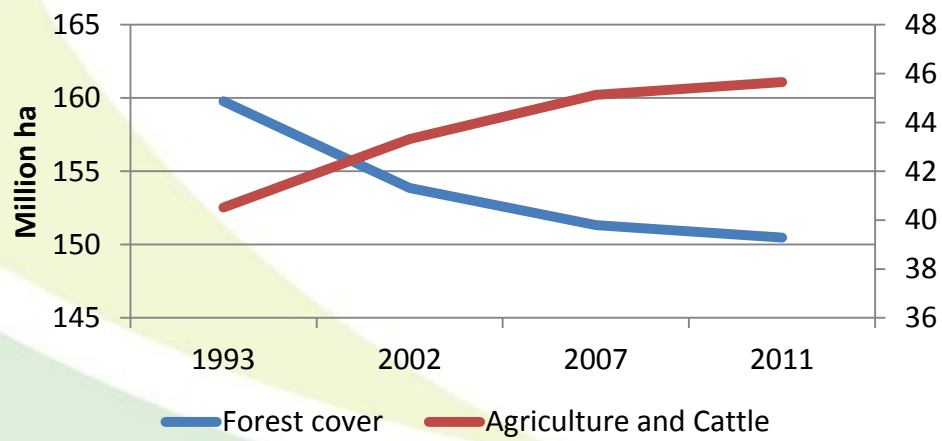
Main food crops:

- Maize
- Beans
- Wheat
- Rice
- Soy
- Sorghum
- Sesame
- Tomato
- Green chile
- Avocado

Main cash crops:

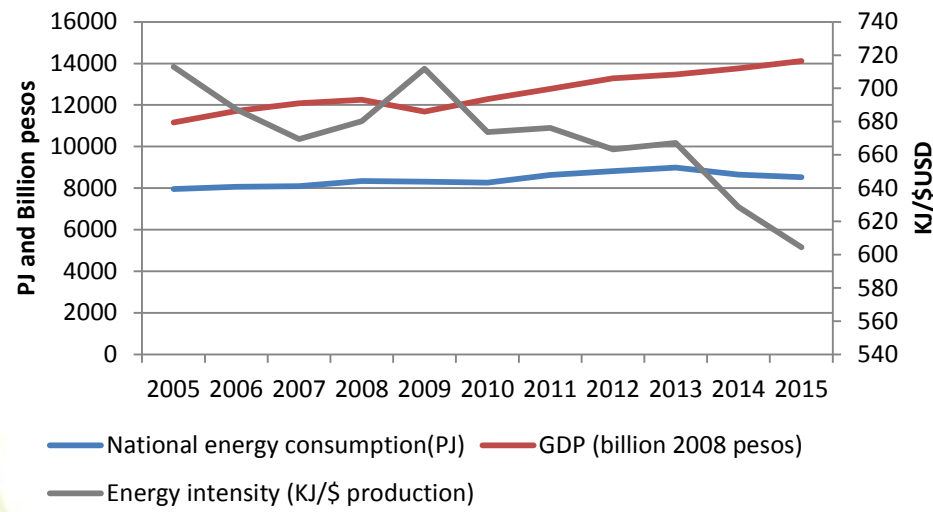
- Coffee
- Sugar cane
- Safflower
- Orange
- Apple
- Lime
- Plantane

Land Use Change

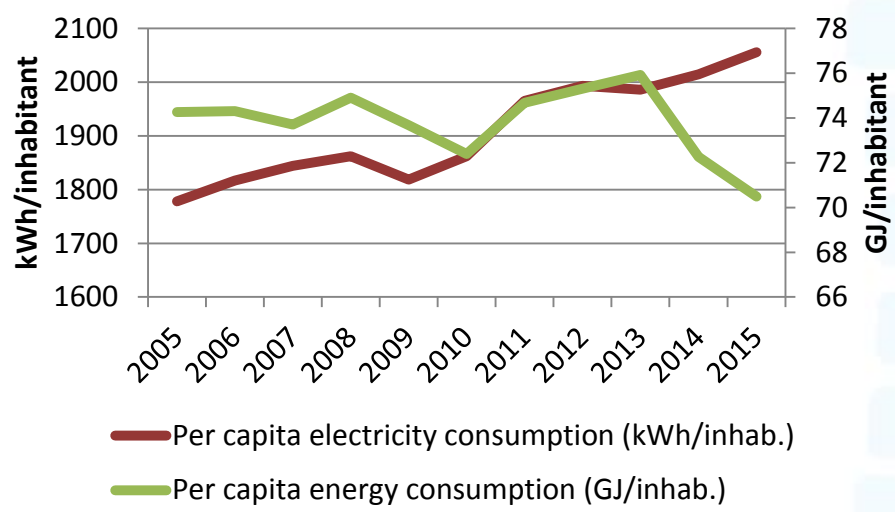


Source: SIAP, SAGARPA

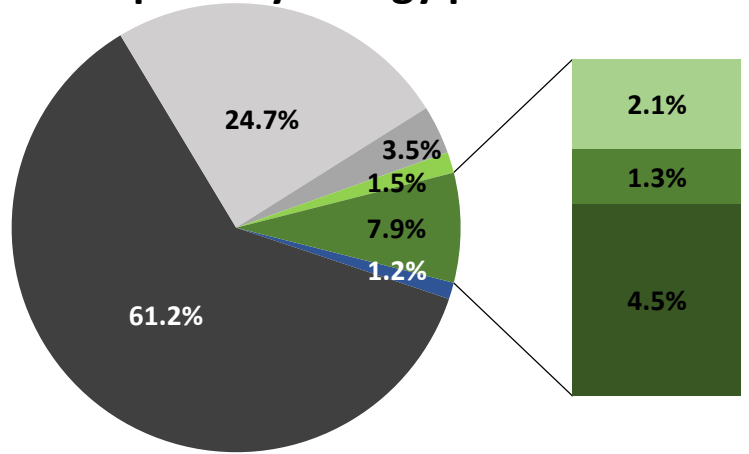
Mexico's Energy Intensity



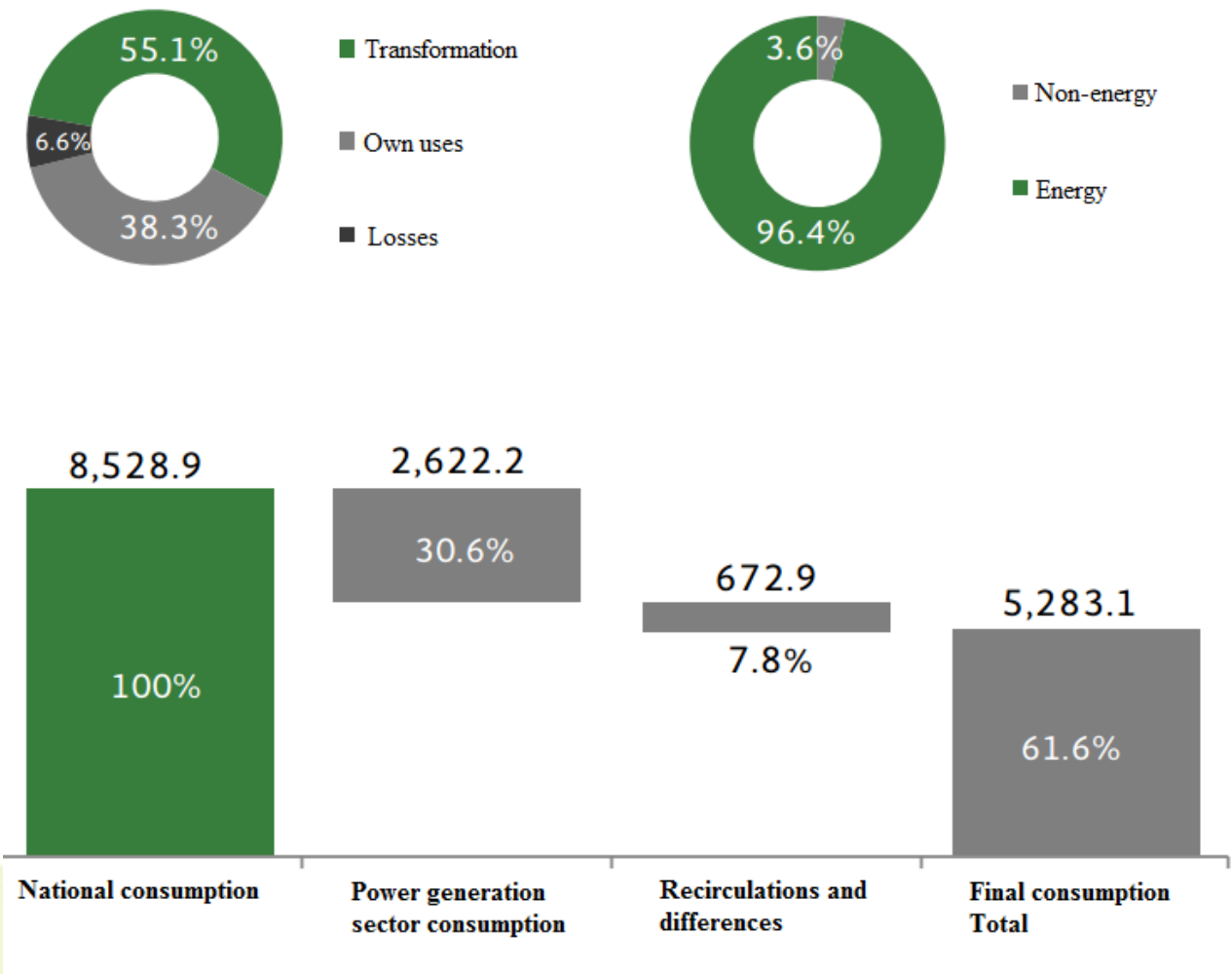
Energy consumption per capita



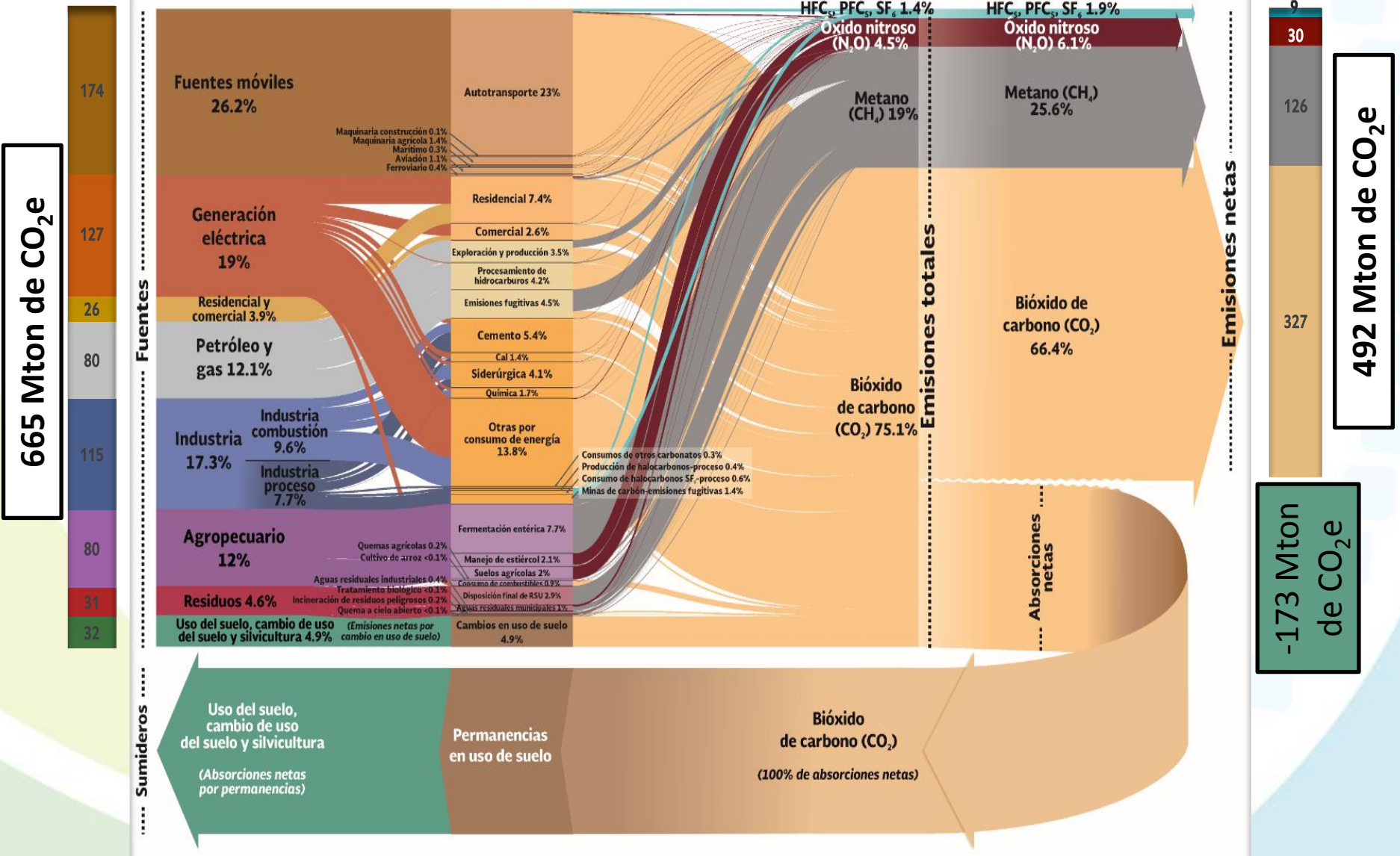
Structure of primary energy production 2015, (PJ)



National energy consumption, 2015 (PJ)



National GHG Inventory 2013



BAU scenario and unconditional mitigation targets, 2013-2030

Greenhouse Gases Mitigation goals

GEI
-22%

-36%

CONDITIONAL GOAL

	Baseline(Mton CO ₂ e)				2030 GOAL	
	2013	2020	2025	2030	UNCONDITIONAL	
					2030	Δ
TRANSPORT	174	214	237	266	218	-18%
POWER GENERATION	127	143	181	202	139	-31%
RESIDENTIAL Y COMMERCIAL	26	27	27	28	23	-18%
OIL & GAS	80	123	132	137	118	-14%
INDUSTRY	115	125	144	165	157	-5%
AGRICULTURE AND HUSBANDRY	80	88	90	93	86	-8%
Waste	31	40	45	49	35	-28%
SUBTOTAL	633	760	856	941	776	-18%
LULUCF	32	32	32	32	-14	-144%
TOTAL	665	792	888	973	762	-22%

BAU scenario and unconditional mitigation targets, 2013-2030

Black Carbon Mitigation goals



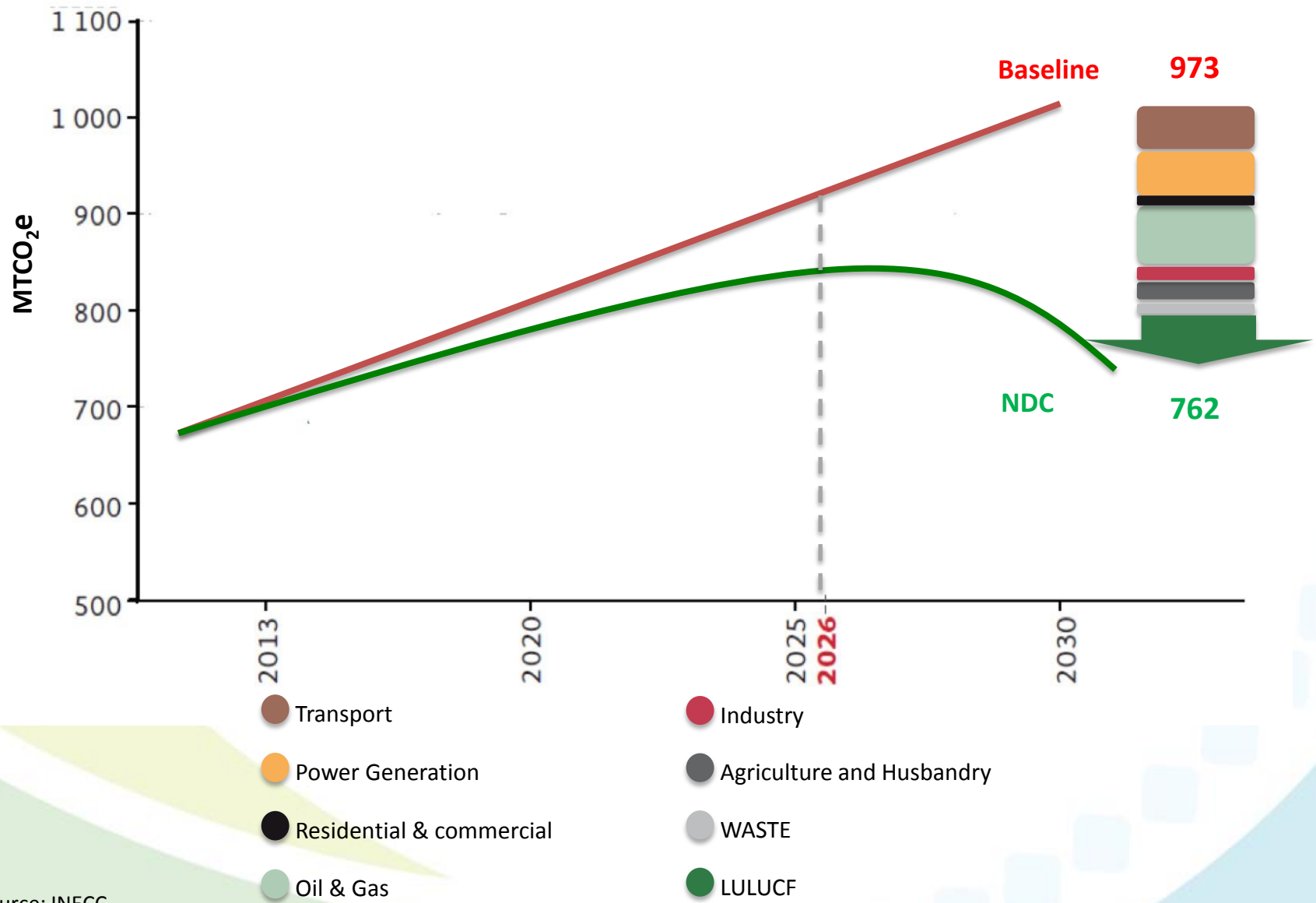
-51%

-70 %

**META
CONDICIONADA**

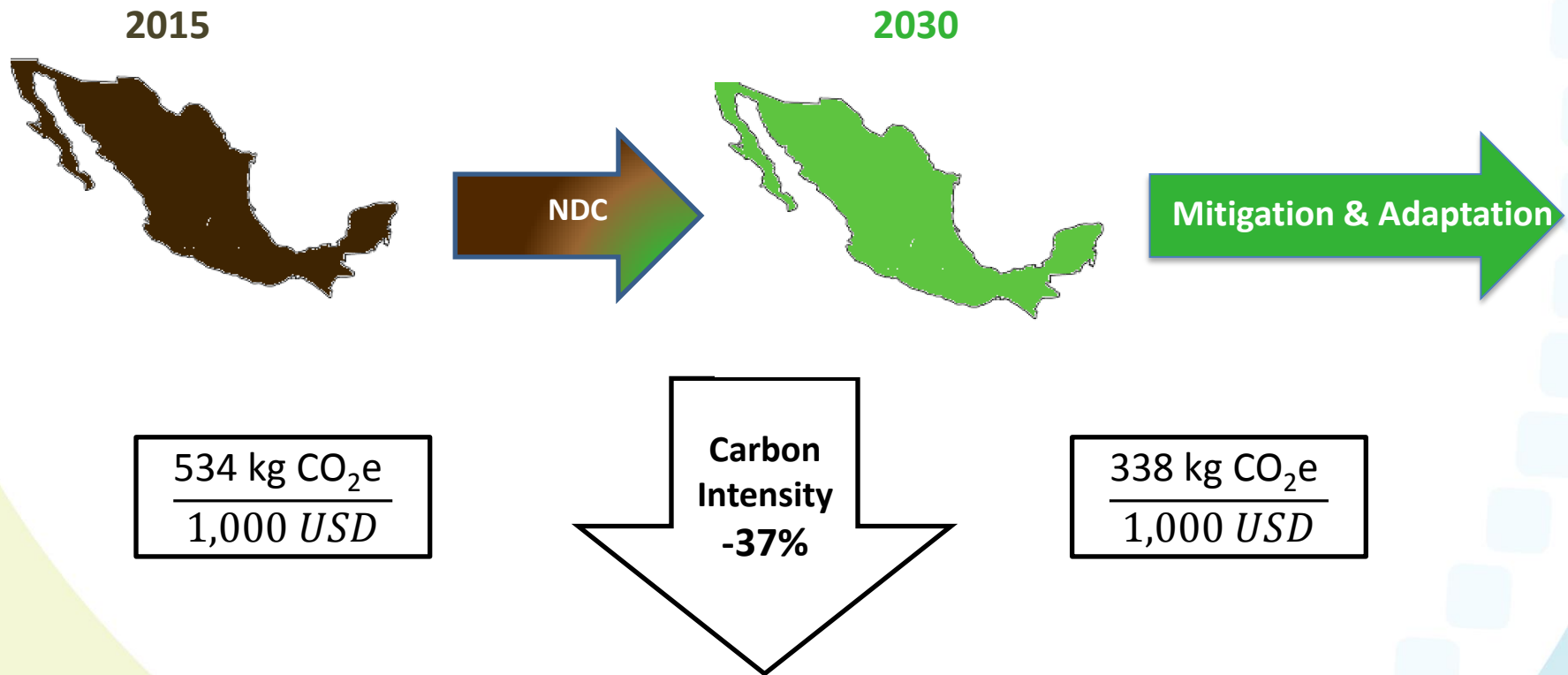
	Baseline(Mton)				UNCONDITIONAL	
	2013	2020	2025	2030	2030	Δ
TRANSPORT	47	47	52	58	10	-83%
POWER GENERATION	8	4	4	3	2	-33%
RESIDENTIAL Y COMMERCIAL	19	16	15	15	6	-60%
OIL & GAS	2	3	3	3	<3	-1%
INDUSTRY	35	43	49	56	41	-16%
AGRICULTURE AND HUSBANDRY	9	11	12	13	10	-23%
Waste	<1	<1	<1	<1	<1	-88%
LULUCF	4	4	4	4	4	0%
TOTAL	125	127	138	152	75	-51%

Baseline Scenario vs NDC (unconditional)



Source: INECC

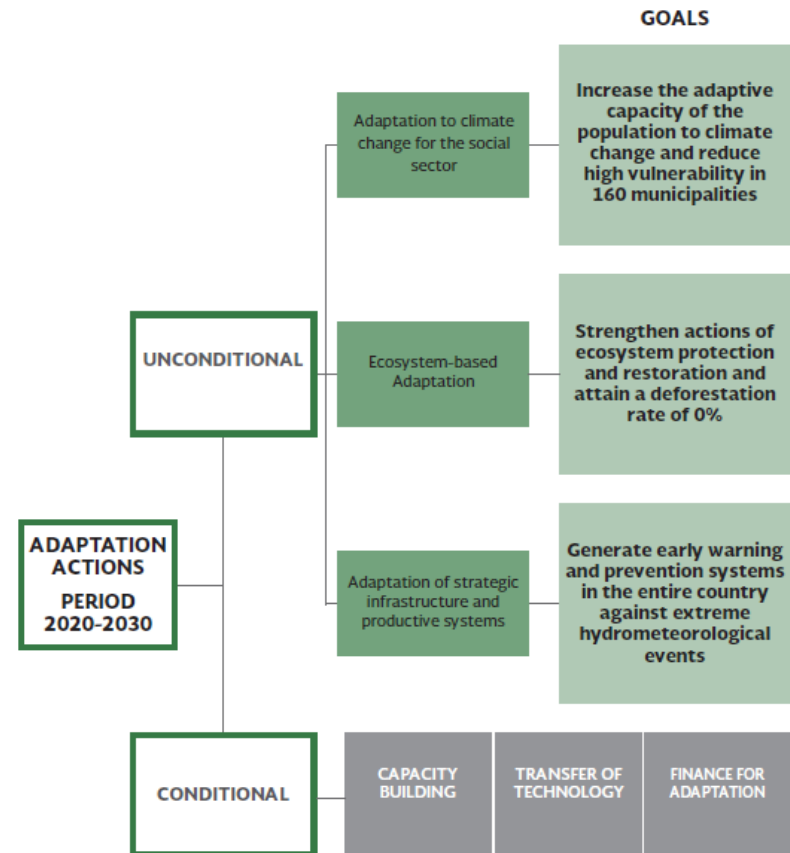
Towards a decarbonization of the economy...



Mexico's adaptation strategy: unconditional and conditional components

Mexico includes an Adaptation component with unconditional and conditional commitments by 2030.

The priority of these actions is to protect the population from the effects of the climate change, such as extreme hydrometeorological events and in parallel, to increase the capacity adaptative of the country's strategic infrastructure and of the ecosystems that harbor our biodiversity and that provide important environmental services.



Models used by Mexico

Climate

Agriculture

Water

Energy

REA
(Reliability
Ensemble
Averaging)

Ceres –
Maize

MARCEG
(Model of
Rural
Agents in a
Context of
General
Equilibrium)

AQUACROP

WEAP
(Water
Evaluation
and
Planning)

INVEST
(Integrated
valuation of
ecosystem
services and
tradeoffs)

THREEME

POLES

LEAP

SIMISE

¡Muchas Gracias!

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