



USAID
FROM THE AMERICAN PEOPLE

LOW EMISSION DEVELOPMENT STRATEGY: PRE-SCOPING MISSION ASSESSMENT MEXICO

FINAL REPORT

NOVEMBER 2010

This publication was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech Inc.

Table of Contents

1.	Introduction to Mexico	6
2.	Background and Context	9
	2.1. Mexico's climate change status	9
	2.2. Key actors in climate change in Mexico.....	10
	2.3. Description of climate change activities at the Federal level.....	20
3.	Summary of Findings.....	24
	3.1. The PECC	24
	3.2. The Private Sector	25
	3.3. Mexican Government Officials.....	26
	3.4. Donors' Activities	26
	3.5. Energy Sector Issues	29
	3.6. State-Level Activities.....	30
	3.7. Activities in the AFOLU Sector.....	33
	3.8. Adaptation.....	38
4.	Recommendations.....	40
	Appendix A: Composition of the C4.....	43
	Appendix B: Members of the "Red por la Transición Energética"	44
	Appendix C: List of Relevant Documents	45
	C.1. Country-Wide Level.....	45
	C.2. Sub-National Level	46
	C.3. Comparative assessment (including Mexico as a case study).....	47
	Appendix D: Marginal Abatement Costs Curves for Mexico.....	48
	Appendix E: Energy Regulatory Environment	50
	E.1. Broad view of the Electricity Sector Regulatory Framework	50
	E.2. Description of selected Legal /regulatory instruments	51
	E.3. Highlights since 2008 and recent regulatory changes	53
	Appendix F: List of Meetings and Contacts	55
	Appendix G: List of References.....	57

List of Exhibits

Exhibit 1.1: Some Facts about Mexico	6
Exhibit 1.2: Map of Mexico	6
Exhibit 1.3: Energy Production by Fuel	7
Exhibit 1.4: Electricity Generation by Fuel.....	7
Exhibit 1.5: GHG emissions by sector in 2006	8
Exhibit 1.6: GHG emissions in the energy sector per category in 2006	8
Exhibit 2.1: Mexico's main milestones associated with climate change	9
Exhibit 2.2: Organizational structure of the CICC.....	10
Exhibit 2.3: Organizational structure of SEMARNAT.....	13
Exhibit 2.4: List of the companies involved in GEI Mexico	17
Exhibit 2.5: Structure of the National Development Plan 2007-2012	20
Exhibit 2.6: Structure of the Special Climate Change Program for 2009-2012	21
Exhibit 2.7: Sectors identified for emissions reductions in the PECC.....	22
Exhibit 2.8: The Climate Change Law	23
Exhibit 2.9: The Climate Change Law - Additional details on the Mexican Green Fund	23
Exhibit 3.1: Mexico's climate change actions at the state level.....	32
Exhibit 3.2: Summary of Mexico's key programs in the AFOLU sector	38
Exhibit E.1: Main legal instruments governing the provision of electricity service.....	50
Exhibit E.2: Status of Renewable Energy Permits in Mexico	52
Exhibit E.3: Law on the Use of Renewable Energy and Financing Energy Transition (LAERFTE)	53
Exhibit E.4: SENER's new responsibilities	53
Exhibit E.5: CRE's new responsibilities	54

List of Acronyms

Spanish		English	
		AFOLU	Agriculture, Forestry and Other Land Uses
AMBB	Asociación Mexicana de Biogás y Biomasa		Mexican Association of Biogas and Biomass
AMDEE	Asociación Mexicana de Energía Eólica		Mexican Wind Energy Association
ANES	Asociación Nacional de Energía Solar		Mexican National Solar Energy Association
CCMSS	Consejo Civil Mexicano para la Silvicultura Sostenible		Mexican Civil Council for Sustainable Silviculture
		CCS	Center for Climate Strategies
CESPEDES	Comisión de Estudios del Sector Privado para el Desarrollo Sustentable		Commission of Private Sector Studies for Sustainable Development
CFE	Comisión Federal de Electricidad		Federal Commission of Electricity
		CIFOR	Center for International Forestry Research
CO ₂	Dióxido de Carbono	CO ₂	Carbon Dioxide
COCEF	Comisión de Cooperación Ecológica Fronteriza	BECC	Border Environmental Commission
COMEGEI	Comité Mexicano para Proyectos de Reducción de Emisiones y Captura de Gases de Efecto Invernadero		Mexican Committee for GHG Emissions Reduction and Capture Projects
CONABIO	Comisión Nacional para el Conocimiento y Uso de la Biodiversidad		National Commission for Knowledge and Use of Biodiversity
CONAFOR	Comisión Nacional Forestal		National Forest Commission
CONAGUA	Comisión Nacional del Agua		National Commission of Water
CONANP	Comisión Nacional de Áreas Naturales Protegidas		National Commission for Natural Protected Areas
CONUEE	Comisión Nacional para el Uso Eficiente de la Energía		National Commission for Energy Efficiency
CRE	Comisión Regulatoria de Energía		Energy Regulatory Commission
CTS	Centro de Transporte Sustentable		Center for Sustainable Transport of Mexico
ECCAP	Estrategia de Cambio Climático para Áreas Protegidas		
EcoSur	El Colegio de la Frontera Sur		
ENACC	Estrategia Nacional de Cambio Climático		National Strategy on Climate Change
FIDE	Fideicomiso para el Ahorro de Energía Eléctrica		Trust Fund for Electricity Saving
FIRCO	Fideicomiso de Riesgo Compartido		Shared Risk Trust Fund
FOMECAR	Fondo Mexicano de Carbono		Mexican Carbon Fund

		GCC	Global Climate Change
GEI	Gases Efecto Invernadero	GHG	Greenhouse Gases
		ICLEI	International Council for Local Environmental Initiatives
IMP	Instituto Mexicano del Petróleo		Mexican Petroleum Institute
INE	Instituto Nacional de Ecología		National Institute of Ecology
INEGI	Instituto Nacional de Estadística y Geografía		National Institute of Statistics and Geography
INIFAP	Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias		National Institute for Forestry, Agriculture, and Livestock Research
IMTA	Instituto Mexicano de Tecnología del Agua		Mexican Institute of Water Technology
		IPCC	International Panel on Climate Change
		LULUCF	Land Use, Land Use Change and Forestry
MDL	Mecanismo de Desarrollo Limpio	CDM	Clean Development Mechanism
MFC	Manejo Forestal Comunitario	CFM	Community Forest Management
		MoU	Memorandum of Understanding
		MRV	Measuring, Reporting and Verification
NAFINSA	Nacional Financiera		
		PA	Protected areas
PACCM	Programa de Acción Climática de la Ciudad de México 2008-2012		Mexico City Climate Change Action Program 2008-2012
PEAC	Plan Estatal de Acción Climática		State Climate Action Plan
PEACC	Programa Estatal de Acción ante el Cambio Climático		State Climate Change Action Program
PECC	Programa Especial de Cambio Climático		Special Climate Change Program
PEMEX	Petróleos Mexicanos		
PSA	Pago por Servicios Ambientales	PES	Payment for Environmental Services
PND	Plan Nacional de Desarrollo		National Development Plan
PROFEPA	Procuraduría Federal de Protección al Ambiente		Federal Attorney for Environmental Protection
PROGAN			Program for Sustainable Livestock Production and Management
REDD	Reducción de Emisiones por Deforestación y Degradación	REDD	Reduce Emissions from Deforestation and forest Degradation
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación		Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food
SCEEM	Sistema de Cuentas Económicas y Ecológicas de México		System of Economic and Environmental Accounting of Mexico

SECTUR	Secretaría de Turismo		Ministry of Tourism
SEDESOL	Secretaría de Desarrollo Social		Ministry of Social Development
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales		Ministry of Environment and Natural Resources
SENACICA	Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria		National Service for Food Health, Safety and Quality
SENER	Secretaría de Energía		Ministry of Energy
SHCP	Secretaría de Hacienda y Crédito Público		Ministry of Finance and Public Credit
SPPA	Subsecretaría de Planeación y Política Ambiental		Vice-ministry of Environmental Planning and Policy
SRE	Secretaría de Relaciones Exteriores		Foreign Affairs Ministry
UCAI	Unidad Coordinadora de Asuntos Internacionales		International Affairs Unit (in SEMARNAT)
UNAM	Universidad Nacional Autónoma de México		National Autonomous University of Mexico

1. Introduction to Mexico

This section provides some general background information on Mexico.

Exhibit 1.1: Some Facts about Mexico

- Area: ~2 million km²
- Climate: varies from tropical to desert
- Population: 111 million people (July 2010 est.)
- Urban population: 77% of total population (2008)
- Administrative divisions: 31 states and 1 Federal District (see map below)
- GDP (purchasing power parity, PPP): U.S.\$1.465 trillion (2009 est.)
- GDP per capita (PPP): U.S.\$13,200 (2009 est.)

Source: CIA, The World Factbook

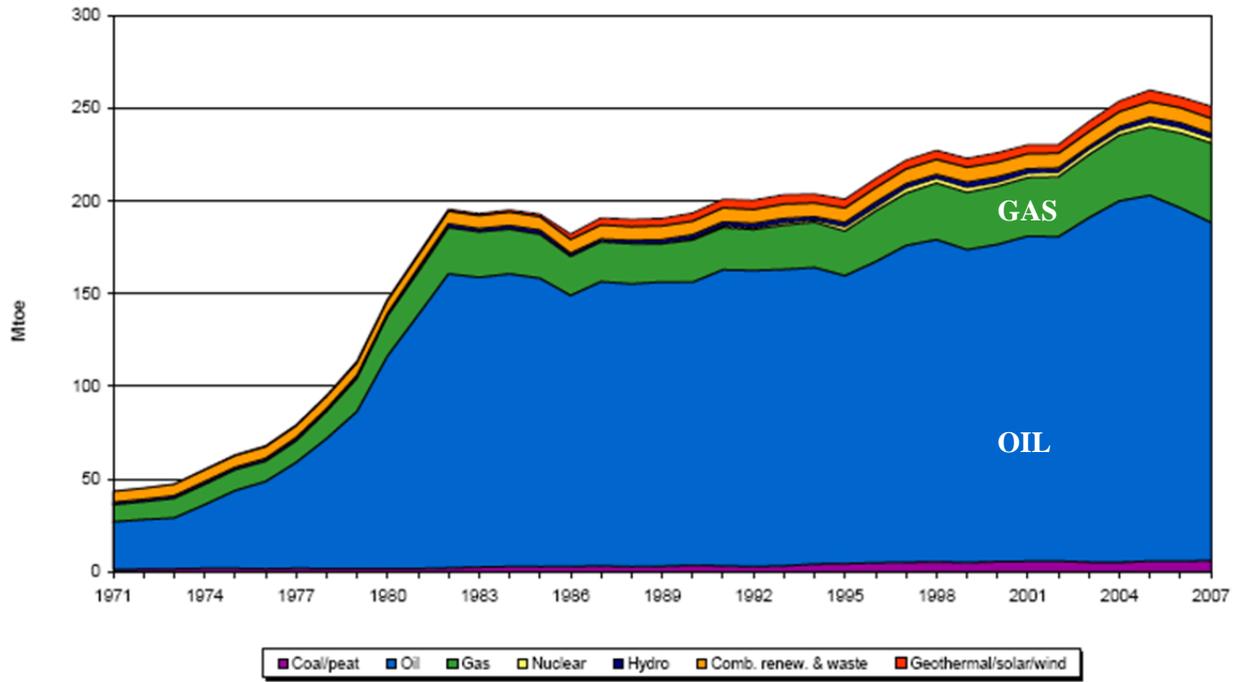
Exhibit 1.2: Map of Mexico



Source: Wikimedia Commons, Mexico States Map w. Names

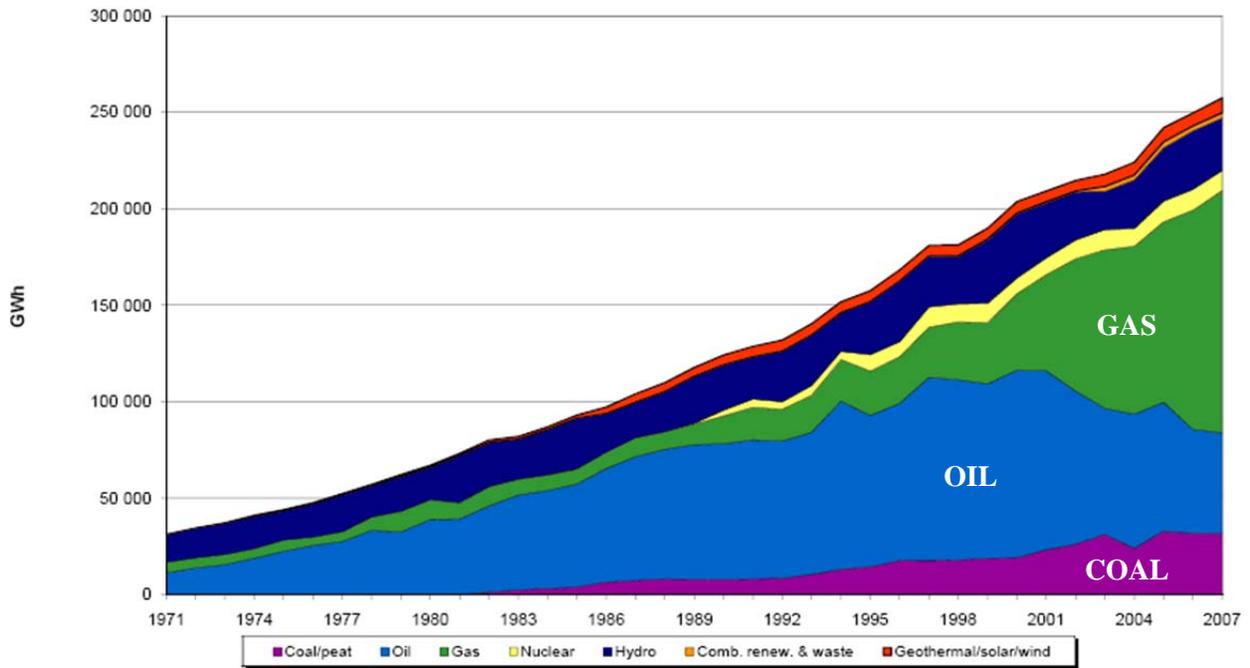
List of the States: Aguascalientes (AG), Baja California, Baja California Sur, Campeche, Chiapas, Chihuahua, Coahuila de Zaragoza, Colima (CL), Distrito Federal, Durango, Guanajuato (GT), Guerrero, Hidalgo (HG), Jalisco, México, Michoacán de Ocampo, Morelos, Nayarit (NA), Nuevo León, Oaxaca, Puebla (PB), Querétaro de Arteaga (QT), Quintana Roo, San Luis Potosí, Sinaloa, Sonora, Tabasco (TB), Tamaulipas, Tlaxcala, Veracruz-Llave (VE), Yucatán, Zacatecas

Exhibit 1.3: Energy Production by Fuel



Source: IEA Energy Statistics, 2009

Exhibit 1.4: Electricity Generation by Fuel

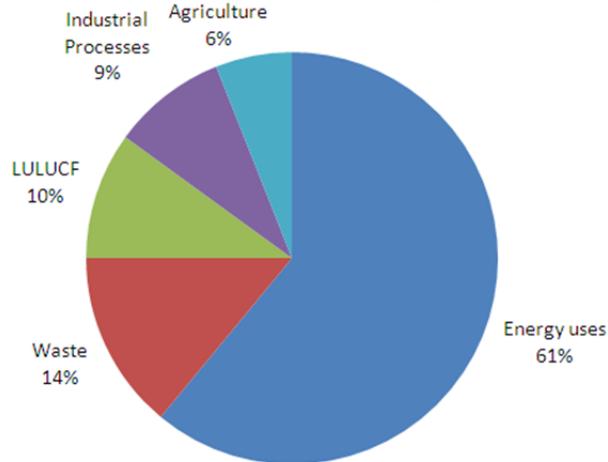


Source: IEA Energy Statistics, 2009

Mexico's GHG emissions inventory

According to Mexico's Fourth National Communication to the UNFCCC, total greenhouse gases (GHG) emissions in the country in 2006 were 709 million metric tons of carbon dioxide equivalent (709 MtCO₂e), with the following contributions: energy uses 61%; waste 14%; LULUCF 10%; industrial processes 9%; and agriculture 6% (Exhibit 1.5).

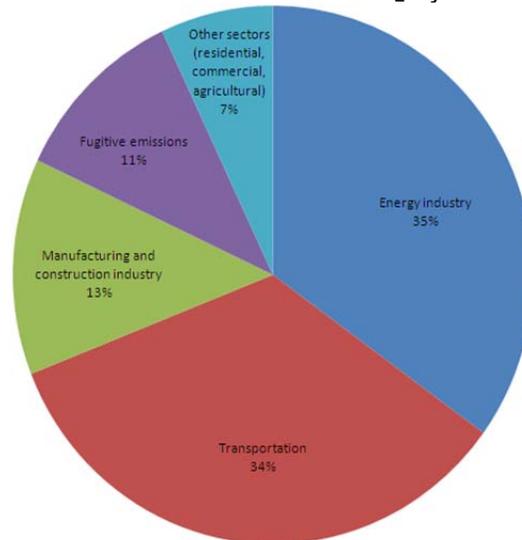
Exhibit 1.5: GHG emissions by sector in 2006
Total: 709 million MtCO₂e/yr



Source: Prepared by the authors based on SEMARNAT, 2009^b

In turn, the energy uses category is subdivided as: energy industry 35%; followed by transportation 34%; manufacturing and construction industry 13%; fugitive emissions 11%; and other sectors (residential, commercial and agricultural) 7% (Exhibit 1.6). GHG emissions by gas, measured in tCO₂e are dominated by CO₂ (69.5% of the total) and methane (CH₄) (26.1%). For the years 1990-2006, the increase of GHG emissions was approximately 40%, an average annual growth of 2.1% (SEMARNAT, 2009^b).

Exhibit 1.6: GHG emissions in the energy sector per category in 2006
Total: 432 million MtCO₂e/yr



Source: Prepared by the authors based on SEMARNAT, 2009^b

2. Background and Context

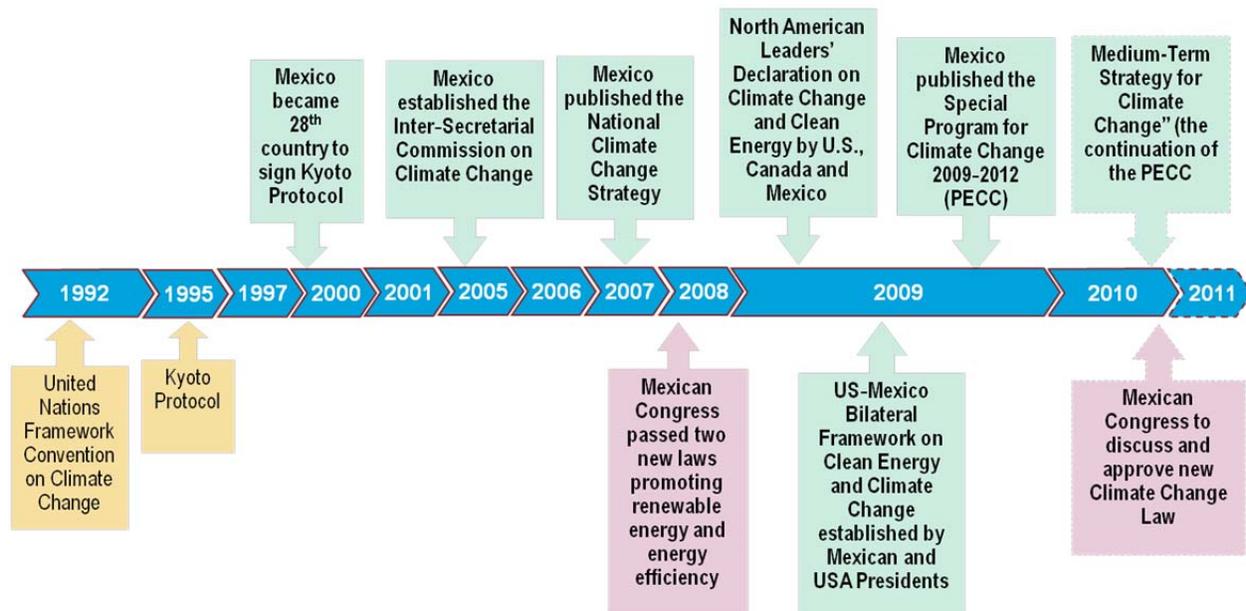
This chapter provides some background and context for climate change in Mexico. It summarizes Mexico's climate change status, players and activities.

2.1. Mexico's climate change status

Mexico has made important progress in the scoping and planning of LEEDS-related development activities and is farther along than many other countries. In 2007 Mexico published its National Climate Change Strategy and in 2009 it published the Special Program for Climate Change 2009-2012 (PECC) in which Mexico set as a target to reduce the country's GHG emissions by 51 MtCO₂e by 2012, and a long-term goal of reducing emissions by 50 percent by 2050 compared to the volume emitted in 2000.

Exhibit 2.1 illustrates some of Mexico's main milestones associated with climate change initiatives. Mexico has not only signed the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, but also it is the only developing country that has submitted its Fourth National Communication to the UNFCCC¹. In this fourth communication, Mexico updated its long-term emissions forecast, GHG emissions inventory and other relevant data.

Exhibit 2.1: Mexico's main milestones associated with climate change



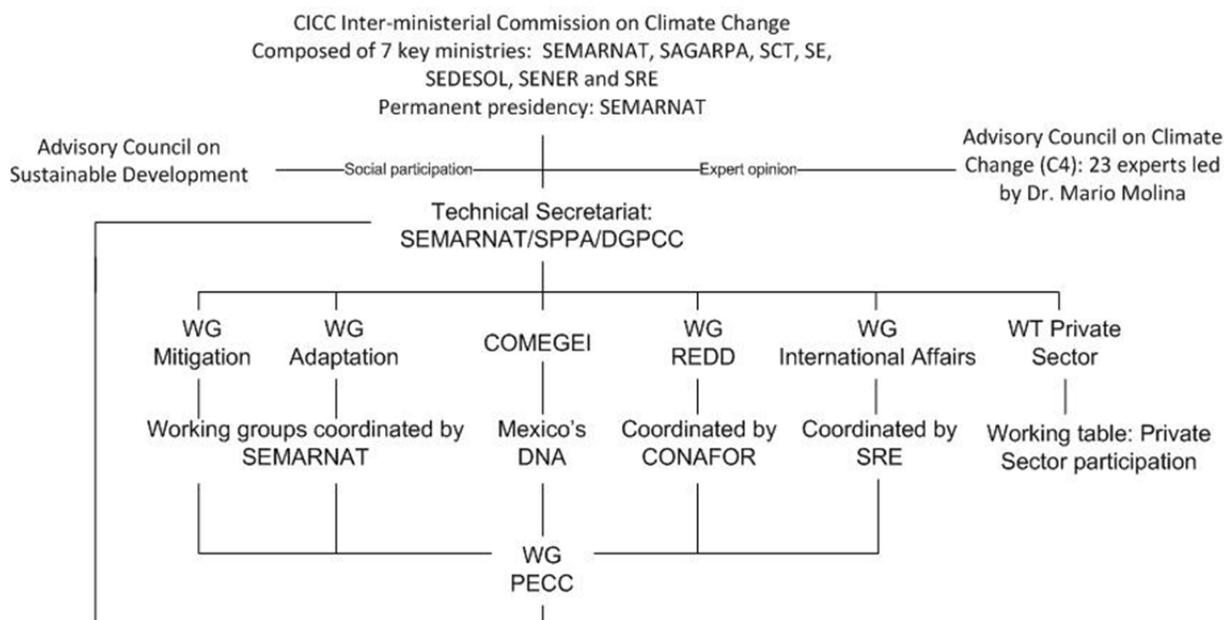
¹ Mexico's Fourth Communication is available in Spanish on UNFCCC website at: <http://unfccc.int/resource/docs/natc/mexnc4s.pdf>

2.2. Key actors in climate change in Mexico

2.2.1. Mexico's Public Institutions

Inter-ministerial Commission on Climate Change (CICC): The CICC was created in 2005. It is composed of senior representatives from seven key ministries: environment (SEMARNAT), energy (SENER), agriculture (SAGARPA), transport (SCT), economics (SE), social (SEDESOL) and foreign affairs (SRE). Also included are SECTUR, the tourism ministry and INEGI, the National Institute of Statistics and Geography. The leading agency is the Ministry of Environment (SEMARNAT), which, as part of the Executive branch, reports directly to Presidencia, the Presidency of the Republic. The Commission convenes twice a year. Its activities include the formulation of national policies and strategies relating to climate change mitigation and adaptation, the coordination of the implementation of these policies and strategies, and the definition of Mexico's position in the international climate change arena. The Commission's activities are funded at the federal level. A climate change advisory board made of 23 experts appointed for four-year terms and led by Dr. Mario Molina, is answerable to the CICC. The CICC hosts working groups on mitigation, adaptation, PECC, REDD, private sector and COMEGEI, which act as the Mexican Designated National Authority (DNA). While the members of the CICC are mainly the heads of 7 key ministries involved in climate change issues, the working groups are comprised of senior officials from the relevant technical offices.

Exhibit 2.2: Organizational structure of the CICC



Source: Prepared by the authors based on FCPF, 2010

Ministry of Environment and Natural Resources (SEMARNAT): Federal government agency created to “promote the protection, restoration and conservation of ecosystems and natural

resources, with the purpose to promote their sustainable use and development” (Organic law of Public Administration, 2003²).

Vice-Ministry of Environmental Planning and Policy (SPPA): SPPA is a vice-ministry of SEMARNAT. As part of its guidelines, SPPA’s mandate is to formulate and coordinate national policy of climate change with participation of federal entities and administrative units in the environment and natural resources sector.

General Directorate for Climate Change Policy (DGPCC): The DGPCC pertains to the Vice-Ministry of Environmental Planning and Policy, which is part of SEMARNAT, and acts as the technical secretary of the Inter-ministerial Commission on Climate Change, keeping track of agreements, convening meetings, and coordinating most of its working groups. Besides developing policy instruments relating to climate change, the DGPCC is responsible to monitor progress in the implementation of the Special Program on Climate Change. In addition, records of the Advisory Council on Climate Change (C4, in Spanish) are kept in this office and support is provided in following up on agreements, as well as convening all sessions.

With financial support from the British Embassy, under UNDP administration, three consultants were hired for the project “Mainstreaming Climate Change in Mexico”, which basically provides human resources to assist the DGPCC in daily activities, while coordinating projects to produce the PECC follow-up system and policy instruments in Adaptation and REDD. Other duties include improving communication mechanisms and materials among the ministries that pertain to the CICC, providing inputs for the working groups, and helping ensure that the goals of the PECC are met.

Office for International Affairs (UCAI): UCAI is a department of SEMARNAT that monitors environmental agreements signed by Mexico. UCAI is in charge of coordinating SEMARNAT’s general policy on international affairs and interaction with international donors and agencies, according to the Ministry of Foreign Affairs (SRE) guidelines.

UCAI’s mandate deals with the adoption of international programs, the definition of positions in international forums and events; signature, with prior opinion of SRE, of agreements with foreign entities and international organizations; as well as controlling the management of the international activities of the administrative units of SEMARNAT entities, sector entities, and Ministry committees. UCAI has oversight, in coordination with SPPA and the Minister’s office, on all activities concerning training, technological development and science, and coordinate the exchange activities related to the economic, scientific and technological cooperation of SEMARNAT.

National Institute of Ecology (INE): INE is a decentralized agency of SEMARNAT. It conducts research on climate change in Mexico, regarding mitigation, adaptation and vulnerability to climate change, in order to comply with the commitments established in the National Development Plan 2006-2012 and with Sectoral and Institutional Programs for the years 2006-2012, as well as with the commitments Mexico acquires through the UNFCCC, as a Non-Annex I Party of the Convention.

In the climate change area, INE’s specific objectives, include: “1) Periodically update the national emissions inventory of greenhouse gases, by source and sinks; 2) Prepare the National

² Ley Orgánica de la Administración Pública, Artículo 32 bis reformada en el DOF del 25 de febrero de 2003 (in SEMARNAT’s website)

Communications to be submitted to the UNFCCC; 3) Conduct methodological studies on mitigation of greenhouse gas emissions in the energy and forestry sectors; 4) Conduct methodological studies to evaluate the vulnerability and adaptation measures to climate change; 5) Establish future emissions scenarios; 6) Conduct studies on health co-benefits due to reduction of fossil fuel burning in cities and promote the development of cleaner technologies; integrate a data base on urban, regional and global pollution” (INE, 2009).

INE also publishes a guide to help the federal states in the elaboration of their climate change action plans (PEACC). The latest version of the document was published in November 2008 and includes the following sections: (1) introduction on PEACC and Climate Change, (2) minimal guidelines for the development of GHG inventories and mitigation measures, (3) challenges, opportunities and strategic planning in the context of climate change, (4) stakeholders and guidelines to develop a PEACC (INE, 2008).

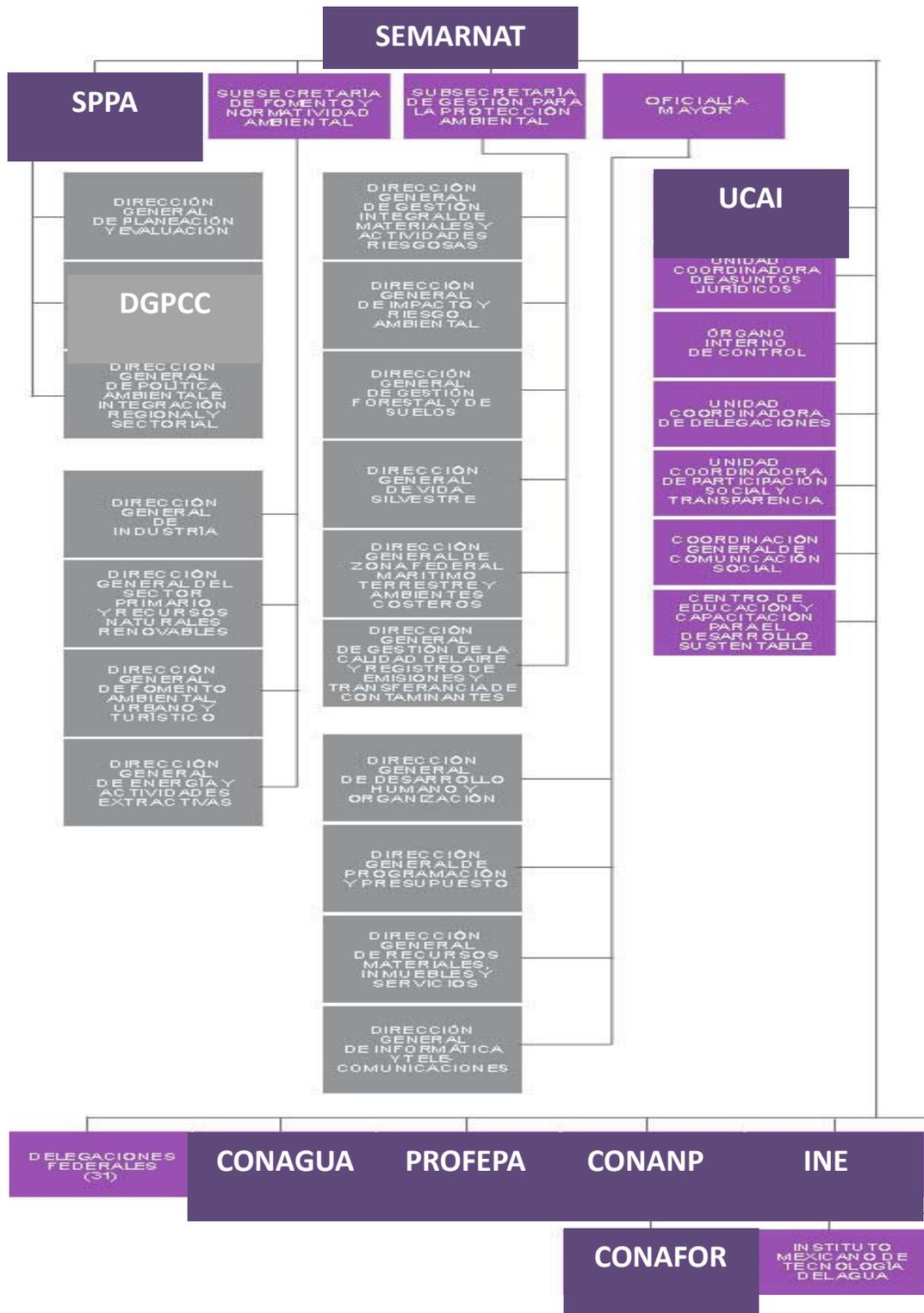
Federal Attorney for Environmental Protection (PROFEPA): PROFEPA was legally created on June 4th, 1992 as a division of the Ministry of Environment and Natural Resources (SEMARNAT) with technical and operational autonomy. As part of its strategic objectives, PROFEPA seeks to:

- “Stop the destruction of Mexico’s natural resources and revert the processes of environmental deterioration.
- Ensure the full access of society to environmental justice in a prompt manner.
- Involve society and its organizations on the surveillance and environmental law enforcement, in a responsible and informed way.
- Reduce the critical issues negatively affecting the natural richness of Mexico (e.g. illegal logging, destruction of flora and fauna, depletion of water and pollution problems)
- Strengthen the presence of PROFEPA and extend its territorial coverage, with federalist criteria.
- Construct an efficient and modern institution, under criteria of honesty, transparency and trustworthiness, in order to give a new image to society.” (PROFEPA, 2010)

Ministry of Economy (SE): The Ministry of Economy is the “federal government institution promoting generation of quality jobs and economic growth of the country, through the promotion and implementation of public policies that translate into better competitiveness and productive investments” (SE, n/a). In terms of climate change issues, SE has played a modest role in supporting some programs for technology innovation.

The National Development Bank (NAFINSA): NAFINSA promotes the overall development and modernization of the industrial sector with a regional approach, stimulating the development of financial markets and acts as financial agent of the Federal Government in the negotiation, contracting and management of credits from abroad. NAFINSA has also structured schemes for long-term financing on sustainable development in accordance with the national plan for 2006-2012.

Exhibit 2.3: Organizational structure of SEMARNAT



Source: Modified from SEMARNAT website
<http://www.semarnat.gob.mx/conocenos/Paginas/organigrama.aspx>

Background and Context

In terms of climate change, NAFINSA has created several support mechanisms for financing renewable energy and energy efficiency projects. Also, other large scale infrastructure projects supporting sustainable development programs have been created to reinforce federal government climate change policy. Among these mechanisms, several multi-national credit lines from IDB, World Bank, KfW and concessional resources from ICF-Climate Investment Funds, have been used for renewable energy projects, mainly for large scale wind and mini-hydro projects.

The institution seeks to encourage participation of commercial banks and investors through private "Project Finance" schemes, focused on clean energy programs. In order to efficiently implement these programs, NAFINSA maintains permanent contact with FIDE, SENER, CONUEE and SEMARNAT, business associations, as well as multilateral agencies to detect potential investment projects.

Ministry of Finance (SHCP): Prepares the national budget; determines levels of funding for government institutions including energy sector. SHCP also administers end-use electricity and hydrocarbons prices and therefore is responsible for subsidy policies.

Mexican Carbon Fund (FOMECAR): FOMECAR is a non-profit trust fund that provides technical and financial support to CDM projects in Mexico. If the Climate Change Law passes, FOMECAR will be substituted by the Green Fund.

Energy Sector

Ministry of Energy (SENER): SENER is responsible for the development of energy policies (electricity and hydrocarbons). SENER coordinates all the strategies, plans, programs and projects related to clean energy and climate change issues that are implemented by the different agencies, commissions and entities in the energy sector (e.g., PEMEX, CFE).

National Commission for Energy Efficiency (CONUEE): Technical body promoting energy efficiency. CONUEE was created in 2008 by the Law for Sustainable Use of Energy to replace the National Commission for Energy Savings (CONAE). It is a "decentralized administrative agency of SENER, with technical and operative autonomy". CONUEE's responsibilities include regulations, public policy, promotion, dissemination, information and evaluation for sustainable use of energy (CONUEE, 2010).

Energy Regulatory Commission (CRE): CRE is an independent regulator with a legislative mandate to regulate the activities of both public and private operators in the electricity and natural gas industries.

Federal Commission of Electricity (CFE): Government-owned vertically integrated utility that provides electricity generation, transmission and distribution services to most of the country (almost 34.2 million customers representing more than 100 million people). CFE generates electricity from 178 plants (51,571 megawatts installed capacity) including thermoelectric (69% of total installed capacity), hydroelectric (22%), coal-fired (5%), geothermal (2%) and wind powered plants and facilities, as well as one nuclear power plant (3%) (CFE, 2010^{a,b}).

Mexican Petroleum (PEMEX): PEMEX is Mexico's state-owned petroleum company; it includes four subsidiaries: (1) Exploration and Production, (2) Refining, (3) Gas and Basic Petrochemicals, and (4) Petrochemicals. PEMEX is the largest company and highest fiscal contributor in Mexico. In 2007, it was estimated that PEMEX and its subsidiaries contributed

Background and Context

about 38% of the total public sector income, which represented about 9.6% of the GDP (UANL, 2008). In 2010 Standard & Poor's estimated that PEMEX generates about 40% of the public sector revenues (Standard & Poor's, 2010). According to the Ministry of Finance (SHCP), the budget approved for PEMEX's operations in 2010 was 260,000 million pesos and PEMEX will ask for 400,000 million pesos in 2011 (El Economista, 2010). More information on PEMEX's climate change activities can be found in section 3.5.2 Summary of Findings, Energy Sector Issues, Oil and Gas

Mexican Petroleum Institute (IMP): The IMP is a public center dedicated to scientific research in the petroleum industry. It was created in 1965 by an initiative from the General Director of PEMEX at the time. The IMP has extensive experience in environment- and climate change-related projects. It can be noted that six specialists from IMP participated actively in the elaboration of the World Bank's study on Low Carbon Development for Mexico (MEDEC).

AFOLU Sector

National Forest Commission (CONAFOR): Part of SEMARNAT, CONAFOR was created in 2001 to support sustainable production and conservation of forest resources based on the Strategic Forestry Program for 2000-2025.

National Commission for Natural Protected Areas (CONANP): Part of SEMARNAT, CONANP was created in 2000 to conserve the natural heritage of Mexico through protected areas, and other activities. CONANP currently manages 173 natural areas under federal protection, including biosphere reserves, national parks, sanctuaries etc.

National Commission for Knowledge and Use of Biodiversity (CONABIO): CONABIO is an inter-ministerial commission created in 1992 composed by the Ministries of Environment, Agriculture, Health, Social Development, Education, Tourism, Economy, Energy, Foreign Service and Treasury.

Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food (SAGARPA): SAGARPA is responsible for all the federal activities in the agriculture, livestock, rural development, fisheries and food sectors. SAGARPA's programs actively focus on environmental protection, sustainable rural development, climate change mitigation and adaptation, and improvement of standards of living in rural and poor areas. For example, SAGARPA is implementing various actions promoting the use of renewable energy in agriculture through FIRCO's Renewable Energy Program.

Key institutions within SAGARPA include:

Shared Risk Trust Fund (FIRCO): FIRCO promotes productivity and sustainability in rural development and helps farmers invest in productive enterprises. FIRCO is known for promoting the use of renewable energy in agriculture, for example through its Renewable Energy Program. FIRCO's Renewable Energy Program was implemented from 2000 to 2004 in partnership with World Bank and Global Environment Facility. It can be noted that this work was initially supported by USAID. Key achievements of the program include the installation of more than 1945 small photovoltaic and wind water pumping systems for new agricultural applications such as milk cooling, fruit refrigeration, and other small agro-businesses processes. In addition to these demonstration activities, currently the program includes, among other activities, institutional strengthening, certification and specifications, and technical assistance for the installation of biodigestors in swine and dairy farms.

National Institute for Forestry, Agriculture, and Livestock Research (INIFAP): INIFAP promotes scientific knowledge and technology innovation to satisfy sector needs.

National Service for Food Health, Safety and Quality (SENASICA): SENASICA deals with animal and vegetal sanitary issues, sanitary risks and implements campaigns in this regard. SENASICA is concerned by climate change because climate change can lead to the appearance of emerging animal diseases and plagues.

2.2.2. Mexico's Private Sector and Civil Society

Mexico's private sector and civil society have been involved in climate change issues through different collaborative mechanisms and round tables. Some of these groups meet in associations, research centers, networks, groups of scientists, commissions and NGOs to discuss specific issues. The most discussed issue is "Energy Transition" through the energy transition network. These groups meet to analyze and propose to authorities and Congress, viable and sustainable economic and technological models to increase the use of renewable energy and feasible energy efficient technologies, lower dependence on fossil fuels and reduce pollution and the impacts of climate change.

Other energy-related topics discussed by the private sector and civil society include activities for greater promotion of small wind and solar energy technologies; promotion of energy efficiency in various productive sectors such as construction, commercial and residential; greater involvement of certified suppliers of equipment for renewable energy; greater public participation in environmental and energy issues; greater empowerment of consumers for getting more sustainable products; further promotion of technologies using applications of hydrogen and increased use of biomass for productive purposes or power generation; and greater participation of the private sector as agent of change in this energy transition.

REDD (Reducing Emissions from Deforestation and Forest Degradation) is the other most discussed issue by the environmental NGOs such as World Wildlife Fund (WWF), The Nature Conservancy (TNC), Conservation International (CI) and key local NGOs such as Fondo Mexicano para la Conservación de la Naturaleza (FMCN), Pronatura, and Consejo Civil Mexicano para la Silvicultura Sostenible (CCMSS), among others.

GHG Mexico Program (GEI Mexico): The GHG Program in Mexico is a voluntary initiative from the private sector launched in 2004 to develop corporate GHG inventory and reporting, and promote emissions reduction projects. The program is coordinated by SEMARNAT and CESPEDDES with the support of the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It can be noted that this work was initially supported by USAID. As of 2009, there were 98 companies registered in the program (Exhibit 2.4) and 68 corporate GHG inventory submitted for a total of 150 million tons of CO₂e (GEI Mexico, 2009).

Commission of Private Sector Studies for Sustainable Development (CESPEDES): Established in 1994 as a private sector think-tank for environmental issues including Global Climate Change. Its aim is to promote actions favoring a more environment-friendly industrial activity. CESPEDES is one of the four research centers of the Coordinating Business Council.

Network for the Energy Transition (Red por la Transición Energética) is a group of organizations and individuals concerned about the current situation and the economic and environmental

effects of the production, processing and end use of energy in Mexico. The network is also active, individually and collectively, in promoting and seeking for other energy alternatives. The network works since 2005, exchanging views and information and carrying out events. A list of participants is presented in Appendix B.

Exhibit 2.4: List of the companies involved in GEI Mexico

Abengoa México; Altos Hornos de México, S.A.: ArcelorMittal Servicios, S.A. de C.V.; ArcelorMittal Las Truchas, S.A. de C.V.; ArcelorMittal Lázaro Cárdenas, S.A. de C.V.; ASSA ABLOY de Occidente S.A. de C.V.; Grupo Herradura de Plata, S.A. de C.V.; Astra Zeneca, S.A. de C.V.; Caterpillar México, S.A. de C.V.; Cementos Moctezuma, S.A. de C.V.; CEMEX México S.A. de C.V.; Cervecería Cuauhtémoc Moctezuma, S.A. de C.V.; Cinemark de México, S.A. de C.V.; Coca-Cola FEMSA, S.A. de C.V.; Concretos Cruz Azul, S.A. de C.V.; Construcciones Metalicas Mexicanas, S.A. de C.V.; Continental Automotive Guadalajara México, S.A. de C.V.; Cooperativa La Cruz Azul, S.C.L; Coral Internacional, S.A. de C.V.; Corporativo Mexicana de Aviación, S.A. de C.V.; Electroger, S.A. de C.V.; Fabrica de Jabón La Corona, S.A. de C.V.; FIRA Banco de México; Flextronics, S.A. de C.V.;- Ford Motor Company, S.A. de C.V.; Gammon Lake, S.A. de C.V.; Grupo Bimbo, S.A. de C.V.; Grupo Cementos de Chihuahua, S.A. de C.V.; Grupo Embotellador CIMSA, S.A. de C.V.; Grupo JUMEX, S.A. de C.V.; Grupo Modelo, S.A. de C.V.; Grupo Porcícola; Mexicano, S.A. de C.V.; Holcim Apasco, S.A. de C.V.; Honda de México, S.A. de C.V.; Honorable Ayuntamiento de Tabasco; Industrias de Fresnillo, S.A. de C.V.; Industrias IEM, S.A. de C.V.; Industrias Monterrey, S.A. de C.V.; Industrias Peñoles, S.A. de C.V.; Ingenio de Huixtla, S.A. de C.V. y Fomento Azucarero S.P.R. de R.L. de C.V.; Ingenio Santa Clara S.A. de C.V. y Cañaverales Mexicanos, S.P.R. de R.L. de C.V.; Instituto Politécnico Nacional; Merck Sharp & Dohme; Minera México, S.A. de C.V.; Minera Autlán, S.A. de C.V.; NHUMO, S.A. de C.V.; Nissan Mexicana, S.A. de C.V.; Nutrilite S. de R.L. de C.V.; Omnibus de México S.A. de C.V.; Petróleos Mexicanos; Productos Farmacéuticos, S.A. de C.V.; Prolec_GE; QISDA Mexicana, S.A. de C.V.; Rabobank; Red de Transporte de Pasajeros del Distrito Federal; RIMSA; Secretaría del Medio Ambiente del Gobierno del Estado de México; Sistema Integral para el Manejo Ecológico y Procesamiento de Desechos; (SIMEPRODE); Sistemas Automáticos contra Incendio, S.A. de C.V.; STRATTEC, S.A. de C.V.; Tecnológico de Monterrey, Campus Guadalajara; Tequila Quiote, S.A. de C.V.; Tequila Sauza, S.A. de C.V.; Tenaris Tamsa, S.A.; Ternium México, S.A. de C.V.; Tetra Pak Querétaro, S.A. de C.V.; Turbo-Mex Refacciones, Mantenimiento y Seguridad Industrial, S.A. de C.V.; Wal-Mart de México

Mario Molina Centre for Strategic Studies on Energy and Environment (Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente, A.C.): The Centro Mario Molina was created in 2004 to continue and consolidate Dr. Molina's work in the field of environment and energy. The Center aims to support the creation and implementation of practical solutions to key energy and environmental issues, focusing mainly on two areas: air pollution and climate change (Centro Mario Molina, <http://www.centromariomolina.org/>). Traditionally, the Centro Mario Molina was mainly focused on the energy and transport sectors. They are now trying to expand their activities to other sectors, such as adaptation in natural protected areas. The Centro Mario Molina received funds from the Slim foundation and WWF to develop a project to address vulnerability in priority natural protected areas. The scope of the project needs to be revised to take advantage of the Center's strengths (modeling, developing indices) and to be in better alignment with CONANP's strategy and the overall national adaptation process.

Mexico National Solar Energy Association (ANES): ANES was created in 1980 to promote the development and spread of renewable energy in Mexico. They do not only focus on solar energy but also on small wind energy, biomass, and hydraulic systems.

Mexican Wind Energy Association (AMDEE): AMDEE was created in 2005 to promote the development and spread of wind energy in Mexico through the construction, installation, operation and maintenance of large scale wind farms. Most of the large scale wind energy developers with the largest amount of megawatts being installed in Mexico are members or

Background and Context

associates of AMDEE, making it an important group in renewable energy policy and implementation.

Mexican Association of Biomass and Biogas (AMBB): AMBB is a “civil association promoting the use of biomass and biogas technologies as tools for the sustainable development of Mexico”. The association links diverse institutions (governmental, educational, industrial, scientific etc.) to transfer and disseminate bioenergy knowledge (AMBB, n/a).

Center for Sustainable Transport of Mexico (CTS): CTS Mexico is an NGO part of a network of CTS of the World Resources Institute (WRI). The objective of the CTS is to catalyze solutions for sustainable mobility that improve quality of life in Mexican cities.

Mexican Civil Council for Sustainable Forestry (CCMSS): CCMSS is a non-profit NGO that “promotes conservation of forest ecosystems through Community Forest Management”. “Members of CCMSS work in conjunction with communities and *ejidos* to put in place sustainable forest management practices to improve harvesting, conservation, industrialization, and commercialization of forest products” (CCMSS, <http://www.ccmss.org.mx/>).

All measures promoted by the CCMSS are by definition REDD activities, since they reduce the risk of deforestation. Through viable management of forests, this organization has been doing REDD+ activities for a long time. Without management, the risk of land-use change increases. Another benefit of these practices is that they address degradation, Mexico’s biggest problem, because they maintain carbon density.

Reforestation Mexico (Reforestamos Mexico, A.C.): Association created in 2002 by the Bimbo Group to promote reforestation activities in Mexico. The idea originated four years earlier when SEMARNAT asked Mexican companies to help in the reforestation effort following the great fires of 1998.

Mexican Fund for Nature Conservation (Fondo Mexicano para la Conservación de la Naturaleza, FMCN): Private institution created in 1994 to secure long-term and stable financing to support on-the-ground conservation projects throughout Mexico. The financial resources come principally from bilateral and multilateral agencies and private foundations. It can be noted that the foundational funds for the creation of FMCN were provided by the government of Mexico and USAID.

Pronatura, A.C.: Pronatura is a civil association created in 1981 promoting biodiversity conservation and sustainable development. It focuses on five key themes: climate change, land conservation, water, Green Funds and priority species.

The Nature Conservancy (TNC) in Mexico: TNC has been working in Mexico since 1988. It focuses on nature conservation by developing management plans for protected areas, controlling the spread of invasive species and helping manage uncontrolled fire. Some of the key places that TNC protects are Baja and the Gulf of California, Chihuahuan Desert, Maya Forest, Mesoamerican Reef, Sonoran Desert, and Chiapas.

WWF Mexico: WWF has been present in Mexico since 1968 concentrating its efforts on forests, freshwater, and marine ecosystems and species conservation in the following ecoregions: Gulf of California, Mesoamerican Coral Reef, Chihuahuan Desert, and Chihuahuan Freshwater System.

Greenpeace Mexico: In Mexico, Greenpeace focuses on the following key themes: sustainable agriculture, forests, climate and energy, and ocean and coasts.

Rainforest Alliance: The Rainforest Alliance is working to reduce the negative impacts of farming, forestry and tourism on Mesoamerica (Mexico, Central America and the Caribbean).

AMBIO – Manejo de recursos naturales en pro del desarrollo sostenible: AMBIO promotes sustainable rural development. Implementing REDD pilot projects in Chiapas, namely the Scolel Te project.

Environmental Defense Fund (EDF): EDF opened new offices in Baja California Sur, Mexico to focus on fisheries restoration.

CeIBA Centro Interdisciplinario de Biodiversidad y Ambiente: CeIBA is a non-profit civil association focusing on environmental policy.

2.2.3. Academia

Mexico National Autonomous University (UNAM): UNAM is the largest and most prestigious university in Mexico. UNAM's Center for Atmospheric Research develops much of the technical contents for the National Communications to the UNFCCC. Two programs are also worth mentioning:

- *Centro Virtual de Cambio Climático en la Ciudad de México* (The Virtual Climate Change Center for Mexico City), a joint project of UNAM and the GDF Institute for Science and Technology³, focuses on scientific analysis of scenarios for climate change in Mexico, focused primarily on vulnerability and adaptation.
- *Programa de Investigación en Cambio Climático (PINCC)* (The Climate Change Research Program) started in April 2010, with the objective of coordinating climate change studies, including impacts on policies and international negotiations.
- *Instituto de Ingeniería* (Engineering Institute): repository of some of the best researchers and modelers in the climate change field.

El Colegio de la Frontera Sur (EcoSur): EcoSur is a scientific research center contributing to the sustainable development of the South border of Mexico, Central America and the Caribbean. EcoSur has also been responsible for estimating the AFOLU component of the National GHG Inventories.

Colegio de Postgraduados (COLPOS): The University COLPOS focuses on the sustainable management of natural resources, the production of nutritive and safe food and the improvement of the quality of life of society.

³ The full list of participants (90 contacts from UNAM, the ministry of environment of the federal district, etc.) can be found on CVCCCM's website at: http://www.cvcccm-atmosfera.unam.mx/cvcccm/index.php?option=com_contact&Itemid=44

2.3. Description of climate change activities at the Federal level

2.3.1. National Development Plan

All of the Federal Administration programs in Mexico stem from the National Development Plan (PND). This plan dictates policy for each ministry, which is then incorporated in Sector Plans. These plans are renovated every six years when a new administration comes into office.

The National Development Plan (2007-2012) has five pillars; the fourth pillar is Environmental Sustainability (see Exhibit 2.5). Climate change is specifically addressed as one of the nine components of this pillar, through two main objectives, which in turn have four strategies each:

Objective 1: Reduce greenhouse gas emissions

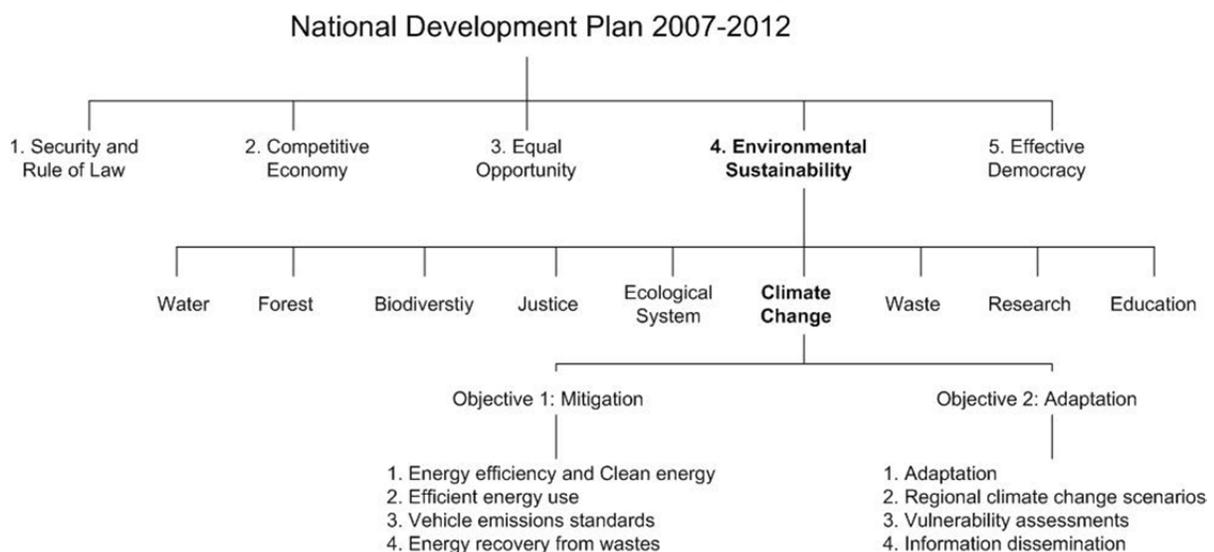
- Promote efficiency and clean technology (including renewable energy) for energy generation.
- Promote efficient energy use in households, industry, agriculture, and transport.
- Promote adoption of international standards in vehicle emissions.
- Encourage energy recovery from wastes.

Objective 2: Promote adaptation measures to climate change effects

- Promote inclusion of adaptation to climate change aspects in plans and tasks of the different sectors of society.
- Develop regional climate scenarios for Mexico.
- Evaluate impacts, vulnerability, and adaptation to climate change in different socioeconomic sectors and ecological systems.
- Promote dissemination of information about impacts, vulnerability and adaptation measures to climate change.

Sectoral plans developed by the ministries incorporate these objectives and strategies in the design of their programs and components.

Exhibit 2.5: Structure of the National Development Plan 2007-2012



2.3.2. National Strategy on Climate Change, 2007

The National Strategy on Climate Change (ENACC) was prepared by the CICC in 2007. It reflects the Mexican Government's commitment to climate change mitigation and adaptation. The ENACC identifies (1) specific measures for mitigation (with estimates of their potential for emissions reductions), (2) priorities for adaptation, (3) strategy to implement an emissions trading system, and (4) a suite of research and capacity-building objectives. The ENACC provided the basis for the PECC.

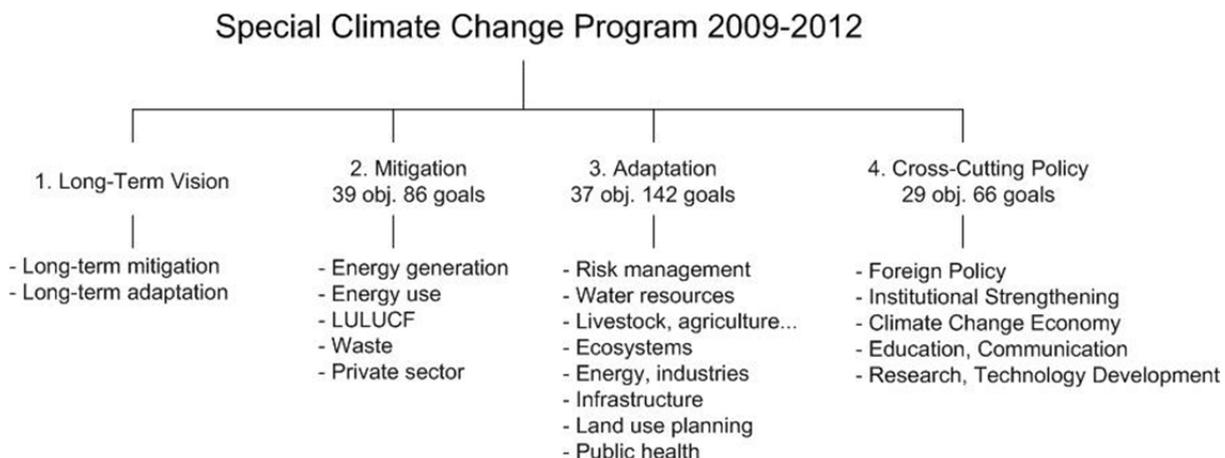
Specific mitigation targets are identified in two major areas: (1) energy generation and use, and (2) vegetation and land use. Specific areas identified in the energy sector include: (1) energy efficiency (CONAE's and FIDE's programs), (2) PEMEX (CHP, reduce fugitive emissions, etc.), (3) power generation and distribution (increase efficiency), (4) industrial sector (CHP), (5) renewable energies, and (6) transport (vehicle replacement, freight by rail).

Specific areas identified in the vegetation and land use sector include (1) carbon conservation (sustainable forest management, etc.) and (2) GHG emissions mitigation (reforestation, land use reconversion, conservation tillage, etc.)

2.3.3. Special Climate Change Program 2009-2012

The Special Climate Change Program (PECC, in Spanish) is "an initiative from the federal government prepared voluntarily and financed from the Government budget , that shows Mexico's interest in contributing to the solution to climate change" (SEMARNAT, 2010). The four components of the PECC are (1) Long Term Vision, (2) Mitigation, (3) Adaptation and (4) Elements of Cross-Cutting Policy (Exhibit 2.6).

Exhibit 2.6: Structure of the Special Climate Change Program for 2009-2012

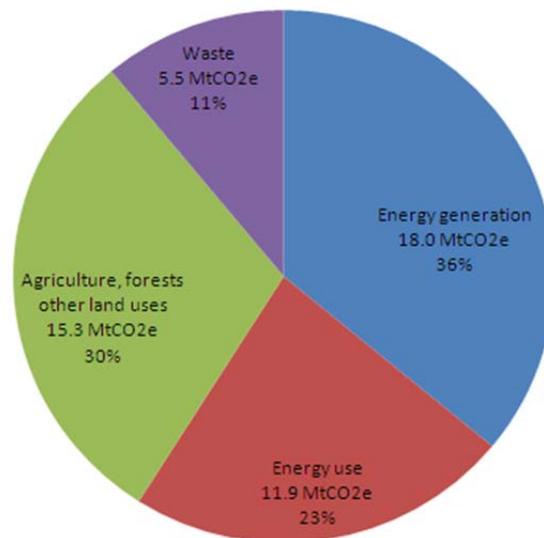


Over the long term, Mexico's objective is to reduce its GHG emissions by 50% by 2050, relative to those emitted in the year 2000. Specific goals for implementation by the PECC are the

reduction of emissions by nearly 51 million tons of CO₂e/y in 2012 (with respect to the 2012 baseline scenario of 786 MtCO₂e). These emissions reductions would result from actions in the following areas: energy generation (36% of total reductions), energy use (23%), agriculture, forestry, and other land use (30%) and waste (11%) (Exhibit 2.7). The PECC comprises 105 general objectives and 294 specific goals.

The PECC also identifies a Medium-Term Strategy for Climate Change, looking toward 2020 and 2030. As stated in Mexico's commitment at COP 15 in Copenhagen, the PECC targets a 30% emissions reduction by 2020.

Exhibit 2.7: Sectors identified for emissions reductions in the PECC



Source: PECC, 2009

2.3.4. Mexico's Climate Change Law

In addition, earlier in 2010 the Mexican Senate formed a multi-party special commission on climate change to draft the Climate Change Law. This commission was presided by Alberto Cárdenas Jiménez (PAN), as the president; with the participation of senators Margarita Villaescusa Rojo (PRI); Francisco Javier Obregón Espinoza (PT); Rubén Fernando Velázquez López (PRD); Jorge Legorreta Ordorica (PVEM), and Luis Maldonado Venegas (PC). Discussions, modifications, and comments to the law were the result of more than seventy meetings held with experts, scientists, academia, government representatives, NGOs, international organizations and with particular input from Mexican Nobel Prize Dr. Mario Molina. The Mexican Congress had final discussions and tried to approve the Climate Change Law by November 2010 prior to the sixteenth Conference of the Parties (COP16) scheduled in Cancun on December 2010, but the Law is still in pre-approval phase (pre-dictamen).

This CC law transcends government administrations, and makes the PECC law. It also creates the National Climate Change System, and new organizations such as the Climate Change Commission which will be in charge of the design of national policies, strategies and goals on CC, now under the CICC, which in turn would disappear when the Law is approved. The Law will intend to create a new market for carbon emissions, and the National Registry for Emissions, a national level Green Fund. There is some concern that the law will convert Mexico

to an Annex 1 country and fear that additionality will disappear for CDM projects. Exhibit 2.8 and 2.9 below highlight some of the key aspects of this law.

More information on the Energy Regulatory Environment in Mexico can be found in Appendix E.

Exhibit 2.8: The Climate Change Law

The Law was developed by the Special Commission on Climate Change of the Mexican Senate. As written the Law includes mandates for federal, state and municipal agencies, creates new agencies and introduces innovative incentives and penalties.

- Mandates the creation of the National Environmental and Climate Change Institute (INMACC) that will:
 - assume the responsibilities of INE, the National Institute of Ecology, which will disappear
 - generate and consolidate all technical information for monitoring GHG emissions and the effects of climate change
- Mandates the creation of a green fund to channel government and private funding from national and international sources to implement mitigation and adaptation actions (see Exhibit 2.9)
- Calls for the gradual elimination of fossil fuel subsidies and electricity generated by them and directs the Ministry of Finance to coordinate with the Ministry of Energy to implement it.
- Creates the National Climate Change Council (NCCC) a permanent body for consultation and evaluation of the CC System. The NCCC is integrated by members of civil society, private organizations, and academics knowledgeable in climate change issues
- Creates a national network of meteorological stations based on the existing stations operated by the various government agencies which should report data to the National Bank of Climate Data
- Directs states to create and implement policies to mitigate and adapt to climate change.

Exhibit 2.9: The Climate Change Law - Additional details on the Mexican Green Fund

Article 39 of the CC Law mandates the creation of the Mexican Green Fund as the financing instrument of the Executive branch of the Federal Government. Once the Law is passed, appropriate regulations will need to be developed and implemented to enable the operation of the Fund.

This fund will receive funding from several sources including an initial direct contribution from the Executive branch, annual contributions from the national budget, revenues generated from fines and penalties for exceeding authorized emissions, contributions made by private, public and social sectors, tax deductible contributions by individuals, donations made by other countries, revenues from sales of emission reduction certificates,

The fund will be operated by a Technical Committee chaired by a representative of the Ministry of Finance (SHCP) with participation of representatives from Ministries of Environment, Social development, Energy, Economy, Agriculture, Livestock, Rural Development, Fisheries, and Food, Tourism and Communications and Transport

3. Summary of Findings

The findings in this section are based on discussions, meetings, and interviews, as well as on observations of activities in Mexico going back several years. As such, much of the content in this section may not be backed up by specific references, but rather represents a series of impressions and summaries that are opinions of the authors (and many experts in Mexico). This section attempts to offer an objective interpretation of the events and activities, with the objective of providing perspective and insight to persons interested in a better understanding of how to work more successfully in Mexico.

3.1. The PECC

The PECC is a valuable but limited program. Its very existence has increased awareness, sent a message of commitment to climate change activities to all sectors of the economy, and provided some quantitative analysis around which discussions and ideas have coalesced. However, there are areas where improvements need to be made, some of which are expressed in the statements below:

- The PECC has voluntary inputs from all government entities, based on budgets available. As such, it is believed that the PECC's mitigation goals are eminently achievable and SEMARNAT reported that as of mid-2010 39% of the 2012 goals have already been achieved (and that full completion of the goals might occur as early as mid-2011).
- Since PECC is a conglomeration of contributions from different entities, a consistent basis in the identification of the different mitigation activities and greater transparency on how the numbers were obtained is needed.
- SEMARNAT recognizes that the economics of the measures were not the only element in the decision process. In addition, SEMARNAT has had to rely on marginal cost abatement curves provided by others (World Bank, Quadri), without sufficient in-house technical capabilities to develop and work from their own analysis and numbers.
- While the inventories on which many of the measures are based are considered of reliable quality, there is less confidence in the baselines. In addition, there has been some criticism of the baselines from both sides: NGOs have tended to think them too liberal, while the private sector has complained that they are too tight.
- There are still some areas of opportunity for improvement of consistency in both the PECC, and the National Development Plan, for example: road building to reduce transport emissions, versus effects on physical environment; or emissions reduction targets in the face of plans for large coal-fired electricity generation in 10 years.
- The MRV for the PECC was relatively weak, although it is now being strengthened through USAID support.
- The PECC's goals are obligatory only to 2012, that is, during the current administration. Although the PECC alludes to goals to 2020, 2030 and 2050, there is no current authority to set binding targets beyond this administration.

Given this situation, there may be a number of opportunities to implement LEDS support, especially in providing SEMARNAT with the tools and methodologies to develop their medium-term and long-range programs.

3.2. The Private Sector

Private sector views cannot be summarized in any simple way. However, the perspectives of the private sector are important, and the comments below attempt to portray both the range and type of thinking:

- The private sector, through CESPEDES, has been promoting a voluntary program for inventories since 2004. Modeled after a similar EPA program (Climate Leaders), adapted to Mexico with WRI methodologies, it has an inventory of more than 150 MtCO₂e in the industrial sector, primarily in large companies.
- However, identification of mitigation projects has lagged for a number of reasons, including: disappointment in CDM and the carbon markets; lack of accredited agencies for validation of measures; technical capacity of staff; and other priorities in hard economic times.
- There is interest in finding out more about parallel markets for carbon emissions reductions, looking for lower transaction costs, and applicability to smaller projects; there is some thought the US might be able to provide some guidance on this.
- There seems to be satisfaction of the Private Sector working group under the CICC, which has taken a coherent approach to private projects: renewable energy; cogeneration; energy from wastes; energy efficiency; and transport. An initial diagnostic and a barriers analysis have been worked on for renewable energy and cogeneration, and work is slated to begin on the other topics. A GTZ consultant has been assisting with these analyses. CESPEDES can be requested to provide this documentation.
- Furthermore, the private sector is frustrated that on one hand there is talk of taxes on fuels or other costs to private companies, but there are few incentives for private sector investment in mitigation projects, such as renewable energy or cogeneration.
- They recognize the sensitivity of the energy sector to private investment in Mexico, but are also quick to see the difficulties the government is having with implementation of its own climate change projects. The result is reduced credibility that large-scale implementation of measures will work.
- All in all, the PECC does not ask for any contributions from the private sector in the current plan to 2012. Still, there is concern that difficulties will come in the next phase of Mexico's climate change programming, beginning with the proposed climate change legislation. Discord between business groups and government arise largely from the Mexican offer at Copenhagen to reduce 30% of greenhouse gas emissions with respect to projected trend towards 2020, consistent with the PECC's medium term notional goal. The feeling is that within a few years, the world will achieve some sort of binding agreement to reduce global emissions, and Copenhagen will be a key reference. This position of the Mexican government is part of the new impulse that Calderón administration is giving to climate change issues and is consistent with the recommendations of the science.

While expressing concern about the burden on business if the government commits to reduction goals in the medium term, the private sector appears to be really interested in implementation models: ideas for financing, reducing transaction costs and developing projects.

3.3. Mexican Government Officials

Mexico's public sector staff with experience in climate change issues is extremely limited in number. The SEMARNAT group working in support of the CICC is less than 10 persons. Participation from other ministries in the working groups under the PECC seems also to be limited; the same names appear in several different working groups

As a result, the existing staff is overworked. This is even truer at the current time, since in addition to their regular work, they are not only organizing to help host the COP, but preparing content to present at the COP. There are constant fire drills and meetings that cut into their technical time.

At the same time, government budgets for consultants are extremely limited. Not only is there a dearth of staff, but also there is a lack of access to top-quality advisors. There are no significant contracts with private consulting firms that would help lead and provide staffing for project work. There is a need for creating greater capacity in all aspects of climate change support activities, for example:

- Provide models and methodologies for consistent analysis and decision-making
- Train government staff in running models, analyzing model results, and obtaining data of sufficient quality to obtain reasonable results
- Involve junior staff in meetings and discussions
- Provide short training courses in different climate-related areas
- Include members of institutions and organizations outside the government, including actors and stakeholders in NGOs, academia, private sector
- Link with educational and continuing education institutions in Mexico

The challenge in formalizing these kinds of capacity building activities will be to open up the opportunities to individuals and groups beyond the immediate circle of climate change practitioners, who are already involved in too many activities. Another challenge will be the design of the capacity building project: developing or assigning a single-point or central responsibility, the organization and design of such capacity building, something which requires an ongoing or permanent presence in country

3.4. Donors' Activities

3.4.1 USAID/Mexico

USAID/Mexico has two major ongoing programs through which GCC-related activities are being carried out: (1) the Mexico Competitiveness Program (implemented by Abt Associates, Inc.) and (2) an interagency cooperative agreement between USAID/Mexico and the US Department of Agriculture (including the US Forest Service).

In the energy sector, the USAID/Mexico Competitiveness Program promotes clean energy technologies at the federal, state and municipal level. Activities include technical assistance and workshops on energy efficiency, renewable energy, smart grid technology, cross-border electricity trade, and sustainable buildings (USAID/Mexico, Clean Energy Handout).

Summary of Findings

In addition, an activity with which DGPCCC has been extremely satisfied, is the design of a database to monitor PECC emissions reductions, including a review of methodologies for mitigation calculations that led to a number of improvements in the formulas.

In the AFOLU sector, the USAID/Mexico Competitiveness Program supports CONAFOR and CONANP in the development of Mexico's National REDD Strategy. Activities include institutional support and demonstration projects (e.g., pilot project in Chiapas) (USAID/Mexico, 2010).

The USDA-USAID/Mexico program aims at mitigating climate change impacts on Mexico's Natural Resources and Biodiversity. In 2009, the program focused on forests (fire management, forest health, control of invasive species) and water (agricultural water-use efficiency, watershed management, landslide and flood prevention and mitigation). In 2010, the program has focused on three key issues: improving watershed management; moderating the effects of desertification; and support for REDD.

3.4.2 World Bank

The World Bank is currently working with Mexico in four projects that deal with the GCC area:

- A policy loan to address low carbon development in the energy, transport, and AFOLU sectors. This loan is geared towards political reform, regulations, and institutional changes in the government. In the AFOLU sector it deals specifically with one goal of the PECC, the incorporation of 2.95 million hectares into sustainable forest management, to revert current negative tendencies.
- An investment loan to fund the new program of investments for CONAFOR. PROCYMAF and PES are both finishing their periods of operation and a new umbrella investment operation is foreseen (PES, commercial plantations, etc).
- A grant through the Forest Carbon Partnership Facility and the Forest Investment Program, for the implementation of actions described in the Readiness Preparation Proposal for REDD.
- In the agriculture sector, the World Bank has a smaller intervention, combined with a GEF donation, working with FIRCO to promote alternative sources of energy, focusing on methane emissions reductions in the swine and dairy sectors.

3.4.3 UNDP

UNDP is funding basically three things for DGPCCC:

- Several consultants to coordinate the process of generation of Mexico's Vision on REDD
- Several consultants to coordinate the process of generation of the Adaptation Policy Framework.
- A process to build capacities in the sectors on existing mitigation methodologies in the PECC and refine assumptions.

3.4.4 IDB

There are funds from IDB in the last stages before disbursement but it has taken the DGPCC about 1.5 years to get them. The agreement with the IDB has consulting components, basically in the activities that are now taking place: PECC follow-up, closer collaboration with federal states, mitigation, adaptation, and a component on sectoral studies (with SEDESOL and SAGARPA).

3.4.5 Other Countries

Germany: GIZ (previously GTZ) has provided resident technical advisors (consultants) on energy efficiency and renewable energy, sitting in SENER and CONUEE offices. They have also provided assistance in the technical assessments in cogeneration and the CICC private sector working group. Currently, there is a proposal from GIZ that intends to provide both funds and technical assistance in the areas of adaptation, energy and REDD. This assistance has received the first stage of approval from the German government, but is still in the negotiation process in Mexico.

U.K.: The U.K. and Mexico have started a Sustainable Development Dialogue (SDD) focusing on six priorities: “(1) National governance for sustainable development, (2) Climate change and energy, (3) Sustainable tourism, (4) Sustainable consumption and production, (5) Sustainable urban development and/or sustainable cities and (6) Natural resources management” (British Embassy Mexico City, n/a).

Norway: In May 2010, Norway’s Minister of the Environment and International Development Erik Solheim signed a MoU with Mexico’s Minister of the Environment, Juan Rafael Elvira Quesada to work together on climate, forests and environment. The MoU is expected to provide concrete benefits on REDD and specifically address MRV issues (NewNet, 2010). Funds are being administered by FAO and UNDP.

France: In February 2010, the French Agency for Development (AFD, in French) granted a long-term loan of 185 million Euros to support Mexico’s actions against Climate Change. In addition to this loan, AFD is developing a program for technical cooperation and plans to sign a MoU with the Mexican’s government (AFD, 2010).

3.4.6 Summary Comments on Donor Assistance

Mexico appears to have excellent relations with donors, and to a certain extent can pick and choose, fast tracking activities that are of greater interest.

Bilateral aid has proven quite beneficial to SEMARNAT. The only agile way to channel these types of resources is through an implementing agency because otherwise it must go through the Treasury and, then, into the budget of SEMARNAT (a very long process, especially if SEMARNAT must first set aside the money, spend it, and then receive reimbursement). A good way to use funds is by hiring specialized consultants to work in specialized activities or in specific projects to increase the response capacity in addressing climate change.

There still seems to be plenty of areas or niches where USG agencies can provide useful technical assistance. However, the absorptive capacity on the Mexican government side is limited due to the reduced number of staff with experience in climate change, thus the hiring of consultants is a good way to make progress on the joint programs.

3.5. Energy Sector Issues

Given the government control in the energy sector, this is a difficult environment requiring innovative models to work and make progress. SEMARNAT is not able to exert much influence over the powerful energy sector institutions. Following is a summary of key areas where emissions reductions are potentially significant.

3.5.1 Electricity Supply

The Federal Electricity Commission (CFE), a classical vertically integrated utility, is the provider of electricity throughout Mexico. While there are a number of private generators supplying CFE, it has the sole responsibility for all transmission and distribution. Efforts to disaggregate and even privatize CFE have failed over the years, and today there is no thinking in this direction. Given its organization and evolution, CFE is not fully aligned with the changes occurring in the world power industry, nor consistent with the broader energy needs of Mexico:

- the Mexican electricity sector has a strong dependence (over 70%) on fossil fuels to generate power
- there are significant bottlenecks to private companies developing projects that will meet national needs and could provide greater efficiency in fuel use
- the high levels of subsidies (more than US\$10 billion/year) to certain sets of users limit the scope of end-use efficiency programs
- regulatory restrictions limit the application of cogeneration opportunities that could improve efficiency in fuel use.

Outside of CFE, there have been a number of proposals for how to invest in emissions reduction projects, including using part of the subsidies to finance clean energy projects. Regulatory changes have also been proposed to provide incentives for cleaner energy. However, there has been no discussion on this from CFE.

On the other hand, CFE is making small steps towards reducing emissions. Their contributions to the PECC are basically taking credit for reductions resulting from private sector wind farms in Oaxaca, some small CFE wind projects and a hydroelectric project. They have a longstanding internal energy efficiency improvement program, although it is very low key and focused on small projects. They are evaluating greater nuclear power generation, and carbon capture and storage. Nevertheless, to maintain access to low-cost fuel, their medium-term planning includes use of petroleum coke and large coal-fired central plants.

In summary, this is an area of great potential emissions reductions, but complicated by lack of data, regulatory limitations, and institutional complications.

3.5.2 Oil and Gas

Petróleos Mexicanos (PEMEX), the state-owned oil and gas corporation, has been developing its internal climate change program for a decade. Just recently, it has created a Sustainable Development department in its Planning area. PEMEX is working hard to reduce flaring, which will result in significant emissions reductions (already incorporated into the PECC goals).

Beyond flaring, there is a pipeline of emissions reduction projects (both CO₂ and CH₄), two of which are in the CDM process. A number of these projects have been identified through the

Summary of Findings

Global Methane Initiative supported by USEPA and its predecessor Methane to Markets Partnership initially funded in Mexico by USAID. However, funding for such projects is next to impossible to obtain through the budget allocation process that PEMEX goes through with SHCP every year. Production and exploration projects, currently more urgent than ever, easily take priority over emissions reduction projects, no matter how negative they are on the carbon cost curve. Unfortunately, given the institutional and constitutional limits, it is difficult for the private sector to invest in these highly attractive projects.

Meanwhile, PEMEX is working hard to complete and refine its emissions inventories, and to use the models provided through Methane to Markets to develop a climate strategy with quantitative reduction goals in each of its four operating subsidiaries. PEMEX clearly has a vision well beyond 2012.

The greater autonomy given to PEMEX through the late-2008 energy reforms has not borne fruit, neither in improved exploration and production, nor in greater operating efficiency.

3.5.3 Energy Efficiency

In the 1990s Mexico was a worldwide leader in energy efficiency programs. Today, however, this field is in transition and evolving to a new phase of energy efficiency programs implementation.. FIDE, the public-private trust fund for electricity savings has shed its cutting edge technical capabilities and focused on residential appliance domestic programs that meet political and social goals, but not cost-benefit analyses. The national energy conservation agency CONAE was renamed CONUEE in the 2008 energy reforms, changing the focus from savings to efficiency, and enabling it with the ability and responsibility to set efficiency goals throughout the public sector, and even among large consumers in the private sector. However, CONUEE was not prepared to meet this challenge, and is striving to keep up with a flood of reports from public sector agencies throughout the country. Updated studies of energy efficiency potential should be done in order to implement key programs and continue with CONUEE programs evolution.

3.5.4 Renewable Energy

In addition to the \$ 24 billion investment in grid-connected wind systems, we estimate an additional several billion dollars of attractive investment potential in smaller-scale renewable energy systems, including small hydro, solar water heaters, and anaerobic digesters for animal wastes and other organic effluent such as from slaughterhouses, tequila producers and wastewater.

SENER is formally responsible for the promotion of renewable energy in Mexico, however there are not enough incentives for installation of renewable energy systems.

3.6. State-Level Activities

Mexico is extremely centralized, 80% of all budgets are federal; especially in health, energy and housing. The dialogue between federal and state activities is limited due to time and capacity constraints. As described below and in Exhibit 3.1, the States are only beginning to work in the climate change arena.

3.6.1 State-Level Work on the US-Mexico Border

The Border Environmental Cooperation Commission (BECC) is actively working with the 6 Mexican border states (Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon and Tamaulipas) on climate change. This work is funded by the Border 2012 funds, largely from the USEPA, is closely coordinated with SEMARNAT and INE, and is being carried out in three stages:

- 1) GHG inventories: these have been completed in three states (Baja California, Sonora, Coahuila), and were formally announced on October 11, 2010.
- 2) Climate change policy development: BECC is working closely with the academic, private and social sectors, including various NGOs linked to the issue of climate change. Some states are making progress and results will be ready soon.
- 3) Quantification and economic analysis of emissions reductions: includes savings, employment generation, and cost-benefit analyses.

The efforts are led by each state. The Center for Climate Strategies (CCS) is providing guidance and support, including regular visits and weekly conference calls. BECC is also working very closely with the National Institute of Ecology (INE), mainly in the preparation of inventories. At this stage, BECC's role is to facilitate processes occurring between different institutions involved as representatives of states and CCS.

For the development of the third phase, which focuses on cost-benefit analyses for emissions reduction, CCS has transferred the REMI model to the states for use in their analyses (CCS has used this model in more than 20 US states). Licenses have been obtained for long-term use of this model, to develop options for implementation of climate change activities and public policies

Work has had a strong emphasis on adaptation issues and, in particular, the vulnerability of the main productive sectors of each State. This type of analysis has been developed by the Mexican Institute of Water Technology (IMTA) focused mainly on land use aspects and its impact on vulnerability. However, the availability and quality of information is quite poor and the group is working on improving collection methodologies.

Two examples help illustrate some of the BECC activities:

- On August 25-26, BECC hosted a videoconference workshop on the development of climate action plans for Mexican border states, based on the inventory work carried out so far. CCS, SEMARNAT and INE staff provided presentations. The objective of this workshop was to build up technical-administrative capacities to create, continuously update, maintain, and implement State Climate Action Plans in border states. This workshop was designed for technical staff from state agencies and related experts with the purpose of strengthening their technical capacities and providing them with the tools to move forward on climate action planning. Nearly 140 representatives from the 6 states were in video attendance.
- On August 4, 2010, Climate Action Reserve, in coordination with BECC, the California Environmental Protection Agency, INE, and the American Chamber of Commerce for Mexico, hosted a workshop to discuss opportunities for carbon offset projects. The purpose was to present to Mexican stakeholders, the opportunities offered by Climate Action Reserve and the U.S. carbon market. More than 285 participants from both

Summary of Findings

Mexico and the United States were introduced to the program, available protocols, and details of the collaboration between the United States and Mexico on greenhouse gas reduction projects. The workshop gathered different municipalities; livestock farmers; forestry organizations; researchers; elected officials; federal and state officials from the environmental, energy, and industry sectors and people interested in the issue in general.

Exhibit 3.1: Mexico's climate change actions at the state level

Out of 32 states:

- 4 states have created Climate Change Commissions,
- 3 states have completed state climate change action plans (PEAC, in Spanish): Mexico City, Veracruz, and the municipality of Chihuahua,
- 8 states are developing PEAC
- 10 states are planning to develop PEAC
- 11 states are seeking funding to start developing PEAC

One of the main concerns is the persistence of program and qualified staff beyond the State administrations. Also, land-use issues are under municipal governments and 3-year terms make it difficult to get much accomplished.

3.6.2 Mexico City

The Government of the Federal District of Mexico City (GDF) has been in the vanguard of climate change action planning in Mexico. In the previous administration (2000-2006), groundwork was laid for inventories and baseline development. In 2006 (one year before the Federal Government published their strategy), the GDF prepared their own *Estrategia de Cambio Climático*, a general strategy based on a detailed inventory and baselines. With World Bank analytical assistance, the GDF worked to turn this into the *Programa de Acción de Cambio Climático (PACC)* in 2008, a detailed program of actions with over 40 measures. Similar programs from London, Tokyo and New York were used as models. A LEDES was an integral part of this, although it also included at least 12 adaptation measures.

The total emissions inventory is 37 MtCO₂e, with a reduction goal of 7 MtCO₂e by the end of the current administration in 2012. The PACC is focused on government actions – no commitments are expected from the private sector. Key measures include converting the taxi fleet to natural gas, bus rapid transit lines, government buildings efficiency, and sustainable new housing developments. The latest progress report on the PACC at mid-2010 shows a total of 1.4 MtCO₂e reduced, primarily in transport, and significantly in the “*hoy no circula*” personal vehicle program, which allows older vehicles into the city only four days out of five. The progress report is a GDF publication, with no third-party verification of the savings.

The GDF program is run by a group of only 4-5 persons, reporting directly to the Secretary of the Environment. In order to try to make the program sustainable, efforts are under way on several fronts:

- Establishment in June 2010 of an Interinstitutional Commission on Climate Change, to coordinate actions among all of the GDF Ministries

Summary of Findings

- Private sector implementation: a new metro line, a city-wide water savings program, a bus rapid transit line, and the central landfill (Bordo Poniente) are all being implemented with private funds up front, that will be repaid in carbon credits through CDM
- Passage of a climate change law in the GDF legislature, making climate change projects permanent and obligatory; a proposal has been drafted
- Modification of the GDF environmental law to include climate change.

Unlike the state climate action programs (Veracruz, Nuevo Leon), there appears to be little coordination of the GDF program with SEMARNAT or the PECC. The emissions reduction goals are separate from the ones in the PECC.

USAID/Mexico has supported the GDF in the design and implementation of some of its mitigation measures, including the solar water heating standard and the public buildings efficiency program.

Similar to Mexico's federal climate change efforts, GDF is looking for international recognition. The mayor is the chair of the World Mayors Council on Climate Change, and the Minister of Environment is the Vice President of the Executive Committee of ICLEI – Local Governments for Sustainability, an international association of local governments committed to sustainable development. Mexico City, with ICLEI support, will host the World Mayors Summit on Climate on November 10, 2010. The mayor also plans to present GDF's programs at COP-16.

At the same time, GDF is struggling with the following issues:

- how to involve the industrial sector (regulation? voluntary programs?)
- there is nothing formal in the education sector on climate change: how to incorporate?
- development of a vision of 30 years for adaptation: they continue to look for funding.

3.7. Activities in the AFOLU Sector

The AFOLU sector in Mexico experiences a series of shortcomings that need to be addressed if the rural population in the country is to increase its standard of living. Subsidies in agriculture and current land use policies have increased the rates of deforestation –but more so degradation– in Mexico's natural ecosystems. AFOLU activities account for 10-15% of total country emissions. Extensive livestock activities exist in more than half of the territory and forest areas are, in fact, places where multiple activities happen simultaneously: agriculture, livestock, and forestry. In terms of land-use tenure, 55% of the territory is under either communal or *ejido* property. In 2008, forest areas in Mexico (according to FAO's definition) covered 65 million ha, about 33% of the total territory (FAOSTAT, 2011). Despite the great potential in the forest sector, production has declined steadily. The same can be said for the agriculture sector. This situation poses major challenges but also opportunities. Reduced Emissions from Deforestation and Degradation (REDD) is seen as a public policy that may combine strengths of the agriculture and forest sector while improving rural livelihoods and benefiting the environment.

3.7.1 REDD

Mexico is in the process of preparing its national REDD strategy. In early 2010, CONAFOR submitted Mexico's REDD+ Readiness Preparation Proposal (R-PP) to the World Bank's Forest Carbon Partnership Facility (FCPF). Based on this REDD+ R-PP, CONAFOR is currently finalizing Mexico's vision of REDD to 2030 for the COP16 and will begin next year to prepare a detailed REDD strategy to 2030 with the FCPF grant.

Summary of Findings

The key elements of Mexico's REDD strategy are: (1) Building and/or strengthening institutional capacities, (2) Improving targeting and effectiveness of existing programs and expanding the model of Payment for Environmental Services (PES), (3) Promoting Sustainable Forest Management (SFM), (4) Improving monitoring capabilities for LU/LUC based on National Forest Inventory, including MRV at local communities and (5) Integrating new financing mechanisms (carbon finance) with positive impact on biodiversity conservation and livelihoods of forest landholders and inhabitants (CONAFOR, 2010).

3.7.2 DGPCC

Currently, the DGPCC is working in producing three major documents and an IT system:

- The development of a follow-up monitoring system for the goals of the PECC has been made possible through financial and technical assistance from USAID and is in the launch stage. This system represents a major step forward in providing transparency, systematization, and processing of complex information provided by many stakeholders.
- DGPCC is assisting CONAFOR to formulate a document to portray "Mexico's Vision on REDD" with financial assistance from UNDP and the Spanish Cooperation Agency for International Development. This document has the consensus of a technical advisory group formed by NGO's, producer associations, academics, and government officials. Mexico's Vision on REDD will be validated and adopted by the REDD working group of the CICC, and will be presented during COP16.
- With financial and technical assistance from UNDP, the process to develop a National Adaptation Strategy has begun. The backbone of this process is UNDP's Adaptation Policy Framework and Territorial Approach on Climate Change. The document "Mid-term Adaptation Policy Framework" is being generated within the Adaptation working group of the CICC and will be presented during COP16. In 2011, a National Adaptation Policy will be produced, as well as its Implementation Plan.
- The mid-term vision (2020-2030) to address climate change requires a series of studies that currently have only incipient funding (e.g. baselines, cost-benefit analyses, evaluating sector vulnerability). Inputs from the other two policy documents will be taken into account but technical and financial assistance to complete the required support material (scenarios, valuation tools) is still needed and represents a major opportunity for collaboration.

The DGPCC co-presides, along with CONAFOR, the REDD working group of the CICC. This working group is formed of government stakeholders exclusively, and was created in December of 2009. So far, it has held three meetings and its main purpose is to create national policy on REDD. It is within this group that Mexico's Vision on REDD is building consensus before its approval by the CICC, publication, and presentation in COP16. The REDD working group has a Technical Advisory Committee formed by representatives of civil society, academia, and government.

3.7.3 SAGARPA

The Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food aims, through objective 4 of its Sector Program, to "Revert ecosystem deterioration through actions that preserve water, soil, and biodiversity". In turn, this objective has four strategies:

- Rezoning of the landscape, coasts, and seas.
- Biosecurity and conservation of biodiversity.
- Prevent and mitigate climate change effects.
- Reduce the use of agrochemicals and promote the use of biofertilizers.

While developing its sector program, SAGARPA regrouped its activities in eight new programs, giving them a sustainable perspective. Given that their actions aim directly at addressing climate change, we briefly present two of them below, focusing on mitigation activities.

1. Acquisition of Productive Assets program

This program aims at increasing capital goods of the rural population, including those living on the coast. Some of its lines of action that mitigate CO₂ emissions include:

- Motor substitution of fishing boats to reduce fuel consumption.
- Biodigestor installation to produce and use methane.
- Acquisition of reaping machines for green harvesting of sugarcane to avoid burning.
- Acquisition of equipment or tools for conservation tilling, which retains carbon in soils.

2. Sustainable use of natural resources program

This is the main program where actions relating to climate change and development take place. Following is a brief description of the most relevant ones:

a) Program for Sustainable Livestock Production and Management (PROGAN) is aimed at helping livestock producers through a menu of interventions. One of the main actions to address climate change is technical assistance for planned cattle raising. With the instrumentation of this activity on 5 million ha, an estimated 2 Mt of CO₂e will be mitigated over a four year period. In *Progan ecológico*, receivers of the program must protect or reforest 30 plants per animal unit.

b) Conservation and Sustainable Use of Soil and Water (COUSSA) supports producers in implementing measures to restore and conserve soil as well as capture and store water. This program promotes sustainable agriculture practices. The estimated impact of these actions by 2012 is 0.32 Mt of CO₂e.

c) The productive reconversion component aims at substituting annual for perennial crops, increasing carbon sinks and taking into account the region's productive potential. It also promotes land use change from agriculture to livestock and from livestock to forestry in areas that are not suitable for the previous activity.

SAGARPA-REDD: SAGARPA is also a key partner in the development of the REDD+ strategy. By agreements with CONAFOR, a single set of criteria will be applied to sampling points from both institutions to have a robust MRV system. With cattle farming in 110 million ha, or 56% of the national surface area, SAGARPA has a well-established sampling system that covers a major portion of the territory.

SAGARPA's position towards REDD is to account for carbon stored in soil, which necessarily entails aiming for the "+" aspect of REDD (conservation and increase of carbon stocks and biodiversity). Major commodity crops, such as cocoa, coffee, and vanilla grow under tree storage of a certain density so SAGARPA's position is that a variety of activities may, and actually do, happen in the same physical space: agriculture, forestry, and livestock farming. Through best management practices in these and other areas, both mitigation of climate change and economic development can be achieved.

3.7.4 CONAFOR

In the PECC, the National Forestry Commission (CONAFOR) committed to mitigate 38.9 Mt CO₂e in the period 2009-2012 and 12.54 Mt CO₂e per year by 2012. Most of the mitigation goals stem from activities already taking place. The umbrella program, ProÁrbol, consists of a number of sub-programs, most of which are included in the PECC:

- PROCOREF, intended for reforestation and restoration.
- Prodeplan, which promotes commercial forest plantations.
- Procymaf, the program to improve productivity of forest ecosystems.
- Prodefor, the forest development program.
- PSA, payment for environmental services.

The recently-named director has restructured the Commission to give necessary relevance to the REDD mechanism, by creating at least two new areas. The Unidad de Asuntos Internacionales y Fomento Financiero handles all negotiations and international financial agreements. This unit is in charge of pushing forward the REDD strategy in Mexico. A management unit to address carbon issues is in the process of being formed.

Historically, CONAFOR has favored fund allocations to reforestation programs. According to the CCMSS, in 2010, the proposed budget for this activity was about 30% of the total budget (in 2007 it was 41.5%). In 2010 CONAFOR is managing an estimated five thousand million pesos.

CONAFOR – REDD: The Mexican REDD strategy was initiated by generating a Readiness Plan Idea Note (R-PIN) and then a Readiness Preparation Proposal (R-PP) for the Forest Carbon Partnership Facility of the World Bank. The R-PP was written and revised during 2009 and submitted in February of 2010. Comments emitted by evaluators were addressed and it was approved in March. Through the process of preparing the document, a multi-stakeholder group was created. This group later became formalized as the REDD Advisory Committee for the REDD working group of the CICC. The difference between the two is that the CICC is formed of government institutions only. The Advisory Committee has been actively proposing the main themes that should be discussed in the construction of the REDD strategy and represents a major accomplishment in civil society participation.

CONAFOR is the leader in designing Mexico's REDD strategy, which is planned in three phases. The initial phase consists of defining Mexico's Vision on REDD and will end in COP16 when the document is presented. This document lays the ground to construct an operative mechanism, detailing the technical, institutional, and financial arrangements that must be addressed to implement REDD. The document also proposes seven strategic lines relating to MRV systems and reference scenarios; institutional arrangements to align public policy; financial and market schemes; REDD pilots; communication, social participation and transparency, and capacity building. The second phase is intended to prepare all the technical aspects needed for implementation and shall be finished by the end of 2011. The third phase will have specific goals and operative procedures to implement REDD, and it is expected to finish in 2012.

Mexico's Vision on REDD is based on active forest management by the owners of the land, promoting local governance. The aim is to maintain and increase carbon stocks while obtaining additional social, economic, and environmental benefits. REDD is seen as an opportunity to align policies in the Agriculture and Forestry sectors. Many issues still need to be addressed,

especially those concerning markets and the financial schemes that may be used to ensure that funds reach local communities.

3.7.5 CONANP

On March, 2010, CONANP published its Climate Change Strategy for Protected Areas (ECCAP), partly financed by USAID. The main problem that the mitigation component of the strategy aims to address is the loss and degradation of terrestrial, coastal, and marine ecosystems, which produces GHG emissions. The mitigation strategy has three main objectives:

- A. Reduce GHG emissions stemming from deforestation and degradation in protected areas (PAs) and their influence zones.
- B. Increase carbon sinks in PAs
- C. Collaborate with other institutions to increase and protect carbon sinks through diverse modes of conservation.

There are seven strategies, of which the most relevant are:

- To promote production systems in buffer and influence zones that favor emissions reductions.
- To conserve terrestrial, coastal, and marine ecosystems to maintain carbon sinks
- To restore degraded ecosystems and increase carbon sinks.

Out of the 11 lines of action, the most relevant to Low Emissions Development are:

- Analyze, evaluate and apply diverse methodologies and standards in monitoring and verification of carbon sequestration projects in PAs, in agreement with national efforts to implement REDD.
- Strengthen the fire management strategies in PAs and their zones of influence.
- Incorporate areas of forest management that favor carbon storage and capture.
- Design, operate, and evaluate REDD processes and projects in and between PAs with the participation of local, regional, national, and foreign stakeholders.

All mitigation strategies in CONANP are linked to the adaptation goals. For example, reducing deforestation has significant impacts on adaptation of ecosystems and rural communities living in the PAs. Conversely, landscape adaptation strategies aim at reducing pressure for land-use change while conserving carbon. With technical support from The Nature Conservancy and resources from the British Embassy and the Mexican Fund for the Conservation of Nature (FMCN), CONANP is developing pilot adaptation projects in four protected area complexes in the country's Southeast.

Currently, the annual operating programs of the protected areas are being developed, integrating climate change into actions through specific projects. Support personnel of the areas will need training to develop capacities relating to climate change.

CONANP- REDD: CONANP actively participates in the REDD working group of the CICC and takes the Natural Solutions stand, that protected areas play a major role in reducing emissions and storing carbon. One concern about the potential role of protected areas declared by CONANP is proving additionality. If declaring these areas is part of business as usual, the action is not considered additional in the current status of international negotiations.

Summary of Findings

USAID has financed the first two stages of the REDD monitoring and verification project in the El Ocote reserve. Thanks to this resource, El Ocote is a potential pilot for REDD at the national level.

3.7.6 AFOLU Sector Summary

Exhibit 3.2 presents a summary of Mexico's key programs in the AFOLU sector. While not all of these deal directly, or even indirectly with a LEDS, they present an integral group of activities that affect mitigation measures.

3.8. Adaptation

Adaptation issues are not directly included in a LEDS. However they deserve a mention here to make the point that in Mexico, adaptation is a bigger climate change issue for the general public. The government is being pressured to put more resources into adaptation, as public awareness is extremely high. Over the last several years, Mexico has experienced unprecedented hurricanes, rains and severe flooding. Both Pacific and Caribbean coasts have been hit with strong storms during this hurricane season. Flooding has been ongoing for weeks in Veracruz and Tabasco states.

The Mexican government is also seriously concerned about adaptation issues, and the PECC does have a section on adaptation. Interest in a model or method for developing and evaluating the costs of adaptation measures has also been expressed.

Exhibit 3.2: Summary of Mexico's key programs in the AFOLU sector

Year	Agency	Name	Comment
1999	CONABIO	Hotspot Early Detection Program	"Provides daily information for the detection, through remote sensing, of wildfires and fires caused by agricultural activities occurring within the Mexican territory as well as in Central America"
		Strategic Forestry Program for 2000-2025	"Articulates specific priorities, goals, and strategies in areas such as community forestry, commercial forestry, soil conservation, forest land-use planning and management, and reforestation"
2001		Law for Sustainable Rural Development	"Establishes the general framework for activities that protect and restore forest cover within the rural development programs"
2003		General Law of Sustainable Forestry Development	
2003	CONAFOR	PSA-H	PES for hydrological services. Aims to increase the provision of environmental services through forest conservation
2003	CONAFOR	PSA-CABSA	PES for carbon sequestration and biodiversity conservation projects, particularly through agroforestry.

Summary of Findings

Year	Agency	Name	Comment
			Created after the protests by <i>¡El Campo no Aguanta Más!</i> ⁴
2007	CONAFOR	Pro-Arbol Program	Includes: National Reforestation Program (PRONARE); Forest Fire Prevention and Fighting; Forest Pest Control and Prevention; Soil conservation; Commercial Plantations (PRODEPLAN); Sustainable Community Forestry (PROCYMAF); Payment for Environmental Services (PES); Forest Development Program; Forest Productive Chains; Mexican Forest Fund
2008	SAGARPA	Sector Program	Regroups SAGARPA's activities in 8 programs. More details above.
2010	CONANP	Climate Change Strategy for Protected Areas (ECCAP)	
Future	CONAFOR	REDD pilot projects	The identified projects are: the Ayuquila watershed in Jalisco, the Cutzamala watershed in Michoacán and Estado de México, and the Lacandona in Chiapas (part of the Corredor Biológico Mesoamericano).
Future	CONANP	REDD pilot projects	Potential projects identified are: Sierra la Laguna, Chichinautzin and El Ocote
2015	CONAFOR	Monitoring, Reporting and Verification system	

Source: Prepared by the authors based on CIFOR, 2010

⁴ Shapiro, 2006

4. Recommendations

The literature review, formal and informal interviews, and analysis of the information available have resulted in a series of recommendations for the consideration of the USG team that will be traveling to Mexico City as part of the LEDS scoping mission. The objectives of these recommendations are to help advance and direct the thinking and planning of this mission, in order that it may be as efficient and useful as possible to both the USG and the Mexican sides.

1. The USG LEDS starting base and Mexican counterpart should be the DGPC and SEMARNAT.
2. SEMARNAT's international affairs department, UCAI, must be the formal diplomatic entry point for USG LEDS activities.
3. Request a single individual on the Mexican government side to coordinate with the USG LEDS mission and facilitate their planning and activities.
4. Begin early coordination with Mexican counterparts prior to the USG LEDS scoping mission.
5. Consider the formal Working Groups under the CICC as potential initial meeting venues for the USG LEDS team.
6. Accept the PECC as the watershed LEDS document that it is; consider the medium- and long-term goals and their corresponding action plans as the target for USG LEDS collaboration with Mexico. While it may be interesting to better understand some of the details of its development, the real value of potential USG assistance lies in helping Mexico detail the goals and actions beyond the 2012 commitments the PECC sets out. The USG LEDS team should focus on helping Mexico develop its medium-term goals by providing tools, methodologies and guidance, allowing DGPC and SEMARNAT to ensure a rigorous and transparent basis for setting their goals. We may consider that if this assistance is successful, SEMARNAT will be able itself to develop it.
7. Focus on key requests expressed by Mexican counterparts, and come prepared to expand the discussion and offer support on these items. Following is our interpretation of issues and areas of need, as expressed in the different meetings and discussions held with key individuals. These should also be the starting point for considering potential collaboration by the USG LEDS scoping team. In fact, it may be useful to begin a conversation with SEMARNAT on these general topics even before the scoping visit.
 - Development of a model specific to Mexico that will allow construction of baseline scenarios based on a bottom-up data approach.
 - Assistance in the construction of medium-term mitigation scenarios, to 2020 and 2030, focused on identifying and analyzing the actions required to meet Mexico's Copenhagen commitments (up to 30% emissions reductions in 2020, subject to technology transfer and financing support from developed countries).

- Development of models for economic, technical and environmental evaluation of mitigation actions, considering rates of implementation, certainty of mitigation results, and analysis of barriers (including legal, economic, financial, regulatory, institutional).
 - Adaptation of these models to Mexico, and their transfer to SEMARNAT, along with the documentation and training programs to ensure their ongoing use.
 - Identification and evaluation of possible NAMAs, or national-level mitigation actions that will contribute to a LEDES in key sectors: for example, efficiency and renewable in electricity generation; CO₂ and CH₄ reduction measures in oil and gas; energy from waste streams; energy efficiency in different sectors (industrial, commercial residential, government); cogeneration.
 - Support in enhancing MRV procedures and capacities. This also appears to be an even greater need at the state level.
 - Improved methods to use available land-use data and calculate emission reductions. Mexico has vast amounts of good quality field data in the agriculture and forestry sectors, but lacks the ability to interpret it clearly and consistently, thus making consensus on baselines difficult.
 - Improved analytical tools to prioritize mitigation actions in the land-use area.
 - Adaptation or development of methodologies and models in Mexico to guide public policy decision-making.
 - Examples of private-sector financing models for greater implementation of mitigation measures; experiences on market development to enhance private participation; taking advantage of parallel markets for carbon credits.
8. Consider USAID/Mexico to provide both the foundation and the “glue” to help maximize the value from the LEDES effort.
9. Five documents should be pre-requisite reading for the scoping mission. Among all the documents generated in Mexico over the last several years, we consider that the following will provide the best combination of background and overview, combined with a flavor for what is going on in climate change in Mexico.
- PECC
 - Synopsis: The Economics of Climate Change in Mexico, SEMARNAT, 2009
 - USAID/Mexico Clean Energy and Climate Change Assessment, 2010
 - USAID/Mexico Forests, Land Use, and Climate Change Assessment, 2010
 - Mexico’s Readiness Preparation Proposal (R-PP) to the Forest Carbon Partnership Facility
- These documents are selected in part because they are in English. The PECC is an obvious choice. The “Economics” document, which attempts to provide a basis for climate change action, is often quoted within SEMARNAT and elsewhere in Mexico. The two USAID studies provide a development perspective, in addition to broadly describing institutions and trends, and even suggesting activities for collaboration. The R-PP provides the basis for a World Bank-funded effort to develop a REDD strategy to 2030.
10. Consider the following ideas for meetings beyond DGPPC. As we had recommended, the entry point for the USG LEDES scoping mission should be the DGPPC, which is the secretariat for the CICC, Mexico’s maximum authority on climate change. In addition, the

following are agencies or institutions that could provide useful complementary points of view to enrich the base of information to be considered by the scoping mission.

- INE, the ecology institute, part of SEMARNAT
- CONAFOR, the forestry commission, part of SEMARNAT
- CESPEDS, the private sector industrial association
- UNAM, climate change research program
- SENER, the Ministry of Energy

INE, CONAFOR and SENER are already included as part of the CICC and active in the CICC's working groups. In addition, two institutions hold significant power in climate change related issues, and could provide potentially useful perspectives on analyses and priorities. However we are not sure about the protocol for such meetings; they would likely have to be requested at a higher diplomatic level than the ones described above, which can be organized directly or through SEMARNAT:

- SRE, the Ministry of Foreign Affairs: it is here that international climate change negotiations are handled, based on technical information provided by SEMARNAT.
- SHCP, the Ministry of the Treasury: this is the focal point of public sector implementation of mitigation programs, as budgets for CFE, PEMEX and all of the public sector energy use.

Appendix A: Composition of the C4

Members of the Advisory Council on Climate Change (C4)

Dr. Mario Molina Pasquel Advisory Board President	Director Centro Mario Molina para Estudios Estratégicos sobre Energía y Medio Ambiente (CMM)
Dr. Carlos Gay García Advisory Board Secretary	Director Centro de Ciencias de la Atmósfera, UNAM
Mtro. Gustavo Alanís Ortega	Presidente Centro Mexicano de Derecho Ambiental (CEMDA)
Dr. Francisco Barnés de Castro	Comisionado, Comisión Reguladora de Energía (CRE)
Ing. Miguel Benedetto Alexanderson	Director Asociación Nacional de la Industria Química(ANIQ)
Dra. Cecilia Conde	Investigadora del Centro de Ciencias de la Atmósfera, UNAM; miembro del IPCC
Dr. Edmundo de Alba Alcaraz	Vicepresidente del Grupo II del Panel Intergubernamental de Cambio Climático (IPCC)
Dr. Bernardus de Jong	Investigador, Colegio de la Frontera Sur, Villahermosa, Tab.
Dr. Jorge Etchevers	Investigador Titular en Edafología, Colegio de Posgraduados
Ing. Lorenzo González-Merla	Presidente de la Cámara Nacional de la Industria del Hierro y el Acero (CANACERO)
Dr. Boris Graizbord	Coordinador del Programa de Estudios Avanzados y Medio Ambiente del COLMEX
Ing. Juan José Guerra Abud	Presidente de la Asociación Nacional de Productores de Autobuses, Camiones y Tractocamiones (ANPACT)
Ing. Miguel Ladrón de Guevara	Confederación Patronal de la República Mexicana, COPARMEX
Dr. Alfonso Larqué Saavedra	Director General del Centro de Investigación Científica de Yucatán A.C. (CICY)
Ing. Jaime Lomelín Guillén	Presidente de la Comisión de Estudios del Sector Privado para el Desarrollo Sustentable (CESPEDES)
Dr. Víctor Magaña Rueda	Investigador del CCA, UNAM; Coordinador del Programa Transversal de Cambio Climático
Ing. Tirso Martínez Angheben	Presidente de la Cámara Nacional de Autotransporte de Carga (CANACAR)
Dr. Rafael Martínez Blanco	Consejero del Consejo Nacional Consultivo para el Desarrollo Sustentable
Ing. Carlos Mena Brito	Director Ejecutivo del Centro Mario Molina
Ing. Fernando Rodríguez Camacho	Presidente de la Cámara Nacional de Pasaje y Turismo (CANAPAT)
Dra. Patricia Romero Lankao	Coordinadora del Departamento de Política y Cultura, Universidad Autónoma Metropolitana - Xochimilco
Ing. Carlos Sandoval Olvera	Presidente Delegación DF del Consejo Nacional de Industriales Ecologistas
Ing. Alejandro Sosa Reyes	Director Ejecutivo de la Iniciativa GEMI

Source: SEMARNAT website

Appendix B: Members of the “Red por la Transición Energética”

Organizations:

Organization	Contact	Details
Asociación Nacional de Energía Solar, A.C. (ANES)	Vicente Estrada Cajigal	President
Asociación Mexicana de Energía Eólica, A.C. (AMDEE)	Leopoldo Rodríguez Jorge Landa	President Director
Asociación de Empresas para el Ahorro de Energía en la Edificación, A.C. (AEAEE)	Arturo Echeverría	President
Asociación Mexicana de Proveedores de Energías Renovables, A.C. (AMPER)	Jorge González Morales	President
Greenpeace México, A.C., Campaña de Energía y Cambio Climático	Beatriz Olivera	
Presencia Ciudadana Mexicana, A.C.	Odón de Buen Gabriel Quadri	Members of Scientific Board
Centro Mexicano de Derecho Ambiental, A.C. (CEMDA), Air and Energy Program	Sandra Guzmán	
Sociedad Mexicana del Hidrógeno, A.C.	Javier Fortuna	President
El Poder del Consumidor, A.C.	Alejandro Calvillo	President
Red Mexicana de Bioenergía, A.C. (Rembio)	Omar Masera	Director
Unión de Científicos Comprometidos con la Sociedad, A.C.	María Elena Álvarez-Buylla Rocés	President
Comisión de Estudios del Sector Privado para el Desarrollo Sustentable (Cespedes)	Alejandro Lorea	Executive Director
Impulso Verde, A.C.	Rafael Carmona Dávila	General Director
Heinrich Böll Stiftung (Fundación H.B.)	Jorge Villarreal	Representative in Mexico
Oxfam México	Raúl Benet	Representative in Mexico

Firms:

- Alesco Consultores, S.A. de C.V. - Alberto Escofet Artigas, Director General
- Bufete de Tecnología Solar
- Energía, Tecnología y Educación, S.C. (ENTE) - Odón de Buen, Director
- Guascor de México, S.A. de C.V.

Individuals:

- Enrique García Corona, Consultant, Asociación Mexicana de Cogeneración
- Gabriel Quadri de la Torre, Ecosecurities de México
- Pablo Gottfried, Project Developer, Empresa Potencia Industrial
- María de Lourdes Melgar Palacios, Independent Consultant
- David Morillón Gálvez, Researcher, UNAM
- Leopoldo Rodríguez Olivé, Project Solicitor, Industrias Peñoles
- David Shields, Consultant and Journalist, Energía a Debate
- Pablo Mulás del Pozo, Researcher, Programa Universitario de Energía

Source: Personal communication of the director of the Red por la Transición Energética

Appendix C: List of Relevant Documents

C.1. Country-Wide Level

Mexico's government publications:

[CICC, 2007. National Strategy on Climate Change \(ENACC\)](#): Reflects the Mexican Government's commitment to climate change mitigation and adaptation. Identifies mitigation opportunities in two main sectors: energy generation and use, and vegetation and land use. Preparation to the PECC.

[SEMARNAT, 2009. Special Climate Change Program 2009-2012 \(PECC\)](#): The PECC is an initiative from the federal government prepared voluntarily and self-financed, which shows Mexico's interest in contributing to the solution to climate change. The four components of the PECC are (1) Long Term Vision, (2) Mitigation, (3) Adaptation and (4) Elements of Transverse Policy. On the long-term, Mexico's objective is to reduce its GHG emissions by 50% by 2050, relative to those emitted in the year 2000. The successful implementation of the PECC would reduce emissions by nearly 51 million tons of CO₂e in 2012 (with respect to the 2012 baseline scenario of 786 MtCO₂e). The emissions reductions would result from actions in the following areas: energy generation (36% of total reductions), energy use (23%), agriculture, forestry, and other land use (30%) and waste (11%). The PECC comprises 105 general objectives and 294 specific goals.

[SEMARNAT, 2009. Mexico Fourth National Communication to the United Nations Framework Convention on Climate Change](#): Reports Mexico's progress in Climate Change, including GHG emissions inventory and long-term emissions forecast. Follows the Third Communication published in 2006.

Climate Change Studies

[Centro Mario Molina and Mc Kinsey, 2008. Low carbon growth: a potential path for Mexico](#): Objective of the study was to fill gaps in existing knowledge base for Mexico, contribute to the PECC and produce a methodology that is repeatable in other countries. Describes 144 mitigation opportunities for a total of 535 Mt CO₂e abatement potential by 2030.

[Quadri, G., 2009. Climate change in Mexico and the GHG mitigation potential by sector](#): Analyzes the national emissions inventory, identifies emission trends and estimates a baseline for 2020. Then evaluates mitigation measures and their cost by sector, and recommends strategies and political instruments.

[Galindo, L.M., 2009. The Economics of Climate Change in Mexico](#): Technical study requested by SEMARNAT and SHCP and funded by the British Government and IDB. Economic assessment of probable climate change costs for different scenarios. Draws the same conclusion for Mexico as the Stern report that it is less costly from an economic perspective, to accelerate economic transformation to stop and reduce the emissions than to pay for the cost of the impacts of climate change.

[Morales, M., 2009. Estimaciones del Impacto del Cambio Climático, desde el Sistema de Cuentas Económicas y Ecológicas de México 2010-2100](#): The objective of this study is to provide decennial estimations of GDP, GNP and costs of exhaustion and degradation of

resources, for the 2010-2100 period. The study was based on Mexico's Economic and Ecological Accounting System (SCEEM, in Spanish).

[World Bank, 2010. Low Carbon Development for Mexico \(MEDEC\)](#): Assesses the GHG emission reduction potential in key sectors and develops a low carbon scenario to 2030

Energy Sector

[SENER, 2009. Special Program for the Use of Renewable Energy](#): Summarizes current and potential levels of generation from renewable energy (Wind, solar, small hydro, geothermal and biomass/biogas). Program focus is to increase the availability of information on renewable energy, develop a national inventory and a catalogue of pilot and demonstration alternative energy projects for rural communities. Program also focuses on policy development, improving regulatory and financing mechanisms to better take advantage of the nation's renewable energy sources.

[ESMAP, 2009. Innovative Financial Mechanism to Implement Energy Efficiency Projects in Mexico](#): Describes a unique mechanism that seeks to create a special financial model with the purpose to attract commercial lending for energy efficiency projects.

[Garrison, J., 2010. Clean Energy and Climate Change Opportunities Assessment for USAID/Mexico](#): Summarizes existing CC efforts focusing on renewable energy and energy efficiency areas. Presents summaries of current programs by donors including WB, IDB, USAID, etc. It reviews current policies on promoting RE and EE programs and identifies main barriers for deployment. It also summarizes potential opportunities for USAID support in five areas: Regulatory and Policy development, capacity building, project development, finance, and monitoring.

AFOLU Sector

[Alviar, M.L., 2009. Impacto del cambio climático en las tierras y sus características](#): Studies the impact of climate change on land characteristics through a geospatial vulnerability assessment. Estimates the cost of climate change on agriculture and land degradation taking into account three main aspects: (1) climate change impacts on land productivity, (2) indirect impacts and (3) GHG emissions from agriculture.

[CIFOR, 2010. Forests, Land Use, and Climate Change Assessment for USAID/Mexico](#): Prepared by the Center for International Forestry Research (CIFOR) for USAID/Mexico. Presents an analysis of climate change challenges with respect to sustainable landscapes. Includes (1) a review of national, sectoral and state programs and reports related to climate change, (2) a review of previous activities of USAID Mexico in LUCC areas, (3) a review of activities of other donors in LUCC area, and (4) a gap analysis.

C.2. Sub-National Level

[SMA DF, 2008. Mexico City Climate Action Program 2008-2012 \(PACCM\)](#): Identifies specific actions in Mexico City for CC mitigation, adaptation and education

Nuevo Leon Sustainable Development Ministry, 2010. Programa de Acción ante el Cambio Climático Nuevo León 2010-2015: The objective of the government of the state of Nuevo Leon is to mitigate the emissions of 1.56 million tons of CO₂e through 20 actions in 5 sectors during the 2010-2015 administration.

C.3. Comparative assessment (including Mexico as a case study)

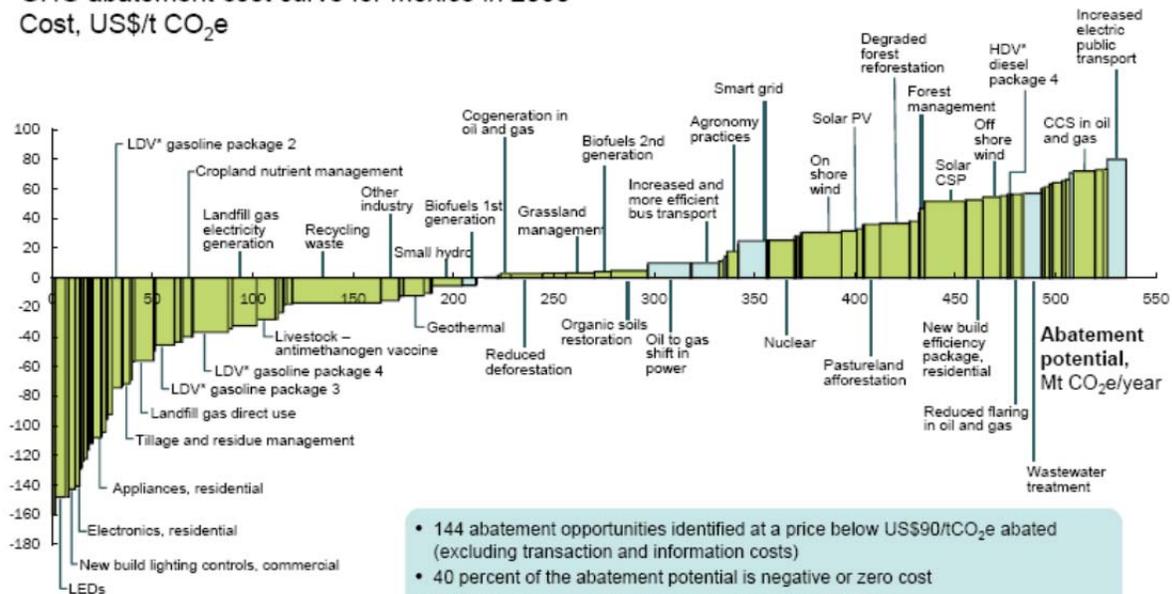
ESMAP, 2009. Low-Carbon Growth Country Studies: Getting Started Experience from Six Countries: Report focuses on the experiences from six developing countries (Brazil, China, India, Indonesia, Mexico, and South Africa) that demonstrate the benefit of a structured approach and commitment GHG mitigation.

Appendix D: Marginal Abatement Costs Curves for Mexico

This 535 Mt of abatement potential consists of 144 different opportunities

GHG abatement cost curve for Mexico in 2030

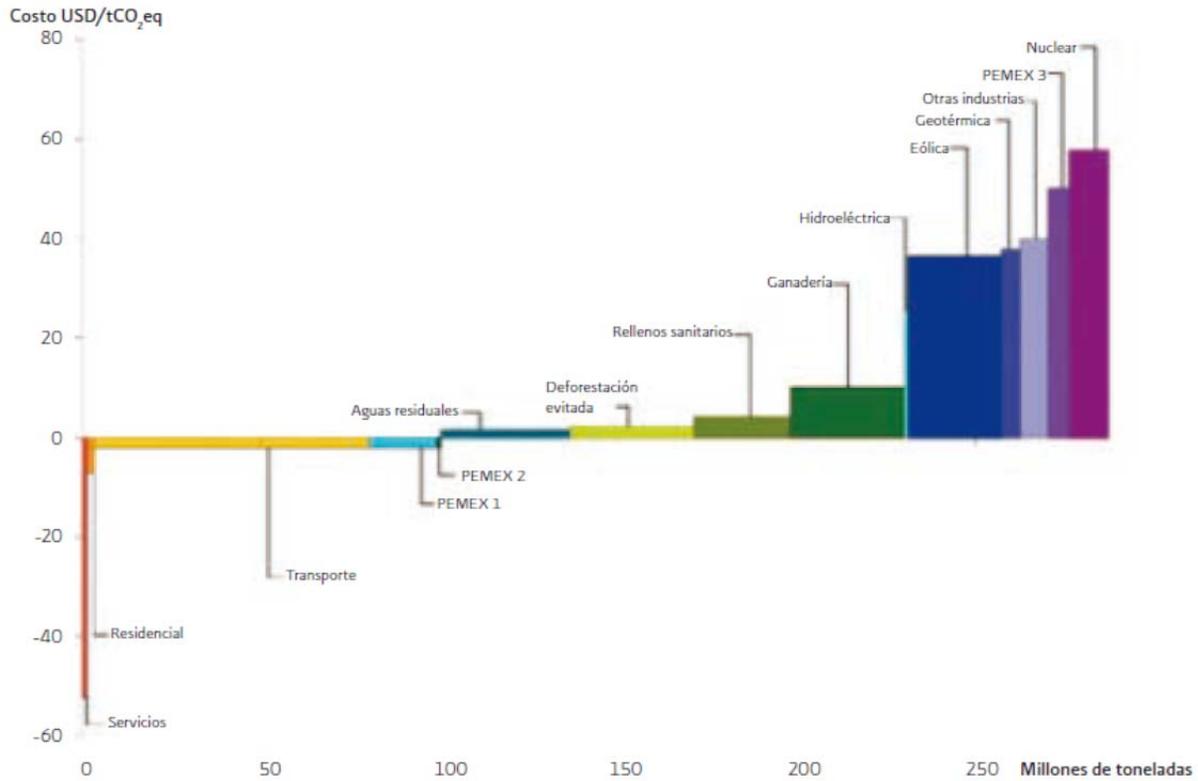
Cost, US\$/t CO₂e



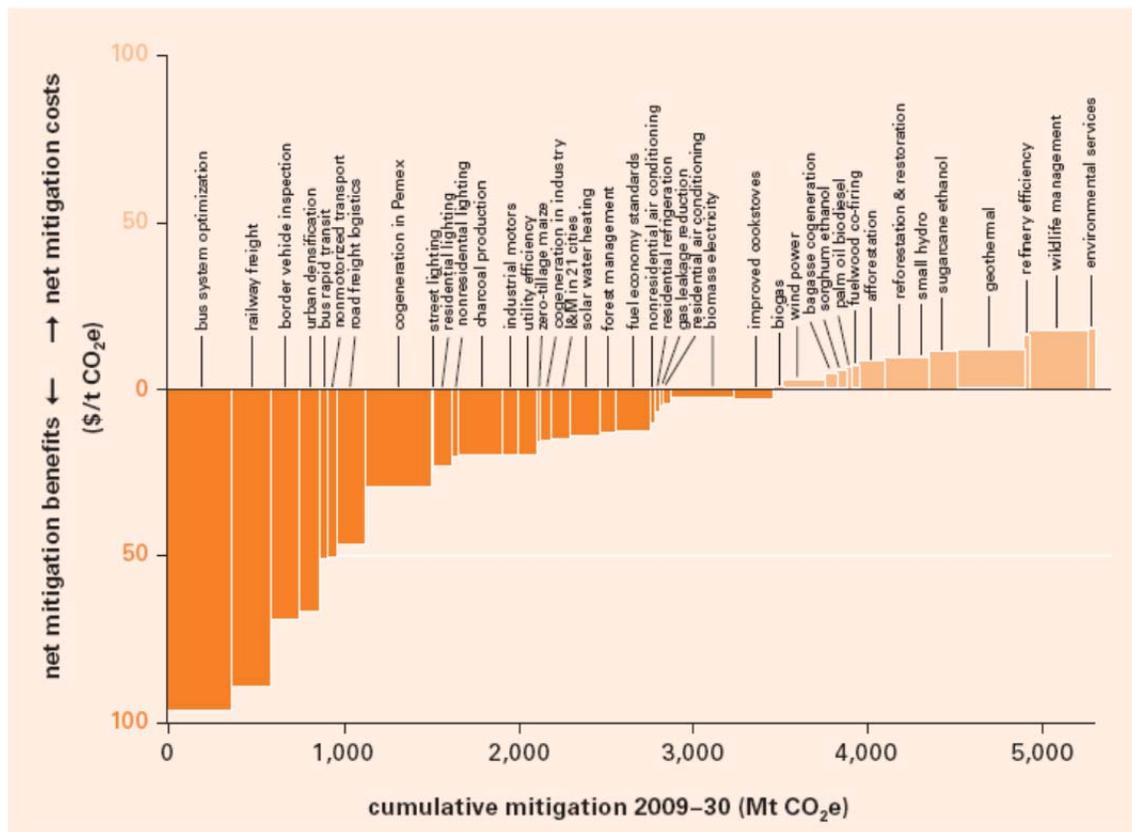
- 144 abatement opportunities identified at a price below US\$90/tCO₂e abated (excluding transaction and information costs)
- 40 percent of the abatement potential is negative or zero cost
- Weighted average abatement cost is about US\$2/ tCO₂e
- No silver bullet to emissions reduction exists – action is required in all sectors
- Many abatement opportunities are fragmented, e.g., energy efficiency and process improvements in industry

* LDVs = light duty vehicles; HDVs = heavy duty vehicles
 Note: The cost estimate for the light-colored bars is approximate
 Source: McKinsey GHG abatement cost curve v2.0; McKinsey analysis

Source: Centro Mario Molina and Mc Kinsey, 2008



Source: Quadri, 2009



Source: World Bank, 2010

Appendix E: Energy Regulatory Environment

E.1. Broad view of the Electricity Sector Regulatory Framework

The entire regulatory framework of the Mexican electricity sector rests on the Constitution of the United Mexican States which states that⁵ the “Nation is in charge of generating, transmitting, transforming, distributing and supplying power for public service.” Therefore, the power sector is under the control of the Mexican State (federal government) through the Federal Electricity Commission (CFE). CFE is a monopoly in the electricity transmission and distribution areas and controls most of the generation in the country (77.5%). In 2009, CFE took-over the operations of Luz y Fuerza del Centro (LyFC), another state-owned company that distributed electricity only in Central Mexico⁶. The Energy Regulatory Commission (CRE) has the responsibility of ensuring proper regulatory oversight of the electricity sector.

The electricity sector in Mexico is considered strategic for the national sovereignty. Therefore, there are constraints to private participation, allowing foreign companies to operate in the country only through six specific mechanisms limited to the power generation area as stated in the Law of Public Electricity Service (LSPEE) described below.

A list of the legal and regulatory instruments governing the provision of electricity service throughout the entire country is presented in Exhibit E.1. There are a few of these legislation pieces that are worth highlighting as described in the following section.

Exhibit E.1: Main legal instruments governing the provision of electricity service

- Constitution of the United Mexican States (Articles 25, 27 and 28)
- Law of the Federal Public Administration
- Law of Public Electricity Service
- Law of the Energy Regulatory Commission
- Law on the Use of Renewable Energy and Financing Energy Transition
- Law for Sustainable Energy
- Regulatory Law of Constitutional Article 27 in Nuclear Matter
- Law on Civil Liability for Nuclear Damage
- Law of Time zones the United Mexican States
- Federal Law on Metrology and Standardization
- Law on Rural Energy
- Regulation of the Law of Public Electricity Service
- Regulation of the Law on the Use of Renewable Energy and Financing Energy Transition
- Regulation of the Law for Sustainable Energy
- Regulations of the Federal Law on Metrology and Standardization

Source: Prospectiva electricidad 2009-2024, SENER

⁵ Source: Constitution of the United Mexican States, page 20, last reform of July 29, 2010.

⁶ LyFC distributed power in Mexico City, 80 municipalities of the State of Mexico, two in the State of Morelos, two in Puebla and five in Hidalgo.

E.2. Description of selected Legal /regulatory instruments

Law of Public Electricity Service (LSPEE). This law is the principal legal instrument that regulates the provision of public electricity service and the organization and operation of the CFE. The LSPEE was approved in 1975 and last reformed in 1992. It established that the government through CFE and LFC, has sole responsibility in the generation, transmission, and distribution of electricity.

An important modification to this Law occurred in 1992 with the purpose of allowing private participation in new power generation in the following forms: Auto-generation, cogeneration, independent production (30 MW plant or larger only for sale to CFE or exports), and small scale generation (less than 30 MW plant), and power imports and exports. It should be also noted that, CFE, as a state monopoly, might also have the power to set rates for electricity sales and transmission charges. However, it is the Ministry of Finance (SHCP) which sets rates for electricity, as well as reviews, updates and modifications based on agreements with Congress.

Law of the Federal Public Administration. This law governs the allocation of responsibilities to line ministries, particularly the Ministry of Energy (SENER). An important fact affecting this Law is the reform of May 8, 2008, when president Calderón signed a decree to reform the Constitution in terms of federal expenditures and monitoring (Decreto Promulgatorio de la Reforma Constitucional en Materia de Gasto y Fiscalización), in which public officials are allowed to sign multiple-year contracts. In the past, only annual contracts were signed in compliance with the federal budget rules established by SHCP. However, this reform permitted to extend the period of contracts that public entities might sign, even beyond the 3 or 6 years of government administration periods. These changes might help to foster energy efficiency and renewable energy projects to be implemented in partnership between the public and private sectors, as many of these projects are developed under multi-year contracts. Also, the reform included the need for public entities to use an improved system for monitoring and reporting results, which will reinforce performance-based models that EE and RE projects use.

Law on Energy Regulatory Commission (CRE). This law regulates the activities and organization of the energy regulator. It is important to highlight that even before the energy sector reforms carried out in 2008, CRE had already issued important regulatory instruments that allowed the development of generation projects from renewable energy sources based on LSPEE and the Law on CRE. Among the instruments issued by CRE before the regulatory reform in 2008 that were instrumental to foster increased power installed capacity we can mention the following:

- CRE approved in August 2001 the *Interconnection Agreement for Renewable Sources of Energy* (CIFER in Spanish). This instrument recognized the particular operating characteristics of renewable resources, such as its intermittent nature, and allowed for specific terms and conditions in the agreements.
- On June, 2007, CRE approved the *Interconnection Agreement for Solar Power for Small Scale*, which is applicable to generators from solar energy with capacity up to 30 kW which will be are interconnected to the low voltage grid in and do not require to use the transmission system to transmit power to their loads.

These regulatory instruments issued by CRE were able to promote the development of renewable energy projects. As an indicator of that trend, CRE had granted a total of 90 permissions for renewable representing a capacity of 2,378 MW through the first quarter of 2009. Exhibit E.2 shows the most current update.

Exhibit E.2. Status of Renewable Energy Permits in Mexico

Technology	Number Permits	In Operation	Under Development	Inactive	Total	%
Wind	23	407.7	2,247.4	-	2,655.1	75.1%
Small Hydro	27	107.6	182.3	2.5	292.4	8.3%
Biomass	53	466.0	83.4	-	549.4	15.5%
Biogas	8	28.5	11.7	-	40.2	1.1%
TOTAL	111	1,009.8	2,524.7	2.5	3,537.0	100.0%

Source: Presentation by Israel Hurtado Acosta CRE Energy Commissioner at the "Foro de Regulación de Energías Renovables:" "REGULACIÓN DE LAS FUENTES RENOVABLES DE ENERGÍA EN MÉXICO" dated October 5, 2010

However, it was perceived that CRE's role had to be modified and reinforced. This was accomplished with the Law for the Use of Renewable Energy and Financing of the Energy Transition (LAERFTE), which strengthened CRE's mandate and new attributions were included added.

Law on the Use of Renewable Energy and Financing Energy Transition (LAERFTE). This Law was passed in November 2008, and includes the development of a Program focused on the development of renewable energy⁷. This program is coordinated by SENER and establishes goals for the development of various technologies. This law also mandates the creation of a Global Energy Transition Fund and the Sustainable Use of Energy Program. This Energy transition fund is managed by a technical committee chaired by SENER and includes representatives of CFE and LFC, different ministries (Finance and Public Credit, Agriculture, Livestock, Rural Development, Fisheries and Food, and Environment and Natural Resources) and several technical institutes (IMP, IIE and CONACYT). This committee is in charge of issuing the rules for the administration, allocation and distribution of resources in the Fund. A more detailed description of the key elements of this law is included in Exhibit E.3.

Law for Sustainable Energy. The Mexican Congress also passed in 2008 this law which established the National Commission for the Efficient Use of Energy (CONUEE) to take the responsibilities of the National Commission for Energy Conservation (CONAE). This Law created new energy efficiency labeling requirements and a voluntary energy efficiency equipment certification program.

⁷ For purposes of this Law, renewable energy sources considered are: wind, solar mini-hydro (less than 30 MW), energy from oceans, geothermal, and bioenergy.

Exhibit E.3: Law on the Use of Renewable Energy and Financing Energy Transition (LAERFTE)

"In 2008, Mexico adopted the Law for the Use of Renewable Energy and Financing the Energy Transition (LAERFTE). Unlike the proposed Renewable Energy Utilization Law, which passed the lower chamber of Congress in 2005 but which was never adopted by the Mexican Senate, LAERFTE stops short of changing CFE's procurement rules for electric power and creating incentives for renewables. Rather, the LAERFTE expands the powers of SENER and the Energy Regulatory Commission (CRE) to promote and regulate renewable energy and cogeneration and establishes the types of new regulations and incentives to be developed, leaving the details up to the responsible government bodies.

Under the LAERFTE, authority for developing a tariff system for renewable energy shifts from CFE to the CRE. The CRE is now responsible for establishing the administrative regulations for renewable and cogeneration power projects, including ceilings for independent power producer tenders and tariffs paid by CFE to small renewable generators.⁵³ In addition, the CRE is responsible for developing model renewable and cogeneration contracts to be used by CFE (Art. 15), and working with the National Center for the Control of Energy (Centro Nacional de Control de Energía, CENACE) to amend dispatch rules for renewable energy generators. Finally, LAERFTE calls for the creation of a new Fund for the Energy Transition and the Sustainable Use of Energy to support the Strategy. The fund will be managed by a technical committee led by SENER and will have an annual budget of roughly \$220 million dollars (3 billion Mexican pesos) for 2009, 2010 and 2011. The fund will be used to provide guarantees and other forms of financial support (possibly loans, grants or other incentives) to promote energy efficiency, clean technologies and renewable energy. Under LAERFTE"

Source: Clean Energy & Climate Change Opportunities Assessment for USAID-Mexico 2010

E.3. Highlights since 2008 and recent regulatory changes

Since 2008 the electricity Mexican regulatory framework has changed mainly in terms of the new special programs promoting renewable energy described above, the national Energy Strategy and key secondary regulatory instruments. A list of the main regulatory changes is provided below. Many of these changes are the result of the new attributions given to SENER and CRE through the implementation of LAERFTE. Exhibit E.4 and E.5 below provide a summary of the new attributions for both SENER and CRE. These new attributions have been the foundation for additional regulatory changes at lower levels, such as permits and regulatory instruments, which have increased investments in renewable energy technologies under a more economically viable approach.

Exhibit E.4: SENER's new responsibilities

- To develop and coordinate the implementation of the Special Program for the Development of Renewable Energy Sources (Programa Especial de Cambio Climático in Spanish), completed and published.
- To coordinate the Consultative Council for Renewable Energy (Consejo Consultivo de Energías Renovables in Spanish), which was created and is having working meetings.
- To define the policies, the energy strategy and conditions to promote a greater national integration (launched a program of several financing mechanisms for innovation on energy efficiency and renewable energy projects)
- To fulfill Mexico's international commitments. (meeting goals for CO₂ reductions, approximately 35.5%)
- To be consistent with the national program of climate change in the mitigation area (working closely with SEMARNAT authorities in aligning goals)
- To elaborate the national inventory of renewable energy sources (still pending to be published).

Exhibit E.5: CRE's new responsibilities

- To issue standards, policies, administrative provisions, and methodologies governing the generation of electricity from renewable energy sources.
- To establish instruments for the calculation of the tariffs/compensation for the services provided between CFE and generators.
- To issue new methodologies to determine the contribution of renewable generation capacity to the National Electric System (SEN- in Spanish).
- To issue of interconnection rules, energy exchange procedures and compensation system for renewable energy projects which are connected to SEN's grid.
- Methodology for the determination of wheeling charges corresponding to transmission services provided by CFE to the developers using renewable energy sources or cogeneration systems.
- Interconnection contract for renewable energy source plants or cogeneration systems plants (developers).
- Interconnection contract for renewable energy sources or medium-scale cogeneration systems
- Interconnection contract for renewable energy sources and cogeneration systems for small-scale.

The main regulatory changes are listed below:

Methodology for the Determination of Charges Corresponding to Transmission Services (Wheeling). This methodology must be followed by CFE in order to calculate charges for transmission services (calculation of wheeling costs). The aim of this methodology is to ensure fair and proportional payments from developers of power generation. Also, it was important to design a stable and transparent wheeling charges system offering flexibility and long term security without imposing unnecessary burdens.

Interconnection Contracts. The interconnection contract for large scale resources is the mechanism through which terms and conditions are set for the necessary interconnection between SEN, renewable energy source and the load centers. The contract serves as the framework for all operations between the CFE and the developer. In the case of renewable energy sources, it is possible to make payments for energy not generated in some months with surplus energy generated in other months, i.e. if there is a net surplus of energy in a month it can be used to compensate energy not generated in future months.

Regulatory Instrument Recently Approved by CRE. CRE recently approved the *Methodology for Calculation of Efficiency* for cogeneration systems and established criteria to define efficient cogeneration. This methodology will be sent to the Federal Commission for Improved Regulations (Comisión Federal de Mejora Regulatoria, COFEMER in Spanish) to undergo the procedure of Manifest of Regulatory Impact (Manifestación de Impacto Regulatoria or MIR in Spanish). Currently, CRE is working on:

- The methodology for calculating compensation that CFE will pay to generator using renewable energy or efficient cogeneration. (This methodology has been sent to the Secretariat of Hacienda - Treasury - and the SENER for their opinion).
- The methodology to determine the contribution of renewable technologies in terms of generation capacity for the SEN.
- Proposals of Interconnection rules and review of dispatching rules.

Appendix F: List of Meetings and Contacts

Name	Title	Institution
Juan Mata <i>juan.mata@semarnat.gob.mx</i>	Director General, Climate Change	SEMARNAT
José Antonio Urteaga <i>jose.urteaga@semarnat.gob.mx</i>	Director for Climate Change Projects	SEMARNAT
Celia Piguéron <i>celia.pigueron@semarnat.gob.mx</i>	Director for Climate Change Projects	SEMARNAT
Roberto Cabral <i>roberto.cabral@semarnat.gob.mx</i>	Adjunct Director General for Strategic Finance	SEMARNAT
Alejandro Lorea <i>cespedes@cce.org.mx</i>	Director	CESPEDES
Rosa María Jiménez <i>rjimenez@cce.org.mx</i>	Program Manager	CESPEDES
Leonardo Beltrán <i>lbeltran@energia.gob.mx</i>	Director General for Information and Energy Studies	SENER
Javier Bocanegra <i>jbocanegra@pemex.gob.mx</i>	Program Manager, Environmental Protection	PEMEX
Lourdes Fernández <i>lfernandezm@prodigy.net.mx</i>	Advisor, Climate Change Projects	PEMEX
María Elena Giner <i>mginer@cocef.org</i>	Deputy Director	BECC
Beatriz del Valle <i>bvalle@dgpa.df.gob.mx</i>	Project Leader for Climate Change and CDM Projects	GDF
Oscar Vázquez <i>ovazquez@dgpa.df.gob.mx</i>	Director of Climate Change	GDF
Odón de Buén <i>demofiloente@yahoo.com</i>	Director	Energy Transition Network
Luis Muñozcano <i>lmunozcano.dgedr@sagarpa.gob.mx</i>	Climate Change Director	SAGARPA
<p>Note: SAGARPA is going through some changes. Luis Muñozcano is no longer involved in climate change activities; the main contact person is now Victor Celaya, General Director (<i>victor.celaya@sagarpa.gob.mx</i>). The operative contact is Iris Jiménez (<i>iris.jimenez@sagarpa.gob.mx</i>)</p>		
Mariana Bellot <i>mariana.bellot@conanp.gob.mx</i>	Director in Charge of Climate Change	CONANP
Miguel Altamirano <i>maltamir@ine.gob.mx</i>	Deputy Director of Studies on Vulnerability and Adaptation to Climate Change.	INE
Sergio Madrid <i>smadrid@prodigy.net.mx</i>	Executive Director	CCMSS

Ricardo Hernández <i>rhernandez@worldbank.org</i>	Senior Environmental Specialist	World Bank
Verania Chao <i>verania.chao@undp.org.mx</i>	Director of the Sustainable Development Program	UNDP
Liliana Dávila <i>ldavila@wwfmex.org</i>	Forests and Climate Change Program Coordinator	WWF
Jorge Rickards <i>jarickards@wwfmex.org</i>	Director of Conservation	WWF
Dr. Carlos Gay García <i>cgay@servidor.unam.mx</i>	Coordinator, Programa de Investigación en Cambio Climático (PINCC) (The Climate Change Research Program)	UNAM
Dr. Adalberto Noyola Robles <i>+52 (55) 5623 3601</i>	Director, Instituto de Ingeniería (The Engineering Institute)	UNAM

Appendix G: List of References

- Agence Francaise de Developpement (AFD), 2010. Appui au Programme de lutte contre le changement climatique du Mexique, available at:
<http://www.afd.fr/jahia/Jahia/site/afd/lang/fr/pid/56000>
- Alviar, M.L., 2009. Impacto del cambio climático en las tierras y sus características – *Climate Change Impact on Land and its Characteristics*
- AMBB, n/a. Asociación ¿Quiénes somos?
<http://www.ambb.org.mx/index.php?option=asoc&Itemid=57> (visited October 28, 2010)
- British Embassy Mexico City, n/a. UK in Mexico, available at:
http://ukinmexico.fco.gov.uk/en/about-us/working-with-mexico/Sustainable_Development/SDD_Programme/Themes_Projects/ (visited October 28, 2010)
- CIDRS, 2007. Nuevo Programa Especial Concurrente para el Desarrollo Rural Sustentable.
- CCMSS, 2007. Nueva Evidencia: Los Bosques Comunitarios de México Protegen el Ambiente, Disminuyen la Pobreza y Promueven Paz Social.
- CCMSS, 2009. Análisis del Proyecto de Presupuesto para Conafor en 2010.
- CCMSS, n/a. ¿Quiénes somos? http://ccmss.org.mx/modulos/casillero_quienes.php (visited October 28, 2010)
- Centro Mario Molina and Mc Kinsey, 2008. Low carbon growth: a potential path for Mexico.
- Centro Mario Molina, n/a. Quienes somos, <http://www.centromariomolina.org/qsomos.html> (visited October 28, 2010)
- CFE, 2010^a. Conoce CFE – Acerca de CFE
<http://www.cfe.gob.mx/QuienesSomos/queEsCFE/Paginas/CFE.aspx> (visited October 28, 2010)
- CFE, 2010^b. Conoce CFE – Estadísticas - Generación
<http://www.cfe.gob.mx/QuienesSomos/estadisticas/Paginas/Indicadoresdegeneraci%C3%B3n.aspx> (visited October 28, 2010)
- CICC, 2007. National Strategy on Climate Change (ENACC).
- CIFOR, 2010. Forests, Land Use, and Climate Change Assessment for USAID/Mexico.
- CONAFOR, 2010. Mexico's REDD+ Readiness Preparation Proposal. PPT presentation to FCPC Participants Committee in Gabon in March 2010.
- CONANP, 2010. Estrategia de Cambio Climático para Áreas Protegidas (ECCAP) – *Climate Change Strategy for Protected Areas*
- CONUEE, 2010. ¿Qué es Conuee? http://www.conuee.gob.mx/wb/CONAE/Que_es_conae (visited October 28, 2010)

El Economista, 2010. Pemex pedirá 54% más presupuesto en 2011, available at <http://eleconomista.com.mx/industrias/2010/07/18/pemex-va-mas-presupuesto>

FAOSTAT, 2011. ResourceSTAT database - Land, available at: <http://faostat.fao.org/site/405/default.aspx>

FCPF, 2010. Readiness Preparation Proposal (R-PP)

Galindo, L.M., 2009. The Economics of Climate Change in Mexico

Garrison, L., 2010. Clean Energy and Climate Change Opportunities Assessment for USAID/Mexico.

GEI Mexico, 2009. Quinta Entrega de Reconocimientos del Programa GEI México, available at: <http://www.geimexico.org/downs/documentos/Programa%20GEI%20Mexico%202009.pdf>

Hernández, M.M., 2009. Estimaciones del Impacto del Cambio Climático, desde el Sistema de Cuentas Económicas y Ecológicas de México 2010-2100

Instituto Nacional de Ecología (INE), 2006. Inventario Nacional de Emisiones de Gases de Efecto Invernadero 1990-2002 México.

INE and UNAM, 2008. Guía para la elaboración de Programas Estatales de Acción ante el Cambio Climático (PEACC), available at: http://www2.ine.gob.mx/sistemas/peacc/descargas/guias_prog_est.pdf

INE, 2009. Areas del Instituto, Cambio Climático, Misión, <http://www.ine.gob.mx/areas/cpcc> (visited October 28, 2010)

Morales, M., 2009. Estimaciones del Impacto del Cambio Climático, desde el Sistema de Cuentas Económicas y Ecológicas de México 2010-2100

Napoles, P.R., 2009. Distribución de los costos del cambio climático entre los sectores de la economía mexicana – Un enfoque de insumo-producto.

NewNet, 2010. Norway to help Mexico and Democratic Republic of Congo tackle deforestation, available at: <http://www.newenergyworldnetwork.com/renewable-energy-news/by-technology/energy-efficiency-by-technology-renewable-energy-news/norway-to-help-mexico-and-democratic-republic-of-congo-tackle-deforestation.html>

PROFEPA, 2010. About Us - Mission, Vision and Strategic Targets, http://www.profepa.gob.mx/innovaportal/v/1153/1/mx/about_us_-_mission_vision_and_strategic_targets.html (visited October 28, 2010)

Quadri, G., 2008. Climate change in Mexico and the GHG mitigation potential by sector.

SAGARPA, 2008. ¿Por qué la SAGARPA se interesa al Cambio Climático? – *Why is SAGARPA interested in Climate Change?*

SE, n/a. Mission and Vision of the SE
http://www.economia.gob.mx/swb/en/economia/p_Mision_y_Vision (visited on October 28, 2010)

SEMARNAT, 2009^a. Plan Especial de Cambio Climático.

SEMARNAT, 2009^b. Mexico Fourth National Communication to the United Nations Framework Convention on Climate Change.

SEMARNAT, 2010. Introduction web-page on the Programa Especial de Cambio Climático 2009-2012 <http://www.semarnat.gob.mx/temas/cambioclimatico/Paginas/pecc.aspx> (visited October 28, 2010)

Shapiro, E., 2006. Payment for Environmental Services Projects in Mexico: Impacts on Forest Management and Rural Livelihoods. Tinker Summer Research report, Center for Latin American Studies, University of California, Berkeley, available at:
<http://www.clas.berkeley.edu/Research/graduate/summer2006/Shapiro/index.html>

Universidad Autonoma de Nuevo Leon (UANL), 2008. Revista Reforma 54, available at:
<http://www.uanl.mx/publicaciones/reforma/54.html>

Standard and Poor's, 2010. Fundamento: Petróleos Mexicanos (PEMEX), available at:
<http://www2.standardandpoors.com/portal/site/sp/es/la/page.article/2,1,1,2,1053067140819.html>

USAID/Mexico. Clean Energy Handout.

USAID/Mexico, 2010. Summary of REDD Activities under the USAID Mexico Competitiveness Program

Vanegas, L.L., 2009. Consecuencias sociales del cambio climático en México – Análisis y propuestas.

World Bank, 2010. Low Carbon Development for Mexico (MEDEC).

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.usaid.gov