British Embassy
Guatemala City

GUATEMALA:
Energy Sector Opportunities for UK Companies

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We are working with Guatemala on a range of issues to strengthen political and trade links. Our work also includes supporting British nationals in Guatemala.

We work in Guatemala to action the UK government's commitment to improve relations with Latin America. This includes supporting prosperity by helping the UK increase exports and attracting foreign investment; increasing human rights; supporting the security and justice sectors; resolving and preventing conflict; and working with the next generation of young leaders. These are supported by the UK funding a range of projects and public diplomacy.

We are encouraging investment in the UK and increasing the number of British firms successfully doing business in Guatemala.

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Sector briefing

Energy sector opportunities in Guatemala

Introduction

The following report has been prepared by gathering historic and current information from official sources. It aims to provide any reader with useful information regarding the energy sector in Guatemala.

It has been written as a useful tool of information for any potential UK investor interested in learning about this Central American market, which represents the biggest, the most reliable and the one much more diversify market across the region. It offers competitive and reliable legislation on electricity generation.

Why Guatemala?

Guatemala is the largest economy in the Central American region. With a population of 14.7 million, the country accounts for 35% of the regional economy. It offers steady and stable growth, and a government committed to attracting foreign investment. It is backing this up with action, such as introducing tax reform and new laws, and signing free trade agreements. The British Embassy in Guatemala City is supporting these efforts by bolstering its commercial capacity to support UK business, and hosting trade missions. The UK is already the biggest energy investor in Guatemala.

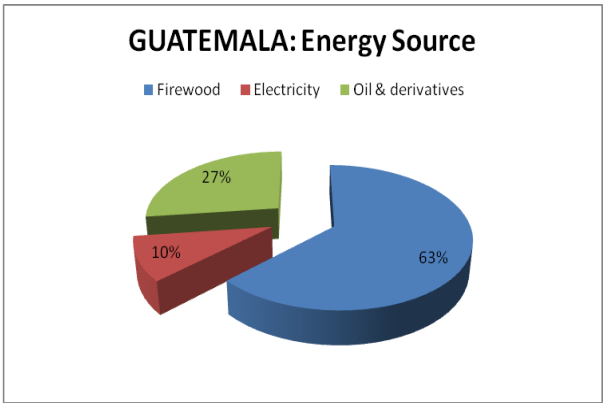
Guatemala Overview

In terms of energy, Guatemala still presents a high dependence of firewood, especially to cover residential demand. Even when it is a country with high-energetic potential natural resources, the country's major energetic source is its forestry richness which accounts 34% of the national territory. However, a high dependence on hydrocarbons still holds the country back when supplying energy for the industry and productive sectors.

Besides firewood, biomass has started to become significant to attend the continuously increasing energy demand. Domestic investment made by the local sugar industry has started to produce biodiesel and energy from sugar-cane pulp. However, firewood still represents the main source of energy (approx. 63%), for residential/household purposes across the country. Some experts explain

these as a result of the inequities and economic gaps between rural and urban areas in which the majority of population lives in poverty, and coverage of electricity (alongside with high prices on distribution) presents some challenges.

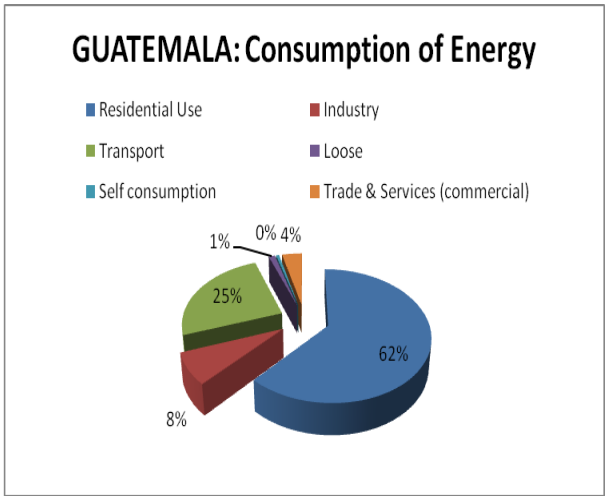
Other sources of energy include derivates of oil/petroleum such as diesel (12%), gasoline (8%), and fuel oil (4%); biodiesel from sugar-cane pulp and liquid petroleum gas/propane (3%).



***Source**: Comisión de Energía Eléctrica – Guatemala (2012)*

Even when it is broadly used, firewood energy is inefficiently exploited across rural areas of the country. 81% of homes are estimated to use this form of energy in a type of stove called "three stones stove", which wastes nearly 90% of the energy.

Due to its high dependency on hydrocarbons for industrial purposes, Guatemala is categorized as a net importer of energy. It is a highly dependent country on hydrocarbons such as petrol and its derivates. However, local authorities have implemented significant measures to change the country's energetic matrix promoting other sources of energy production, which include clean and renewable energy. This change is also intended in increasing the domestic production of energy by 78% in a 14 years period.



***Source**: Comisión de Energía Eléctrica – Guatemala (2012)*

Guatemala's energy sector includes three main areas and/or subsectors: electricity generation, transport and distribution (demand). Electricity production relays on renewable sources (64%), with a third of production by non-renewable ones (36%).

Guatemala's Energy Production 2011

Source	GWH	Percentage
Renewable	5,204.99	63.89%
Non-Renewable	2,941.58	36.11%
Total	**8,146.57**	**100.00%**

***SOURCE**: Ministry of Energy and Mines (2012)*

The generation sub-sector is a much diversified one. It includes hydroelectric, geothermic, biomass, solar and wind energy plants. According to official data, in 2011 Guatemala had a total installed energy capacity of 847 megawatts, an increase of 0.58% on the previous year (842MW). On the renewable energy sector, installed capacity has increased by 20MW.

Considering its natural resources, Guatemala is looking to diversify its energy needs away

from hydrocarbons towards clean energy. It not only aims to make significant savings as oil international prices keep increasing, but also to reduce prices on electricity and to minimize the impacts of carbon emissions while shifting the energy mix promoting renewable sources of energy.

Economic growth has had a positive impact in Guatemala's need for energy; mining demand has quadrupled since the mid 1980s up until today. Several events have happened during this time, such as the electricity rationing during 1991, which led the government to sign contracts with private suppliers to meet the country's power requirements. In 1992, the government signed a contract with Enron (USA) to build a 110MW plant in Puerto Quetzal (Pacific, 180km from Guatemala City).

Continued power supply constraints forced the government to issue more power supply contracts with private companies and allowed thermal installed generation capacity grew nearly 400% in the period from 1993 to 2002. Other facilities were built during this period, adding more capacity to the country's generation scheme. Two geothermal-powered plants were added to the energy production capacity: Calderas 5MW (1998) and Zunil 24MW (1999). During the same period, hydro installed electric generating capacity remained essentially static.

The other major energy sector in Guatemala is oil and gas. The country has natural reserves in both energetic sources. However, both are under utilized. Currently there are 153 oil wells. However, only 58 currently produce oil. This new tender process, called Ronda Guatemala (Guatemala Round) aims to be the first of a series of international biddings that will reach the country's 80 million barrels per day potential. These government efforts are set to reduce the impacts of high international prices of oil. Most of domestic production is heavy crude oil with an international price averaging 66% WTI[1].

[1] WTI: West Texas Intermediate.

Field	Sulfur Content	API Gravity	Combustion (kcal/kg)	Cinematic Viscosity cSt @ 100F
Xan	6.18%	16.0	9997	287
Rubelsanto	3.20%	23.6	9850	26.65
Chocop	7.03%	13.7	10.167	423
Yalpemech	< 2%	32.9	NA	NA

***SOURCE**: Invest in Guatemala[2] (2012)*

Energy Sector Organization and Legal Framework

In Central America, Guatemala presents the best opportunities for power generation across the region. A consistent and investment-friendly legislative framework, makes Guatemala an attractive market for international companies to invest in.

Electricity and Oil and Gas sub-sectors cover the domestic power demand in the country. Whilst Guatemala is the only oil producing country in Central America, the electricity sub-sector is the most important and developed across the country. The Ministry of Energy and Mines (*MEM,* www.mem.gob.gt) is responsible for energy policy. The Legal framework for energy is enshrined in the Constitution since all natural resources with energy potential are considered national assets and state property. Legal framework also includes specific laws ruling each one of the subsectors and their ruling bodies/entities. The regulations for the Electricity Law were issued in 1997, while the Wholesale Market regulations were issued in 1998. Other important pieces of legislation include the Incentives Law for Renewable

[2] Invest in Guatemala, is an invest the invest promotion agency of the Government of Guatemala (http://www.investinguatemala.org)

Energy Projects of 2003 (Decree 52-2003), its Regulations issued in 2005 (Decree 211-2005), and the Renewable Energy Generation Norms issued in 2008 (171-2008). They all aim to promote the development of renewable energy generation projects across the country, as a way to reduce the high dependence of hydrocarbons in energy production.

Electricity wise, the sub-sector is ruled under the National Electricity Law (Decree 93-96) passed by the National Congress, aimed to reform the electric power market. This piece of legislation allowed private companies to participate in a number of projects. It opened up energy commercialization, distribution, transmission and generation from the control of the then two major stakeholders in the 1990s (*Empresa Electrica de Guatemala, Sociedad Anonima* –EEGSA- and *Instituo Nacional de Electirificación* –INDE). This law set up a competitive market where only the prices of transportation and distribution are regulated.

Before this law came into force, MEM, EEGSA and INDE were the only players in the market. Once it was enforced, international companies most of them through joint consortiums with a local partner, started to invest in the country.

The Ministry of Energy and Mines' role is to make national policies and indicative plans regarding energy/electricity. The regulator agency is the National Commission of Electricity (CNEE) whilst the operator of the National Interconnection System deals with all electrical transactions is the Wholesale Market Administrator. Within this wholesale market scheme, power generators, carriers, distributors, big users (industrial/commercial) and traders are the players.

Regionally, the Central American Electricity Market Treaty and its Protocols rule the sector across the region and all matters related to the regional electricity interconnection. This particular regional initiative sets Guatemala as a regional hub for power due to own natural resources and the investment-friendly legal framework ruling power/energy sector.

This particular legal framework has attracted many foreign investments across a variety of energy sub-sectors. The UK is already the biggest energy investor in Guatemala, with US$1.2 billion of capital, including around US$700 million in a coal-powered plant currently under construction, and a significant investment in the transmission in rural areas across the country. World class UK players have set their eyes in the country: Ashmore Energy International, Actis, Blue Oil whilst others have started to pay more attention to the opportunities the country has to offer energy wise.

EEGSA sold its generation in 2001. Before that, in 1998 the company divested 80% of its distribution assets to a consortium comprising Iberdrola (Spain), TECO Power Services (USA) and Electricidade de Portugal (Portugal). In the same year INDE split its distribution assets creating two regional companies Distribuidora Eléctrica de Occidente (Deocsa) and Distribuidora Eléctrica de Oriente (Deorsa) which Union Fenosa (Spain) subsequently acquired and in 2012 sold to Energuate a Guatemalan company funded by UK Actis.

As for the generation, INDE has retained control of its assets, which are held as legally distinct companies allowed under the Electricity Law. There are also 14 municipally owned distribution companies which serve their regions.

The main outcome of the Electricity Law is the creation of a regulatory agency (La *Comisión de Energía Eléctrica*[3]) and a wholesale power market administrator entity (*Administrador del Mercado Mayorista*[4])

Regionally, Guatemala also has begun several projects with its neighbours to increase the reliability of its power supplies. A planned connection with Mexico's electricity grid is expected to allow it to import power. In addition, Guatemala and five other Central American countries –El Salvador, Honduras, Nicaragua, Costa Rica and Panama- have agreed a regional project known as SIEPAC (Central American Interconnection System) that aims to interconnect transmission grids allowing power to flow between the different countries.

Oil and gas sector is regulated by the National Law of Hydrocarbons from 1983 (Decree 109-83) and its reforms. The Commercialization Law of Hydrocarbons is the other piece of legislation ruling this sector. Royalties are set as for a fixed rate of 20% to a 30 API[5] degrees, with an additional 1% for any API degree. A 5% fixed royalty rate is set for all oil projects.

Other legislation applicable to the oil and gas sector is the Foreign Investment Law of 1998 (Decree 9-98) and the current Commerce Code.

Renewable energy potential

Guatemala enjoys considerable renewable resources, which to date have not been fully taken advantage of. In fact, with 5,000MW of hydroelectric power potential, the country only uses 17.06% (853MW); and with 1,000MW potential geothermal energy, just 4.92% (49.2MW) is used. Other sources of renewable energy have started to be developed. Wind, solar and biomass generation projects have been targeted as sustainable means to reduce the country's dependence on hydrocarbons. Especially biomass where the local sugar industry has made significant investments to use the sugar-cane residues as a source of energy to their sugar production plants/mills.

The current energy capacity installed and in use in Guatemala is as follows:

Resource	Capacity	In Use	% of Use
Hydroelectric	5,000MW	853.0MW	17.06 %
Geothermic	1,000MW	49.2MW	4.92%
Biomass	700MW	381.0MW	54.43 %
Solar	10,446GW/y	52.2GW/year	0.50%
Wind	7,800MW	0.1MW	0.00%

***SOURCE**: Ministry of Energy and Mines (2012)*

Three assessment products are under development:

1) A high (10-km) resolution solar map in cooperation with State University of New York (SUNY);
2) A medium (40-km) solar map in cooperation with the US National Renewable Energy Laboratory (NREL); and
3) A 1-km wind map in cooperation with NREL. A geospatial toolkit will integrate the solar and wind data with geographic information system (GIS) data to support an overall solar and wind energy resource assessment.

Opportunities

Power demand in 2012-2013, according to the Wholesale Market Administrator, will be about 8,821.58GWh, meaning 230GWh more

[3] Comisión Nacional de Energía Eléctrica (CNEE) http://www.cnee.gob.gt

[4] Administrador del Mercado Mayorista (AMM) http://amm.org.gt

[5] API: American Petrol Institute gravity.

than in 2011-2012. This reflects a slight decrease directly related to economic growth which is the most important index to estimate power demand.

Guatemala wants to move towards cleaner energy sources, with hydro the most competitive, but also some focus on wind power projects. However, costs to produce power in energy farms remains higher than other sources. Biomass represents an interesting opportunity, where Guatemala is already showing significant progress. There is a good opportunity to develop the bio-fuel sector further.

There are many electricity generation projects programmed to enter in order to cover the increasing demand. The Expansion of the Transport System Plan is aimed to develop the transport network from a radial topology towards a ring or grid one. This plan is expected to be completed by 2018 and includes the following stages:

Ring	Geographical Location	Lines (km)	Number of stations	Estimated Cost (US $ Millions)
Metropacifico	Central and South	144	17	119.1
Hydro	North West	464.3	8	108.7
Atlantico	North East	585	4	115.8
Oriental	South East	55	4	16.7
Occidental	South West	146	7	61.7
Others	Guatemala-Mexico Interconnection			73
TOTAL		1394.3	40	495

***SOURCE**: Ministry of Economy (2012)*

The National Indicative Plan 2008-2022 has set a number of projects to increase power generation. It includes both non-renewable and renewable sources. Amongst the non-renewable sources, a total of US$2.66 million Investment is expected in nineteen different power generation plants that include gas and vapour turbines. In the renewable sector, US$6,799 million are expected to be invested in 30 hydro-power plants and one biomass powered plant in a sugar-cane mill.

The natural reserve of oil in the Northern part of Guatemala (Peten, Alta Verapaz, Izabal) and the small proven natural gas reserves also present good opportunities for international companies to enter the market to develop exploration and exploitation projects.

In the oil and gas sector, due to the natural resources and government efforts to reduce the country's high dependence on imported hydrocarbons, a new tender process for seven areas in northern Guatemala is being promoted internationally. Granted companies, which are expected to be major international companies, are expected to gain contracts for up to twenty five years. This is the first tender launched by the government since 1997. The hope is to raise domestic production from 10 to 20 million barrels per day by 2020.

Contracts for oil and gas are commonly issued for a 20-25 years period, with an option to renew. Companies from the United States, Canada and Mexico are the ones who have shown more interest in these reserves. In fact, much of the country's oil production is shipped to the United States. There is no one refinery set in the country. However, the *Refinería del Motaga* project (Zacapa, east) is aiming to cover the national needs of hydrocarbons with a small surplus forecasted to be exported. Currently this project is seeking international investors to formally start operations.

Looking further ahead the Guatemalan government has already identify additional future sites, including natural gas exploration off the south coast.

Risks

Although Guatemala is politically stable, there still are some risks for companies considering investing in the country's energy and mining sectors. The UK Government expects UK businesses to operate at all times in a way respectful of human rights whether in Britain or overseas, and has been working on a UK strategy on business and Human Rights - based on the UN Guiding Principles.

The main obstacle for the development of any new energy/power projects across the country is social conflict. Bad experiences from the past remain in the minds of villagers, such as the incidents happened during the construction and opening of Chicxoy hydro plant 1976-1983. Recent incidents have also tarnished reputation of energy companies interested in, or already investing in, the country. This has led to a situation where new projects are met with scepticism and opposition, sometimes violent; regardless of the potential benefits to the communities.

Economic and social disparities between rural and urban areas exacerbate the situation. Fears about manipulation often drives resistence to energy projects. These have led to demonstrations, including the blocking of important transit routes in Guatemala.

But in general local communities have been more welcoming of new energy projects, both electricity and oil and gas projects. This is partly due to legislation, which guarantees a fixed rate of 4% of net profits to the local municipality, but also due to direct aid programmes set up by the companies for the communities, such as schools, medical clinics, and other small economic development projects included within the companies' corporate social responsibility programmes.

It is therefore advisable to create and develop a good communications program direct to the villagers in order to share with them the benefits of any particular energy project.

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