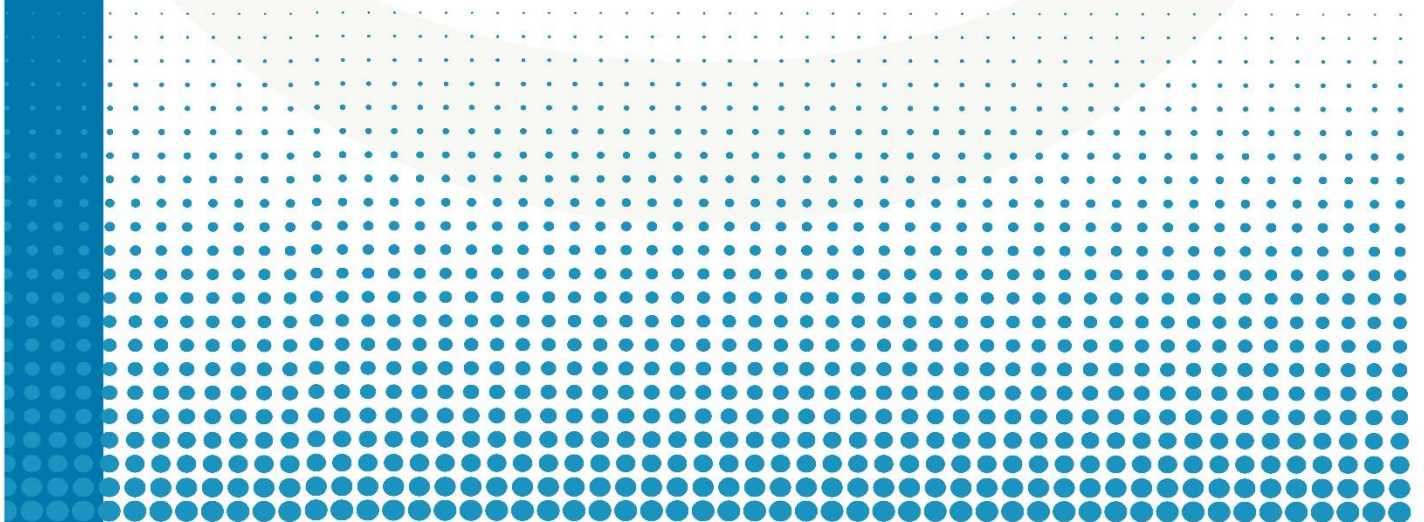


Renewable Energy Policy Brief

MEXICO

JUNE 2015



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1. Policy

Mexico is in the midst of a major energy reform including the oil, gas and electricity sectors. A constitutional reform on 20 December 2013¹ ended the state monopoly on generation and commercialization of electricity, as well as on fossil fuel exploration and extraction. This was followed on 11 August 2014 by a legislative package of 21 elements known as “secondary laws”² that include, among others, a new Electricity Law, a Geothermal Law, and a Petroleum Law. On 31 October 2014, 25 Regulations³ to those secondary laws were enacted. New norms were published thereafter and are still subject to public comment: Interconnection Criteria for Power Plants (23/12/2014), Initial draft of proposed Market Guidelines for wholesale electricity market (24/02/2015), Social Impact Assessment Guidelines (06/03/2015). Also, a legislative “green package” is expected in 2015.⁴

Electricity

México has overall **targets** of 24.9% electricity from clean energy sources by 2018⁵, 35% by 2024, 40% by 2035 and 50% by 2050⁶. “Clean energy” includes renewables, cogeneration, nuclear energy, fossil fuels with CCS, and “other low-carbon technologies.”⁷ The 2014 Special Programme for the Use of Renewable Energy (PEAER) set a target of 24345 MW of renewable energy capacity by 2018 disaggregated as follows: hydropower (13030 MW), wind (8922 MW); geothermal (1018 MW), bioenergy (784 MW) and solar (627 MW).

México’s Electricity Law of 2014, and its Regulation, liberalize power generation and

commercialization, while maintaining the transmission and distribution monopolies under state-owned enterprise, but with new elements that allow private sector through association or contracts with CFE operate, finance, install, maintain and expand networks; SENER can determine that non-CFE lines be contracted. The reform provides for an Independent System Operator through a Decree for the Establishment of the National Energy Control Centre (CENACE) and its role in the wholesale electricity market (Published in the Federal Official Gazette 28/08/2014).

The law seeks to meet clean energy targets through a **clean energy certificate** system, which was further developed in October 2014 through the Clean Energy Certificate Guidelines,⁸ and will enter into force on January 1st 2015. The government will determine the requirements for clean energy certificates on a yearly basis three years in advance of the compliance period. The first compliance period will be 2018 and as of March 31st, 2015 the Clean Energy Quota for this period was fixed to 5% of total electricity use. All clean energy projects developed after August 2014 will receive, for 20 years, one Clean Energy Certificate per MWh generated.⁹ Clean energy certificates will be bankable¹⁰ and do not expire. Penalty for non-compliance will be between USD 30-250/MWh.¹¹

Previous to the recent reform, the legislative framework for the support of renewable energy was the 2008 Law for the Development of Renewable Energy and Energy Transition Financing (LAERFTE¹²). The main instruments for development of renewable electricity were

¹ Articles 25, 26 and 28 were modified on 20 December 2013, DOF 20-12-2013.

² DOF 11-08-2014

³ DOF 31-10-2014

⁴ The legislation amending the constitution gives one year to enact all the rules needed to implement the reform. In June 2014 legislation proposals were introduced superseding the renewables law LAERFTE and a new renewables law is anticipated.

⁵ Special Program for the Use of Renewable Energy (PEAER) 2014

⁶ The 2024 target is set both by 2008 Law for the Use of Renewable Energy (LAERFTE) and 2012 General Climate Change Law (DOF 06-06-2012), while the 2035 and 2050 targets are found only in LAERFTE.

⁷ 2014 Electricity Law

⁸ DOF 31-10-2014

⁹ For fossil fuel generation which qualifies as “clean energy” a coefficient yet to be determined will be applied. Art 6.

¹⁰ Bankable clean energy certificates can be stored over time and redeemed at future compliance periods.

¹¹ The penalty, stipulated in Art 165 of the Electricity Law, is set as 6-50 “minimum salaries”/MWh. Minimum Salary is legally defined in Mexico and changes from year to year. For 2014 it equals 67 Mexican Pesos. There is the possibility to double the penalty for those failing to comply more than once.

¹² DOF 28-11-2008

a self-supply regime (explained below) and **auctions** for 20-year PPAs by the state-owned utility (CFE). The new Industry Electricity Law foresees the so called “Abasto Aislado” (Isolated Supply). Article 22 defines it as power generation and imports of electricity for self-supply or export purposes, but not requiring access to the T&D grid infrastructure. Articles 23, 24 among others, further describe this concept. Existing projects under the self-supply regime are grandfathered as External Legacy Contracts. With the reform, CFE becomes a player in the liberalized market.¹³ It maintains existing PPAs and is expected to continue procuring renewable electricity. Mexico also has net metering and small-scale generation measures (explained below) that are maintained through the reform.

Self-supply was allowed under the 1992 Public Electricity Service Law as a way to allow private investment in the sector while complying with Mexico’s constitutional limitation on the sale of electricity (lifted by the 2014 reform). By including both the electricity generator and the consumer as partners in the same project, there was no “sale”. Combined with the grid access provisions described below, particularly energy banking and the use of the national grid for the transport of energy¹⁴ by self-suppliers whose consumption was physically separated from generation, self-supply grew to be the main modality for development of renewable electricity in Mexico.

Starting in 2001, a series of specific subsequent measures increasingly improved **grid access** for renewable and clean energy. These measures were reflected through the “interconnection contract.” A grid interconnection contract for renewable energy plants over 500kW was established in 2001 by RES/140/2001¹⁵, while the RES/007/2006 replaced it and introduced the concept of “Potencia Autoabastecida” (Self-Supplied Power) or a capacity credit for renewables providing firm capacity during the hour of maximum demand of the system.

It included transmission cost discounts between 50-70%, and **energy banking**, whereby the grid would virtually store surplus energy to be delivered at a later time. The 2003 RES/013/2003¹⁶ established a system of transmission fees per kWh that became known as “stamp system” (estampilla postal). The 2004 Wheeling Agreement established the regulations for self-suppliers to use the grid to transport electricity from off-site plants to load centers. In 2010, RES/066/2010¹⁷ revised the “stamp” transmission charges for renewable energy at USD 2.49/MWh for medium and high voltage (>1kV) and USD 4.98/MWh for low voltage (<1kV).¹⁸ RES/065/2010¹⁹ set the rules for interconnection of large hydropower plants (>30MW)

In 2007, RES/176/2007²⁰ provided grid connection rules for **small-scale** (<30kW) solar generators. In 2010 RES/054/2010 provided **net metering** for small-scale (10kW residential and 30kW commercial; low voltage <1kV) and medium-scale (<500kW; medium voltage 1-69kV) generators. Net metering balances over a period of 12 months. In 2012, RES/249/2012 regulated collective generation for small scale self-supply.

The development of **dedicated transmission lines** for renewable energy in the states of Oaxaca, Tamaulipas, Baja California and Puebla was done through a voluntary coordination process between the energy regulator CRE, the public utility CFE and renewable energy developers known as “*open season*” (temporada abierta). Through a call of interest, the demand for transmission by renewable energy developers could be estimated. After a vetting process and the deposit of guarantees by developers, CFE had a “firm” demand for transmission that was then used to build the infrastructure. The largest *open season* was in Oaxaca, where CFE reserved 20% of the transmission capacity for its own wind power developments. Other than those, all other

¹³ PEMEX, the state-owned oil company also enters the electricity market with co-generation assets

¹⁴ Also known as “wheeling” and referred to in Mexico as “porqueo.”

¹⁵ DOF 07-09-2001. The interconnection contract was subsequently modified and updated by resolutions mentioned in the text and by RES/032/2004, RES/007/2006, RES/192/2007, RES/054/2010 and RES/067/2010.

¹⁶ DOF 26-02-2003

¹⁷ DOF: 16/04/2010

¹⁸ Conversion rate of the day the regulation was approved, 14 April 2010

¹⁹ DOF 20-04-2010

²⁰ DOF 27-06-2007

projects where under the self-supply modality.²¹

Until the 2014 reform, geothermal energy was regulated by the National Water Law.²² In order to clearly regulate geothermal development and to differentiate it from water extraction, the 2014 Geothermal Law and its Regulation²³ were adopted. The geothermal law creates **geothermal concessions** and regulates prospection and exploration. Concessions last for 30 years, are extendable and cannot be sold, but can be transferred after formal notification. Exploration permits require the deposit of a refundable guarantee of 1% of total planned exploration budget. Exploitation concessions require the deposit of a guarantee of 0.5% of total investment required until commercial operation, at which point it is refunded.

Fiscal incentives include accelerated depreciation allowing companies and individuals to depreciate 100% of expenses on renewable energy equipment on one fiscal period. This was introduced by a 2004 Decree²⁴ and has been maintained in the new 2013 Income Tax Law.²⁵ Equipment must be functional for at least five consecutive years. These incentives apply to all renewable energy uses (e.g. not only power generation but also for example solar heaters or biomass furnaces).

Subnational fiscal incentives include, for example, a 20% discount in the water bill in Mexico City for users with solar (both PV and solar water heating) equipment who reduce their energy consumption by at least 20%.

A **carbon tax** of about 39 MXN/tonC (3 USD/ton C)²⁶ was introduced through Decree the Special Tax Law on Production and Services on December 2013²⁷, CDM credits from

Mexican projects can be redeemed to pay the carbon tax.

Direct funding for renewable energy programmes is provided by the Fund for the Energy Transition and Sustainable Electricity Use, a dedicated fund mandated by LAERFTE and established in 2009. Since its creation and until 2014 the fund has received USD 668 million from the federal budget, of which about 22% have been used for renewable energy projects and the rest for energy efficiency.²⁸ Funded projects have included, for example the elaboration of a National Inventory of renewable energy and the publication of a renewable energy Atlas of areas feasible for renewable energy development, as mandated by LAERFTE's 2013 amendment.²⁹

Another fund is the Energy Sustainability Fund for **research and technology development**, funded by a levy on oil sales. Since its creation in 2008, it has dedicated USD 139 million³⁰ to renewable energy research and technology projects. Contributions to this fund continue with the energy reform and with its recently approved and reformed legal framework, the Fund now has more flexibility and dynamism to invest resources in R&D but also in initiatives like talent development in which the Fund could not invest in the past.

Additional funding for renewables may be available in the future from the *Mexican Petroleum Fund*, mandated by the 2014 "secondary laws" to collect, manage, invest and disburse income derived from the exploration and extraction of hydrocarbons. Once the fund reaches 3% of national GDP³¹, up to 10% of the fund's yearly increment can be spent on science, innovation and renewable energy.³²

²¹ Source: CRE 2012 Memoria descriptiva temporadas abiertas de reserva de capacidad de transmisión y transformación

²² <http://www.diputados.gob.mx/LeyesBiblio/ref/lan.htm>

²³ DOF: 31-10-2014

²⁴ DOF: 01/12/2004

²⁵ Income Tax Law, DOF 11-12-2013, Art 34. XIII

²⁶ Exchange rate 13 Dec 2013, when the law was approved. Please note C is different than CO₂. Under perfect combustion conditions, one ton of C yields 3.66 tons of CO₂.

²⁷ DOF 11-12-2013

²⁸ A total of 8.15 billion Mexican pesos. Source: <http://fotease.energia.gob.mx/>

²⁹ http://www.dof.gob.mx/nota_detalle.php?codigo=5293049&fecha=21/03/2013

³⁰ 1.9 billion Mexican Pesos, source: sustentabilidad.energia.gob.mx

³¹ Mexico's GDP in 2013 was USD 1.261 trillion. Source: World bank

³² Art 8, Decree modifying Federal Budget and Public Debt Laws DOF 11/08/2014, and Art 94 Law of Mexican Petroleum Fund for Stability and Development of DOF 11/08/2014.

LAERFTE required social consultation for projects >2.5MW, and the 2014 Electricity law requires **social impact assessments** for all generation projects. **Environmental impact assessment** by the ministry of environment is required for all projects by the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA)³³. Additionally, an **environmental impact authorization** is required for geothermal exploration³⁴ and hydropower³⁵ from the National Water Commission.

Heating

In 2007 the PROCALSOL programme set a goal of reaching 1.8 million m² of solar collectors installed by 2012.

In 2010 the public mortgage lender (INFONAVIT) introduced the Green Mortgage programme, whereby borrowers could access additional credit by meeting energy and water efficiency **requirements**, including solar water heating. In 2011, the “green mortgage” requirements were extended to all INFONAVIT mortgages.³⁶ Partial **subsidies** for solar collectors were offered from 2010 to 2012 to INFONAVIT mortgage-holders under the *25000 Solar Roofs* programme.

At the subnational level, in 2006 Mexico City established a **mandate** for all new and refurbished swimming pools and large commercial buildings (>50 employees) to achieve 30% of their water heating energy needs through solar collectors.³⁷

Fiscal incentives include **accelerated depreciation**, as discussed under the electricity section.

Transport

The Law for the Promotion and Development of Bioenergy³⁸ of 2008 and its regulation³⁹ in 2009 provide the legal framework for the development and production of biofuels in Mexico. The stated objectives of the law are to achieve rural development, particularly in

marginalized areas, to ensure food security, and to reduce pollution and greenhouse gas emissions. The bioenergy law allows the use of corn for energy production only on years when there is a national surplus of corn. Given the added uncertainty of corn availability as a bioethanol feedstock, most development has been from sugarcane and sorghum.

The 2009 PROINBIOS and Bioenergy Introduction programmes aimed at generating a demand for bioethanol and biodiesel of 986 million liters and 17.4 million liters respectively during the period 2011-2012. This was to be achieved by **blending** 6% of bioethanol in gasoline and 0.5% of biodiesel in the cities of Guadalajara, Monterrey and Mexico DF.

As of November 2014, PEMEX started a new procurement auction for a total of 2,215 million liters of locally produced bioethanol for blending with gasoline at 8 regional terminals. The process resulted in the participation of 6 companies that will produce the biofuel for PEMEX under 10 year contracts.

Energy Access

The Electricity Law of 2014 establishes that the government strategies for electrification of rural and peri-urban areas will promote the use of renewable energy.⁴⁰ To this end, it provided for the creation of the “Fondo de Servicio Universal Eléctrico” (Universal Power Service Fund).

The 2007 *Integrated Energy Services Programme* (PSIE) aims at the electrification with renewable energy of 50,000 households (250,000 people) in 86 communities in the states of Chiapas, Guerrero, Oaxaca and Veracruz. The Programme was launched in with a budget of USD 100M, and a timeframe of 5 years.⁴¹ The program was extended until 2014.

In the context of the 2013-2018 National Development Plan, the federal Isolated Communities Electrification project aims at

³³ [DOF 26-04-2012](#)

³⁴ [Geothermal Law](#)

³⁵ [National Water Law](#)

³⁶ http://portal.infonavit.org.mx/wps/wcm/connect/infonavit/trabajadores/saber+para+decidir/cuido_mi_casa/ahorro+y+cuido+el+medio+ambiente

³⁷ NADF008-AMBT-2005

³⁸ DOF 01-02-2008

³⁹ DOF 18-06-2009

⁴⁰ Art. 116,

⁴¹ Sources: PEAER 2014 and http://www.sener.gob.mx/webSener/res/0/ER_para_Desarrollo_Sustentable_Mx_2009.pdf

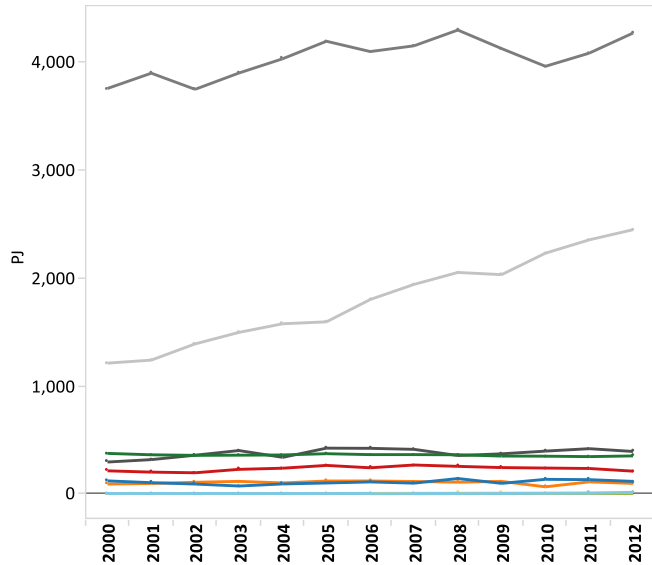
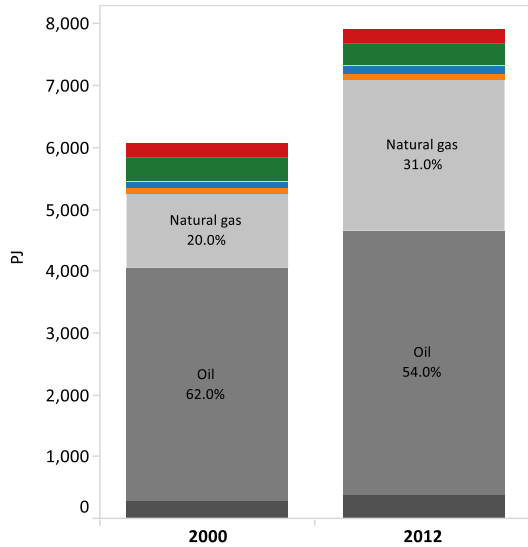
providing household with 250W solar home systems or mini wind turbine equivalent.

The programme *Light for Mexico*, also known as *Bandera Blanca*, aims at electrifying over one thousand communities with over 100 inhabitants, both through grid extension and with solar energy.

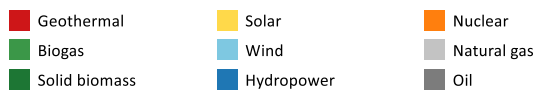
At the subnational level, many states have programs for rural electrification, often in collaboration with international public and private partners, such as for example *Programa Luz en Casa Oaxaca* or *Educación con Responsabilidad Ambiental* in Chiapas.

2. Statistics

Total Primary Energy Supply



Excludes electricity trade

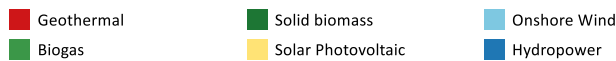
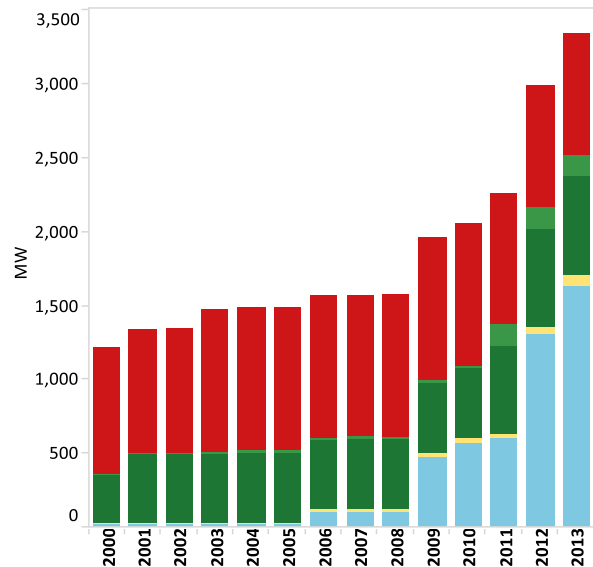
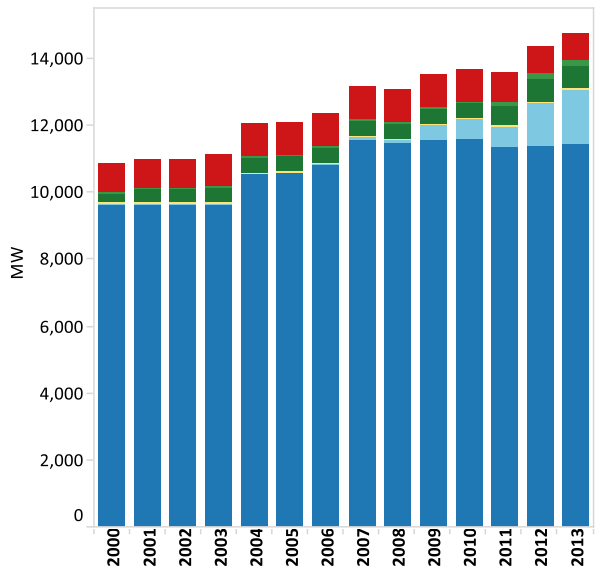


	Total Primary Energy Supply	Share of renewables
2000 Total	6,063.0 PJ	
Of which renewables	707.9 PJ	11.7%
2012 Total	7,887.6 PJ	
Of which renewables	696.5 PJ	8.8%

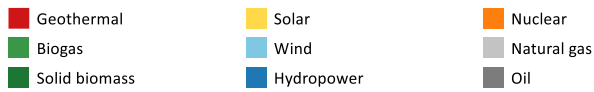
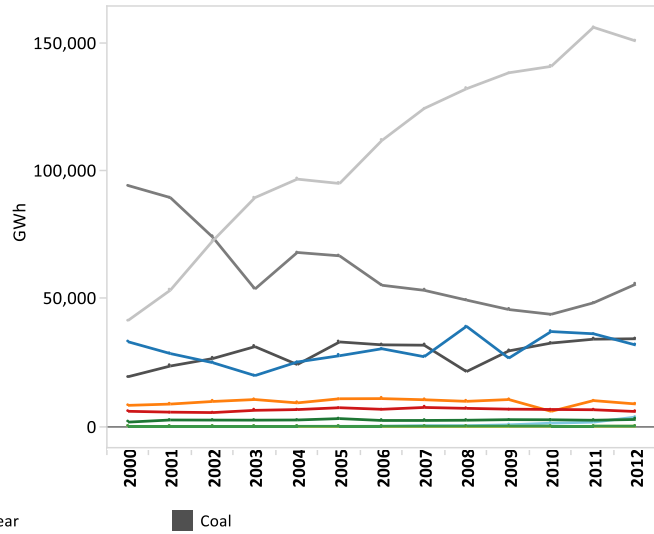
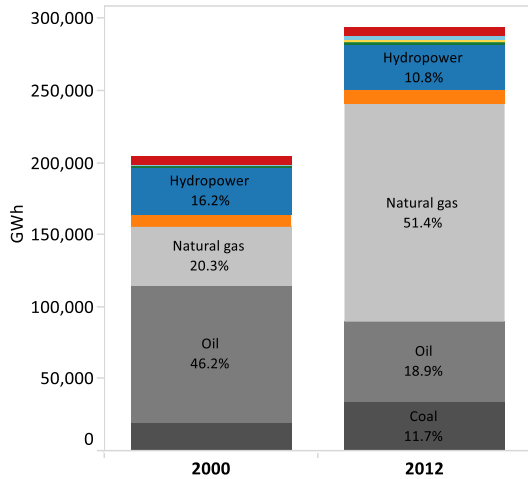
Total includes electricity trade

	Total Primary Energy Supply	Share in total renewables
2012 Geothermal	209.4 PJ	30.1%
Wind	13.1 PJ	1.9%
Solar	6.7 PJ	1.0%
Biogas	1.8 PJ	0.3%
Solid biomass	350.8 PJ	50.4%
Hydropower	114.7 PJ	16.5%

Renewable Power Capacity



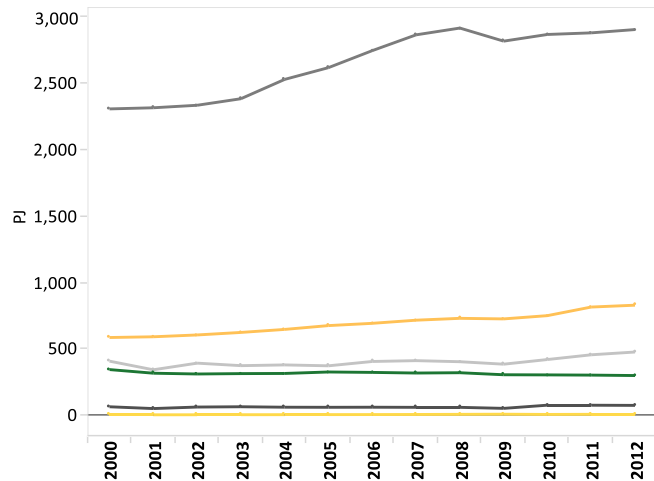
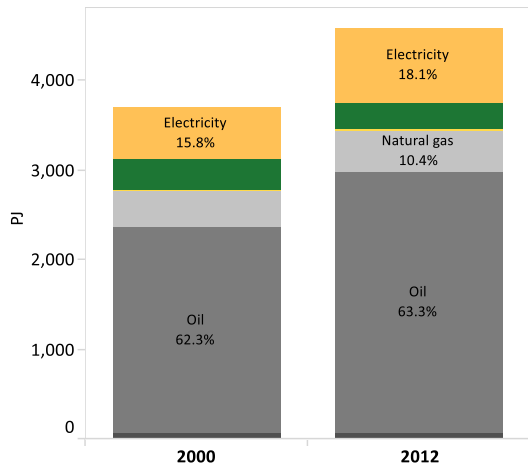
Electricity Generation



		Electricity generation	Share of renewables
2000	Total	204,177.0 GWh	
	Of which renewables	40,732.0 GWh	19.9%
2012	Total	293,862.0 GWh	
	Of which renewables	44,176.0 GWh	15.0%

		Electricity generation	Share in total renewables
2012	Geothermal	5,817.0 GWh	13.2%
	Wind	3,644.0 GWh	8.2%
	Solar	69.0 GWh	0.2%
	Biogas	91.0 GWh	0.2%
	Solid biomass	2,700.0 GWh	6.1%
	Hydropower	31,855.0 GWh	72.1%

Total Final Energy Consumption



		Total Final Energy Consumption	Share of renewables
2000	Total	3,702.6 PJ	
	Of which renewables	344.4 PJ	9.3%
2012	Total	4,582.4 PJ	
	Of which renewables	304.1 PJ	6.6%

		Total Final Energy Consumption	Share in total renewables
2012	Solar	6.4 PJ	2.1%
	Solid biomass	297.7 PJ	97.9%

Sources for these statistics: IRENA, IEA, UN

Renewable Energy Policy Briefs

This brief is part of an IRENA series providing a comprehensive and timely summary of renewable energy policies in Latin America (including Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay, and Venezuela).

The brief brings together the most up-to-date information on renewable energy public policies for the power, heating and transport sectors, and also includes a section on energy access policies. The objective of this brief is not to provide an assessment of the reported policies. The brief is primarily based on the information contained in the [IEA/IRENA Joint Policies and Measures Database](#), complemented with information drawn from: (i) additional existing legislation, (ii) official government sources such as plans, reports and press releases, and (iii) input from country policymakers and experts. While the brief focuses on policies at the national level, sub-national policies are also included where relevant. Specific projects or programmes implemented by actors such as international organisations, development partners and the private sector are beyond the scope of this brief.

The information contained in this document is posted on IRENA's [REsource](#) web portal, will be used to update the [IEA/IRENA Joint Policies and Measures Database](#), and will form the basis of IRENA's future policy work in Latin America.



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