

SENER



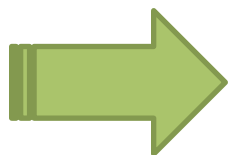
ENERGY POLICY IN MEXICO

May 17th, 2012

ENERGY DEMAND IN MEXICO

- Mexico will show an economic growth estimated at 3.5% annual average rate for the next 15 years.
- At the same time, Mexico's population will be 8.3% higher by 2026.
- These actions will boost the energy demand in all the economic sectors of the country (residential, transport, industry, services, power generation)

Energy demand is estimated to increase by 3.4% on average for the 2012-2026 period



- This increase in the energy demand will require the expansion and modernization of most of the hydrocarbon and power infrastructure in Mexico.
- ¿How are we going to meet the expected increase in energy demand while being sustainable?

Energy Transition

Mexico's energy sector is evolving

Energy Policies

1970s-2000s

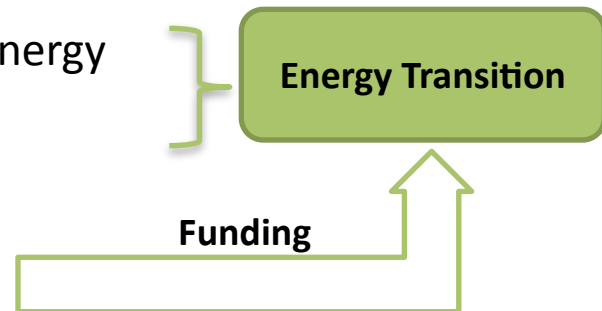
- High dependence on fossil fuels
- Vulnerability to economic crises
- High energy subsidies

Current

- Support to renewable sources of energy
- Energy efficiency public programs
- Petróleos Mexicanos Reform

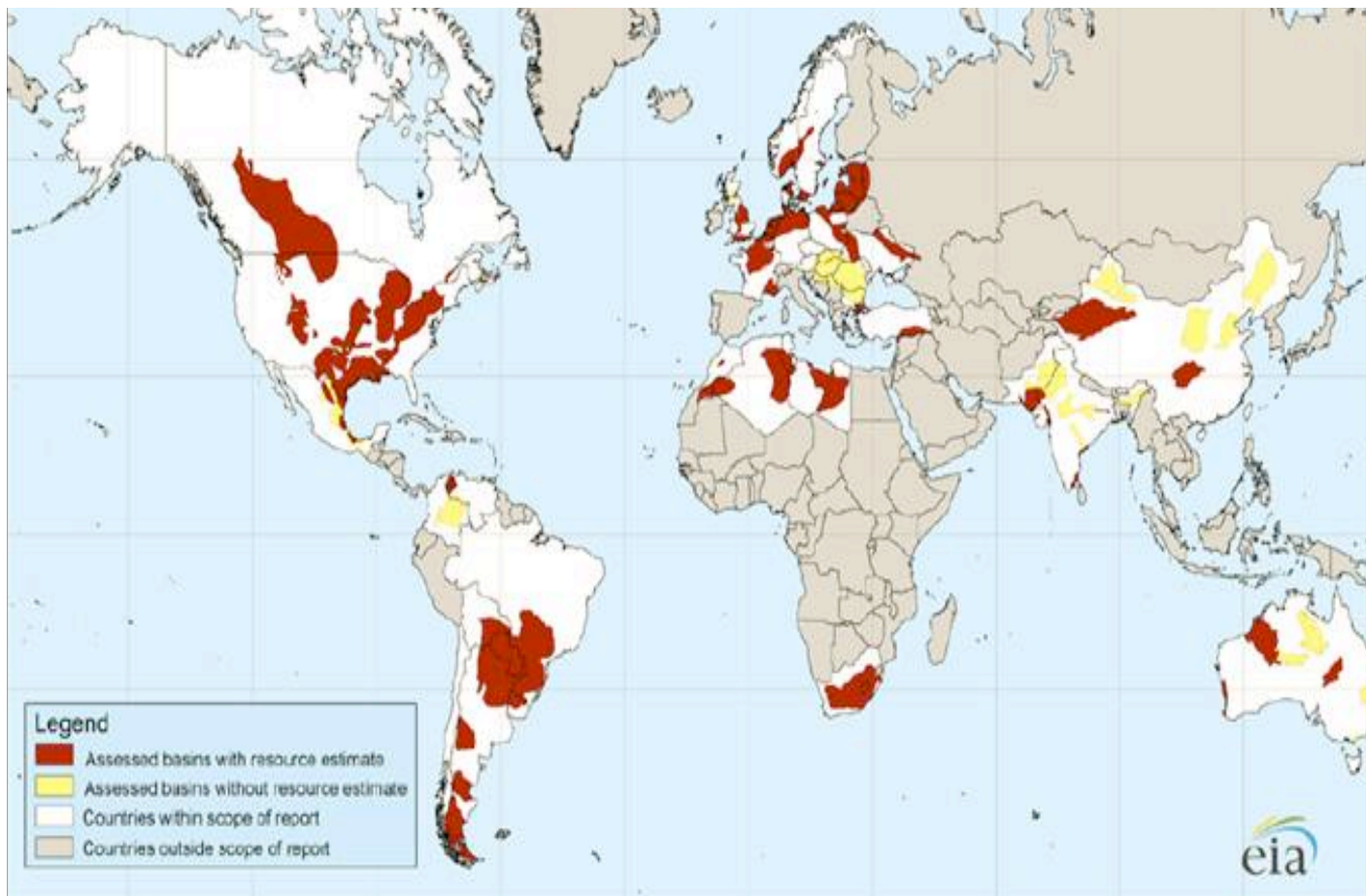
Energy Transition

Funding



Shale gas around the world

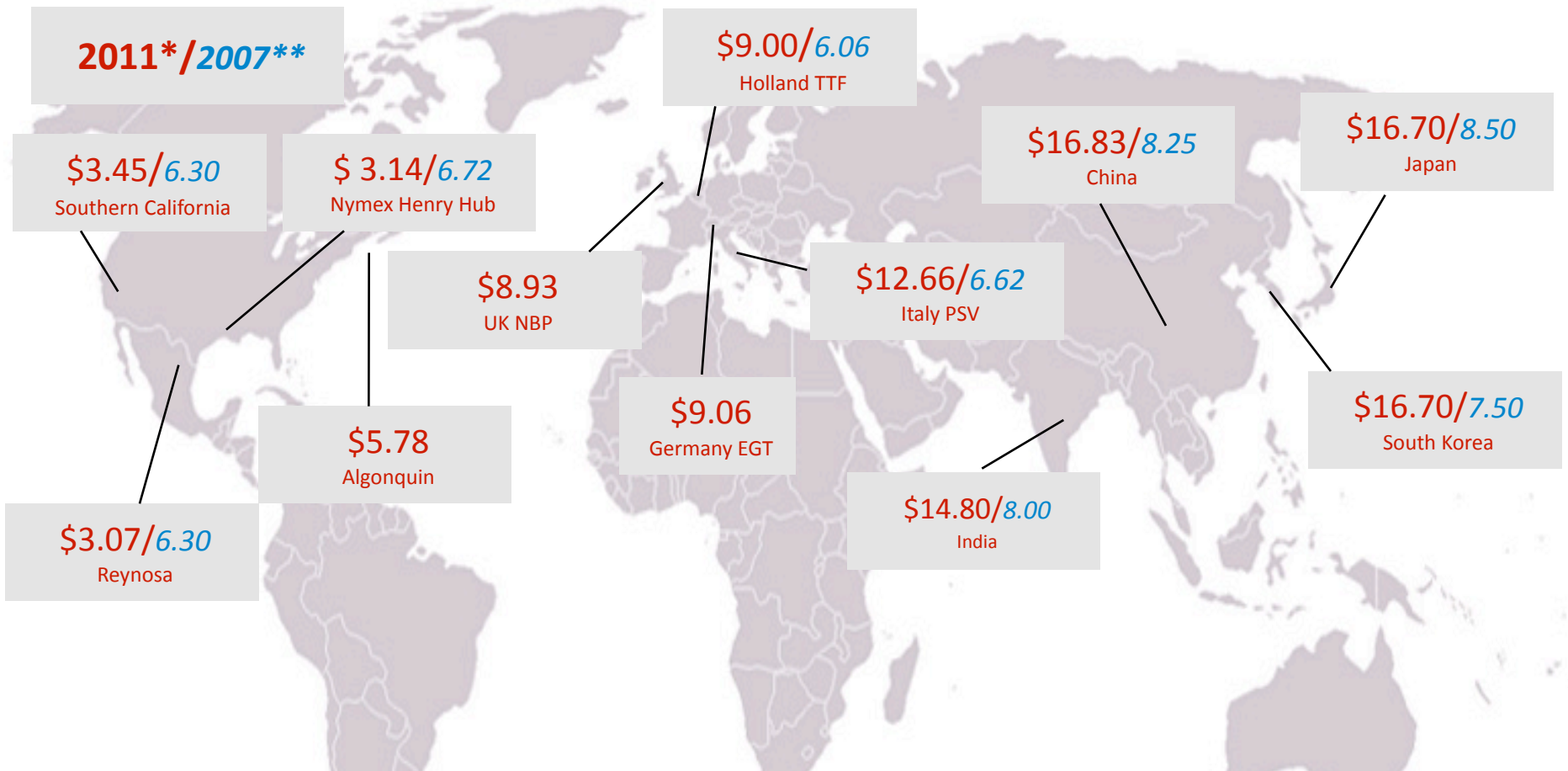
México has a great potential to exploit shale gas. At the current production rate, shale gas could boost up natural gas reserves up to **60 years**.



Technically Recoverable Shale Gas Resources (trillion cubic feet tcf)

China	1,275
USA	862
Argentina	774
Mexico	681
South Africa	485
Australia	396
Canada	388
Algeria	231
Brazil	226
Poland	187
France	180
India	63
UK	20

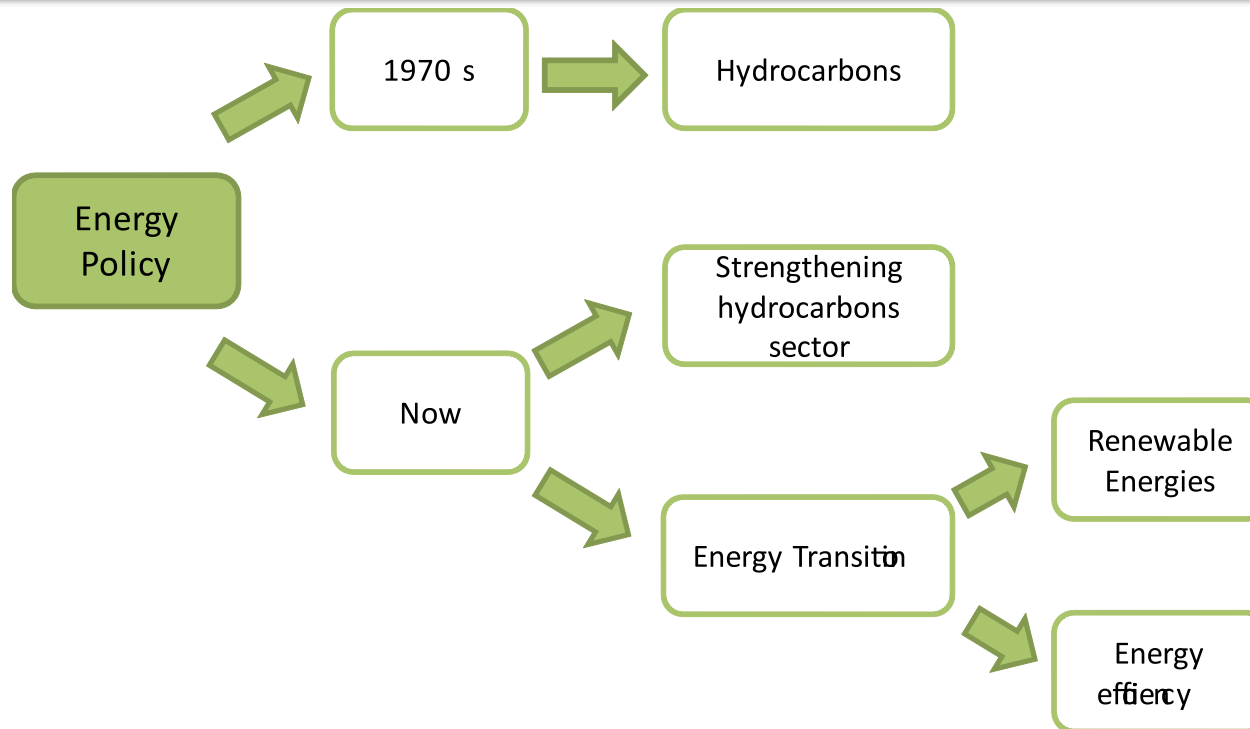
Natural Gas Prices



A **substantial increase in the supply** of this fuel in the **United States**, as well as in its reserves, has radically altered international relative prices, making **North America** the region with the **world's cheapest gas**.

• 14 December, 2011 prices (USD/MMBtu)
 ** September, 2007 prices (USD/Mmbtu)

Energy Transition in Mexico



However, the development of **renewable energies** still faces **significant challenges**. Two of the most relevant among them are the high cost and the long maturity periods of these technologies.

As a **transition fuel is needed**, the role of **natural gas** is destined to increase.

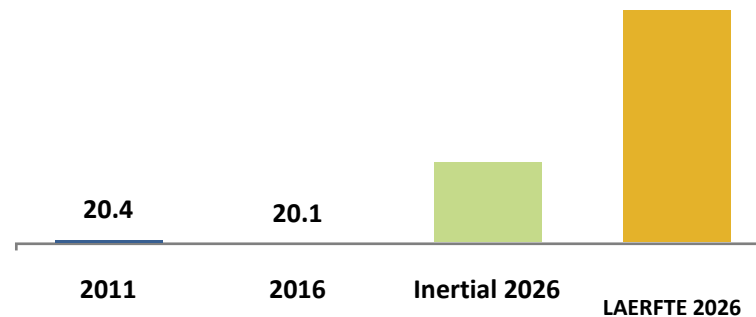
LAERFTE ACT

On November 2008, the **Renewable Energy and Transition Act (LAERFTE)** was approved in order to promote and encourage the renewable energy power generation.

Furthermore, on June 2011 an amendment to this Act was published which promoted and encouraged the non-fossil energy sources by **establishing a 35% generation of renewable energy goal** by 2024*, 40% by 2035 and 50% by 2050.

2026's
Goal*

Power generation from non-fossil sources (%)

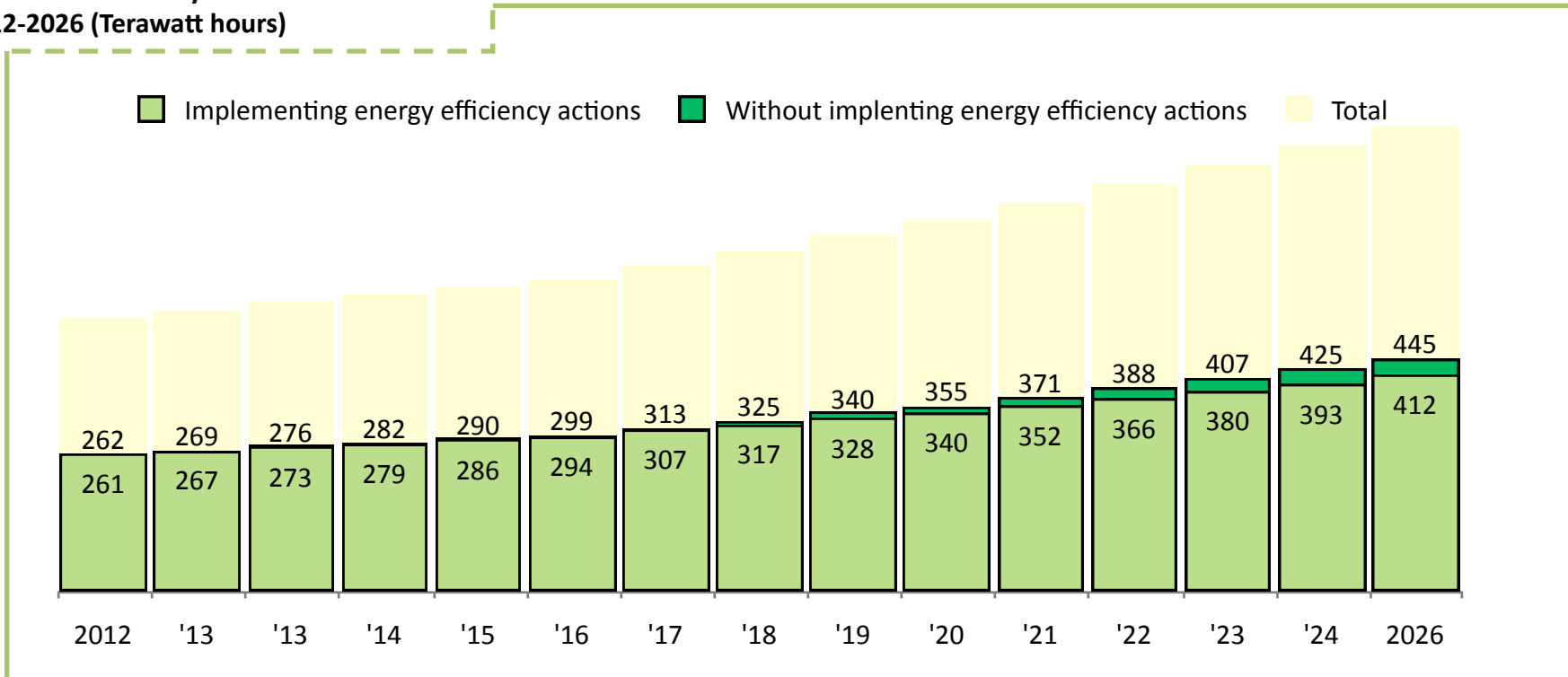


*LAERFTE laws shows goals for 2024, nevertheless the planning scenario, considering an Inertial scenario was made for 2026

Mexico's power generation demand

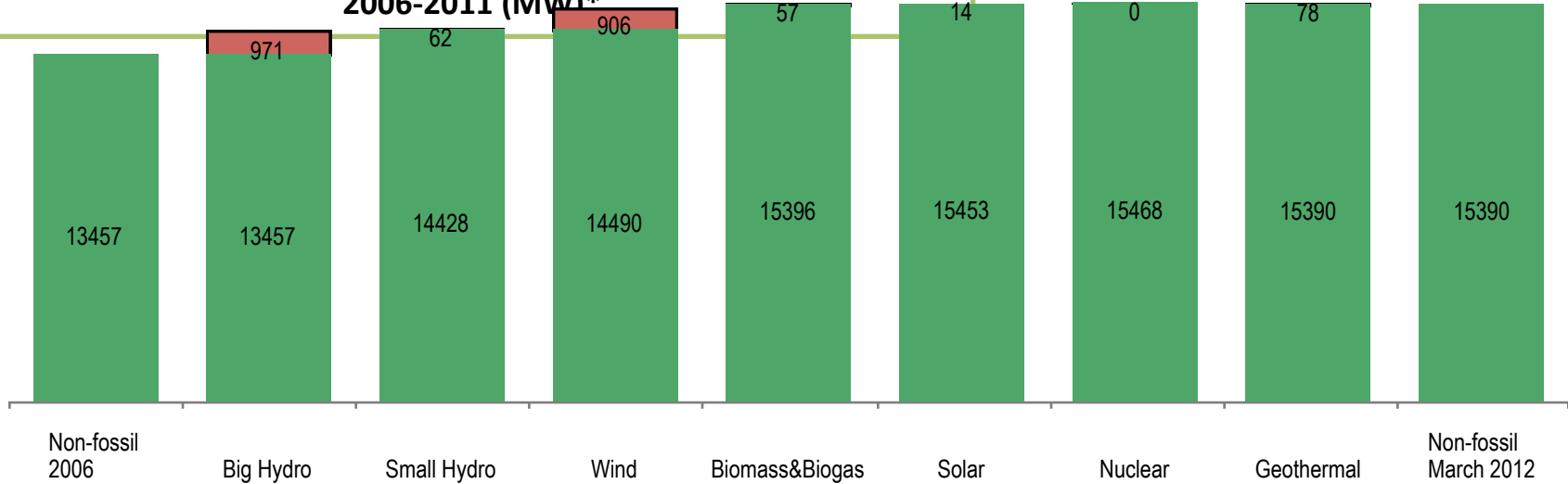
- In México, power generation demand will increase 3.6% on average annually over the next 15 years
- To meet the energy demand its mandatory to increase generation, transmission and distribution capacity, including related infrastructure of fuel supplies

Estimated electricity demand in Mexico 2012-2026 (Terawatt hours)

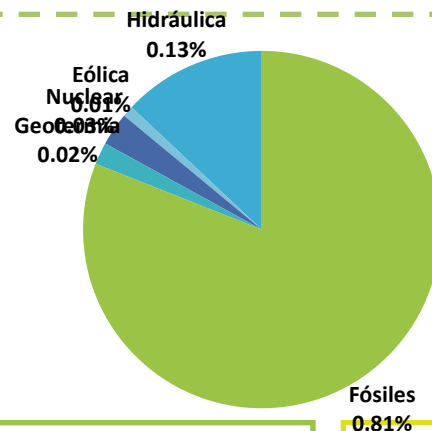


Current Installed Capacity in Mexico

Installed capacity from non-fossil sources (power generation), 2006-2011 (MW)*



Power generation, 2011 (GWh)



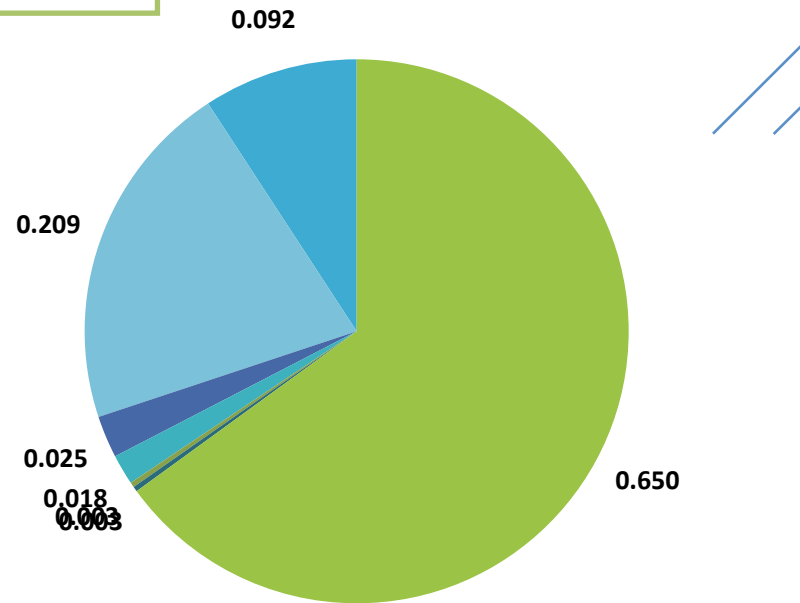
Capacity: 61,770 MW

Generation: 291,673 GWh

*Reference: SENER with data from CRE and CFE. Numbers at March, 2012.

Future power supply 2026

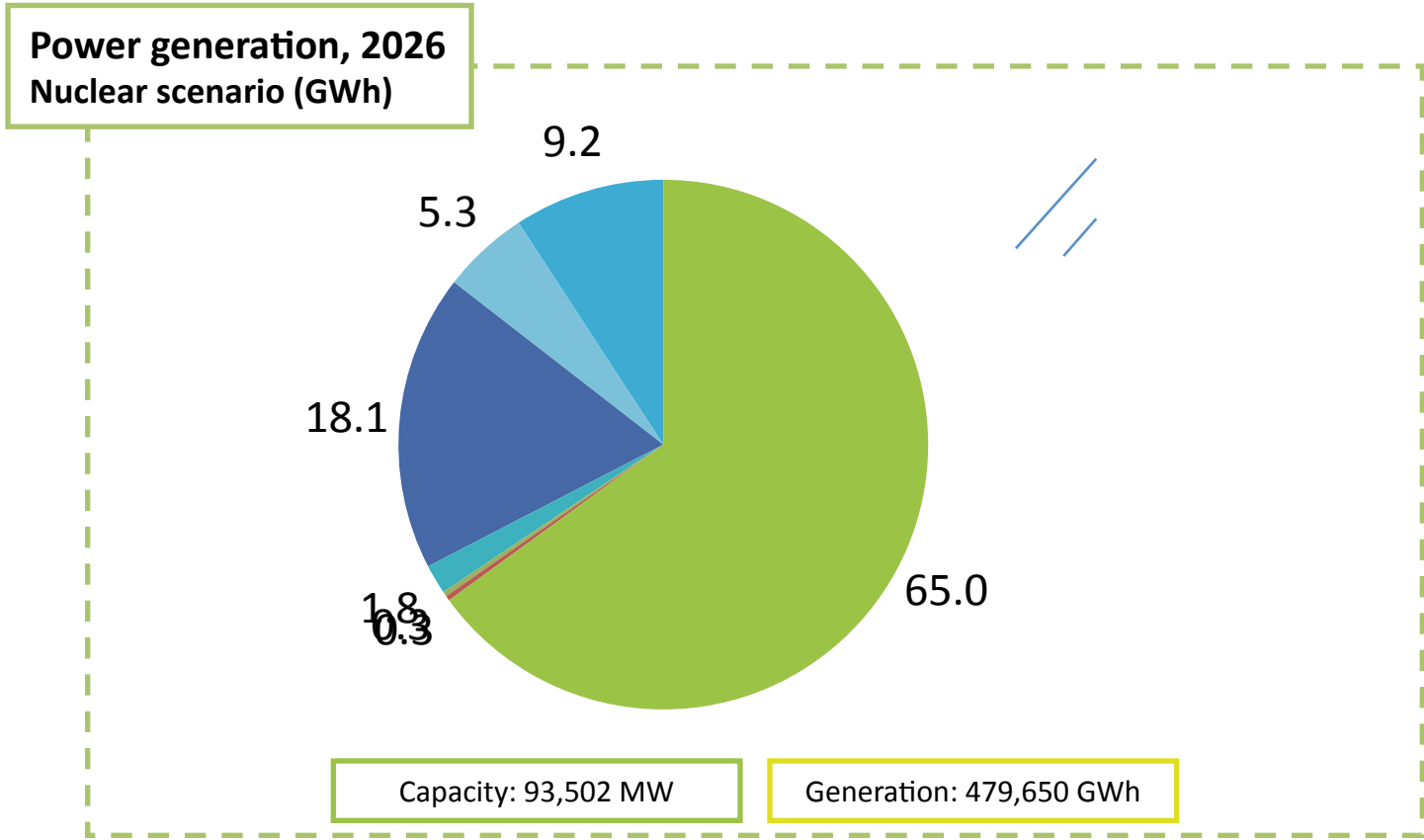
**Power generation, 2026
Renewables scenario (GWh)**



Capacity: 119,072 MW

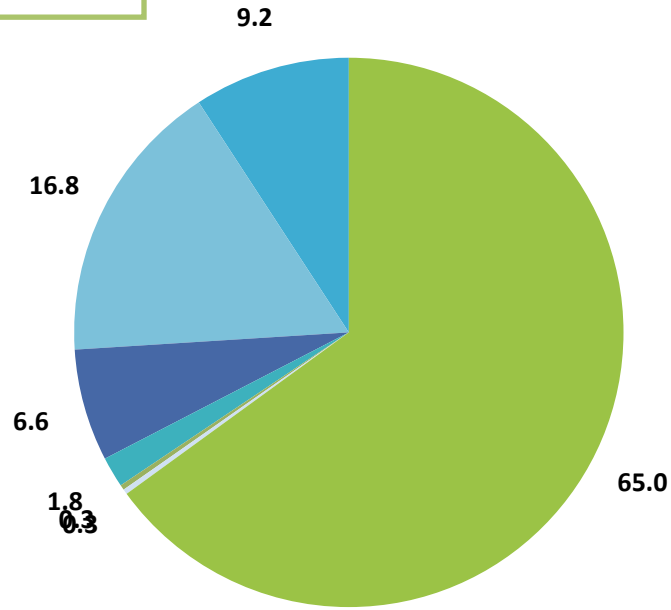
Generation: 479,650 GWh

Future power supply 2026



Future power supply 2026

Power generation, 2026
Hybrid scenario (GWh)



Capacity: 112,962 MW

Generation: 479,650 GWh

Planning scenario costs and externalities

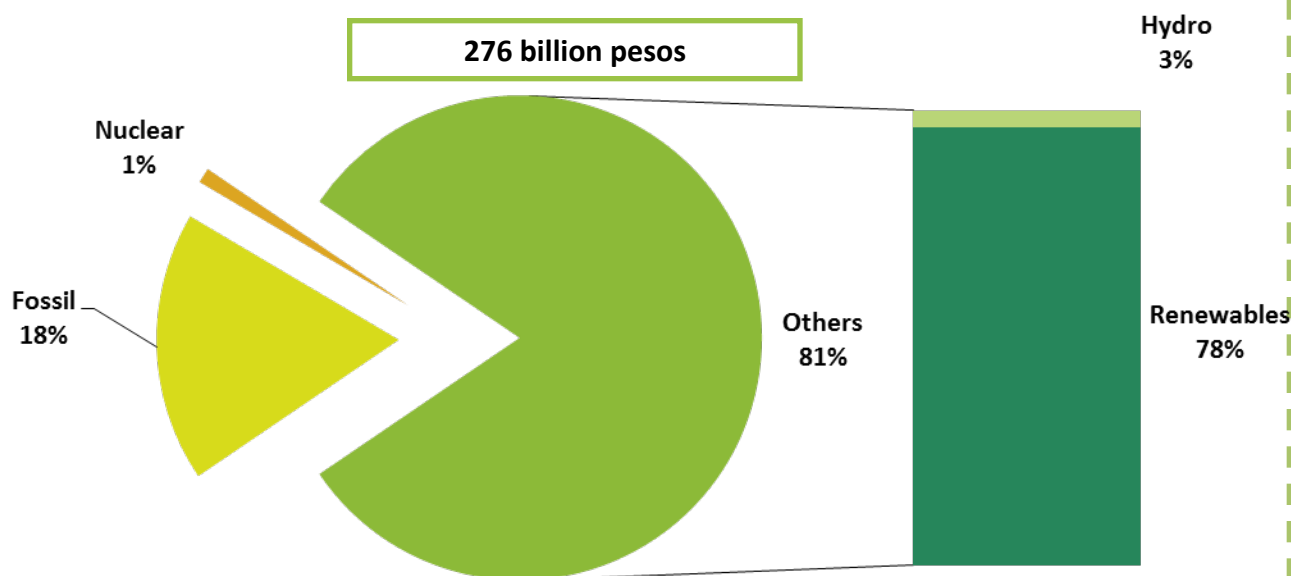
SCENARIO	TOTAL CAPACITY SUPPLY MW	TECHNOLOGY	COST Million of 2012 dollars per year
Scenario 1 Renewables	28,411	284 wind farms 100MW 1 Gas Turbine for 3MW installed wind capacity	4,117
Scenario 2 Nuclear	11,200	7 or 8 nuclear plants 1,400MW	2,922
Scenario 3 Hybrid	20,900	2 nuclear plants 1,400MW 209 wind farms 100MW 1MW Gas Turbine for 3MW	3,803

- Because of the **LSPEE**, the **energy planning decisions** are usually made from a **minimum cost perspective**. The social and environmental impacts this process generates should be internalized.
- **Social and environmental impacts** in power generation could be evaluated through a complete fuel cycle quantification analysis.
- The **first methodology publication** includes greenhouse gases impacts. However, it is necessary to expand actual methodology terms to include health and environmental impacts.

Renewable Power Generation Cost

According to planning projections, electricity generation costs in 2026 according to scenario 1 is estimated in **351 billion pesos**

Electricity Generations Growth Costs



The cost of increasing the electricity generation based on renewables is estimated in **276 billion pesos**

Specific Actions

1. Incorporate externalities and the impact of incorporating intermittent sources for the planning and power dispatch. These also include subsidies on fossil fuels and cost differentials.
2. Identify international funding mechanisms (rapid start-up funds) to cover the incremental costs associated to renewables
3. Optimize CFE's backup capacity when incorporating renewables.
4. Expand and reinforce the power transmission network to facilitate the interconnection of electric power plants to self-sufficiency, independent production and small renewable energy production in regions of the country with the highest potential.
5. To provide certainty and encourage private sector investment in renewable energies, work on the regulatory framework must be held.

Private participation and incentives for renewable energy

Private participation

- Self-consumption
- Independent power production
- Cogeneration
- Exports and imports of electricity

In addition and in order to facilitate the access to the transmission lines, CRE has implemented a mechanism named “The open season” where all the large scale producers agree to finance the construction of the transmission line.

Incentives:

- Accelerated depreciation (up to 100% during the first year)
- Interconnection contracts for renewable energy sources (CRE):
 - Transmission costs through “Stamp methodology”
 - Long-term contracts
 - “Net-metering” contracts for small-scale projects (until 500kW)
 - Open season direction
- Obtaining emission reduction certificates
- Zero customs duty of general import and export tax for antipollution equipment and its parts

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