



# **Methane to Markets Mexico**

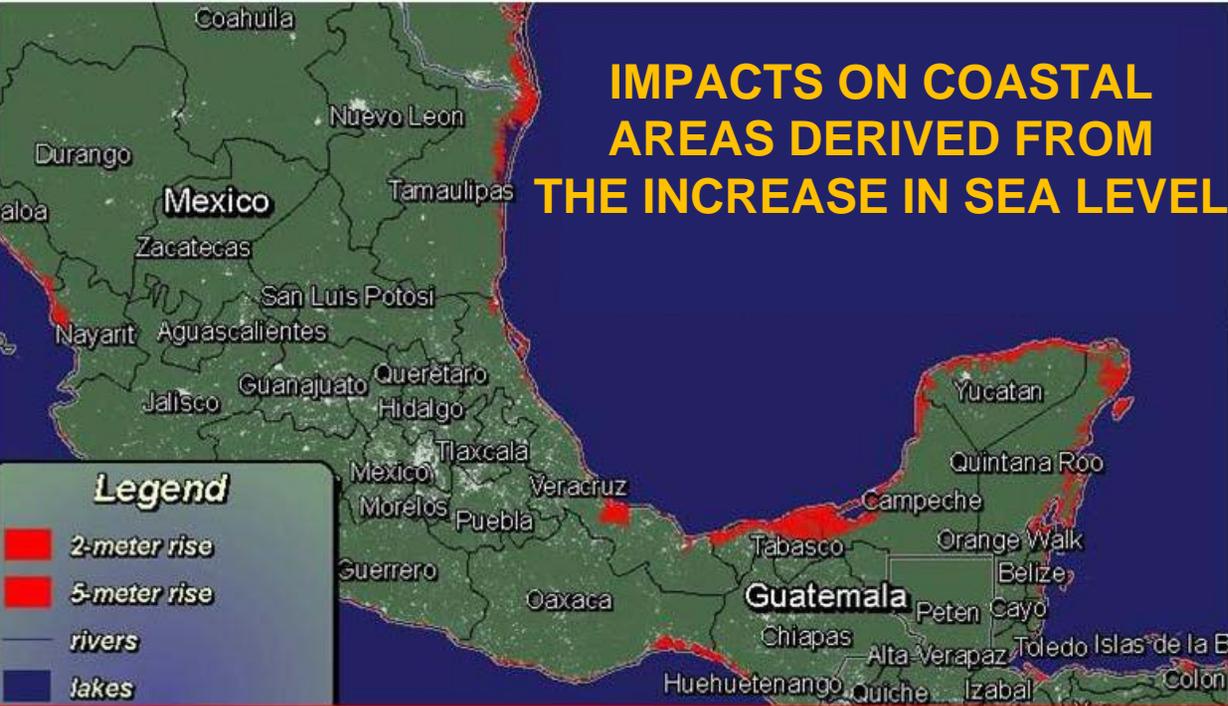
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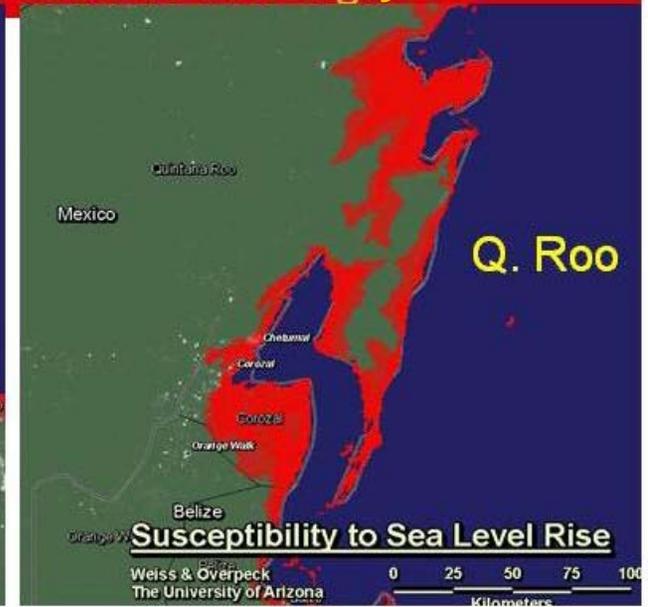
# Potential impacts of Climate Change in Mexico

- Mexico is considered the fourth mayor bio-diverse country in the world.
- Highly vulnerable to the effects of climate change:
  - Temperature of the sea surface in Caribbean Sea, Gulf of Mexico and Pacific Ocean could rise between 1 and 2°C, accordingly
  - The number and strength of severe storms and hurricanes could increase dramatically,
  - Draught periods could be longer and more extreme,
  - Possible increase in the number of forest fires,
  - Grasslands, semi-desertic vegetation, woodlands and forests could be severely damaged, deriving in the
  - Modification and loss of habitats as well as extinction of wild flora and fauna.



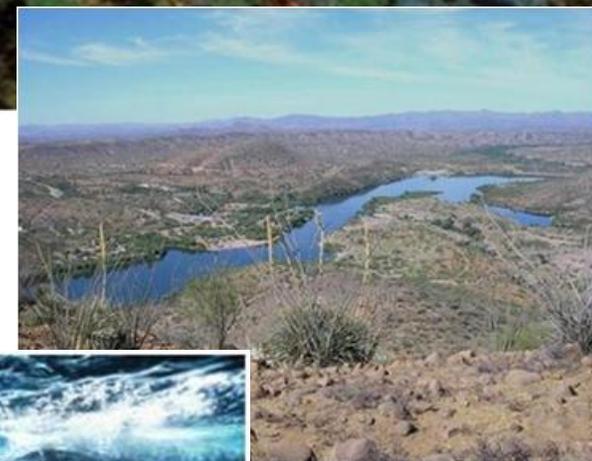


**Increase in sea level from 2 to 5 meters in different coastal areas of Mexico  
Forecast: Increase of 40 cm from now to the end of this century.**



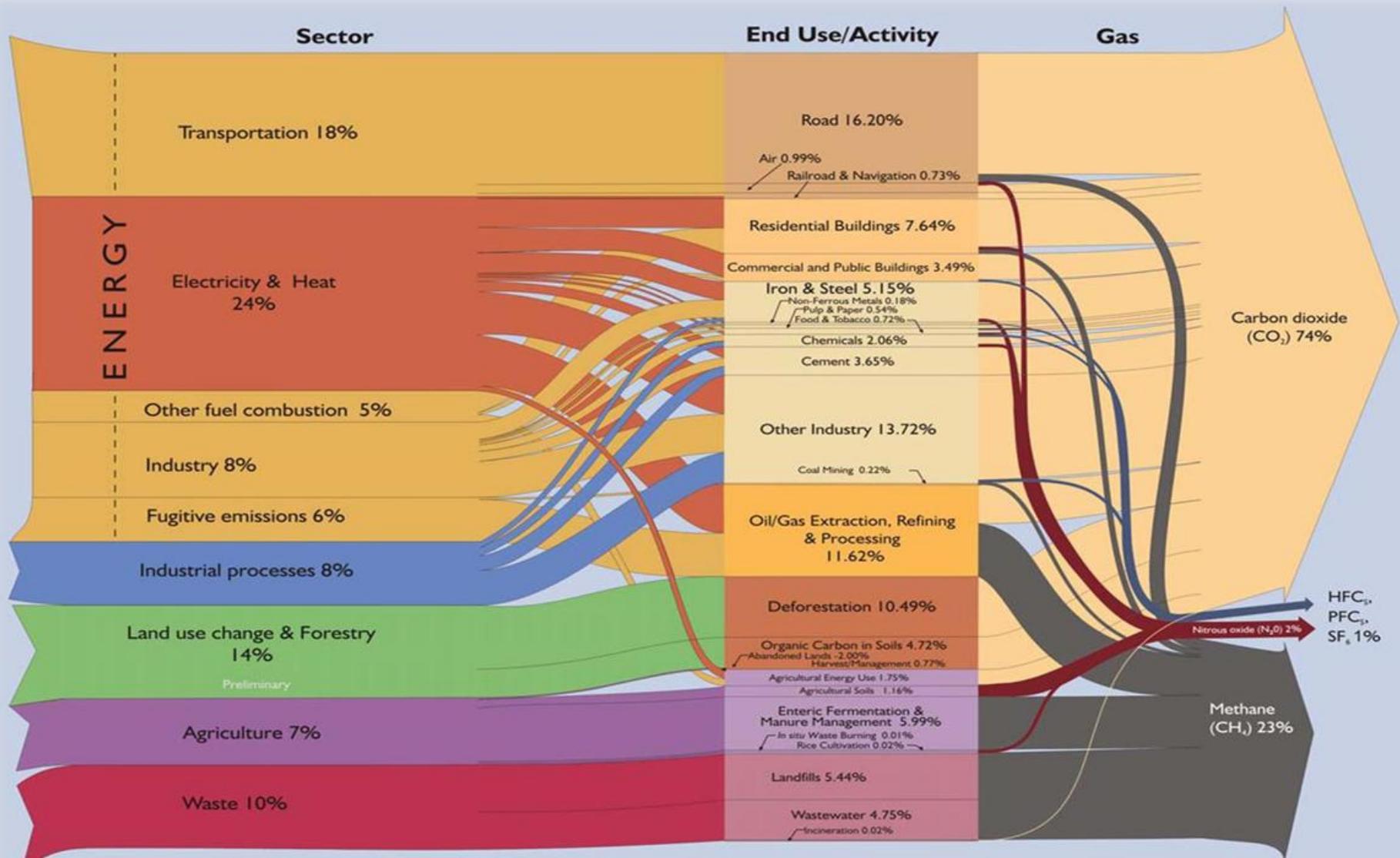
# Current effects

- Annual temperature in Mexico has risen almost  $0.5^{\circ}\text{C}$  in the last 100 years.
- This increase in temperature has derived in the increase of:
  - Heat waves,
  - Severe draughts,
  - Water scarcity in some areas,
  - Floods in low areas,
  - Forest fires,
  - More severe hurricanes,
  - Increase in sea level in low coastal areas, and
  - Glaciers melting





# Green-House Gas Emissions in Mexico



Data from 2002: 643'183,000 tons of CO<sub>2</sub>e

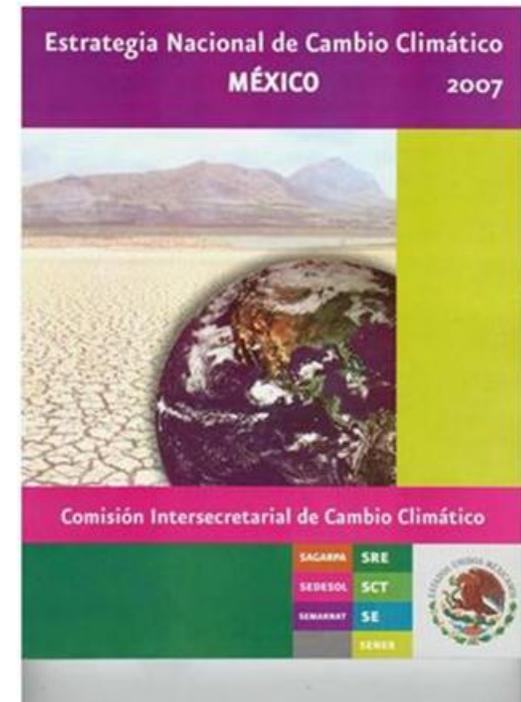
# National Strategy for Climate Change

SEMARNAT



SECRETARÍA DE  
MEDIO AMBIENTE Y  
RECURSOS NATURALES

- In 2007, the Mexican Government presented the National Strategy on Climate Change (NSCC), which identifies:
  - Specific measures for mitigation,
  - Estimates Mexico's potential for emission reduction,
  - Proposes a suite of research objectives as a tool for laying out more precise mitigation targets, and
  - Outlines national requirements for capacity building for adaptation to the effects of climate change.



# National Strategy for Climate Change

- **The National Strategy also contributes to:**
  - **Identify opportunities for mitigation measures and emission reduction,**
  - **Acknowledges the vulnerability to climate change of diverse economic and social sectors and regions, and proposes measures to develop the necessary national and local-level capacity for response and adaptation, and**
  - **Contributes to develop strategies, set priorities and implement policies for the Special Programme on Climate Change, which will be presented in February 2009.**



# Mexico's participation in M2M

- Mexico takes part in the partnership since 2005, as a mean to participate in in the worldwide efforts to mitigate green-house gases emission and climate change.
- Mexico saw the possibility to implement projects addressed to recover and use of methane as a valuable source of clean energy, to advance in guarantying energy security, improve environmental quality and reduce greenhouse gas emissions.
- In this context, in 2006, SEMARNAT, USAID and EPA established a programme to implement a series of projects to:
  - Capture methane emissions produced by inefficient agricultural and industrial processes and practices, and
  - Use captured methane as a renewable source of clean energy.

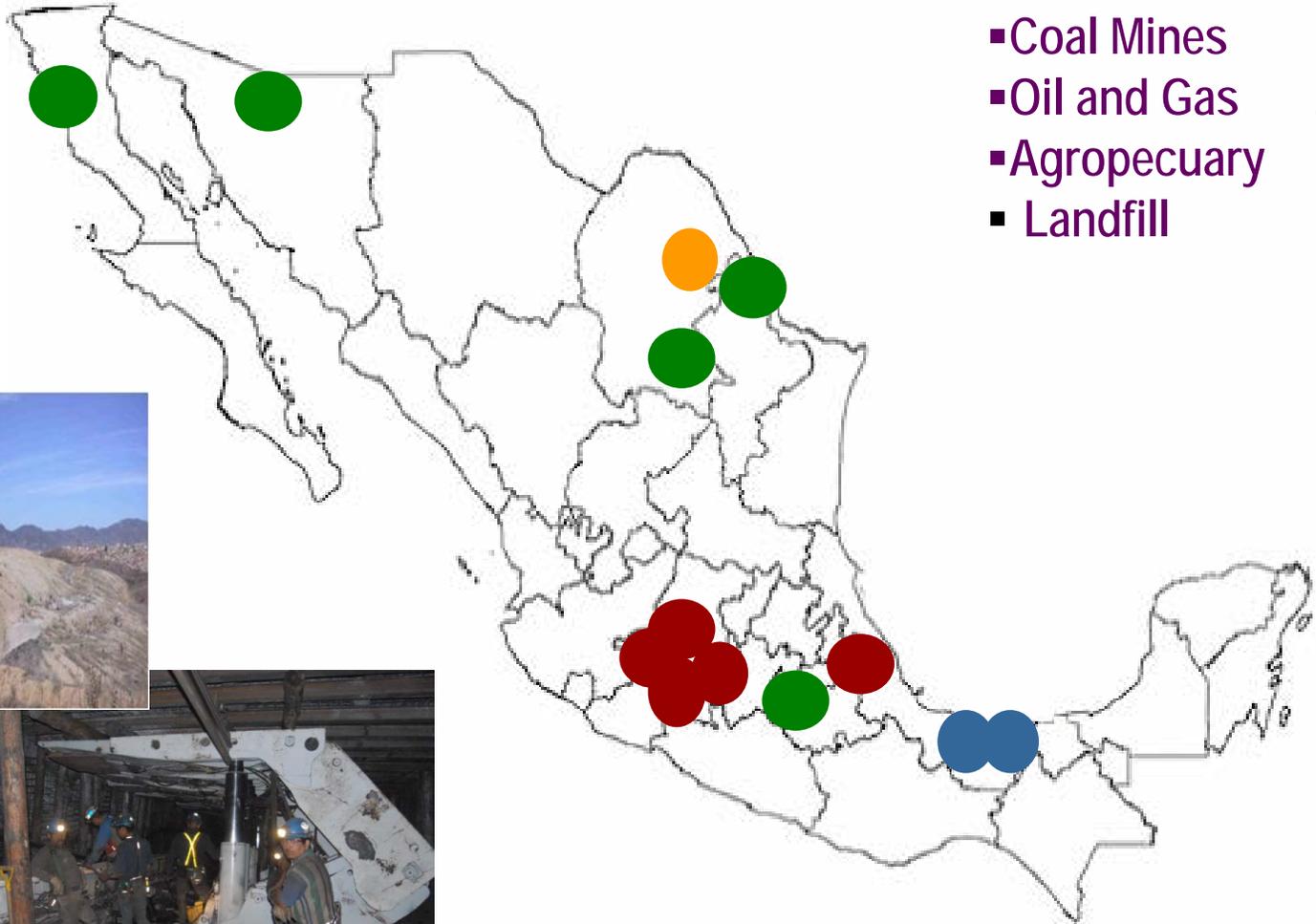


# M2M objectives in Mexico

- Stimulate economic growth by promoting international collaboration to develop regional and local capacities,
  - Guaranty energy supply,
  - Develop technical schemes for cost effective projects for methane recovery and use,
  - Promote participation of governmental, private, multilateral agencies and other interested sectors in project development and implementation,
  - Improve local air quality
  - Reduce green-house gas emissions
  - Mitigate Climate Change
- 
- The Methane to Markets Programme is now an important element in the Mexico's Special Programme for Climate Change.



# M2M projects in Mexico



# Coal Mines Subcommittee



- **Main coal producers in Mexico are located in the northern State of Coahuila, mainly on the Sabinas and Rosita basin, with 7 mines:**
  - **Minera Carbonífera Río Escondido (MICARE, thermal coal)**
  - **Minerales Monclova (MIMOSA, metallurgical coal)**
  
- **More than 55% of the total reserves of these two companies together account for nearly 86% of Mexico's coal production.**

<b>Estimated emissions recovered and used by the proposed project</b>	<ul style="list-style-type: none"><li>• <b>56.1 million cubic meters of methane per year for the life of the project (7 years)</b></li><li>• <b>392.7 million cubic meters of methane total</b></li></ul>
	<ul style="list-style-type: none"><li>• <b>606,630 Tons CO<sub>2</sub>e per year for the life of the project (7 years)</b></li><li>• <b>4'246,411 Tons CO<sub>2</sub>e total</b></li></ul>

# Oil and Gas Subcommittee ...

- **It is estimated that Mexico's natural gas systems will emit approx. 64.0 million Tons CO<sub>2</sub>e by 2010 and rise to 111.4 million Tons CO<sub>2</sub>e by 2020.**
  
- **PEMEX has completed the following activities:**
  - **Preliminary analyses of methane emissions in its subsidiary PEMEX Gas and Basic Petro-chemistry.**
  - **Baseline measurements in gas compressors of the Ciudad PEMEX gas processing complex.**
  - **Identified and quantified fugitive emissions in the Cactus, Ciudad PEMEX, and Nuevo PEMEX gas processing complexes.**
  - **Replacement of “wet seals” in gas compressors.**
  - **Pipeline surface leak reduction from valves and joints.**
  
- **Emission reductions estimated by the implementation of these projects account for 34,930 Ton CO<sub>2</sub>e/year.**

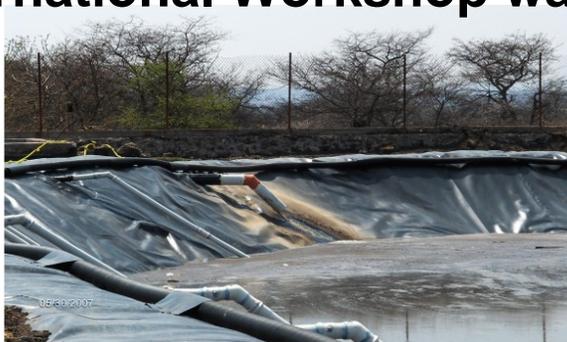
# Oil and Gas Subcommittee

- Ongoing and planned activities
  - Measurement of methane emission reductions due to the replacement of “wet seals” in 43 additional gas compressors with an estimate reduction of 250,000 – 350,000 **Ton CO<sub>2</sub>e/year**,
  - Fugitive emissions measurements in complexes and gas pipelines,
  - Capacity building for implementation of Fugitive Emissions Reduction Programmes in PEMEX Gas,
  - Measurement of methane vapors emissions in crude oil tanks and separation batteries,
  - PEMEX methane emissions inventory,
  - Implementation of an Energy Efficiency Approach to Reduce Methane Emissions.



# Agriculture Subcommittee ...

- Under the M2M Initiative, Mexico launched a pilot program called: "Integrated Manure Management and Methane Recovery and Use in the Lerma-Chapala Basin".
- It consists on a four lagoon-type anaerobic bio-digester pilot project and one module-type biodigester with a Total Emission Reduction Potential of 1,372 Tons of CO<sub>2</sub>e/year.
- A first practical/theoretical workshop on bio-digester design and operation for swine manure treatment and methane recovery was held in May 2007.
- On April this year, the Agriculture Subcommittee Meeting and an international Workshop was held in Morelia.



- There is an important reduction potential in Mexico

## Swine Production

- Biogas production is nearly 4,100 million of m<sup>3</sup>/year.
- Reduction potential is 36.6 million Ton CO<sub>2</sub>e/year.

## Dairy Production

- Biogas production is over 264.5 million of m<sup>3</sup>/year.
- Reduction potential is 2.4 million Ton CO<sub>2</sub>e/year.

- There are 143 methane recovery and use projects in swine and dairy farms participating in different stages of the CDM Programme with a reduction potential of 3,490 million ton CO<sub>2</sub>e/year.



- **Together with the participation of local governments, there have been developed 5 prefeasibility studies in the landfills of Ensenada, Nuevo Laredo (already finished), Nogales, Saltillo and Cuautla (in process).**
  
- **The Total Emission Reduction Potential of these projects is 281,000 Tons CO<sub>2</sub>e/year**
  
- **Actions needed to increase methane recovery and use:**
  - **Creation of legal, socio-economic and administrative conditions to develop and implement landfill gas recovery projects,**
  - **Promotion of public and private investment addressed to biogas recovery and its use for energy production,**
  - **Support to local authorities to set in place a structured rate for waste collection in order to provide reliability and a financial autonomy for efficient operation of the waste management system.**

# Landfill Subcommittee

- According to a World Bank and SEDESOL study, there are at least 85 potential landfill sites for biogas recovery and use, with a potential of 31 million Tons CO<sub>2</sub>e.
- The top ranked sites include: Cd. Juarez, Chihuahua, Tijuana, Leon, Aguascalientes, Puebla, Nuevo Laredo, Querétaro, Naucalpan Tlalnepantla, Mexico City, Guadalajara, Cuautitlan, Puerto Vallarta, Monterrey, Atizapan, Zapopan, Cuernavaca and Cautla.
- Out of these sites, only Leon and Aguascalientes have methane recovery and combustion systems, and
- Only Monterrey generates electricity from methane recovery.



# Following steps in M2M



- Development of local capacities, though capacity building workshops addressed to local governments, potential investors, farmers, mining industry and developers.
- Replication of pilot projects developed under the M2M Initiative.
- Promotion of the recovery and use of methane as source of clean and cheap energy.
- Reach the interest of national and international financiers and developers.
- Development of a set of best practices and implementation guides for project development and implementation.
- Promote the implementation of a larger number of projects in the different areas of the Initiative.



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