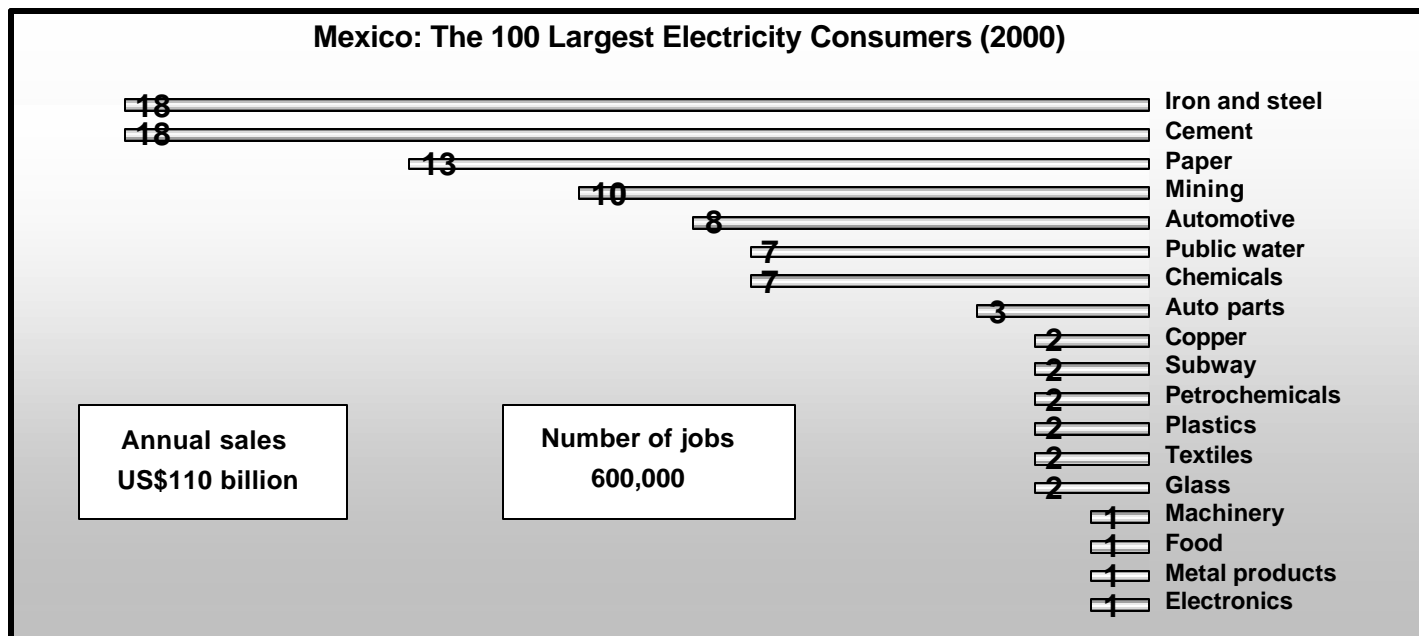


*Backgrounder*  
*Market for renewable electricity in Mexico's industries*

**Mexico has the opportunity to make a shift to more renewable electricity generation, and big industry wants it**

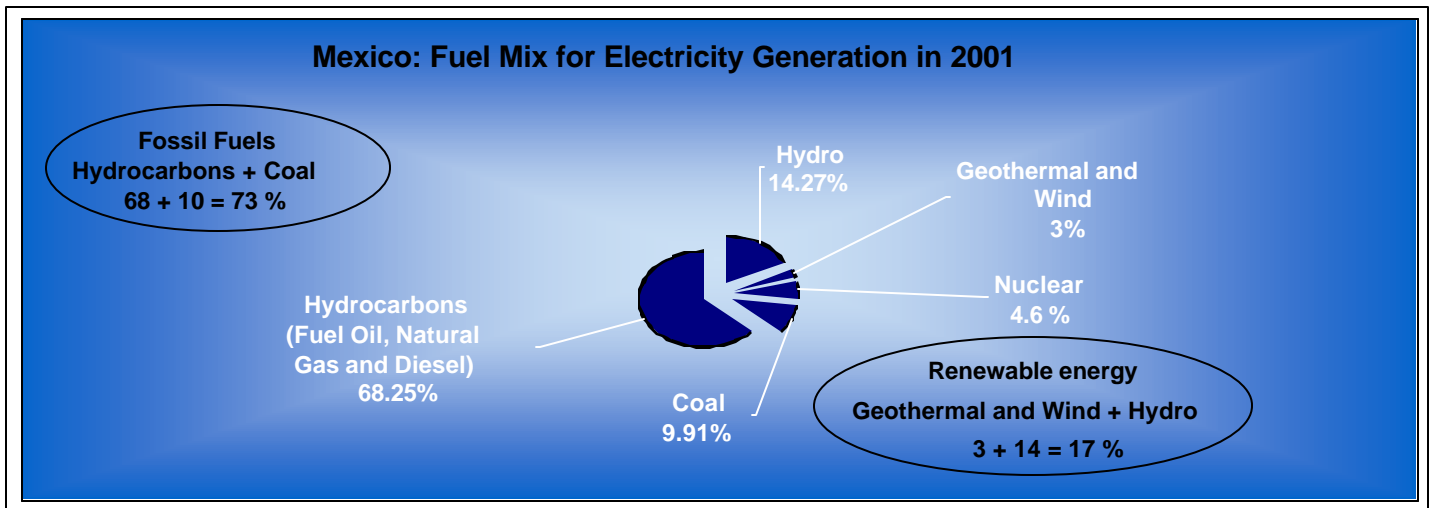
Two organizations partnered in the first-ever survey to find out if big industry was interested in more renewable electricity. Mexico's National Commission for Energy Conservation (CONAE) and the North American Commission for Environmental Cooperation (CEC) hired Gallup Mexico to find out what executives in 100 of the country's largest electricity consumers thought of energy-environment linkages, and if they supported greener power.

In June and July, Gallup did telephone interviews with directors and managers in such industries as iron, steel, cement, paper, mining, automotive and chemicals. These big companies have combined annual sales of US\$110 billion and a workforce of some 600,000 employees. They account for more than one-quarter of all industrial power use in Mexico, spending about US\$1.3 billion a year on electricity.

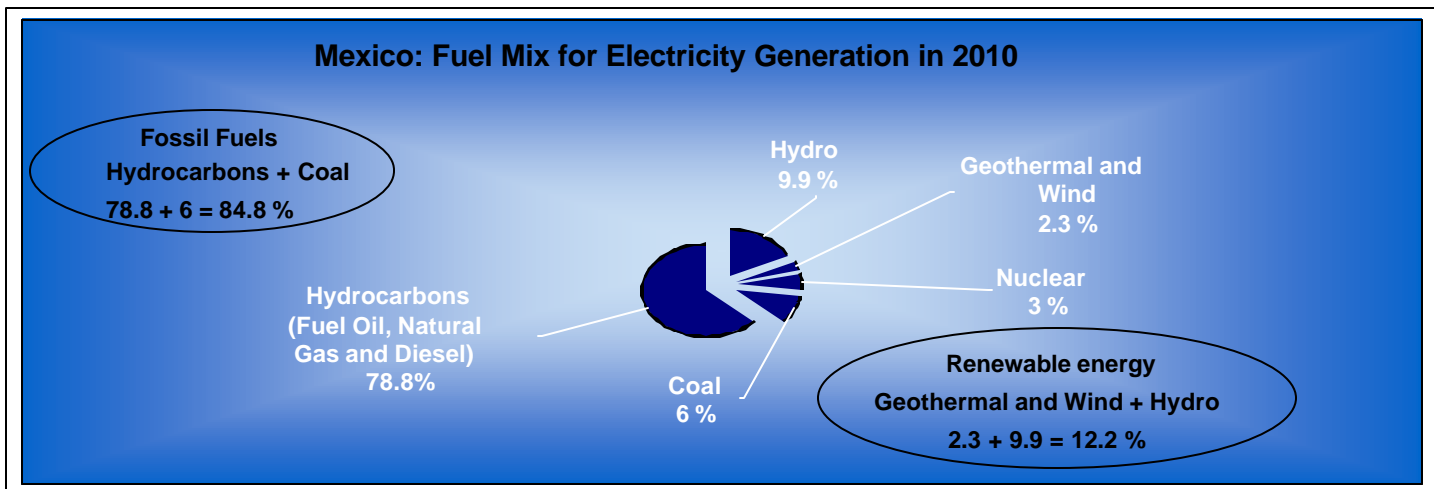


## The energy picture

About three-quarters of Mexico’s electricity is generated by burning fossil fuels, mainly oil and natural gas. This uses up nonrenewable resources, and releases a mix of pollutants that contribute to climate change, smog and the accumulation of toxic substances such as mercury in the environment. Renewable sources have a small share of the market.



The country is poised for a major expansion of electrical generation to meet growing demand. Mexico’s electricity supply is predicted to grow 75 percent over the next nine years, a growth rate far higher than forecast for the United States or Canada. With most of the investment planned so far slated for natural gas, it means that fossil fuels could account for 85 percent of electricity generation in Mexico by the end of the decade. Although there is a shift from oil to cleaner-burning natural gas, there would still be significant releases of air pollutants and the consumption of nonrenewable resources.



About 10 percent of the planned new electricity generation is from hydroelectricity in the south of Mexico and geothermal in the north. Recent projects involving solar and wind energy are at demonstration scale and have limited output. Recently, officials from the State of Oaxaca announced that in the next 10–15 years they will implement a program for developing wind projects that could reach 200 megawatts of installed capacity, compared to the existing 2.18 megawatts of wind power generation in all of Mexico. However, given current trends in energy sources, renewable electricity will still lose market share over the coming decade.

### Mexico\*: Installed Capacity, Sales and Peak Demand of Electricity

	2001	2010	Change	Annual rate of growth %
Installed Capacity (MW)	36,659.34	64,000.00 <sup>p</sup>	27,340.66 MW +75%	6.4
Peak Demand (MW)	26,197.00	44,767.00	18,570.00 MW +71%	6.1

Notes: One MW (megawatt) equals one million watts.

\* The data do not include sources that account for about seven percent of electricity generated in the country.  
p = preliminary forecasts (based on data published for 2009)

Source: *Comisión Federal de Electricidad* [Preliminary data].

This trend to increasing use of fossil fuels is similar to US projections which show renewables' market share dropping over the next two decades. The United States gets 51 percent of its electricity from coal-burning power plants, with nuclear at just under 20 percent, gas at 15 percent and hydroelectric at just over eight percent. Other sources, including wind and solar contribute only 2.4 percent.

In Canada, government projections show increases in hydroelectricity and burning of biomass, particularly wood. Canada gets 62 percent of its electricity from hydroelectric sources, because of its large rivers. Energy sources such as wind, solar and small-scale hydroelectricity make up only 1.2 percent of the supply. Most of the rest comes from burning fossil fuels or nuclear.

In the past, renewable energy has been seen as uneconomic for large-scale power production, but prices have been falling to the point that some forms of renewable energy are becoming more cost competitive with conventional sources, such as fossil fuels, particularly when the environmental costs of fossil fuels are factored in. The average price paid for electricity by Mexican industry in 2000 was US\$5.29 cents per kilowatt-hour [KWh]. Wind power can now be delivered for under 5 cents per KWh in areas with wind speeds averaging above seven meters a second. Photovoltaic solar panels produce electricity costing 30–40 cents per KWh today, and it is expected that this cost will fall below 10 cents during this decade. However, the costs for building renewable energy plants are higher than for conventional fossil sources. Construction of modern gas-fired plants cost US\$400,000 per megawatt, wind power costs \$1 million a megawatt and solar can cost up to \$4 million per megawatt.

## Key findings from the Mexico survey

The Gallup survey found that although Mexican industry is heavily dependent on fossil fuels for its electricity, there is a strong demand for more renewable energy. Among key findings:

- 65 percent of those surveyed said electricity generation has a major impact on the environment, but only 33 percent said their company had a large impact on the environment because of electricity purchases.
- Oil, coal and nuclear power were mentioned as the top three electricity sources having environmental impacts.
- Global warming was the most frequently cited environmental problem linked with electricity generation, followed by fine particulates, smog, acid rain and mercury.
- 88 percent said there is a need to decrease the environmental impact of electricity generation, while eight percent more felt there was no need now, but there would be in the future.
- 52 percent said that their customers see a need to reduce the impacts now, rising to 84 percent when asked if this will become a need in the future.
- 94 percent said that if they had the option to purchase renewable electricity, they would do so, with solar power the first choice.
- 54 percent said they would pay more for renewable electricity, with the average acceptable price differential at just under 11 percent. However, only 35 percent felt the public would pay more for their products or services to cover increased costs of dealing with environmental issues.
- If the government were to bring in new policies to reduce the environmental impacts of electricity generation, the companies would support a range of policies, including tougher emission standards, requirements for better technologies, and caps on emissions, combined with the right to trade emissions among companies, and emission portfolio standards requiring companies to use certain amounts of renewable electricity.

## Big market opportunity

Only about half the expected growth in electricity generation has been planned, creating an opportunity for greater development of renewables. If renewable electricity were even to hold its current market share in Mexico, this would require an investment of at least US\$3 billion over the next nine years. There are opportunities for expansion in a number of sectors, particularly wind power.

Most of the opportunities for expansion are for wind power and some small hydro, plus solar and biomass from burning garbage. Wind generation is one of the world's fastest-growing sources of renewable energy, and is starting to be cost-competitive with fossil fuels. Both the United States and Canada produce turbines of good quality, and with the proper incentives such as long-term contracts, the market could be expanded. The same is

true for solar panels. Although solar energy was highly favored by those polled, it is still relatively costly, and is not suited for large-scale generation.

Among the opportunities for expansion of renewable electricity supplies in Mexico:

**Wind**—The country has an estimated wind potential of 5,000–15,000 megawatts. [By comparison’s Mexico’s current electrical generating capacity is under 40,000 megawatts].

**Solar**—Almost three-quarters of the country is in high solar regions. With an average of 290 sunny days in a typical year, the roof of an average small house could generate 100 times more electricity than most households use.

**Small hydraulic**—These projects, which do not require large dams, could generate another 3,250 megawatts.

**Geothermal**—Mexico already has a major generating station in Baja California to generate electricity by tapping heat from the Earth’s interior. The country could tap an estimated 12,000 more megawatts of electricity using underground heat sources.

**Biomass**—Burning plant material or organic waste from garbage can fire electrical generators, but the potential depends on a number of factors.

Odón de Buen, president of CONAE, said the joint survey was good news for the country. Big industries “are willing to buy a green product that adds value to their products in a world where consumers are increasingly environmentally concerned,” said Mr. de Buen.

This means a business opportunity that leads to a cleaner environment. Mexico has many of the industrial and technological capabilities to be building more equipment for renewable electricity. They government wants to promote more green electricity, but without getting into subsidies.

The renewable electricity message was endorsed by Filiberto J. Ruiz Maroto, Corporate Director of Operations for the Cement Group of Apasco S.A. of C.V. “Our activities entail the intensive use of thermal and electrical energy. Because of our large energy consumption, as well as our commitment to sustainable development, we consider it a priority to adopt the most advanced technologies which allow us to reuse energy and source renewable energy,” he said.

The results of the study were welcomed by Arturo Whaley Martínez, President of Inversiones Eólicas, S. de R. L., a joint venture between SIIF Energies (a subsidiary of Electricité de France) the Mexican DEPROE S.A. and Princeton Energy Group of California, that seeks to increase wind electricity generation. “Mexico is privileged to have a great potential for wind power,” said Mr. Whaley. “The generation of wind power electricity will grow rapidly in the next five years, and this will place Mexico among the leaders in renewable energy production.”

<b>What managers and directors in the 100 companies said they would prefer as an electricity source</b>	
<b>SOURCE</b>	<b>%</b>
Solar	45
Hydroelectric	29
Natural gas	14
Thermoelectric/geothermal	5
Nuclear	3
Coal	1
Oil coke	1

## **Web sites**

North American Commission for Environmental Cooperation  
Environmental challenges and opportunities of the evolving continental electricity market.  
<<http://www.cec.org/electricity>>.

National Commission for Energy Conservation (CONAE)  
<<http://www.conae.gob.mx/>>

The Energy Research Centre of the National Autonomous University of Mexico  
<<http://www.cie.unam.mx/>>