

“ Integrating the Energy Markets in North America: Issues and Problems, Terms and Conditions”

Mexico’s Energy Policy

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The North American Energy Sector



Topics to be covered:

- I.- Importance of Energy for the North American Region**
- II.- Areas of Tri-National Collaboration (NAEWG)**
- III.- Outlook of the Mexican Energy Sector: Challenges and Policies**

I.- Importance of Energy for the North American Region

Importance of Energy for the whole region



- ❑ North America accounts for **7%** of the world's population, and generates one third of the world's economic output.
- ❑ North America produces nearly **25%** of the world's energy supply and consumes about **30%**.
- ❑ Energy is a fundamental element for economic and social development for the three countries.

North America in the Global Energy Economy



North America accounts for a large share of world energy supply and demand.

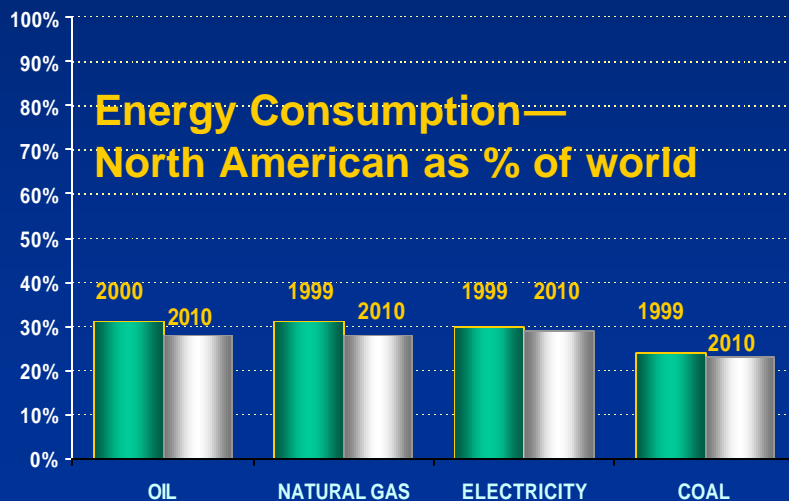
Demand:

- North America's share include: **31%** of the world oil demand, **31%** of natural gas, **24%** of coal and **30%** of electricity.

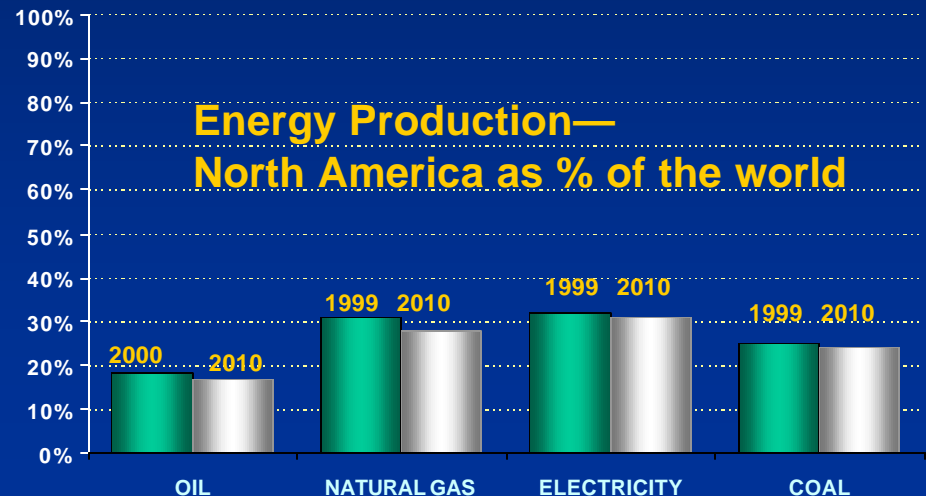
Supply:

- North America accounted in 2000 for around **19%** of the world's oil production, **31%** of natural gas production, **25%** of coal output and **32%** of electricity generation.

**Energy Consumption—
North American as % of world**



**Energy Production—
North America as % of the world**



Oil Reserves



North America, at the end of 2000, had 50 billion barrels of crude oil in proven conventional reserves.

- North America is an important region for the world oil markets. It encompasses approximately 20% of world oil production in 1999 and 31% of world oil demand.
- Currently, oil and gas projects are accelerated in the region.
- In 2002 Mexico's production is expected to reach 2.8 million barrels per day and this year it will increase to reach 3.0 million barrels per day.

Oil Crude

Proven reserves of conventional crude oil 2000 Total: 50 billion barrels

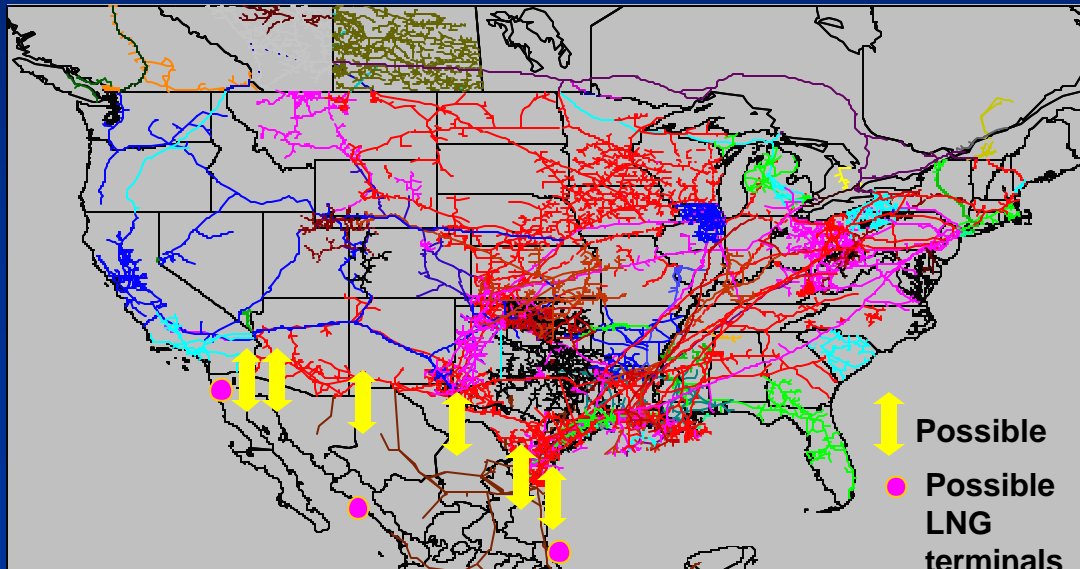


Natural Gas

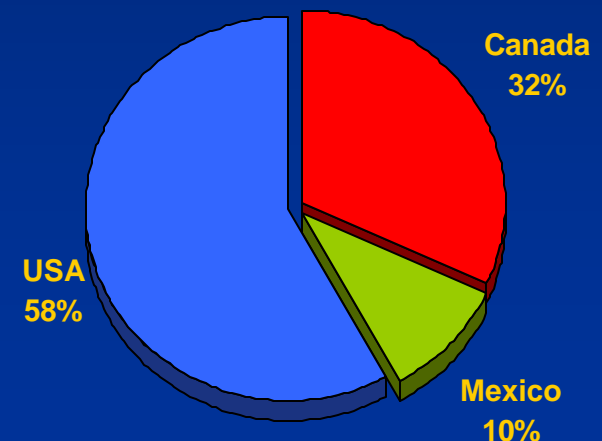


The economic growth in North America is increasingly dependent on a reliable supply of natural gas.

- ❑ In 2000, North America's natural gas consumption reached **75 billion** cubic feet per day, **one third** of global demand, with a regional deficit of **1 BCF**.
- ❑ The three countries are planning to expand their pipeline infrastructure to take advantage of the relative abundance of the supply sources of the region.
- ❑ The growing demand of natural gas is moving the industry to develop more infrastructure and to diversify the sources of external supply.



Natural Gas proved reserves 2000
Total: 289 trillion cubic feet



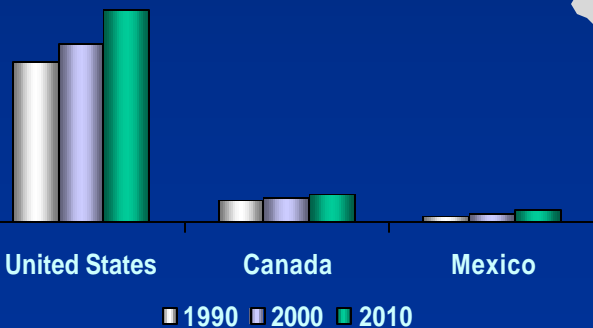
Power Generation



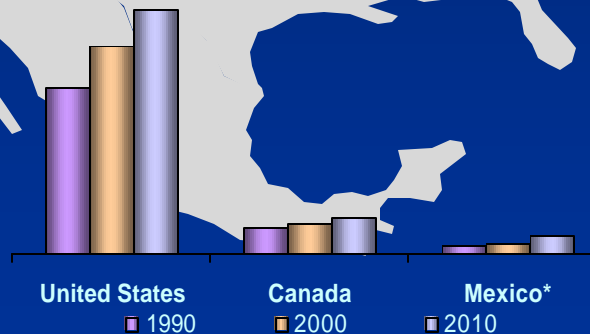
North America generated 4550 terawatt-hours in 2000, 14% of which came from power plants that use natural gas as a fuel.

- ❑ In order to cope with increasing demand, new investments are required to increase generation in the three countries as well as to expand and modernize transmission.
- ❑ Border interconnections between Mexico and the USA are very limited for a robust energy market.
- ❑ Gas-fired power plants have declined in the past few years, due to high prices of natural gas, the shift to combined cycle plants and to environmental concerns over nitrogen oxides.

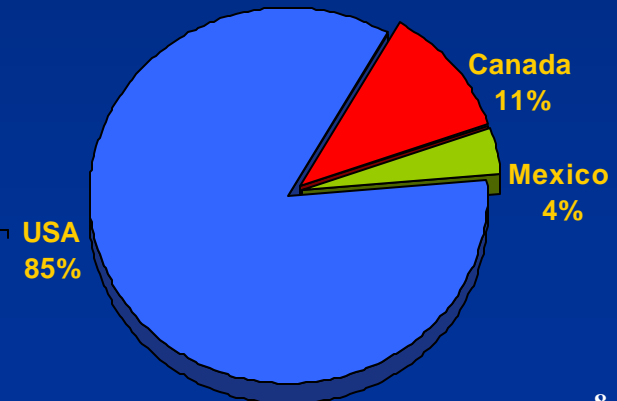
Electricity Generation Capacity (GW)



Electricity Generation (TWh)



Electric Power generation capacity 2000
Total: 967 Gigawatts



Fuente: North America, the Energy Picture.

Subsecretaría de Hidrocarburos

20/10/03

Towards a Sustainable Development Agenda for North America



- ❑ The three countries share their commitment to develop industrial policies
- ❑ Reduction of greenhouse gas emissions and contaminants in energy processes is a priority for a sustainable development
- ❑ From an environmental point of view, North America is one region, and we must take into account the impact of emissions affecting border regions and the continent.

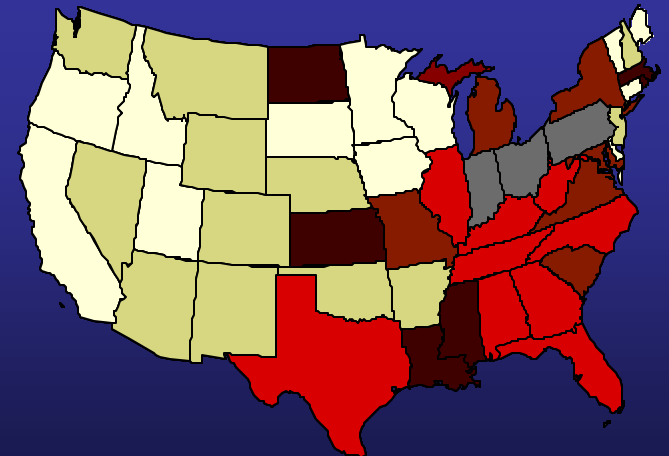
SO₂ and NO_x emissions (2000)



Thousand ton SO₂/year



1.7 million tons SO₂



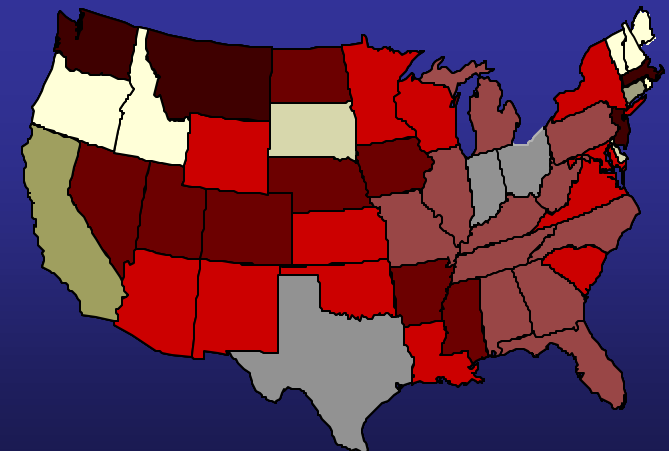
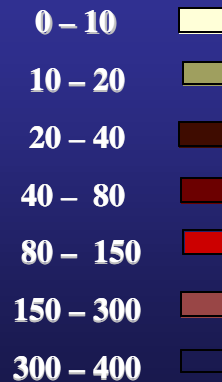
11.2 million tons SO₂

x6.5

Thousand ton NO_x /year



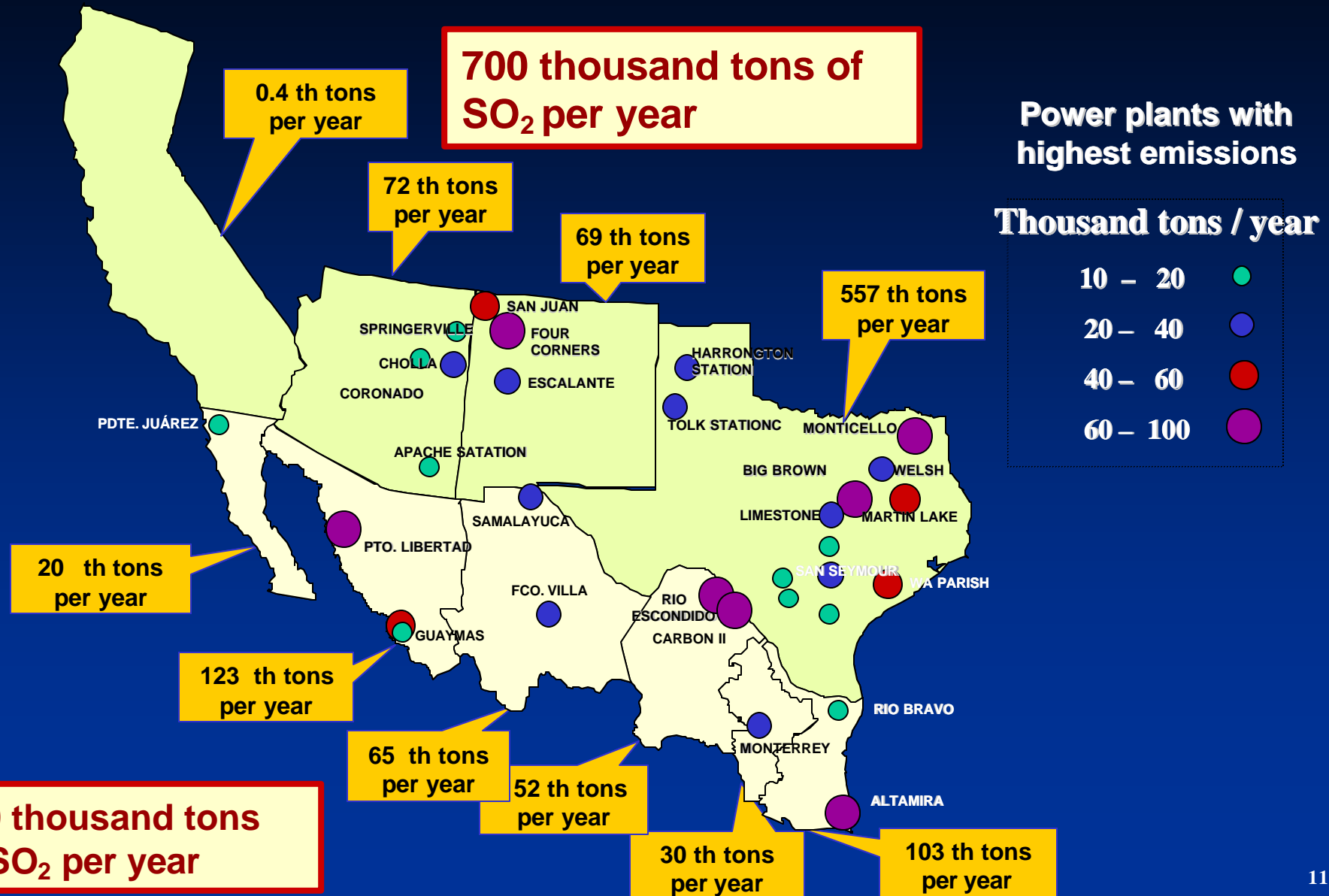
0.28 million tons NO_x



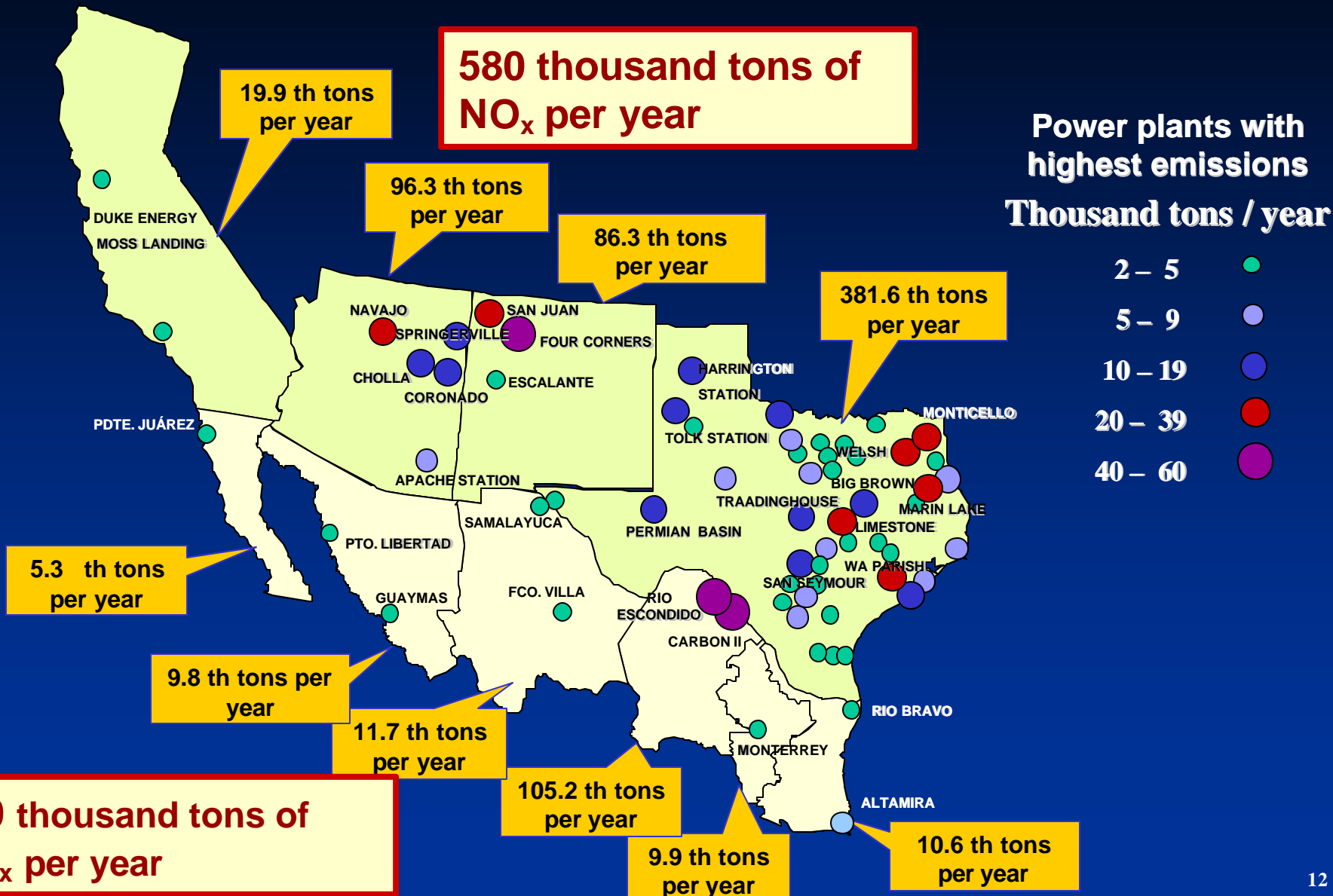
5.1 million tons NO_x

x18

SO₂ emissions on US-Mexico border (2000)



NO_x emissions on US-Mexico border (2000)



The North American Energy Sector



- ❑ Energy policies in the region must contemplate North America as one region in terms of energy supply and demand, trade, security and environment.
- ❑ However, in order to advance in the discussions about regional energy integration, there must be a convergence of interests in the three countries and a recognition of our mutual challenges and opportunities.

What are we doing to address these common challenges and opportunities?

II.- Areas of Collaboration

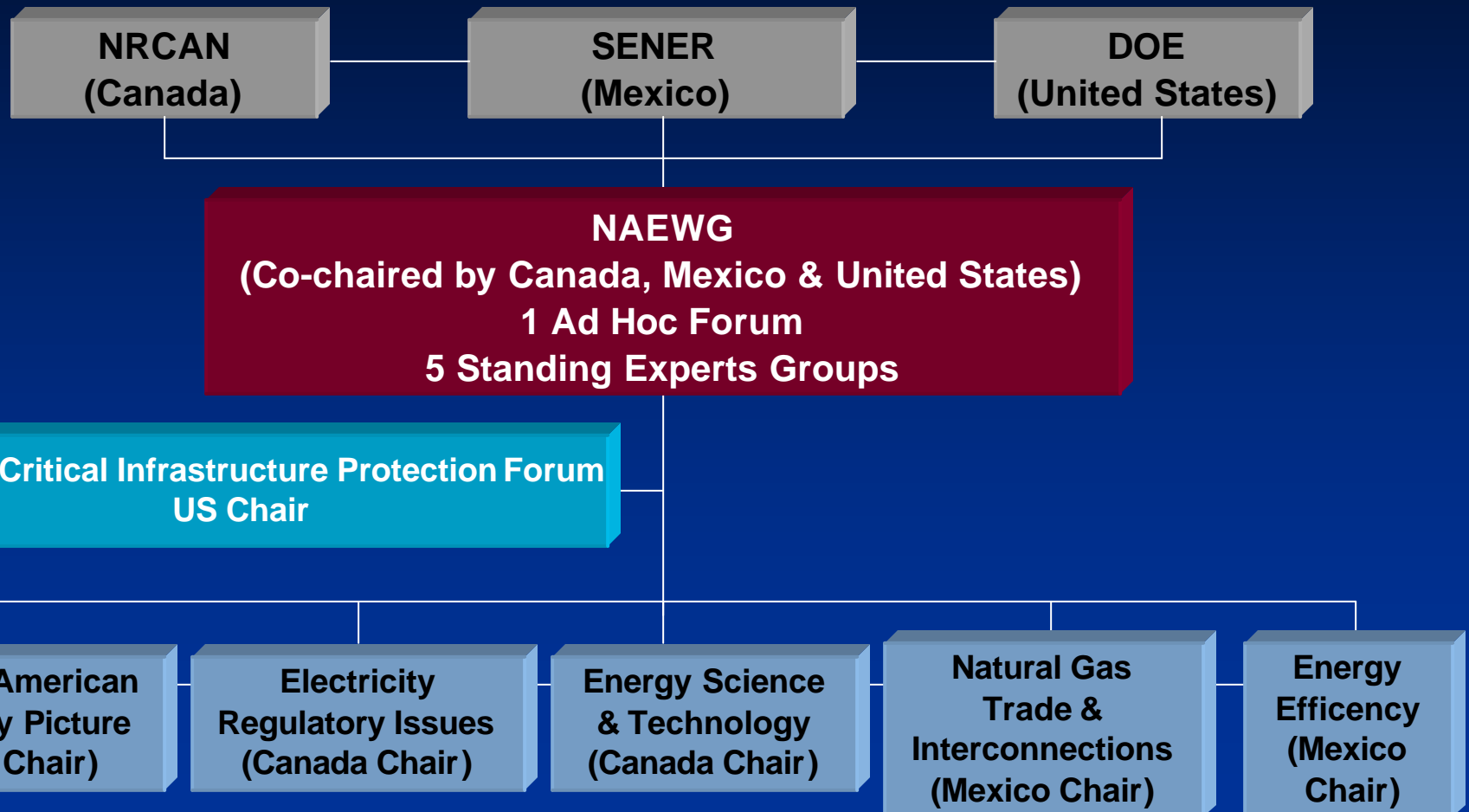
- ❑ Given the interest of the three national leaders, the Energy Ministers of the three countries agreed to explore areas of cooperation in specific energy matters .

- ❑ As a first step, the heads of delegation of the **North America Energy Working Group (NAEWG)** agreed to create six groups of experts that are working on the following areas:
 1. *A joint energy report on the outlook for North America (Energy Picture)*
 2. *Electricity regulation*
 3. *Energy Science and Technology*
 4. *Natural Gas Trade and Interconnections*
 5. *Critical infrastructure in natural gas and electricity*
 6. *Energy efficiency standards*

Trilateral Working Group Organization



- The structure of the North American Energy Working Group (NAEWG) is as follows:



Energy Picture Experts Group



- ❑ The **North American Energy Picture Experts Group** was formed at the inaugural meeting of the NAEWG in June 2001.
- ❑ Its main objective is to provide an overview of North American energy.
- ❑ This is done by cooperating to produce a summary of the region's economy, energy supply and demand, existing infrastructure and projections of energy supply and demand.
- ❑ A public report was published in June 2002, titled "**North America, the Energy Picture**", which presents a compilation of policy, regulatory and statistical information provided by each nation.
- ❑ The Group agreed to produce this document on a regular basis, with the next report to be published in June 2004.
- ❑ Currently the group is working on the implementation of the SAGE model in order to use the same modeling methodology for long term forecasting.

Electricity Experts Group



- ❑ The **Experts Group on Electricity Regulatory Issues** has as main goal to foster cooperation among the three governments to ensure a reliable North American electricity grid system, while respecting the role and authority of each country.
- ❑ In December 2002 the Group issued a report named **“North America- Regulation of International Electricity Trade”**
- ❑ The report presents an overview of federal regulations with respect to construction and operation of international powerlines and electricity exports and imports.
- ❑ The Group has regularly held conference calls & meetings to exchange views and share their developments.
- ❑ The latest activities include, among others, completion of an **inventory of cross border interconnections.**

Energy Science and Technology Experts Group



- ❑ The purpose of the **Science and Technology (S&T) Experts Group** is to identify areas of mutual interest of the work that the three countries are doing in S&T.
- ❑ Within the Group, a Joint Steering Committee (JSC) has been formed, several strategic areas of interest have been defined, and specific projects within those areas are being initiated.
- ❑ A cooperation agreement will be signed by the three countries by the end of the year.
- ❑ The JSC focuses as well on possible funding mechanisms.

Energy Science and Technology Experts Group



- ❑ Within the (S&T) Experts Group some of the issues undertaken are:
 - Renewable energies
 - Energy efficiency in buildings
 - Energy efficiency in industry
 - Fossil fuels
 - Electricity R&D
- ❑ The energy Efficiency in Buildings Group developed an investigation project called “La Casa Nueva, An affordable Eco Housing Challenge” which is a showcase for energy efficient and renewable housing technologies.
- ❑ The Fossil Fuels Group has identified 5 priority areas for cooperation, including combustion, pipeline security and integrity, enhanced oil recovery, deep water exploration and production technology, and ground water and soil remediation.

Natural Gas Trade & Interconnections Experts Group



- ❑ The **Natural Gas Experts Group** was created in December 2001.
- ❑ Its main goal is to ensure a well functioning, reliable and integrated North American system of natural gas.
- ❑ It is also in charge of identifying issues that need to be addressed for an optimally functioning market, such as regulatory structures, border interconnections, technical specifications, technology research and production incentives.
- ❑ The Group's first report will be a trilateral **“Vision for the North American Gas Market”**, to be released by December of this year.

- ❑ The purpose of the **Energy Efficiency Experts Group** is to investigate ways by which closer cooperation and harmonized action may be undertaken in the three nations' energy efficiency programs.
- ❑ It is also important to point out that the Group should ensure the effectiveness of those programs without incrementing their costs.
- ❑ Compliance with recognized standards and mandatory labeling programs is expected to lower the incremental costs of manufacturing and selling energy-using products.
- ❑ Mexico has already harmonize its standards for electric motors and refrigerators with those of the US and Canada.

Concluding remarks for North America



- ❑ There is a strong and fast growing demand for natural gas and electric power in the North American Region.
- ❑ Existing interconnections in the Mexican-US border are still marginal, particularly for electric power. There is a large potential to develop strong interconnections in order to secure supply and enhance energy trade
- ❑ Power grids have to be reinforced and their expansion should consider an important growth in international exchange.
- ❑ There is a need for better understanding of the different legal and commercial structures of each country.
- ❑ We must recognise the North American Region as a single environmental region
- ❑ A shared long term vision is essential to develop the region to its full potential.

III. Outlook of the Mexican Energy Sector: Challenges and Policies

Importance of the Energy Sector to the Mexican Economy



- ❑ Energy is one of the most important economic activities in Mexico and the main source of income for the Federal budget
 - Oil represents **17%** of **total exports** if maquila is not included.
 - Oil-related taxes account for **33%** of the **Federal Budget**.
 - If BLT's and IPP's are included, nearly **70%** of **public investment** is directed to energy projects
 - Public companies in the oil and power sectors give employment to about **250,000 workers**

Mexico's energy sector challenges:



- Our main challenges are to:
 - I. Guarantee energy supply to a country with one of the highest **growth rates in demand**
 - II. Meet **investment requirements** to adequately expand energy infrastructure
 - III. Carry out a **structural reform** to introduce higher efficiency and quality of service, and to **promote private participation**

Energy Demand Forecast 2002-2011



- During the next ten years, natural gas is projected to be the fastest growing energy fuel in Mexico, faster than electricity demand, one of the world's largest.

Average annual percent change

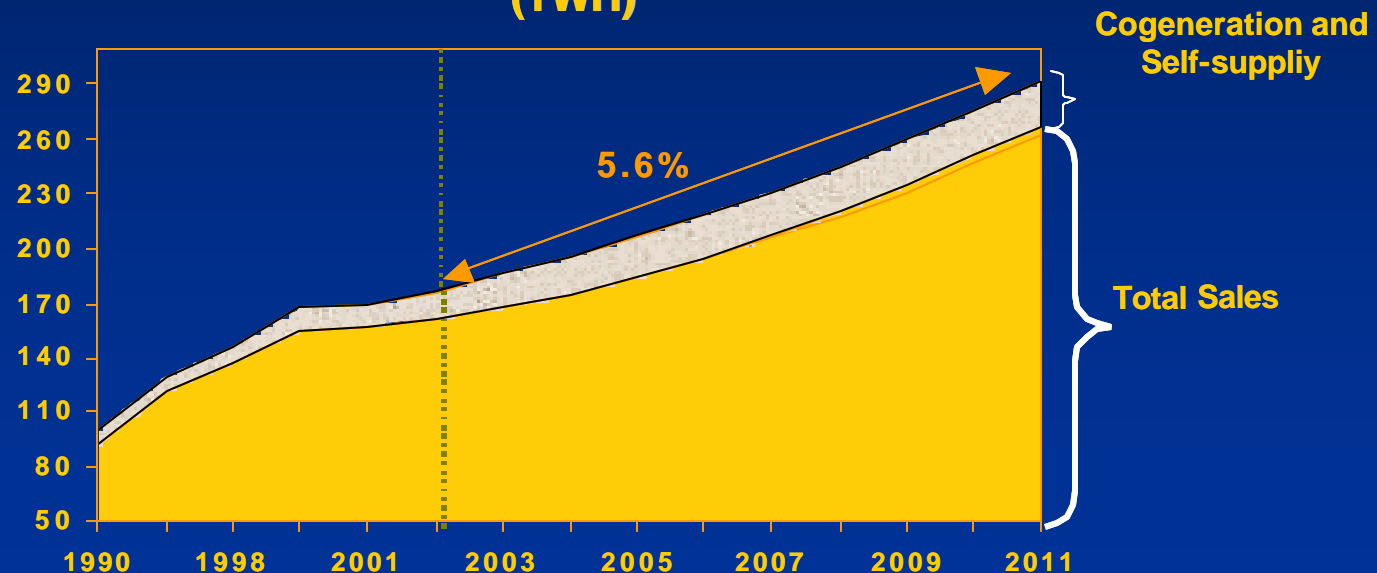


Power Energy Demand



- Demand for electric power will grow at an annual rate of **5.6%**, reaching **290 TWH** in 2011.
- In 2011, **61 new power plants** will have to be in operation in order to satisfy demand.
- Power generation capacity is growing rapidly with the use gas-fired technologies.

**National Power Demand 2001-2011
(TWH)**

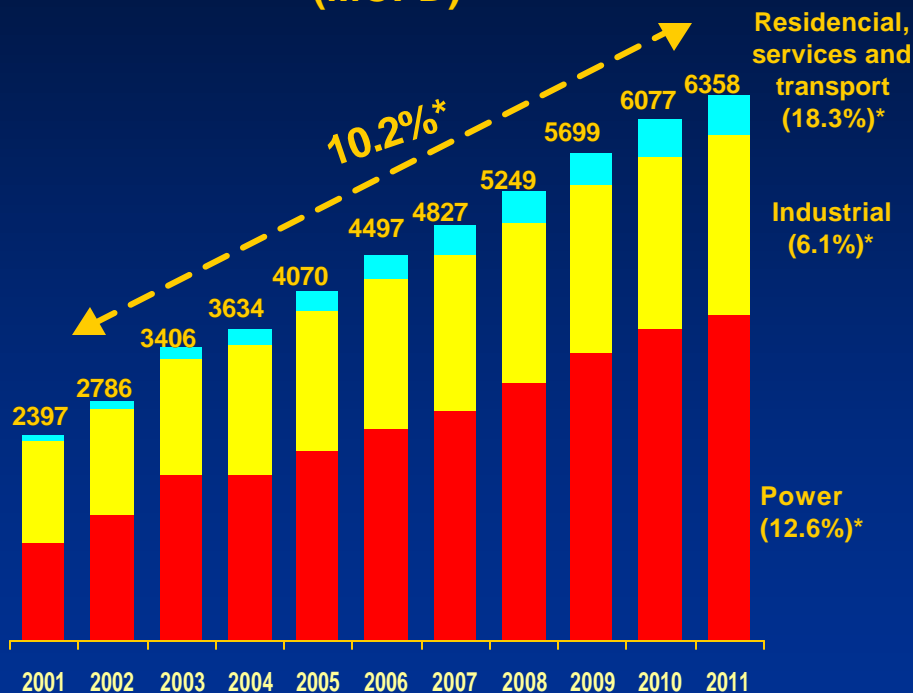


Fuente: Comisión Federal de Electricidad

National Demand for Natural Gas



Natural Gas Demand without Pemex self-consumption (MCFD)



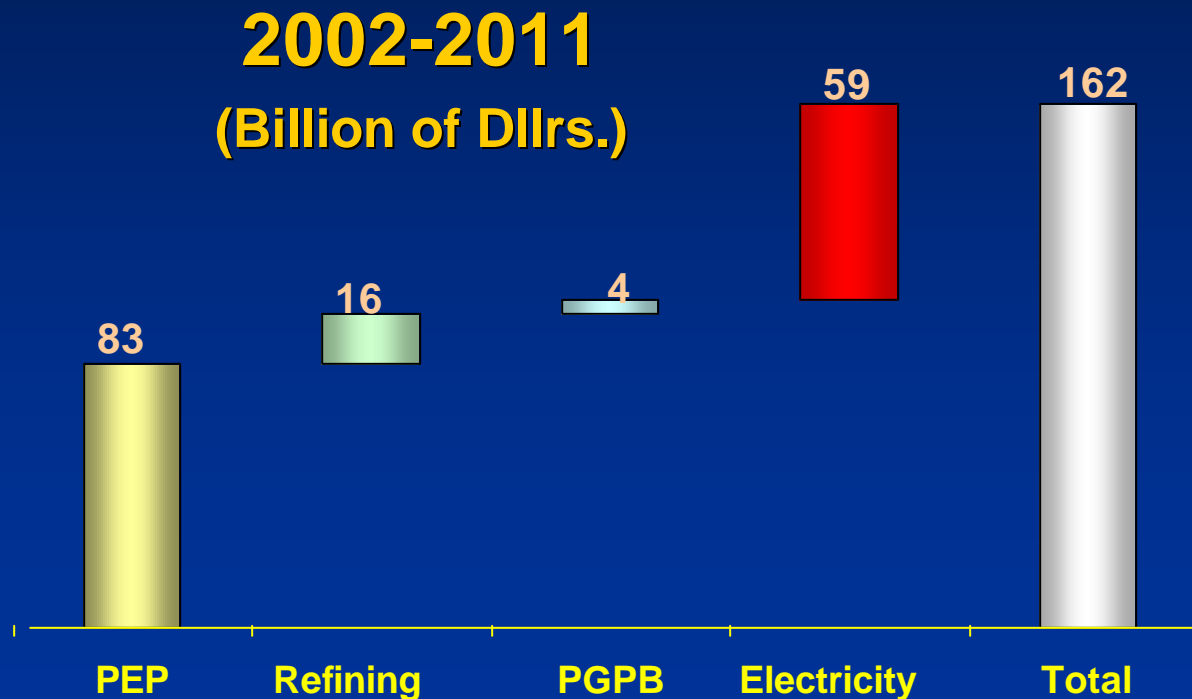
* Tasa media de crecimiento promedio anual 2001-2011.

- In the next 10 years, total demand of natural gas will increase from **4.8 bcf** to **9.2 bcf**.
- If we do not take into account Pemex internal consumption, national demand will grow at an average rate of **10.2% per year**.
- Demand for power generation will grow **12.6% per year**. By the end of the decade, this sector will constitute **60%** of the market for natural gas.

Future Investment Requirements in the Energy Sector



- During the next decade, more than **\$160 billion USD** will be required in the energy sector.
- Large part of the resources will be directed to maintain production capabilities and to boost production of non associated natural gas.



Investments commitments made by the current administration



- ❑ Under President Fox's administration, investments in the energy sector have **increased substantially**.
- ❑ The mechanism known as PIDIREGAS (IPP's and BLT's) has been the **main tool to finance** energy infrastructure projects.
- ❑ In the last years Mexican energy sector has been a **preferred** destination for foreign investors.
- ❑ Even though the new investment policies have produced **positive results**, additional reforms are needed to attract investment in order to develop the required infrastructure.

New investment schemes are required



- ❑ Based on the present schemes, it will not be possible to insure the investment requirements to meet the expected increase in power demand without compromising the financial standing of CFE.
- ❑ An **electric reform** is needed to:
 - Facilitate the financing of infrastructure expansion.
 - Grant CFE larger degree of autonomy.
 - Reduce CFE's fiscal load, so that it is similar to that of any private company.
 - Reduce the level of implicit subsidies, and to transfer the responsibility of subsidies to the federal budget.
 - Allow more private participation in power generation without government guaranties.

Objectives of the Legal Reform



The main objectives of the reform are:

- A reliable supply of power at competitive prices.
- A modern energy industry, capable of meeting increasing demand.
- Non-privatization of CFE and LFC. Both public utility companies will be modernized and granted a larger degree of autonomy.
- More participation in power generation from private and social sectors.
- More resources available to expand general access to electricity.

Key Elements of the Proposed Legal Reform



- ❑ Existing schemes for autogeneration, co-generation, small scale production and independent generation will remain unchanged.
- ❑ The legal reform would allow **self-consumers** (users whose consumption requirements are greater than **2,500 MW** hour per year) to buy directly from private generators.
- ❑ CFE would buy excess capacity from private generators when there is an advantage to the final consumer.
- ❑ The transmission grid and distribution lines would remain in the hands of the State. Although private generators and self-consumers will have non-discriminatory access to the grid.
- ❑ The National Dispatch Center will be transformed to guarantee transparency and fairness

Concluding remarks for Mexico



- ❑ The rapid rate of growth of the Mexican energy demand and the large investment required to expand energy infrastructure are our strongest challenges.
- ❑ This administration has made an effort to substantially increase the level of investments in the energy sector, and new strategies that secure supply have been implemented.
- ❑ Despite the positive results achieved so far, it will be **necessary to complement** this effort with new schemes of private participation. Towards this aim, a reform proposal for the power sector has been submitted to Congress.
- ❑ Large investments have been possible within the present legal framework but more opportunities will be opened if the reform is authorized.



**A COUNTRY WITH ENERGY IS A
COUNTRY WITH FUTURE**

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