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Methane to Markets Mexico

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**MINISTRY OF ENVIRONMENT
AND NATURAL RESOURCES**

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Mexico in numbers

- Mexico is considered the fourth major bio-diverse country in the world.
- Climate goes from arid zones to cold alpine climates, with humid tropical forest and other ecosystems.
- Is bounded to the west and south by the Pacific Ocean, to the east by the Gulf of Mexico, and to the southeast by the Caribbean Sea.
- 476 km³ of water available per year.
- Mexico's population reaches 105 million inhabitants
- From 1910 to 1970, the quantity of water available dropped off from 31,000 to 10,000 m³/inhabitant/year
- Annual temperature in Mexico has risen almost 0.5°C in the last 100 years.



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Potential impacts of C. C. in Mexico



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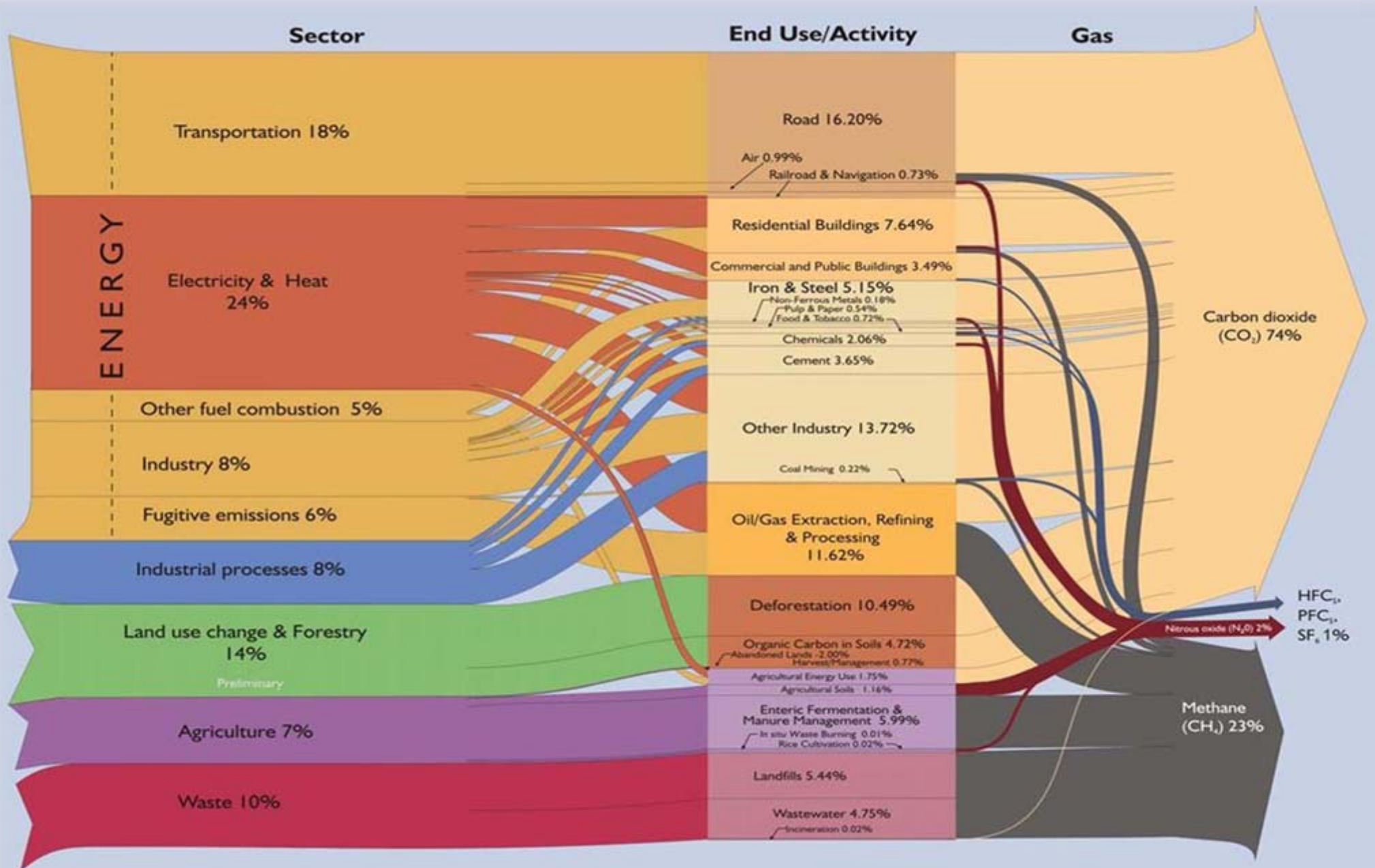
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- **Highly vulnerable to the effects of climate change:**
 - **Temperature of the sea surface in Caribbean Sea, Gulf of Mexico and Pacific Ocean could rise between 1 and 2° C,**
 - **The number and strength of severe storms and hurricanes could increase dramatically,**
 - **Floods in low areas more frequently**
 - **Draught periods could be longer and more extreme,**
 - **Possible increase in the number of forest fires,**
 - **Glaciers would melt**
 - **Grasslands, semi-desertic vegetation, woodlands and forests could be severely damaged**
 - **Modification and loss of habitats as well as extinction of wild flora and fauna.**



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Green-House Gas Emissions in Mexico



National Strategy for Climate Change



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- **Environmental issues and Climate Change: priority for President Felipe Calderon's administration**
- **2007, Mexican Government presented the National Strategy on Climate Change (NSCC), identifying:**
 - **Specific measures for mitigation,**
 - **Mexico's potential for emission reduction,**
 - **Research objectives for laying out more precise mitigation targets, and**
 - **National requirements for capacity building for adaptation to the effects of climate change.**



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Mexico's participation in M2M

- Part of a set of actions to participate in worldwide efforts to mitigate green-house gas emissions and climate change,
- 2006, SEMARNAT, USAID and EPA established the programme as a mean to implement projects to:
 - Capture methane emissions produced by agricultural and industrial processes and practices, and
 - Use captured methane as a renewable source of clean energy.



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M2M objectives in Mexico

- **Mexico takes part in the partnership since 2005 in order to:**
 - **Stimulate economic growth by developing regional and local capacities,**
 - **Develop new sources of energy,**
 - **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**



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M2M projects in Mexico



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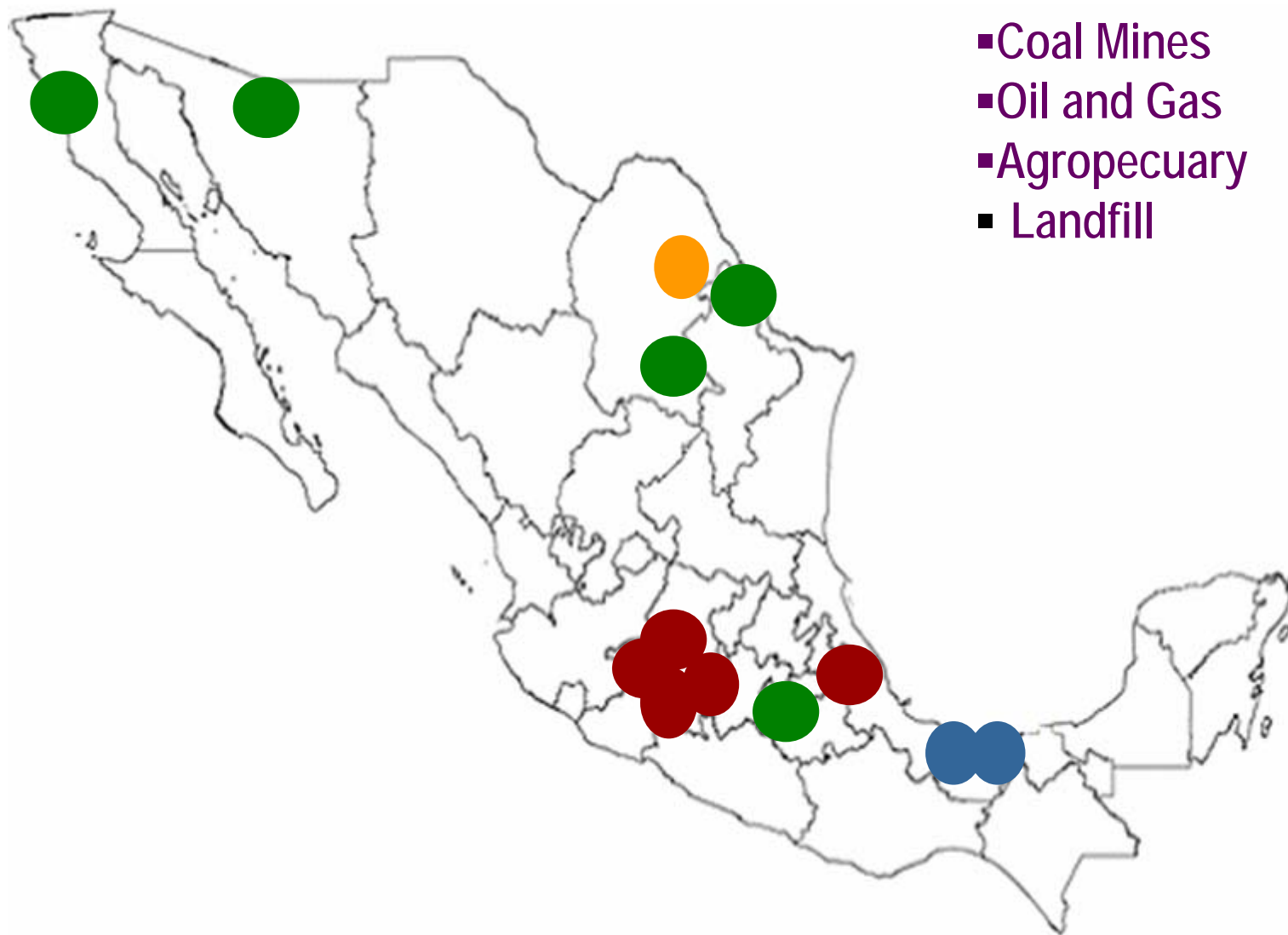
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Coal Mines Subcommittee



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- Main coal production in Mexico is located in the northern State of Coahuila, mainly on the Sabinas and Rosita basin:
 - 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.

Estimated emissions recovered and used by proposed project

- 56.1 million cubic meters of methane per year for the life of the project (7 years)
- 392.7 million cubic meters of methane total
- 606,630 Tons CO₂e per year for the life of the project (7 years)
- 4'246,411 Tons CO₂e total



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Oil and gas subcommittee...



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- Mexico's natural gas emissions are estimated in approx. 64 million Tons CO₂e by 2010 and 111 million Tons CO₂e by 2020.
- PEMEX has completed the following activities:
 - Preliminary analyses of methane emissions in 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 implementation of these projects account for nearly 35,000 Ton CO₂e/year.



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Oil and gas

▪ Ongoing and future activities

- Measurement of emission reductions from the replacement of “wet seals” in gas compressors with estimate reduction of 250,000 – 350,000 Ton CO₂e/year,
- Fugitive emissions measurements in complexes and gas pipelines,
- Capacity building for implementation of Fugitive Emissions Reduction Programmes,
- 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.



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Agricultural subcommittee ...



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- **Pilot program: "Integrated Manure Management and Methane Recovery and Use in the Lerma-Chapala Basin",**
- **Four lagoon-type anaerobic bio-digester pilot project,**
- **One module-type biodigester with a Total Emission Reduction Potential of 1,372 Tons of CO₂e/year.**
- **First practical/theoretical workshop on bio-digester design and operation for swine manure treatment and methane recovery in May 2007.**
- **April 2008, Agriculture Subcommittee Meeting and an international Workshop in Morelia.**



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Agricultural subcommittee



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- Important reduction potential in Mexico

Swine Production

Dairy Production

- Biogas production: nearly 4,100 million of m³/year.
- Reduction potential: 36.6 million Ton CO₂e/year.

- Biogas production: over 264.5 million of m³/year.
- Reduction potential: 2.4 million Ton CO₂e/year.

- 143 methane recovery and use projects in swine and dairy farms in different stages of the CDM Programme,
- Reduction potential of nearly 3,500 million ton CO₂e/year.



Landfill subcommittee ...

- 5 prefeasibility studies in Ensenada, Nuevo Laredo (already finished), Nogales, Saltillo and Cuautla (in process),
- Participation of local governments,
- Total Emission Reduction Potential of 281,000 Tons CO₂e/year
- Actions needed to increase methane recovery and use:
 - Creation of legal, socio-economic and administrative conditions to develop and implement gas recovery projects,
 - Promotion of public and private investment for biogas recovery and use for energy production,
 - Support local authorities to set structured rates for waste management,
 - Promote financial autonomy for efficient operation of waste management systems.



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Landfill subcommittee

- At least 85 potential landfill sites for biogas recovery,
- 31 million Tons CO₂e potential,
- Major sites include: Cd. Juarez, Chihuahua, Tijuana, Leon, Aguascalientes, Puebla, Nuevo Laredo, Querétaro, Naucalpan, Tlalnepantla, Mexico City, Guadalajara, Cuautitlan, Puerto Vallarta, Atizapan, Zapopan, Cuernavaca, Cuautla and Monterrey.
- Only Leon and Aguascalientes have methane recovery and combustion systems, and
- Only Monterrey generates electricity from methane recovery.



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Next steps in M2M

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



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