

GOBIERNO FEDERAL

SENER

Technical Workshop on Short-Lived Climate Forcers

Emission Sources and Mitigation Strategies Implemented the Residential Sector in Mexico

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Energy consumption in Mexico

In 2009, residential, commercial & public energy consumption represented 19.0% of total Mexico's energy consumption.



According to FAO, in the residential sector in Mexico, LPG provides the largest share of demand: 42 percent in 2000 and 40 percent in 2008. Fuel wood's share was 36 percent in 2000 and 33 percent in 2008, making it the second largest energy source. Source: Woodfuels and climate change mitigation. Case studies from Brazil, India and Mexico, FAO, 2010

CO₂ emissions in the residential sector from fossil fuel

from fossil fuel combustion 450 8,500 425 8,000 400 CO₂ Petajoules 7,500 Ц 375 7,000 350 CO2 emissions 6,500 325 TPES 300 6,000 00 01 07 03 04 05 06 07 08 09 Source: Balance Nacional de Energía 2009, SENER, México

sector 2009, 403.5 Tg CO_{2 eq}. Industry 14.0% Residential 4.9% Transport 38.4% Agriculture 2.0% Commercial/public 1.1% Other energy industries 11.4%

CO₂ emissions from fossil fuel combustion by

Electricity 28.1%

In 2009, the residential sector had 4.9% of GHG emissions from fossil fuel. Source: Balance Nacional de Energía 2009, SENER, México



Trends in total primary energy supply and CO₂ emissions

Energy saving potential

Areas of opportunity for energy saving with potential of 280 TWh by 2024 (14%).

According to PRONASE, lighting represents ~18% of national electricity consumption, from this, the residential sector demands ~33%.



¹ Optimization, cataliyst, continuous function, efficient ovens, etc.

PECCC Mitigation goals

	INEGEI */ (MtCO ₂ e)	Mitigation Goal (MtCO ₂ e)				
Category	2006	2008-2012	2012	Accumulated		
				From 2012	%	
Energy Production	196.53	51.78	18.03	18.03	35.6	
•Oil and Gas	84.07	40.83	10.33	10.33	20.4	
•Electricity	112.46	10.95	7.70	18.03	35.6	
Energy Use	233.50	22.21	11.87	29.90	59.0	
•Transportation	144.63	11.35	5.74	23.77	46.9	
•Residential, Commercial and Municipalities	24.88	8.80	5.53	29.30	57.8	
•Industry	56.83	1.82	0.52	29.82	58.9	
•Federal Public Administration		0.25	0.08	29.90	59.0	
•Other use	7.16					
Agriculture, Forestry and other land use	131.56	46.46	15.29	45.19	89.Z	
•Agriculture	42.56	2.52	0.95	30.85	60.9	
•Livestock		2.14	0.91	31.76	62.7	
•Forestry	89.00	30.20	9.96	41.72	82.4	
•Farming-Forest Frontier		11.60	3.48	45.19	89.Z	
Waste	100.42	8.58	5.46	50.65	100	
•Municipal Solid Waste Disposal	53.83	7.56	4.44	49.63	98.0	
•Municipal Waste Water Treatment and discharge	46.39	1.02	1.02	50.65	100	
•Other wastes	0.20					
Industrial Process	53.29	-	-	-	-	
Total	715.30	129.03	50.65	50.65	100	

TABLE 3. TOTAL EMISSIONS REDUCTIONS BY CATEGORY AND SUBCATEGORY

*/Preliminary data from INEGEI 2006, to be published in 2009.

PECCC Mitigation goals

Goal	Categories	Executed By	Mitigation MtCO ₂ e		Cumulative	
			2008-2012	2012	To 2012 MtCO ₂ e	%
Ml	Reinjection of sour gas in Cantarell	Sener	27.60	6.90	6.90	14
M82	Landfill sites with controlled methane combustion or energy generation	Sedesol, Semarnat, Local Governments	7.56	4.44	11.34	22
M64	Incorporation of 2.95 million hectares to Sustainable Forest Management	Semarnat	11.88	4.37	15.71	31
M18	Promotion of self-supply projects for electrical energy generation with renewables	Sener, Private Sector	3.65	3.65	19.36	38
M78	Pilot project of incentives for reducing emissions from deforestation and forest degradation (REDD)	Semarnat	8.97	2.99	22.34	44
M37	Energy savings through new household appliances and incandescent bulb replacement programs. "Para Vivir Mejor"	Sener	4.73	2.68	25.02	49
M43	Installation of 600 thousand efficient wood burning stoves	Sedesol, Sagarpa	1.62	1.62	26.64	53
M31	Increased use of rail for freight transport	SCT	3.90	1.60	28.24	56
M66	Additional 2.175 million hectares incorporated in programs of environmental services payment	Semarnat	6.27	1.43	29.67	59
M65	Additional 2.5 million hectares of terrestrial ecosystems incorporated as Wildlife Conservation Management Units	Semarnat	4.19	1.39	31.06	61
M3	Operational efficiency in PEMEX	Sener	4.96	1.24	32.30	64
M27	Construction of 38 new highways	SCT	1.20	1.20	33.50	66
M39	Green buildings and green mortgages	Infonavit	2.10	1.20	34.70	69
M15	Wind power generation by CFE	Sener	2.40	1.20	35.90	71

Energy efficiency policies in the residential sector

The strategy of the Mexican government is to work in three areas related to energy efficiency in the residential sector

NOM Refrigerators and freezers*

- **Room** Air Conditioners *
- **Central Air Conditioners***
- Washers

Standardization

- Water Heaters
- **Domestic Pumps**
- Fluorescent Compact Lamps
- Lighting



Having clear information is essential for decisions when home appliances.

Programs for supporting the sustainable use of energy

Program for home appliances

- National campaign for sustainable
- Program for promotion of solar water heaters
 - (Procalsol)
- Others

Mexico Official Standards

Residential



- Refrigerators and freezers*
- Room Air Conditioners *
- Central Air Conditioners*
- Washers
- Water Heaters
- Domestic Pumps
- Fluorescent Compact Lamps
- Lighting

Industrial and commercial

- Motores monofásicos
- Motores trifásicos*
- Aislantes térmicos
- Refrigeración comercial



Agriculture

- Bombas verticales
- Bombas sumergibles
- Sistemas de bombeo para pozo profundo



Buildings

- Sistemas de alumbrado en edificios
- Sistemas de alumbrado en vialidades
- Envolvente de edificios no residenciales
- Aislantes térmicos para edificaciones



Example of standardization

- The development of Mexican Official Standards of Energy Efficiency has had important results.
- Due to to technological changes and setting of standards, there have been significant savings in the use of electrical appliances, e.g. refrigerators :



2-door Refrigerator Automatic 411 dm³ (15 cubic feet)

Energy Efficiency Programs

Energy efficiency programs have had significant outcomes.



¡Cambia tu viejo por uno nuevo!

Programa de Sustitución de Equipos Electrodomésticos para el Ahorro de Energía



Appliance Replacement Program

- Replacement of refrigerators and air conditioners
- Low income households are beneficiated through endowments
- Middle income households receive affordable loans
- More than 1 million substitutions in 2.5 years (90% of them are refrigerators)
- Residential consumption of power decreases.
- During the first 10 years of operation 7.2 TWh will be saved
- Reduction of government subsidies.

Energy Efficiency Programs

Sustainable Light Program

- Free accelerated replacement of incandescent bulbs for LFCAs (4x4)
- Comprehensive service
- Nationwide objective: 45.8 million LFCAs in 2 years.
- Reduction in electricity bills
- Estimated savings of 4.1 TWh per year
- Estimated CO₂ emissions avoided: 2.78 MtCO₂ per year
- Reduction of government subsidies
- Estimated investment \$ 187 million USD



Energy Efficiency Programs

Solar Water Heaters Program

Objective:

To develop an appropriate framework for the solar water heater technology market

Target:

1 800 000 m² installed by the end of this administration (2012)

Benefits:

372,000 tons of eq CO₂ emissions per year, and the saving of 249 millions liters of LPG per year.



Green Mortgage

The Green Mortgage Program promotes the use of gas, electricity and water saving technologies.

This program, implemented through INFONAVIT, provides for the extension of a conventional mortgage when the following eco-efficient technologies are used in the projects:

- Water-saving equipment in bathrooms.
- Solar water heaters to reduce gas consumption.
- Efficient lighting.
- Thermal insulation.
- High-efficiency air conditioners



Green Mortgage

- These technologies allow for savings of about \$18 USD a month in water, gas and electricity. This is equivalent to 1/5 of the mortgage in 30 years.
- The program also estimates reductions in subsidies for home energy by almost \$8 USD per month and the mitigation of 91 kg CO2e/month.
- In 2011, 300-350 thousand green mortgages will be granted.



Efficient stoves

- The Federal Government, though the Social Development Secretary is currently launching a program to support the use of efficient stoves. It will simultaneously contribute to the reduction of health, environmental and energy problems.
- 500 000 efficient stoves are to be delivered by 2012.
- The amount of fuel used is reduced by 50% using efficient stoves, allowing for significant energy savings.
- This type of stoves reduce GHG emissions. This contributes to prevent diseases and reduce health care expenditures.



Potential of GHG Mitigation in fuelwood

Trends in c and charcoal use in Mexico, 1990 to 2020



Source: Wood fuels and climate change mitigation Case studies from Brazil, India and Mexico, FAO, 2010

According to Special Climate Change Program 2009-2012 (PECC), the replacement of one traditional open fire by more efficient devices could avoid 2.7 ton of CO_{2eq} per year. In 2008 SEDESOL delivered 82,307 efficient devices that means 222,228 ton of CO_{2eq} avoided.

Biomass consumption accounts for 32.8 percent of residential energy demand and is primarily used by rural households for cooking in traditional open fires.

The replacement of traditional open fires by more efficient devices in rural households reduces wood fuel consumption and improves combustion efficiency.

CO₂ avoided emissions by actions in the energy use



Energy use includes: Transportation, Residential, Commercial, Municipalities, Industry, Federal Public Administration and Other Uses.

According to the Fourth National Communication of Mexico to the UNFCCC

Energy efficiency measures, preliminary figures for the first half of 2009 show savings of 12,558 GWh, equivalent to 10.2 million tonnes of CO₂.

Actions of energy efficiency included: Standardization (industrial, commercial and public services) and Daylight Savings Program and Measures in the residential sector

Final coments

Mexico will continue working on:

- \circ Standards
- Promotion of best practices
- Legal framework
- Promotion of R&D
- Innovation



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Thank you very much

