

# Striking the right energy balance

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In Mexico, as in any other country the government's goal is to improve the quality of life and provide for the needs of its population through economic growth and with a sustainable environment; this duality leaves most countries with a big dilemma. Mexico, however, has previewed a concept which is now becoming part of the core dimension, besides improving population welfare and considering environmental sustainability: energy security.

The reason is simple. Mexico depends intensely on its energy production, and of course, consumption. That is why ensuring a strong energy sector is the cornerstone of Mexico's development. It is, therefore, essential that the government set the guidelines for the conditions to build infrastructure to ensure supply, boost competitiveness and generate jobs, while at the same time considering the rational use of resources and the preservation of the environment.

A balance must be struck.

In the late seventies, the abundance of oil in our country led us to bet on this fuel as the main source of energy, but ensuring the supply at all costs. However, being aware of the effects on climate change and price volatility, these conditions have forced us to look for cleaner alternatives. During President Calderón's

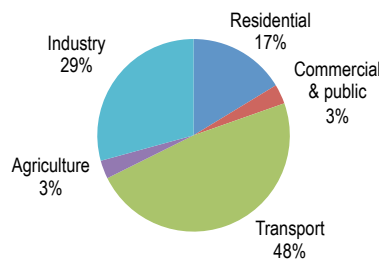
administration, Mexico has implemented a series of actions to achieve a transition towards a more sustainable energy sector without compromising economic growth and with a shared vision for reconciling short- and long-term goals. The main objective of this energy transition is to depend less on oil and to diversify the power/energy mix, while making the most of these resources.

It is important to emphasise that this transition does not imply dismissing hydrocarbons, but rather optimising their efficiency. These fuels hold still an important share in the power generation mix, and are an important source of income for Mexico's treasury. Indeed, energy is not only a utility, but a crucial detonator of economic development. During the current administration, the energy sector has accounted for up to 10.6 per cent of the total GDP. Furthermore, in 2011, oil revenues accounted for 35.1 per cent of the total federal income. Additionally, the total worth of oil exports added up to 15 per cent of the total worth of national exports.

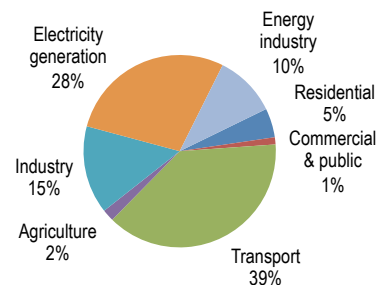
Since the beginning of this administration Mexico's hydrocarbon surpluses have been used to move towards the use of cleaner energy. Today, they play a key role in financing the energy transition. More than 100

Main energy indicators in Mexico, 2010

Total final energy consumption in 2010  
4,678 PJ



CO<sub>2</sub> emissions from fuel combustion in 2010  
407.3 Tg of CO<sub>2</sub>



The transport sector is one of the main energy consumers, both in Mexico and in the world in general. In our country, domestic and international transport represented 48% of the country's total final energy consumption in 2010. In the same year, this sector generated 39% of total GHG emissions from fuel combustion. The high share of GHG emissions from the transport sector is a result of the prevailing use of petroleum products, which comprised 99.8% of final energy consumption in the transport sector.

billion dollars have been invested in the last six years to strengthen the oil industry. It seems contradictory, but a healthier oil industry now will allow us to have a more sustainable environment in the future.

Furthermore, the energy transition is composed of several defined actions. On the demand side, actions have been taken to enhance public policy in order to foster a more efficient use of energy in residential and business/industry sectors; and on the supply side, actions to increase the renewable and clean sources of energy participation in the power sector had already begun. Through these actions, the administration ensures that energy supply sets the conditions required for economic growth.

As an example, Mexico is working to promote energy efficiency and permeate actions in the general population lifestyle. This is achieved through the publication of energy efficiency rules and standards for different sectors of the Mexican economy and through the implementation of public energy efficiency programmes.

In this regard, two important energy efficiency programmes have been launched in the last years: “Luz sustentable” and “Cambia tu viejo por uno nuevo”. The “Luz sustentable” programme substitutes incandescent light bulbs for more efficient compact fluorescent lamps. It is the most ambitious programme of its kind worldwide and through its implementation 45.8 million incandescent light bulbs will be replaced by the end of 2012. Additionally, the “Cambia tu viejo por uno nuevo” programme allows the substitution of almost two million inefficient refrigerators and air conditioners for new ones. These programmes reduce the subsidies used in residential electricity consumption while, at the same time, the households save more energy. They also contribute to the global effort of reducing greenhouse gas emissions to the atmosphere while contributing to ensure the energy supply.

Equally important are the actions undertaken by the government to increase the participation of clean sources of energy in power. Currently, the installed capacity of non-fossil generation capacity accounts for 24.5 per cent of the total installed capacity of the country, while the share of power from these sources adds 19.3 per cent. The National Energy Strategy (2012-2026), which sets the guidelines for the future of the Mexican energy sector, establishes that the non-fossil share in electricity generation should reach 35 per cent over the next 15 years.

Recently, several new regulatory schemes have been implemented to provide greater incentives for the use of clean energy in the power sector. Examples of these new regulations are the transmission and transformation capacity open seasons and the new

methodology for the price determination paid by the Electricity Federal Commission (known as CFE, its acronym in Spanish) to renewable energy private generators. Together, these mechanisms promote renewable energy power, while providing legal certainty to potential investors.

In addition, Mexico has considerable unexploited renewable energy resources for power and energy services facilities, thus aiming to create important value chains. These resources include biomass, geothermal, mini hydro, wind and solar energy.

The results speak for themselves. The total installed wind power capacity is 437 times greater than in 2006, a total of 875 MW in March 2012. It is expected to be almost twice that by the end of 2012.

However, the development of renewable energies still faces significant challenges. First, its intermittent nature, caused by seasonality, the precipitation level, the Earth’s natural rotation and wind variability makes it necessary to have synchronisation and backup capabilities with other technologies to ensure stability of the electric supply. Second, the main barriers for the development of these technologies are related to the return on investment which depends on the still high cost of some of these technologies

In order for to obtain the above mentioned goals, a transitional fuel should be considered. This increasingly needed fuel is the natural gas. The Mexican Government is convinced that natural gas will help close the gap between the immediate needs of the economy while providing the population with cleaner energy at reasonable prices. All these actions should be done before transitioning to a renewable energy-based sector.

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PEMEX offshore platform, Sonda de Campeche, Gulf of Mexico



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Furthermore, the Federal Government has started a comprehensive natural gas strategy that strengthens the legal framework and, at the same time, creates a new institutional arrangement aimed to increase competitiveness. Through this strategy the total investment in natural gas transportation infrastructure will hardly be comparable to any done before.

With the construction of more than 4,000 kilometres of natural gas pipelines, the transport network will increase 38 per cent. As a whole, the implementation of the strategy will guarantee the supply of natural gas in more than 80 per cent of all states in Mexico. This strategy, that combines both public and private efforts, will result in job creation, and local economic development.

In addition, shale gas represents a unique opportunity for Mexico. According to the Energy Information Administration (EIA), Mexico's potential technically recoverable shale gas resources are the fourth largest in the world, amounting to 681 trillion cubic feet. This means that, once the strategy is fully implemented, the natural gas reserves could increase from 24 to 60 years' supply.

These resources will help meet the growing energy demand at competitive prices and promote economic development. The increased natural gas supply will benefit Mexico in several ways: First, increasing investments. The exploitation of shale gas could attract between 7 and 10 million dollars' worth of annual investment. Second, more jobs will be created and the national energy industry will be strengthened as value chains will be developed. Finally, the natural gas supply will be ensured for the long term.

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As a whole, we have a challenge. Diversifying the energy mix by fostering clean sources, the rational use of energy, ensuring the energy supply and promoting the development of new technologies are essential in the transition of our country towards a more sustainable energy sector. However, establishing the right balance to achieve these goals is not the sole responsibility of policy makers. Addressing the most effective approach and proposing solutions for these issues requires de participation of the energy-industry executives, researchers, consumers and citizens.

This report supports the security statement that there is no single 'silver bullet' solution for energy sustainability and that the most effective approaches vary from country to country. Nevertheless, it is imperative that a global effort is orchestrated, in which each country plays its part and each citizen assumes their responsibility. Otherwise the transition is futile.

Our actions have immediate and future, local and global consequences. If we are to build a new vision, we should first recognise the environment and all natural resources as a global shared asset.

In Mexico, we are committed to keep moving towards a more secure and sustainable energy sector. **E**



Eolic park, Isthmus of Tehuantepec, La Venta, Oaxaca