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# Challenges and Opportunities for the Energy Sector in the Eastern Caribbean

## Saint Lucia Energy Dossier

Ramon Espinasa
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Christiaan Gischler
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Energy Division
INE/ENE

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# Abstract

This Energy Dossier is part of a series of publications produced by the Energy Division of the Infrastructure and Environment Department of the Inter-American Development Bank. It is designed to increase the knowledge base about the composition and organization of the energy sector of Latin American and Caribbean countries. Each dossier describes the energy matrix of the country under analysis and then dives deeply into the institutional organization and regulatory framework of the energy sector in that country. This series is an important contribution to the understanding of the energy sector of the Eastern Caribbean countries, as many projects providing comparable information have been carried out in this part of the hemisphere.

**Keywords:** Energy; electricity; energy matrix; Caribbean; Eastern Caribbean

**JEL Codes:** Q40, Q43, Q48

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# Index

# Acronyms

| | |
|---|---|
| Boe/day | Barrels of oil equivalent per day |
| CDSPS | Cul de Sac Power Station |
| CR&W | Combustible renewables and waste |
| ECERA | Eastern Caribbean Energy Regulatory Authority |
| EPAC | Energy Policy Advisory Committee |
| ESA | Electricity Supply Act of 1994 |
| ESB | Electricity Supply Bill of 2015 |
| GDP | Gross domestic product |
| GWh | Gigawatt hour |
| HOSL | Hess Oil Saint Lucia Company Limited |
| IPP | Independent power producer |
| IRENA | International Renewable Energy Agency |
| Kboe/day | Thousand barrels of petroleum equivalent per day |
| LUCELEC | Saint Lucia Electricity Services Limited |
| MVA | Mega volt amps |
| MW | Megawatt |
| NEP | National Energy Policy |
| NREL | National Renewable Energy Laboratory |
| NURC | National Utilities Regulatory Commission |
| PPA | Power purchase agreement |
| RC | Regulatory commission |

# Country Overview: Saint Lucia

The island of Saint Lucia is part of the Lesser Antilles and is located north of St. Vincent and the Grenadines, northwest of Barbados and south of Martinique. The island is 43.5 kilometers long and 22.5 kilometers wide and covers a total land area of 617 square kilometers. It has a population of 182,273, of which more than a third resides in the capital of Castries (World Bank, 2014a).

**Map 1** Saint Lucia


**Source:** Author's own work.

Saint Lucia has a high level of development, with a score of 0.714, ranking 97th out of 187 countries on the 2013 Human Development Index (UNDP, 2014). In 2013, it recorded a national gross domestic product (GDP) of US$1.28bn, and its per capita GDP stood at US$7,620 (IMF, 2015).

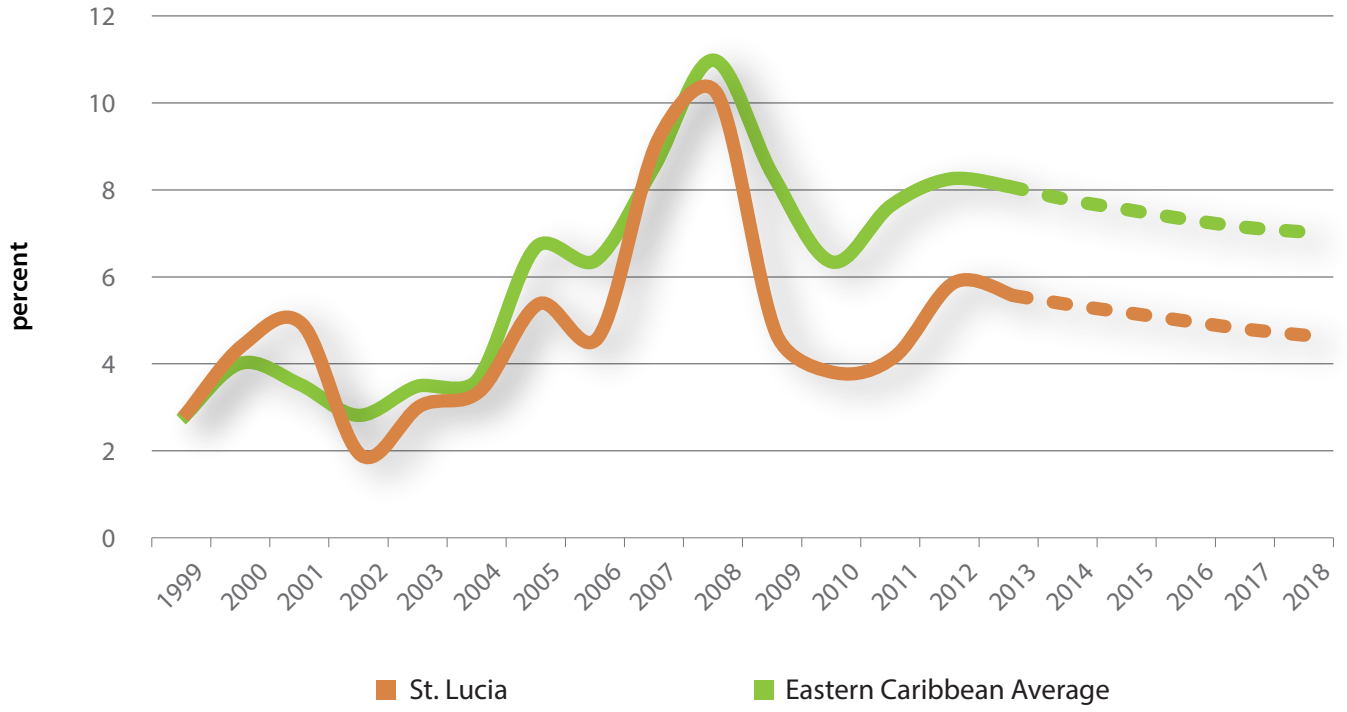
Saint Lucia's economy, similar to those of most of its Caribbean neighbors, is disproportionately service oriented and dominated by the tourism and financial sectors. The service sector accounts for 73 percent of GDP and consists primarily of tourism and offshore banking.

St. Lucia's industrial sector is the largest and most diversified in the Windward Islands (Dominica, Grenada, Martinique, and Saint Vincent and the Grenadines), representing around 20 percent of the economy, and its products are mainly destined for export. The sector includes light manufacturing and assembly plants producing paper and cardboard boxes, apparel, electronic components, and plastic products.

The agriculture sector, a major contributor to the national economy in the past, primarily from banana mono-crop plantations, today accounts for just 3.9 percent of GDP. The importance of this sector decreased following the government's 2006 decision to close the sugar industry after sustained losses for several decades. Nonetheless, it employs approximately 11 percent of the total working population (Government of Saint Lucia, 2014b).

Like many small island states, Saint Lucia is highly reliant on imported fossil fuels to meet its energy needs. Its oil import costs have historically remained in line with the Eastern Caribbean average. Saint Lucia spent 10.2 percent of its GDP on oil imports in 2008. This share has since fallen to around 6 percent. Saint Lucia is forecasted to spend slightly less on energy imports as a share of GDP than the Eastern Caribbean average over the next few years (IMF, 2013b). According to figures by the National Renewable Energy Laboratory (NREL), Saint Lucia spends 6.75 percent of GDP on fuel imports related to electricity and 16.45 percent on overall fuel imports (NREL, 2015).

**Figure 1** Oil Import Costs as Share of GDP




**Source:** IMF (2013).

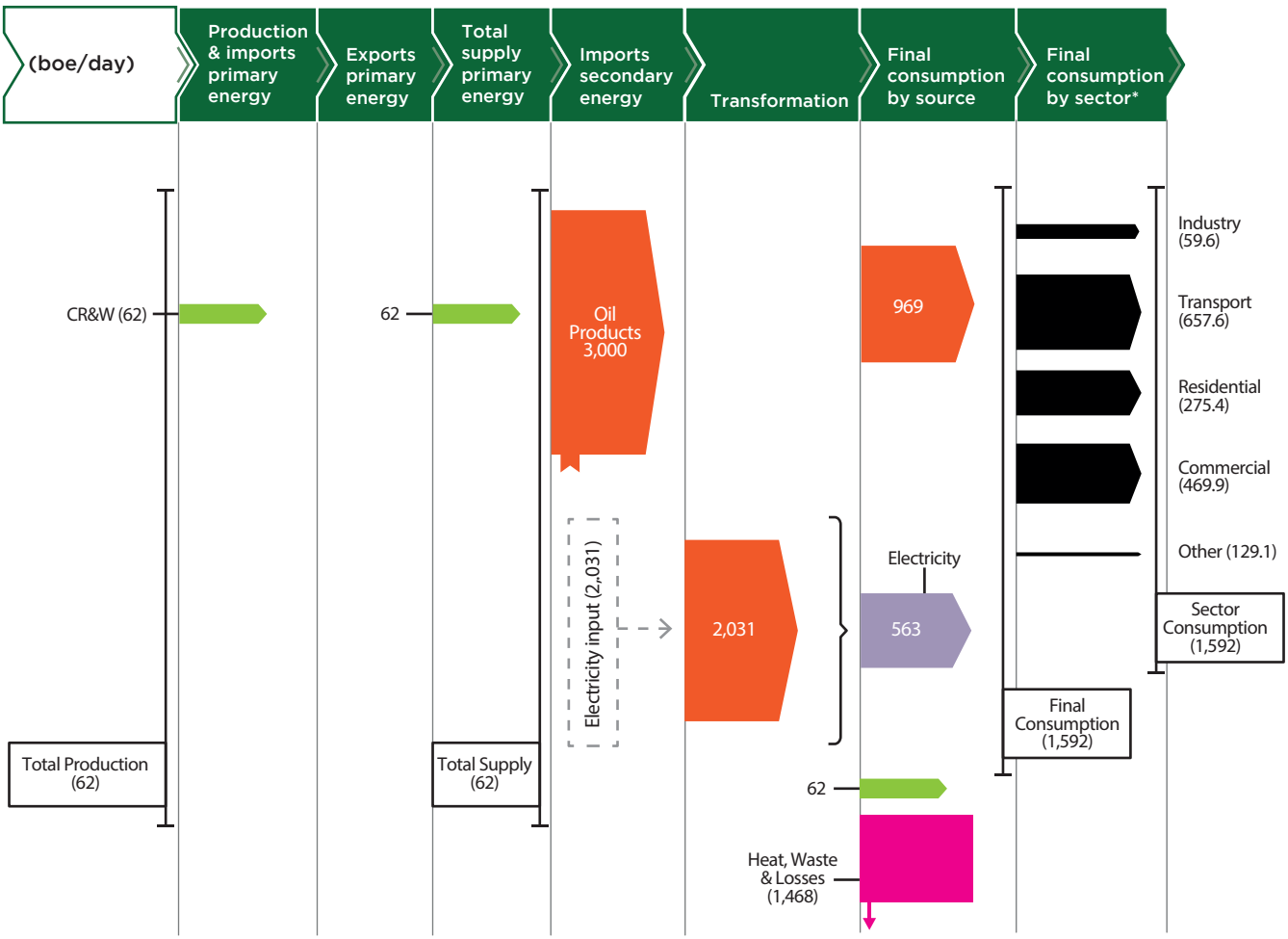
# The Energy Matrix of Saint Lucia

The island nation's production of primary energy is limited to 61 barrels of oil equivalent per day (boe/day) of combustible renewables and waste (CR&W). The vast majority of energy (around 98 percent) is imported in the form of oil products. The island nation imports a total of 3000 boe/day. About two-thirds of oil products (2030 boe/day) are used to generate electricity. Losses during generation, distribution, and transmission total 1468 boe/day, leaving 563 boe/day of electricity for final consumption. In total, final consumption of Saint Lucia is 1,592 boe/day, of which 969 boe/day are oil products, 563 boe/day are consumed in the form of electricity, and 61 boe/day are CR&W.

Consumption by sector is as follows: the transportation sector consumed 41 percent of energy with 658 boe/day, followed by the commercial sector with 26 percent and 470 boe/day, the residential sector with 17 percent and 275 boe/day, the industrial sector with 4 percent and 60 boe/day,[1] and other at 8 percent and 129 boe/day.

1 The commercial sector may be unrepresented in official figures, as hotels in Saint Lucia operate significant self-generation capacity.

**Figure 2** Saint Lucia, 2013

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**Editor:** Ramón Espinasa (INE/ENE).
**Authors:** Malte Humpert.
**Source:** Own calculations based on EIA, IRENA, LUCELEC, Government of Saint Lucia.

# Total Energy Supply

The total energy supply in Saint Lucia totaled 3061 boe/day in 2013. Imported oil products accounted for 3000 boe/day and made up 98 percent of the total supply, with the remaining two percent coming from CR&W. CR&W accounted for 61 boe/day (EIA, 2012; IRENA, 2012).

While Saint Lucia has no proven fossil fuel resources, it possesses substantial renewable energy potential. Its geothermal prospects are excellent, and its location in the tropics ensures widespread availability of wind and solar resources. In December 2014, St. Lucia received US$2 million in funding from the World Bank to start a Geothermal Resource Development Project. The government has announced that it will use this funding for exploration, development, and implementation of a geothermal project in the country. As of December 2014, the government was in advanced stages of negotiations with Ormat Technologies, a U.S.-based company, to develop geothermal resource at Soufriere, including surface exploration in 2015. Financial backing for the project comes in part from the World Bank, SIDS DOCK, and the Government of New Zealand (Castalia, 2015).

# Domestic Production

Saint Lucia, like most Eastern Caribbean countries, is highly dependent on imported fossil fuels to meet its energy demand. Saint Lucia has no known petroleum reserves and, apart from limited usage of combustible renewables, all energy is imported, mainly from Trinidad and Tobago.

Saint Lucia receives about 98 percent of its overall energy through imported oil products, with the remaining share coming from CR&W. While the island state has significant wind, solar, and geothermal energy potential, other indigenous energy sources, such as hydropower or fuel wood, are limited.

All of these options have yet to be developed commercially. All refined petroleum products are imported and subsequently stored at the Hess Oil St. Lucia Company Limited (HOSL) oil storage facility in the northern part of the island. HOSL is the exclusive supplier of fuel to the island utility company, St. Lucia Electricity Services Limited (LUCELEC) (Castalia Consulting, 2012; Government of Saint Lucia, 2003; World Bank, 2010).

**Figure 3** Share of Total Energy Supply, 2013


**Source:** EIA (2012); IRENA (2012).

In addition to CR&W, Saint Lucia employs a very limited number of solar water heating systems in the residential sector as well as the hotel industry. The penetration, however, is not as high as in Barbados or Grenada (Samuel, 2013).

# Commercial Balance of Primary Energy

Saint Lucia did not import any primary energy in 2013.

# Domestic Primary Energy Supply

The primary energy supply of Saint Lucia was 61.2 boe/day in 2013.

# Electricity

## Installed Capacity

LUCELEC is the island's sole utility company and is responsible for the generation, transmission, distribution, and sale of electricity. It holds an exclusive license until 2045, with exceptions for small-scale, self-generated electricity. LUCELEC operates a single power station at Cul de Sac. The Cul de Sac Power Station (CDSPS) operates 10 diesel engines. The first three diesel engines—each between 6–7MW—were installed in 1990.

To keep up with Saint Lucia's growing demand following the closure of the two original stations at Union and Vieux Fort, LUCELEC continuously expanded generation capacity at CDSPS. It added a total of four 9.3MW generators, made by the Finnish company Wärtsilä, in 1998 and 2000. Additional capacity was installed in 2003, 2007, and 2012, when three 10.3MW diesel generators, also by Wärtsilä, came online. Total available capacity at CDSPS stands at 86.2MW.

The 2012 addition represents the last scheduled expansion at CDSPS. LUCELEC plans to open a second power station in the south of the island at La Tourney. The La Tourney location was chosen given its proximity to both the Hawanorra International Airport and a marine port facility, allowing easy access and delivery of oil products. Furthermore, a second generation facility will allow LUCELEC to reduce the risks associated with producing all electricity at one location and reduce the vulnerability of the electricity sector in the event of hurricanes or unforeseen circumstances. LUCELEC also plans to enable the La Tourney Power Station to use different types of fuel to reduce dependence on one specific type of (fossil) fuel and lessen the exposure to sudden fluctuations in the fuel prices (LUCELEC, 2013; 2014c; Parsons Brinckerhoff, 2013).

In addition to its fixed units, LUCELEC owns two mobile Caterpillar units, purchased in 2011, with a combined capacity of 2.5MW. These units are normally based at Union Station to provide back-up power during major interruptions, such as hurricanes or unscheduled maintenance. Thus, the units are only in operation when needed. Following the loss of the Soufriere substation, LUCELEC set up a temporary power station at Belle Plaine by relocating and using the Caterpillar units (LUCELEC, 2013).

LUCELEC also concluded preliminary work for the installation of a 75kW solar system at CDSPS, the first of its kind. No date for the installation and opening of this PV system, the first of its kind in the country, has been set (Light and Power, 2014; LUCELEC, 2013).

**Table 1** Inventory of LUCELEC Power Stations, 2014

| Power stations | Type | Capacity | Details | Year built |
|---|---|---|---|---|
| Cul De Sac Power Station | Diesel | 86.2 MW | 3 MAK engines,<br>3x 6–7MW<br>7 Wärtsilä<br>4x 9.3 MW<br>3x 10.3MW | 1990<br><br>2x 1998, 2x 2000, 2003, 2007, 2012 |
| Union Power Station | Mobile diesel | 2.5MW | 2 Caterpillar mobile generators | 2011 |

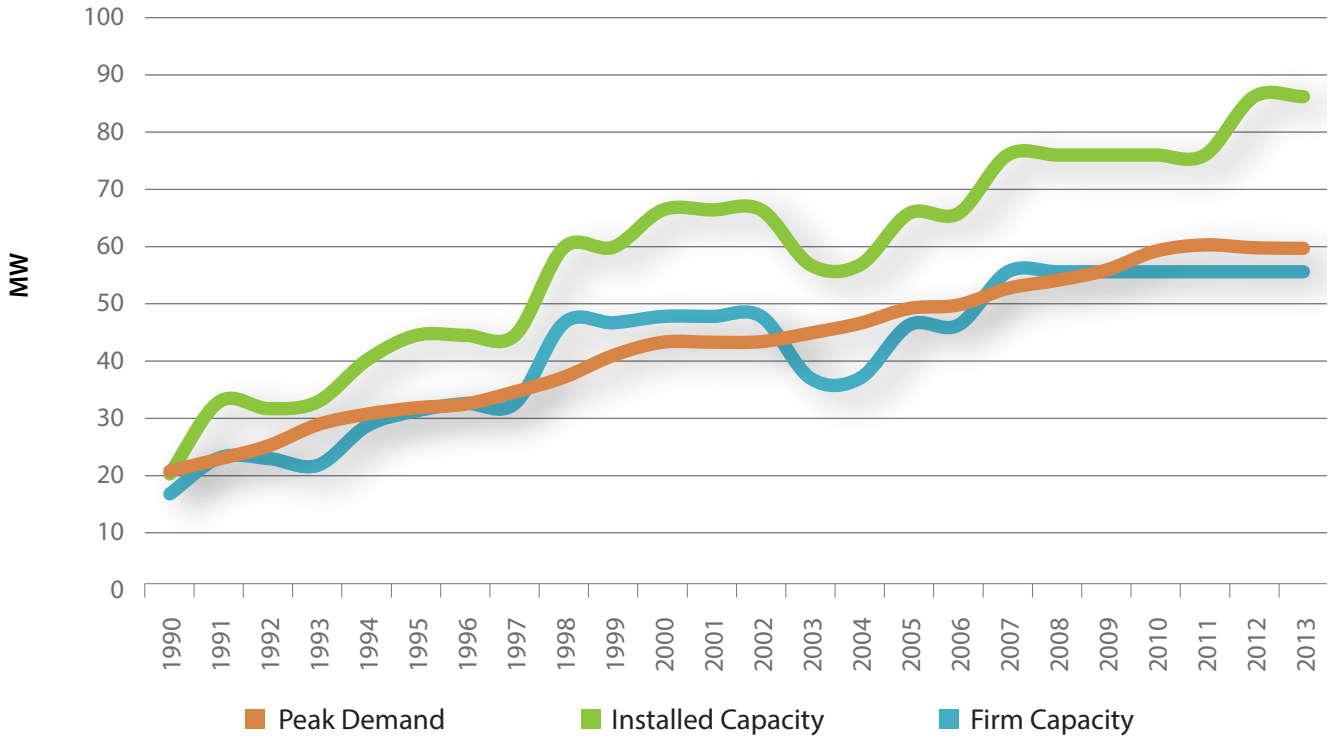
**Source:** : LUCELEC (2014c; 2014e); Parsons Brinckerhoff (2013).

LUCELEC's installed capacity has increased fourfold in the past 23 years. When it opened the CDSPS in 1990, its available capacity was 20.3MW, with 16.8 of this being firm capacity. Peak demand at that time exceeded total available capacity with 20.8MW.

The following year, with the first of the Wärtsilä engines coming online, available capacity increased to 32.9MW compared to a peak demand of 22.9MW. Firm capacity stood at 23.1MW. The growth of LUCELEC's available capacity continued to outpace the growth of peak demand.

Its firm capacity, however, has lagged behind and has been below peak demand since 2009. From LUCELEC's documents, it remains unclear how it defines and calculates firm capacity.

**Figure 4** LUCELEC Installed Capacity and Peak Demand, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

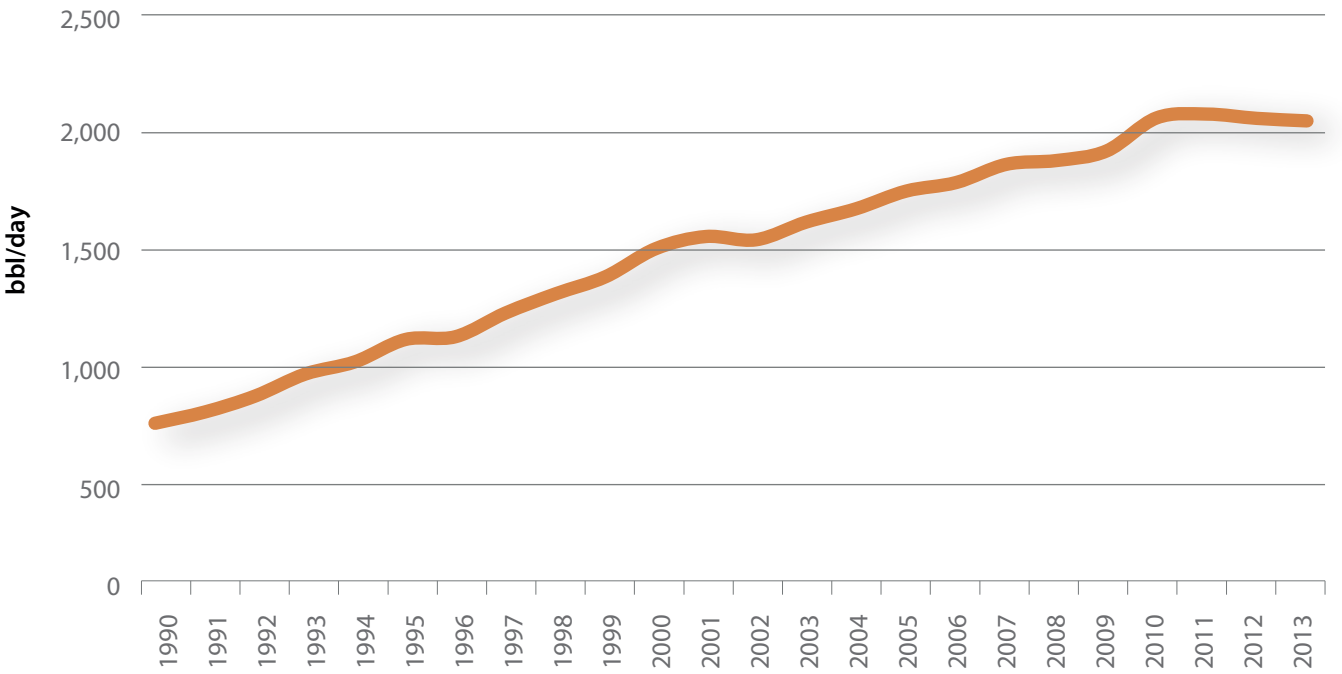
## Input to Electricity Generation

Of the 2030 boe/day intended for electricity generation in 2013, all 2030 boe/day came from liquid fuels, exclusively diesel. Imports of diesel fuel almost tripled between 1990 and 2013, growing from 779 bbl/day to 2030 bbl/day in 2013. Diesel consumption has been steady over the past four years, peaking at 2058 bbl/day in 2011 and declining slightly since.

In 2013, LUCELEC spent about EC$112 million on fuel and lubricants, representing 59 percent of its overall expenses. With about 65,862 customers, Saint Lucia is the largest electricity market in the Eastern Caribbean, both in terms of peak electricity demand and number of customers.

Economies of scale allow it to offer some of the lowest electricity rates throughout the region. Nonetheless, electricity prices remain volatile, as all utility scale generation on the island is based on imported fossil fuels. To reduce this vulnerability, LUCELEC actively conducts hedging against volatile fuel prices. As this practice began only in 2009, its impact on electricity prices and price stability is not yet known.

**Figure 5** LUCELEC Diesel Consumption, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

## Electricity Matrix

LUCELEC's net generation stood at 382.9 GWh in 2013, of which it sold 334.4 GWh to consumers. Generation decreased by 0.5 percent compared to 2012, and sales increased by 0.3 percent.

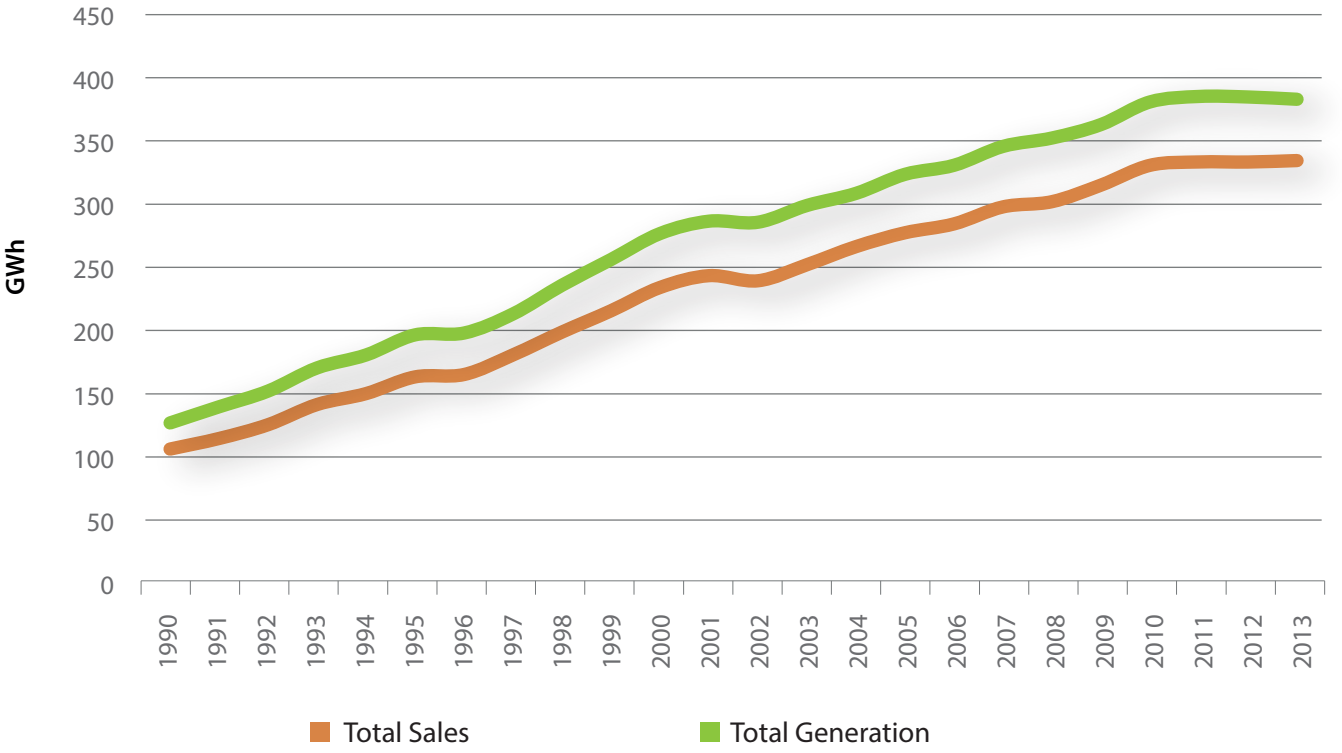
LUCELEC's sales and generation figures can be separated into three distinct phases of growth over the past 23 years. During the first phase, from 1990–2000, the utility experienced rapid growth, and sales increased by an average of 8.56 percent per year while generation grew by 8.3 percent annually. The second phase, from 2001 to 2010, saw lower levels of growth; LUCELEC's sales grew by 3.5 percent annually, with generation increasing by 3.2 percent per annum. The third phase began in 2011, during which LUCELEC experienced very limited or even negative growth. Over the past three years, its sales increased by just 1.1 percent, or 0.37 percent annually, while its generation grew by 0.6 percent, or an average of 0.2 percent annually.

**Table 2** LUCELEC Electricity Generation in GWh, 2008–2013

| Electricity in GWh | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 |
|---|---|---|---|---|---|---|
| Net Generation | 382.9 | 384.7 | 385.2 | 380.8 | 362.9 | 352.3 |
| Sales | 334.5 | 333.3 | 333.4 | 330.7 | 315.1 | 302.0 |

**Source:** : LUCELEC (2013).

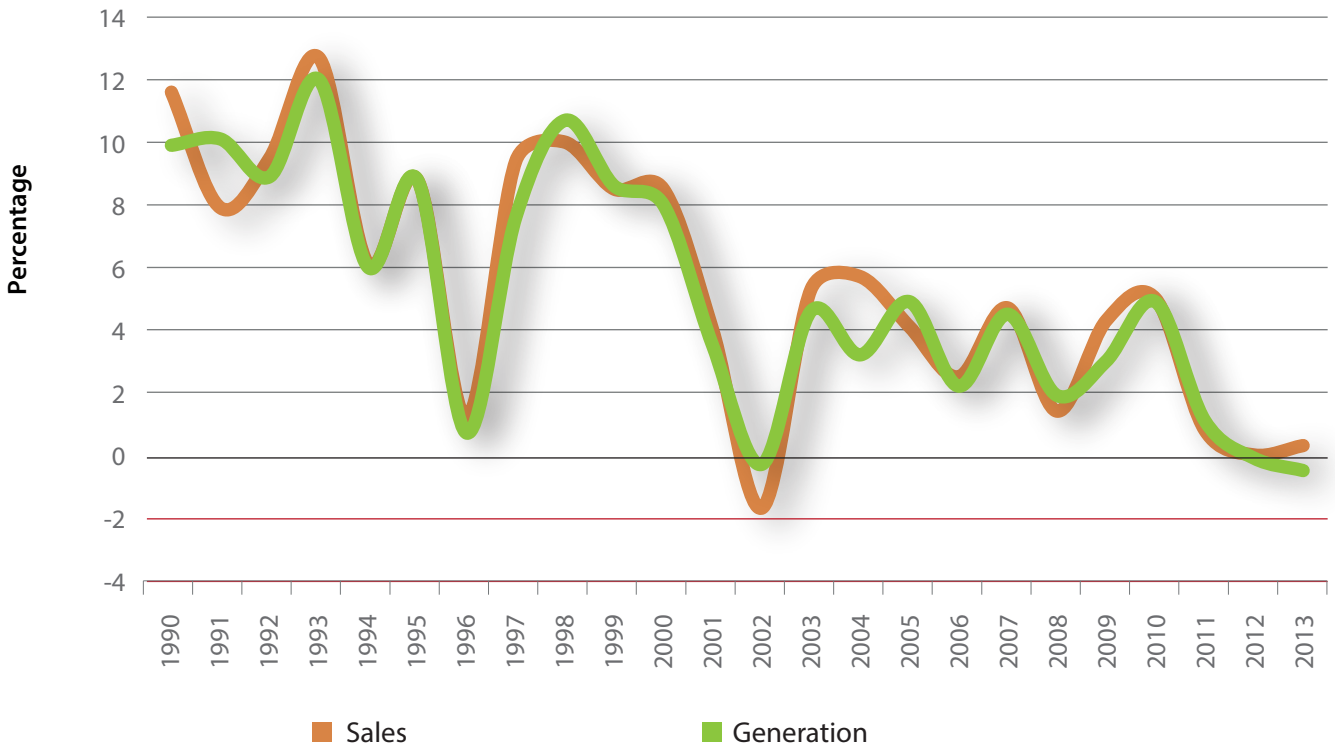
**Figure 6** LUCELEC Net Electricity Generation in GWh, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

There is large variation in LUCELEC's year-over-year growth of electricity sales and generation. In the 1990s, annual growth figures frequently topped 10 percent. Starting in the early 2000s, annual growth rates declined and have also seen less year-over-year variation. Annual growth rates between 2003 and 2010 have hovered between 2 and 5 percent. Following the recent global economic downturn, LUCELEC has seen little or no growth starting in 2011.

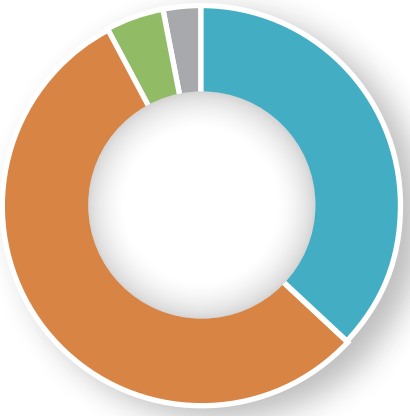
**Figure 7** LUCELEC Annual Change in Sales and Generation, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

The commercial sector dominates electricity consumption in Saint Lucia, accounting for 58 percent of electricity sales, followed by the residential sector, accounting for 34 percent. Industrial consumption stands at 5 percent, and other (street lighting) accounts for 3 percent. The commercial sector consumed 193 GWh of electricity, followed by the residential sector with 112 GWh, the industrial sector with 17 GWh, and other with 10 GWh. In 2013, LUCELEC had 7,096 commercial customers, 58,648 residential customers, and 98 industrial customers.

**Figure 8** Electricity Sales by Sector, 2013



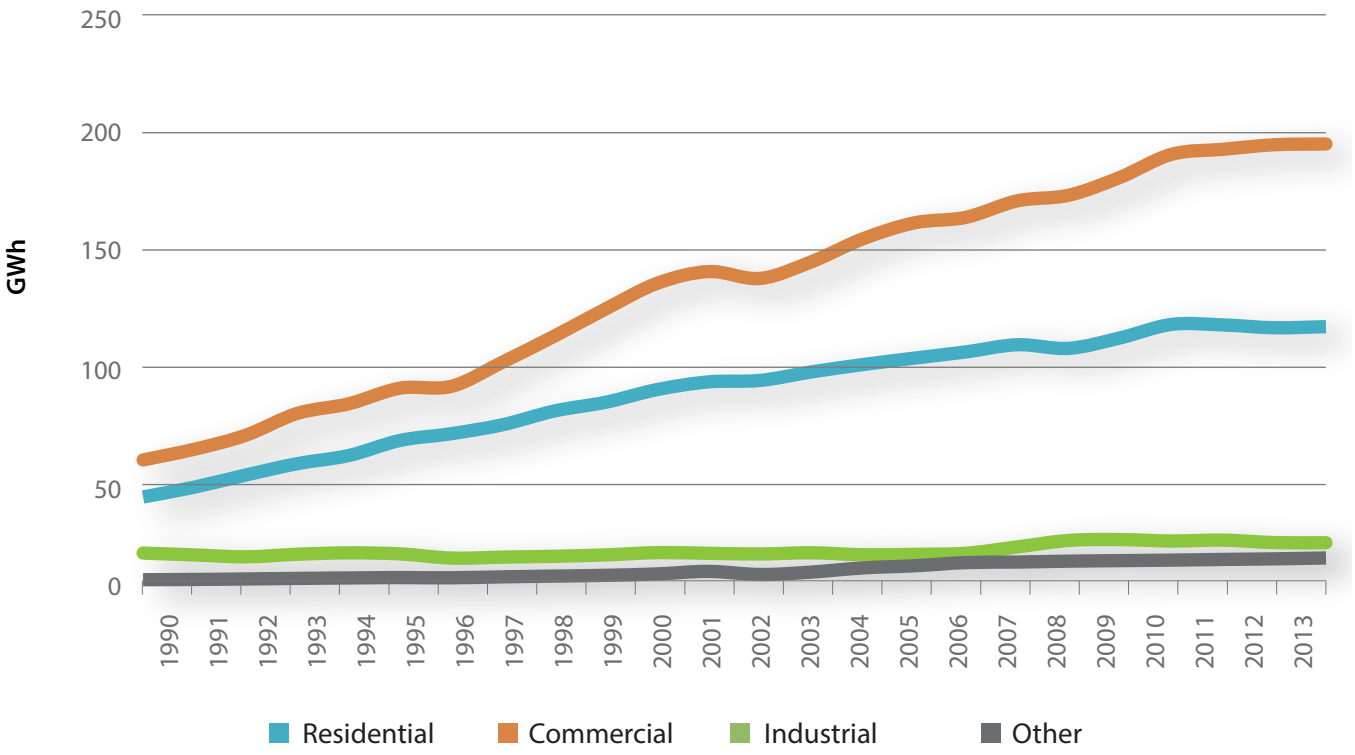
58% Commercial
34% Residential
5% Industrial
3% Other

**Source:** LUCELEC (2013).

The commercial sector has seen a significant increase in consumption, both in absolute numbers and in share of overall sales. Commercial sales stood at 54 GWh in 1990, representing 50 percent of total electricity sales. This figure nearly quadrupled to 193 GWh, representing 58 percent of all sales in 2013. In contrast, the industrial sector experienced a significant decline in importance. While industrial electricity consumption represented 13 percent of sales in 1990, it accounted for only 5 percent in by 2013. Consumption in absolute terms did not change significantly, growing only slightly from 13 GWh in 1990 to 17.6 GWh in 2013.

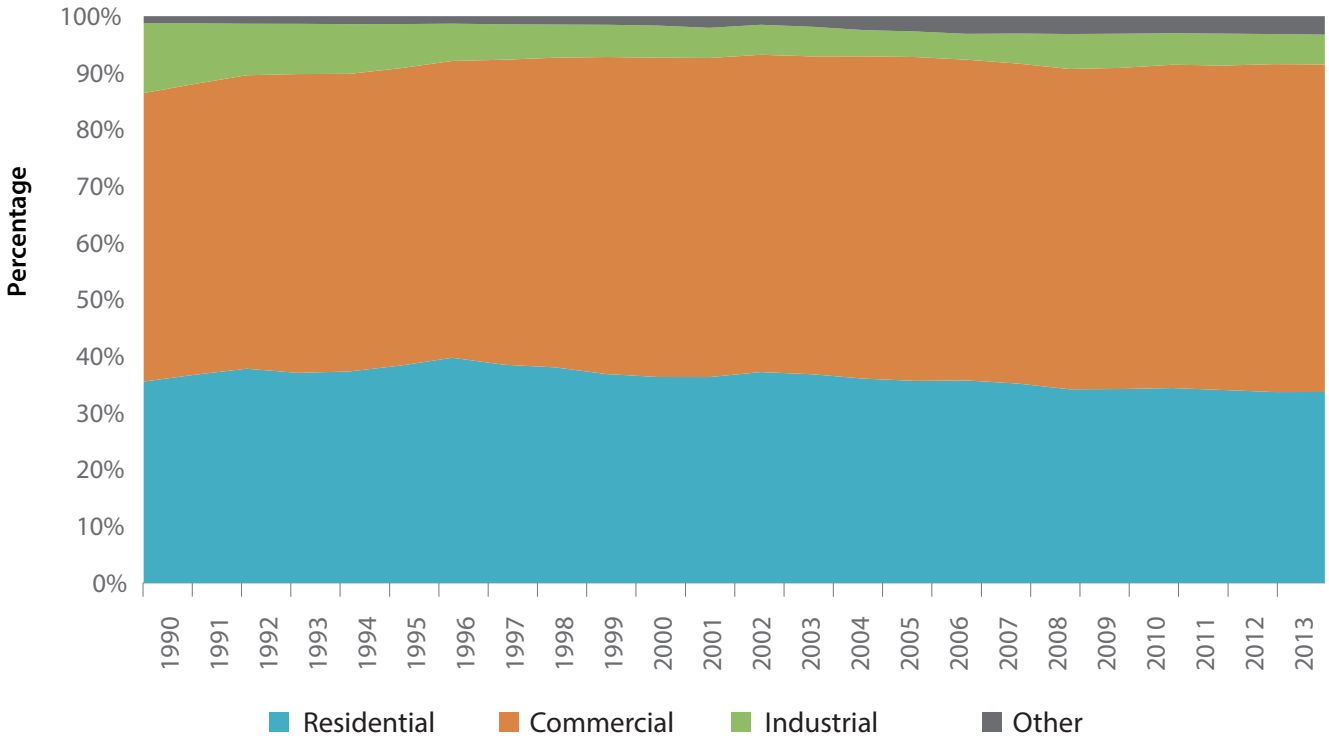
The residential sector also experienced a slight decrease. While it represented 35 percent of electricity sales in 1990 and as much as 40 percent in 1996, its share dropped to 34 percent by 2013. Residential sales figures roughly tripled, from 38 GWh to 112GWh, over the same period. Other sales, specified as street lighting by LUCELEC, increased significantly, from 1.3 GWh to 11 GWh, between 1990 and 2013. As a share of all sales the increase has been less significant, from 1.3 percent to 3.2 percent, due to the small absolute figures.

**Figure 9** LUCELEC Electricity Sales by Customer Type, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

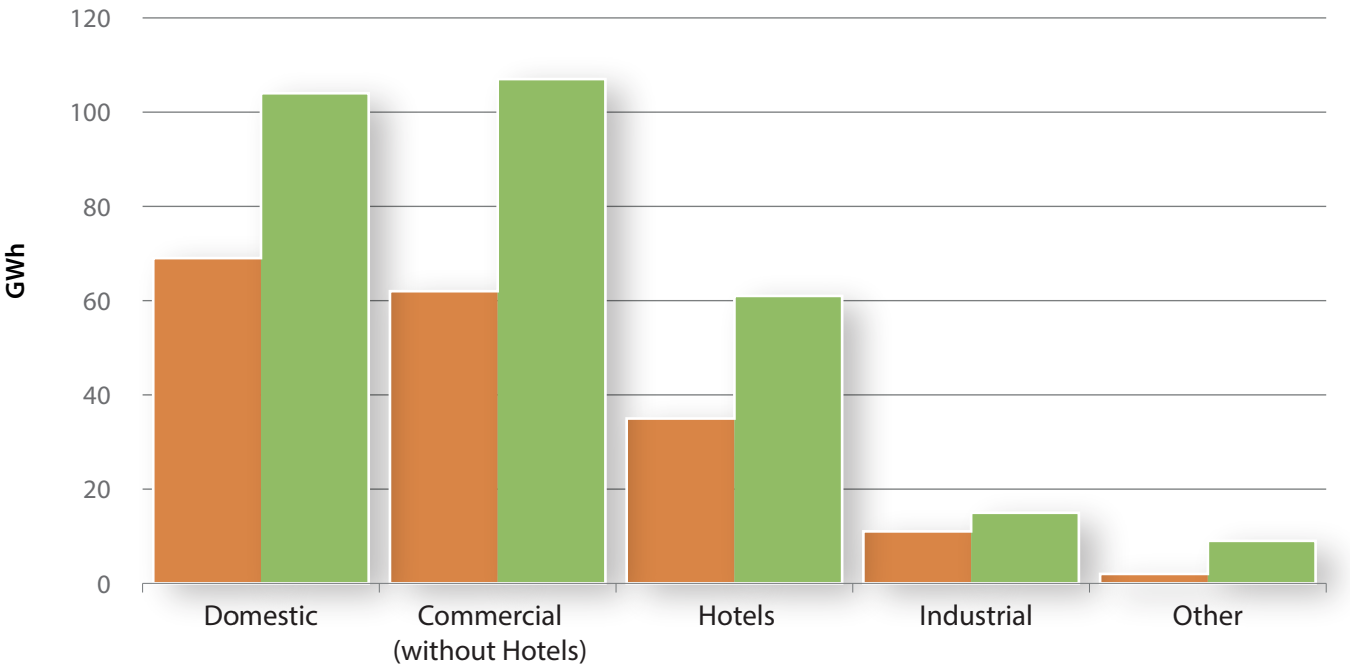
**Figure 10** LUCELEC Share of Electricity Sales by Customer Type, 1998–2012




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

The importance of Saint Lucia's hotel and tourism sector contributes to the dominance of the commercial sector. In 2007, the last year for which figures are available, hotels accounted for 61 GWh out of a total of 168 GWh for the commercial sector. Based on these figures the hotel sector accounted for around 20 percent of all LUCELEC sales in 2007. Due to the continued expansion of the hotel sector and its above-average consumption pattern, its importance as a consumer of electricity is likely to have further increased since 2007.

**Figure 11** Electricity Consumption by Sector, 1997 and 2007




**Source:** Government of Saint Lucia (2011)

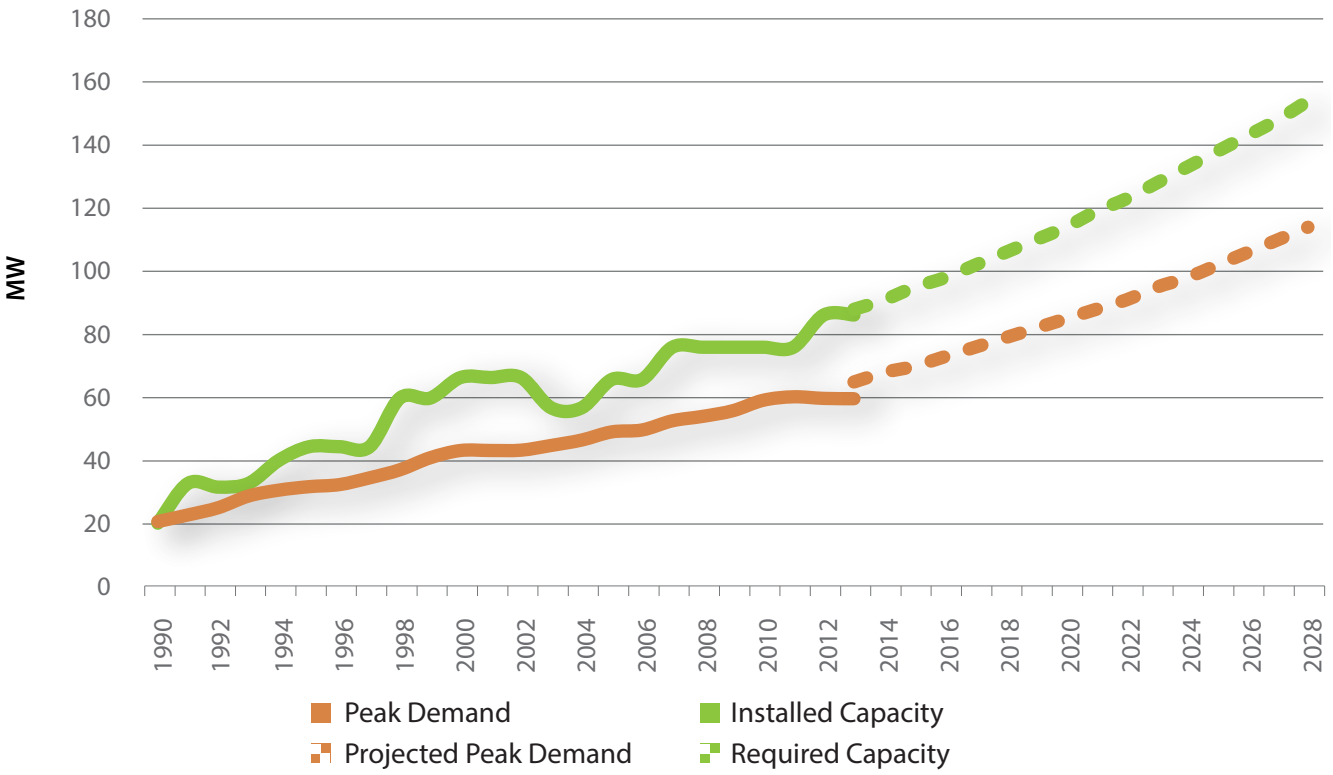
Based on demand forecast studies by the World Bank, Saint Lucia will require continuous expansion of generation capacity in the immediate future as well as ongoing expansion for the next decade to meet peak demand. Projected required capacity is slated to grow by 80 percent, from 86 MW in 2013 to 154 MW in 2028. Similarly, peak demand is expected to increase drastically, from 60 MW in 2013 to 114 MW in 2028. Considering that LUCELEC's peak demand has remained flat since between 2010 and 2013, these growth projections may prove to be too aggressive, and capacity demand and peak demand may experience a more shallow growth path.

**Table 3** Saint Lucia's Projected Capacity Requirement and Peak Demand (in MW)

| | 2015 | 2017 | 2019 | 2021 | 2023 | 2025 | 2027 |
|---|---|---|---|---|---|---|---|
| Projected capacity needs | 95 | 102 | 110 | 119 | 128 | 138 | 148 |
| Projected peak demand | 70 | 76 | 82 | 88 | 95 | 102 | 110 |

**Source:** World Bank (2010).

**Figure 12** Saint Lucia's Projected Capacity Requirement and Peak Demand (in MW)




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013); World Bank (2010).

In Saint Lucia, the full range of renewable resources is available, with the exception of hydropower.

**Table 4** Saint Lucia's Resource Availability

| Geothermal | Solar (PV and hot water) | Energy Efficiency | Waste to Energy | Wind | Hydro |
|---|---|---|---|---|---|
| ✔ | ✔ | ✔ | ✔ | ✔ | |

**Source:** Castalia (2015).

## Generation Forecast

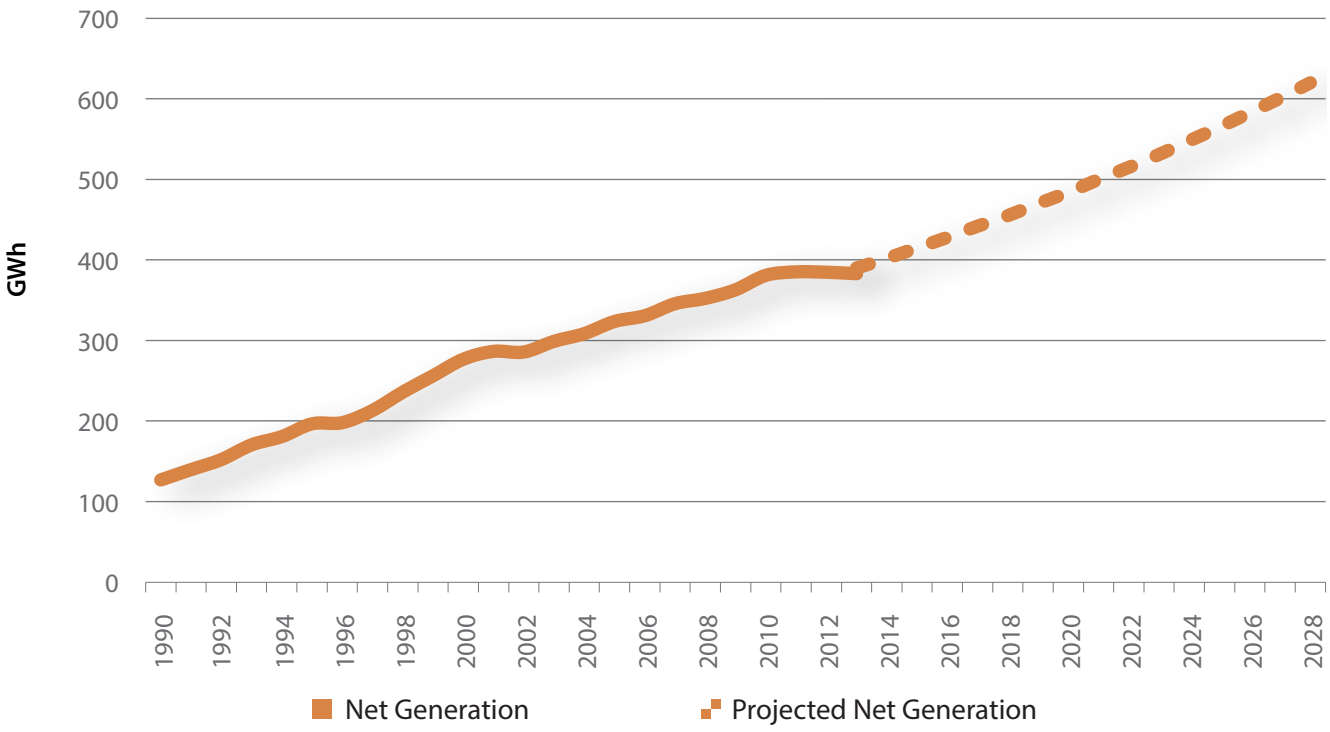
Saint Lucia's gross generation needs are also projected to grow by 60 percent between 2013 and 2028, from 383 GWh to 620 GWh. Considering that LUCELEC's sales have remained largely flat since 2013, these growth projections may prove to be too aggressive, and capacity demand and peak demand may experience a more shallow growth path.

**Table 4** Saint Lucia's Projected Generation Needs in GWh

| | 2015 | 2017 | 2019 | 2021 | 2023 | 2025 | 2027 |
|---|---|---|---|---|---|---|---|
| Projected capacity needs | 415 | 442 | 470 | 500 | 531 | 565 | 601 |

**Source:** World Bank (2010).

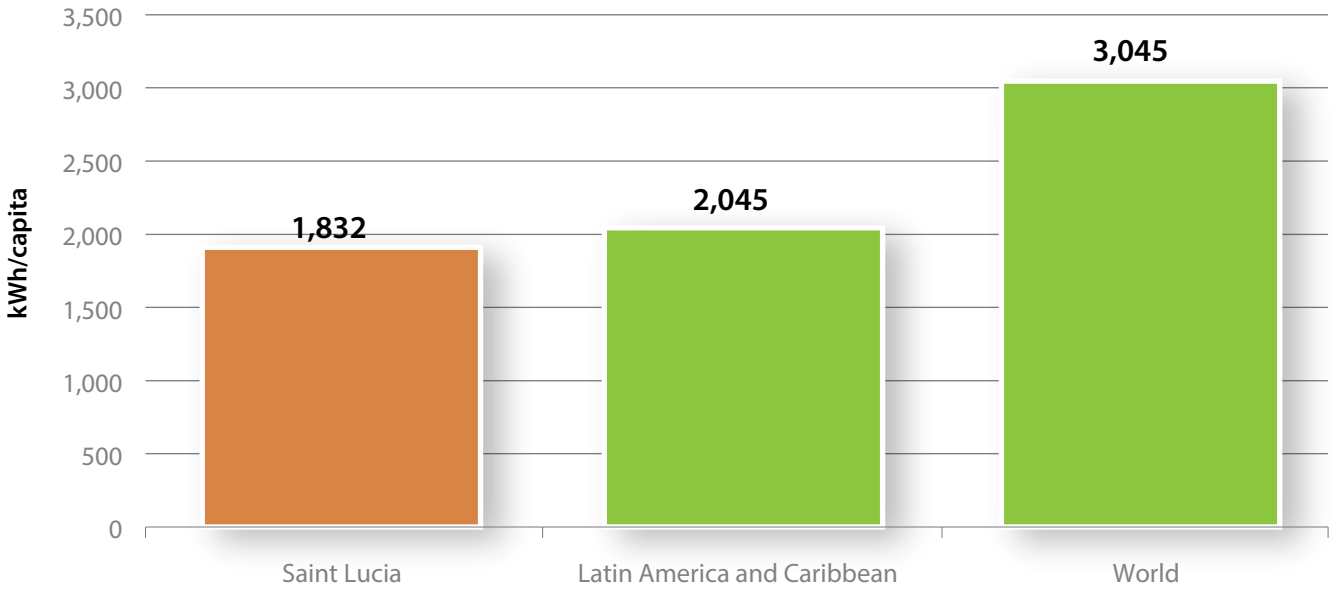
**Figure 13** Saint Lucia's Projected Net Generation




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013); World Bank (2010).

In 2013, per capita consumption in Saint Lucia stood at 1,832 kWh, about 10 percent lower than the Latin American and Caribbean average. The government of Saint Lucia leads the ECS in the adoption of building codes to increase energy efficiency, but the impact and level of enforcement of these measures remains unknown, as not all of these standards are mandatory (Castalia Consulting, 2012; Government of Saint Lucia, 2003).

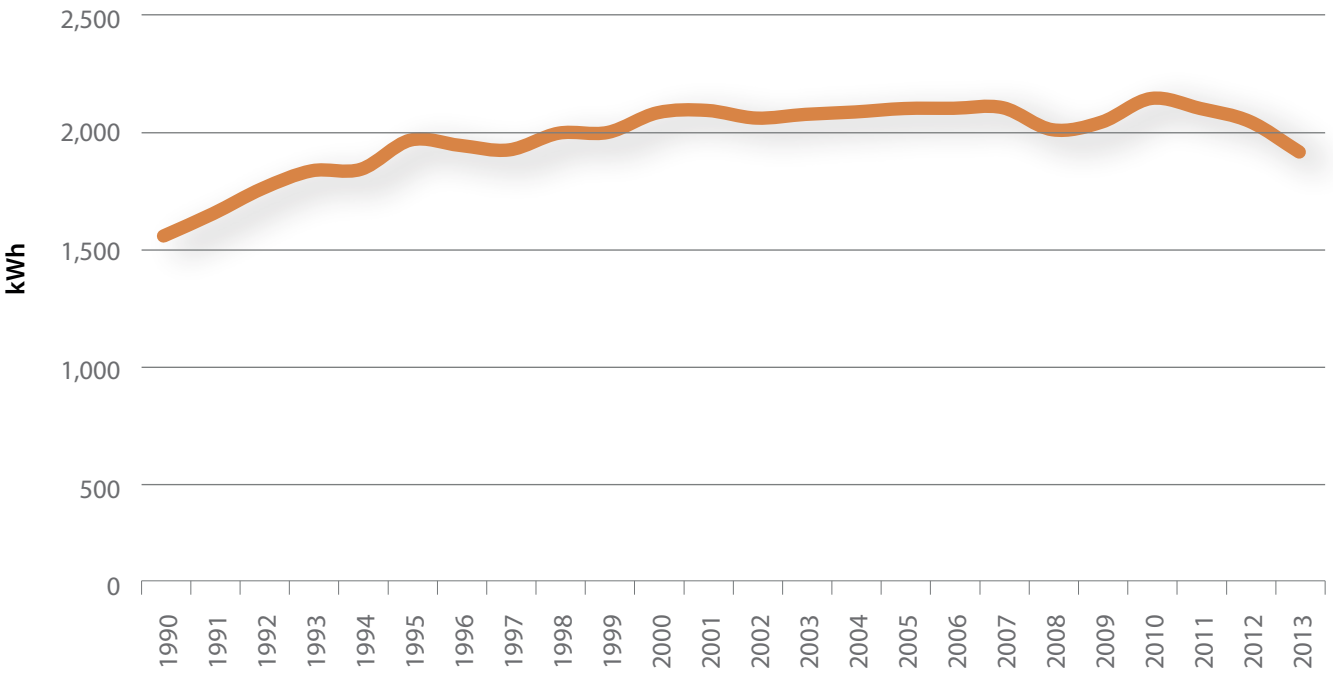
**Figure 14** Electricity Use per Capita, 2013




**Source:** LUCELEC (2013); UN (2014); World Bank (2014b).

Consumption per customer in the residential sector increased steadily between 1990 and 2000, growing from 1605 kWh to 2070 kWh. Consumption has been mostly flat since then topping out at 2124 kWh in 2010 before declining to 2037 kWh in 2012 and 1922 kWh in 2013, the lowest level since 1994. The slow increase in per capita consumption over the past 10 years can in part be explained by rising electricity costs, providing an incentive for consumers to conserve electricity use.

**Figure 15** Residential Electricity Consumption per Customer, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

In contrast, per customer consumption in the commercial sector, primarily the growing tourism sector, nearly doubled between 1990 and 2013, from 14,951 kWh to 27,226 kWh. Consumption per customer in the commercial sector peaked in 2012 at 29,091 kWh. This more rapid increase can be explained by the increase in the average size of hotels and other tourism-related businesses. Average consumption in the industrial sector grew from 110,754 kWh in 1990 to 179,837 kWh in 2013.

# Secondary Balance and Final Consumption

## Secondary Energy Balance

Saint Lucia imports all oil products.

## Final Consumption by Sector

Final energy consumption by sector in 2013 totaled 1592 boe/day. The transportation sector consumed 41 percent of all energy, with 658 boe/day. This was followed by the commercial sector with 470 boe/day, representing 30 percent, and the residential sector with 275 boe/day, accounting for 17 percent. Industry accounts for 4 percent with 60 boe/day. Other consumption accounts for 129 boe/day, or 8 percent.

**Figure 16** Energy Consumption by Sector, 2013

41% Transportation
30% Commercial
17% Residential
8% Other
4% Industry

**Source:** Government of Saint Lucia (2000); LUCELEC (2013).

The transportation and commercial sectors account for 71 percent of energy consumption in Saint Lucia. As in all Caribbean countries, the growing penetration of motor vehicles over the past two decades has led to increased consumption by the transportation sector. Although there has been a net increase in the number of registered vehicles, exact figures are not available as Saint Lucia does not maintain accurate official databases tracking the number of vehicles on its roads. There are very few hybrid or electric vehicles on the island, and no public transportation system exists. Privately operated minibuses, seating 12 to 15 passengers, provide group transportation. Growing air travel associated with the tourism industry adds to the large share of overall consumption by the transportation sector. Tourism also contributes a large share to growing consumption by the commercial sector, directly in the form of hotels and resorts (EIA, 2012; Government of Saint Lucia, 2000; Government of Saint Lucia, 2011).

# Institutional Organization of the Energy Sector

## Current Institutional Structure

In the current institutional setup, four ministries are involved in the decision-making processes related to the energy sector. The Ministry of Sustainable Development, Energy, Science, and Technology is responsible for overall energy planning, including strategic direction and future development. It also coordinates with the Sustainable Development and Environment Division.

The Ministry of Infrastructure, Port Services, and Transport holds primary responsibility over the electricity sector. There is no independent regulatory commission (RC) for the electricity sector; instead, the Electrical Services Department within the Ministry provides limited regulatory functions for the sector and is tasked with consumer protection and quality assurance. This structure may change in the near future, as the government is in the process of implementing recommendations from the National Energy Policy of 2010 (hereafter NEP), which includes the establishment of a regulatory commission.

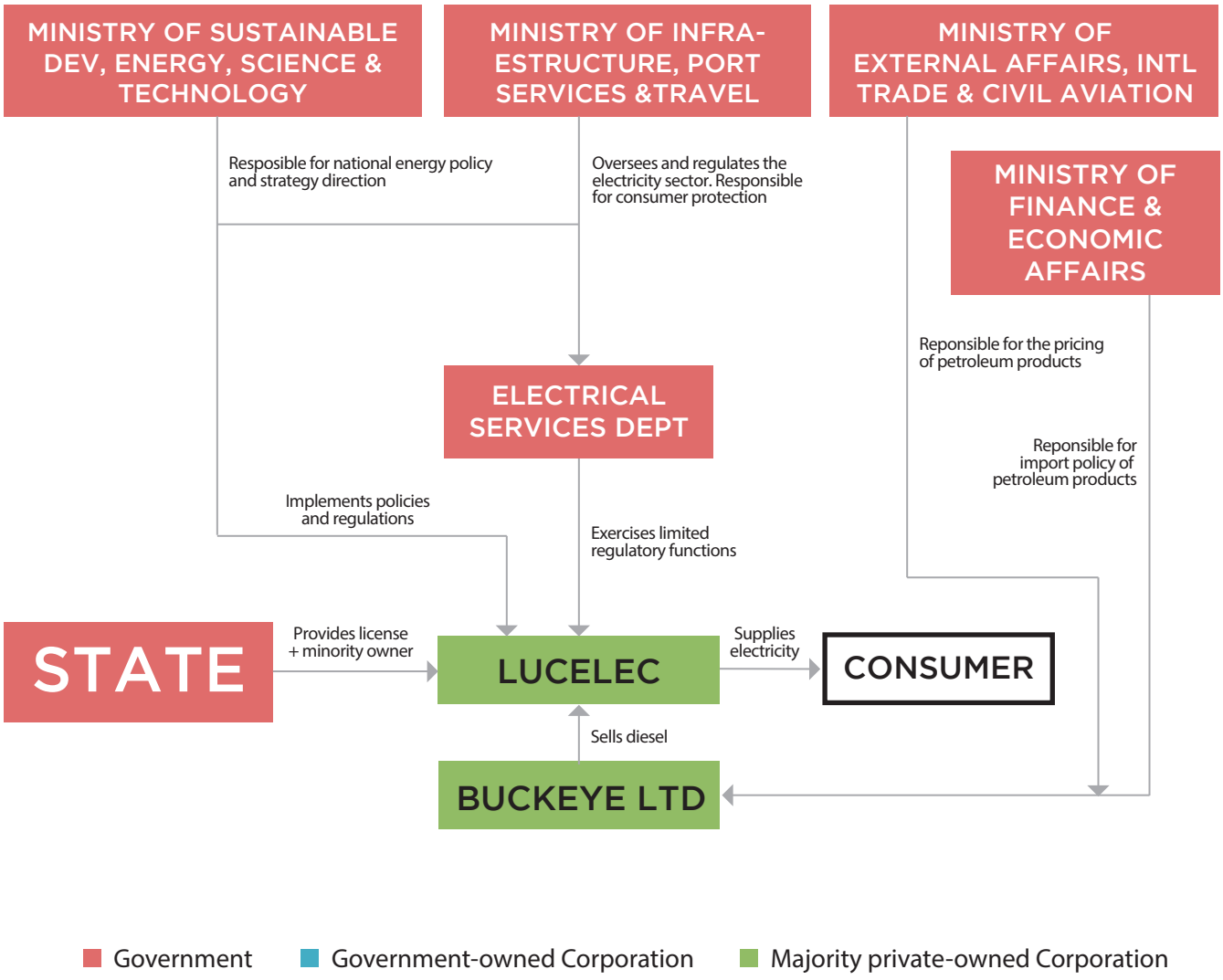
The Ministry of Finance and Economic Affairs holds responsibility for the pricing of petroleum products. Lastly, the Ministry of External Affairs, International Trade, and Civil Aviation, specifically the International Trade Division, oversees the import of petroleum products (Ephraim and Tulsnie, 2010; Government of Saint Lucia, 2015c; 2015d; 2015e; 2015f; Samuel, 2013).

**Table 5** Institutions and Responsibilities of the Energy Sector

| Entity | Type | Tasks and Responsibilities |
|---|---|---|
| Ministry of Sustainable Development, Energy, Science. and Technology | Government ministry | Responsible for overall energy planning, including strategic direction and future development. |
| Ministry of Infrastructure, Port Services, and Transport | Government ministry | Oversees and regulates the electricity sector. Tasked with consumer protection and ensuring quality of service. |
| Ministry of Finance and Economic Affairs | Government ministry | Responsible for the pricing of petroleum products. |
| Ministry of External Affairs, International Trade, and Civil Aviation | Government ministry | Responsible for policy related to the import of petroleum products. |
| Saint Lucia Electricity Services Limited (LUCELEC) | Public-privately owned, vertically integrated utility | Responsible for the generation, transmission, distribution and sale of electricity. |
| Buckeye Saint Lucia Terminal Ltd. | Privately owned multinational oil company | Operates a 10-million barrel facility for the storage and transshipment of crude oil and petroleum products. |

**Source:** Ephraim and Tulsnie (2010); Government of Saint Lucia (2015c; 2015d; 2015e; 2015f); LUCELEC (2014d); Reuters (2014); Samuel (2013).

**Figure 15** Organization and Functioning of the Energy Sector, 2015




**Source:** Author's own work based on information from Emanuel and Gomes (2014); Government of Saint Lucia (2005; 2010; 2015c; 2015d; 2015e; 2015f); Samuel (2013).

**Table 6** Key Legislation and Structure of the Energy Sector

| Key Legislation | Regulator | Utility | Ownership structure |
|---|---|---|---|
| ESA, 1994<br>NEP, 2010<br>Land Acquisition Act, 2001<br>Physical Planning and Development Act, 2001<br>Public Utilities Restriction on Shareholding Act No. 11, 2003<br>ESB, 2015<br>Draft National Utilities Regulatory Commission Act, 2015 | Ministry of Infrastructure, Port Services, and Transport | LUCELEC | Emera St. Lucia Ltd., 20%<br>First Citizens Bank, Ltd. 20%<br>National Insurance Corporation, 16.79%<br>Castries City Council, 16.33%<br>Government of Saint Lucia, 12.44%<br>Individual shareholders, 14.44% |

**Source:** Government of Saint Lucia (2005); Government of Saint Lucia (2015b); LUCELEC (2014a); OAS (2010).

## Planned Reforms of the Energy Sector

Saint Lucia embarked on an ambitious path to make greater use of its renewable energy potential in the early 2000s. It has, however, been unable to implement much of its program goals, in part due to a lack of comprehensive energy policy, inflexible regulatory conditions, and technology and financing challenges to develop geothermal sites. The NEP sets an overall roadmap for the energy sector, and aims to address the above-mentioned challenges. The government is currently in the process of implementing the various aspects of the policy. The NEP aims to ensure a secure and sustainable energy future for Saint Lucia reducing dependence on imported oil products through the exploitation of domestic renewable energy resources.

The NEP recognizes that previous efforts to promote renewable energy technology, namely the Cabinet Conclusion No. 464 of 1999 eliminating import duties and consumption taxes on renewable energy equipment and the 2011 decision to make the purchase of solar water heaters tax deductible, have been insufficient to address the challenges the energy sector faces as a whole. Furthermore, the Sustainable Energy Plan of 2011 passed by Cabinet Conclusion No. 695 which aimed at enhancing energy security failed due to a lack of appropriate regulatory and policy framework. The NEP attempts to remedy the shortcomings of these previous policies by suggesting broad changes throughout the energy sector.

The government emphasizes that market mechanisms are key to developing a more sustainable energy sector but it recognizes that there may be a need for government intervention to promote the exploitation of indigenous energy resources and to achieve higher energy efficiency and conservation. The policy is guided by the following tenets: (i) achieving energy security and reliability at the least cost through liberalization and private sector participation, (ii) diversifying the nation's energy base by exploiting indigenous renewable energy resources, (iii) increasing efficiency in the production, conversion and use of energy to reduce the country's energy intensity, (iv) minimizing the environmental impact by rehabilitating existing facilities and by setting and enforcing appropriate environmental standards for new and future projects, (v) ensuring sound economic development by implementing pricing regimes providing adequate energy supplies to all sectors, and (vi) establishing an appropriate regulatory framework with clear guidelines and legal protection to encourage private sector investments.

The NEP lays out the following institutional setup: the Ministry of Sustainable Development, Energy, Science, and Technology is responsible for formulating and monitoring the implementation of the NEP, along with (i) developing and formulating energy policy and coordinating the overall sector, (ii) developing and advancing legislation for electricity, petroleum and gas subsectors, (iii) promoting the development and adoption of energy efficiency standards, (iv) encouraging the participation of the private sector in the renewable energy sector, and (v) advising the cabinet on energy sector matters and regulation.

The Ministry of Infrastructure, Port Services and Transport is tasked with consumer protection; efficient, reliable, and cost-effective service; and the issuance of licenses for public electricity services, including generation, transmission, and distribution. It serves as the primary point of contact for customer complaints and facilitates their resolution or hands them over to the Regulatory Commission. It will furthermore assist the ministry in charge of energy planning, energy policy, and legislation issues.

The NEP also foresees the establishment of an Energy Policy Advisory Committee (EPAC) jointly chaired by the abovementioned ministries. The EPAC will function as a discussion forum for state institutions and the private sector and make recommendations on the appropriate actions, instruments, and strategies to achieve the overall objectives of the NEP in the fastest manner possible. As of August 2015, no public information about the creation of EPAC was available.

Acknowledging the multidisciplinary nature of the energy sector challenges the EPAC will involve, in addition to the two previously mentioned ministries, experts from a number of ministries, associations, and companies, including the ministries responsible for finance, physical development and transportation, the Chamber of Commerce, LUCELEC, and the Tourism Association. EPAC will have its permanent secretariat within the ministry responsible for energy planning.

According to the NEP, an RC, financed through licenses and other fees, will be set up to operate nationally initially, to potentially be integrated into the ECERA at a later point. The RC will be responsible for the economic regulation of the electricity sector. Its key tasks will be: (i) specifying the terms and conditions for the issuance of licenses for generation, transmission, and distribution to LUCELEC and for the installation and operation of power generation facilities to independent power producers (IPPs) and communicating these recommendations to the ministry in charge of public utilities; (ii) approving tariff structures and rates for customers consuming less than 2,000 MWh; (iii) determining the specifics of net metering for small-scale self-generation and setting the rates for delivery of electricity to the grid; and (iv) ensuring and monitoring the quality and reliability of service and acting as arbitrator between utilities, customers, and other parties.

Under the NEP, LUCELEC's license for the generation, transmission, and distribution of electricity based on the ESA will continue to be in effect. Future licenses will be limited to a period of 25 years unless exceptional economic reasons necessitate a longer period. LUCELEC will be required to establish separate cost centers for generation, transmission, distribution, and sales to ensure that costs can be tracked accurately and to the satisfaction of the RC.

The addition of new fossil-fuel-based power plants will remain a prerogative of LUCELEC following approval by the RC. Licenses for the development of specific renewable energy projects, however, may be granted to IPPs but will require collaboration and cooperation with LUCELEC whenever possible. The RC has yet to define the processes and procedures on applying for licenses for renewable energy projects. IPPs will be allowed to deliver and sell electricity into LUCELEC's grid based on bilateral power purchase agreements (PPAs) between the entities.
Under the NEP, commercial entities, such as hotels or manufacturing facilities, will be able, with prior approval by LUCELEC, to install co-generation plants up to a maximum capacity of 500kW but not to exceed 30 percent of capacity needed to provide average electricity consumption based on the prior three years. Excess electricity can be sold to the grid and will be reimbursed on the basis of average avoided costs. Rates will be adjusted and published annually by the RC. Total installed self-generation capacity will be limited to 3MW for the first four years, and the RC, after consultation with LUCELEC and stakeholders, may decide to increase the limits every four years. All co-generators must adhere to safety regulations and electricity and environmental standards to secure a license. Licenses are not required for producers not connected to the grid.

In order to promote the development of indigenous renewable energy resources, the NEP suggests setting minimum quotas of annual average contribution of electricity from renewable sources. The NEP has set goals of 5 percent in 2013, 15 percent in 2015, and at least 30 percent by 2020. The 2013 goal was not met, and it remains doubtful that the 2015 or 2020 goals can be achieved, seeing how they are only a few months and five years into the future.

Responsibility to meet these quotas falls to LUCELEC, which can develop these resources independently, through joint ventures, or by contracting outside investors and operators. If the quotas are not met, the RC will be tasked with preparing an international public tender to invite IPPs to install and operate the capacity for the share of the renewable energy quota not met by LUCELEC. Furthermore, the policy provides for private participation in and small-scale generation of renewable energy. The NEP states that small-scale, grid-connected renewable electricity by systems up to 10kW do not require a license and may only be denied by LUCELEC under exceptional circumstances, such as grid stability.

The original limit of 10kW may be adjusted upward in the future following negotiations between the RC and LUCELEC. The NEP will allow net metering with supply exceeding self-consumption to be compensated by LUCELEC at a specific net-billing rate set by the RC. The NEP also set a number of energy efficiency measures for the electricity sector, construction sector and transport sector (Government of Saint Lucia, 2010). The government put in place an import tax reduction program for efficient vehicles as well as duty and excise tax exemptions for vehicles operating on sustainable fuels.

## Regulator

There does not exist one single or any designated regulatory authority in charge of overseeing the energy sector. Overall control and guidance of the energy sector falls to the Energy, Science and Technology Unit within the Ministry of Sustainable Development, Energy, Science and Technology.

# Institutional Structure of the Electricity Subsector

Saint Lucia's electricity sector is dominated by a single utility company, LUCELEC, which holds an exclusive license for the generation, transmission, distribution and sale of electricity.

## Saint Lucia Electricity Services Limited

LUCELEC holds the exclusive license for the generation, transmission, distribution, and sale of electricity. This legal monopoly was established with the Power Supply Regulation of July 1, 1964, which granted the utility an 80-year license until June 30, 2045. The original legislation was superseded by the Electricity Supply Act of 1994 (hereafter ESA), but LUCELEC's exclusive license was left intact (Government of Saint Lucia, 2005; OAS, 2010).

In theory, an independent RC was supposed to be set up to regulate the sector, but regulatory functions were carried out by the Ministry of Infrastructure, Port Services, and Transport, including the setting of electricity tariffs and fuel surcharges. In practice, however, LUCELEC has been largely self-regulating (Castalia Consulting, 2012; Government of Saint Lucia, 2005).

## The Electricity Supply Act

The ESA grants LUCELEC an exclusive 80-year license for the generation, transmission, distribution and sale of electricity until June 30, 2045. The act guarantees a fixed rate of return for the utility and allows it to pass on the cost of fuel to the consumer through a fuel surcharge, eliminating market risks for LUCELEC and reducing incentives to innovate generation capacity and invest in e.g. renewable energy resources. To this effect LUCELEC has in the past publicly stated that it does not intend to go into this risky explorative undertaking itself, in order to protect consumers from such ventures that may negatively affect its tariff (OAS, 2010).

Under Section 4 of the ESA, LUCELEC is given the power to issue sublicenses to any person, local authority, or government department for the generation, transmission, distribution, and sale of electricity. The government may revoke such licenses. Section 5 specifies that the government may revoke LUCELEC's license after a period of 55 years (2020) with 24 months' notice.

Under Sections 6 and 7, however, it would be required to purchase all shares at fair market value and all incurred debt. Section 8 specifies LUCELEC's landownership and usage rights, while Section 9 grants it tax exemptions and duty-free imports of all plant machinery, equipment, meters, instruments, and other tools necessary for the generation, transmission, and distribution of electricity. Losses by the utility can be carried forward indefinitely and be set off against profits in subsequent years. Under Section 11, inserted in 1999, LUCELEC pays a 20 cents per gallon fee for all fuel purchased from HOSL.

Under Section 15, the government may acquire land under the Land Acquisition Act that is reasonably required by LUCELEC for the generation of electricity. This provision may be key to establish wind and solar farms in the future. It goes hand in hand with Section 23, which allows LUCELEC to harness water and wind energy on public and private lands without charge. Section 25 establishes LUCELEC's exclusive license and also requires the government to give 12 months' notice if it decides to develop geothermal energy at the Soufriere location. All electricity generated from the fumaroles at Soufriere by a third party will have to be sold to LUCELEC.

Under Section 27 LUCELEC is responsible for maintaining sufficient capacity to meet peak demand even with its two largest generating units unavailable. Under Section 28 and Section 29, electricity charges and LUCELEC's allowable rate of return are specified in Schedule 1 and Schedule 3 of the ESA. Section 35 requires a review of electricity rates at the end of every five years.

Schedule 1 specifies the basic energy rates per kWh for domestic, commercial, and industrial customers as well as hotels and street lighting. It also lists minimum monthly charges. Schedule 2 allows the company to add a fuel surcharge per unit consumed based on the total number of imperial gallons of diesel fuel used and the price levels in the preceding month.
LUCELEC's allowable rate of return is calculated under Schedule 3 according to the weighted average percentage cost of equity and the weighted average percentage cost of debt. The target rate shall not be less than the 12-month average deposit rate paid by commercial banks plus 10 percent and shall be at least 15 percent per year (Government of Saint Lucia, 2005).

The Public Utilities Restriction on Shareholding (Saint Lucia Electricity Services) Act of 2003 specifies that no entity other than Caribbean Development Corporation can own more than 20 percent of LUCELEC's shares.

LUCELEC was established and granted an exclusive license by Ordinance No. 27 in 1964. It became a publicly held company in 1994, when its shares began trading on the Eastern Caribbean Securities Exchange. The company is led by a 10-member board of directors, four of whom are appointed by the Caribbean Development Corporation, one each by the government of Saint Lucia, Castries City Council, the National Insurance Corporation, and three are elected during the annual shareholders meeting. The board appoints one ex-officio director who functions as chief executive officer.

LUCELEC has established a reputation as a model supplier of electricity, ensuring reliable and efficient service for its customers and reliable returns on investment for its shareholders. Reliable returns are in part guaranteed by the fuel surcharge, which allows LUCELEC to pass on any increases in the cost of electricity generation beyond the base price to consumers. In order to reduce fuel price fluctuations, the company employs a fuel price hedging program on a 12-month rolling basis for 75 percent of estimated volumes (LUCELEC, 2013).

Nonetheless, LUCELEC's return on equity has declined considerably over the past five years, from 19.1 percent in 2009 and 2010 to 16.3 percent in 2011, 14.1 percent in 2012, and 12 percent in 2013 (LUCELEC, 2013). LUCELEC's ownership structure is as follows: Emera St. Lucia Ltd. Owns 20 percent, First Citizens Bank Ltd. 20 percent, National Insurance Corporation 16.79 percent, Castries City Council 16.33 percent, Government of Saint Lucia 12.44 percent, and individual shareholders 14.44 percent (LUCELEC, 2013; 2014a). The government of Saint Lucia effectively controls 45.56 percent of LUCELEC's shares since, in addition to its direct stake, government bodies control an additional 33.12 percent through the National Insurance Corporation and the Castries City Council.

## Planned Reforms of the Electricity Subsector

As part of the reforms associated with the NEP, the government is in the process of repealing the existing ESA and passing a new Electricity Supply Bill in 2015 (hereafter ESB). It held a national consultation on the draft bill on March 25, 2015 (Government of Saint Lucia, 2015a). The bill is expected to be completed in September 2015 and to be passed by Parliament by the end of the year (Castalia, 2015).

According to the draft bill, electricity generation from renewable energy sources will be opened up to competition while LUCELEC will keep its monopoly on the generation from fossil fuels as well as transmission, distribution, and sale of electricity until June 30, 2045. The government can revoke the license after 55 years (2020), by giving at least 24 months' notice of the revocation. This proposed revision of the supply regulation is part of the government's efforts to achieve a rate of 35 percent of electricity generated from renewable energy sources by 2020, up from the original goal of 20 percent set out in the NEP.

Under the proposed bill, the government can require LUCELEC to enter into PPAs with IPPs that produce electricity from renewable sources of energy. LUCELEC would continue exclusively to distribute and sell electricity to the end consumer (George, 2014; Government of Saint Lucia, 2015b). According to the bill, no generation license will be required for (i) grid-connected systems if installed capacity does not exceed an amount to be specified by the minister,[2] (ii) approved consumer-generator systems generating electricity from renewable sources and feeding them into the grid under a net-metering or net-billing scheme, and (iii) self-generation systems not connected to the grid (Government of Saint Lucia, 2015b).

In addition to the ESB, the government is working on the creation of a National Utilities Regulatory Commission (NURC) to act as the primary regulator of the electricity sector. Its tasks would include: (i) the issuance, monitoring, and revocation of generation licenses; (ii) the establishment and approval of elec-

2 It is unclear if this provision also applies to fossil fuel based generation.

tricity tariffs; and (iii) the receipt and resolution of electricity customer complaints. The NURC would have the power to set the exclusivity of a license in terms of energy source or service area and can require a license holder to enter into a PPA with an IPP. The NURC would also present an annual report to the minister on all significant developments in the sector (Government of Saint Lucia, 2015b).

The NURC will establish and approve electricity tariffs, which will reflect: (i) the costs incurred from efficient generation: (ii) the costs of the use of derivatives and future derivatives; and (iii) a reasonable return on capital. The license holder will submit a new tariff request every 12 months within two months following the date of commencement of the license. The NURC has 28 days to approve the tariff. In additional to annual reviews, the NURC will carry out a complete triennial or quinquennial tariff review of the entire tariff structure based on established expansion and efficiency goals. Under the proposed ESB, the minister has final authority over establishing tariff schemes and tariffs, setting the share of renewable generation, specifying the terms of the license, and setting the net-metering or net-billing regulations (Government of Saint Lucia, 2015b).

**Table 7** Renewable Energy Support Policies, 2015

| Feed-in tariff | Net metering/ net billing | Renewable portfolio standard | IPPs permitted | Tax credits | Tax reduction/ exemption | Public loans/ grants |
|---|---|---|---|---|---|---|
| Suggested as of 2015 | ✔ | – | ✔ | ✔ | ✔ | – |

**Source:** Auth et al. (2013); NREL (2015).
**Note:** No current licenses for IPPs. Licenses are handed out by LUCELEC.

## Regulator

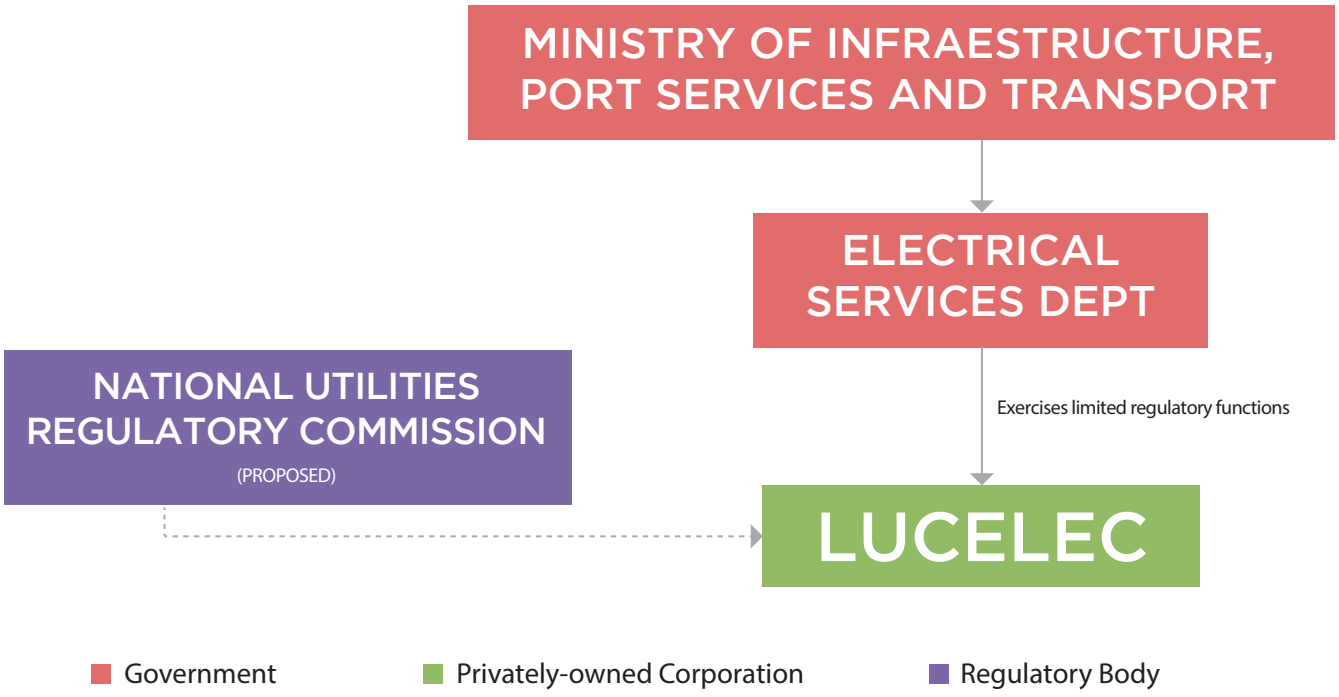
There is no independent regulator in Saint Lucia. A number of government agencies and ministries jointly exercise limited regulatory oversight to ensure LUCELEC's compliance with the ESA, its amendments, and other sector regulation. According to the ESA, a review board composed of the Minster of Finance, a member of LUCELEC, and two additional members, oversees the utility's operations, monitoring its efficiency, development plans, and performance targets, and reviewing rates and rate structure. To date, no review board has been created.

A certification committee's role would be to facilitate the tariff review and approve tariff changes. The Ministry of Finance has not yet created a certification committee, and thus acts as de factor regulator. In practice, however, LUCELEC largely self-regulates. LUCELEC submits its annual reports, final return, and audited accounts to the Ministry of Finance to verify that it follows the tariffs guidelines and rate of return targets set out in the ESA. The Ministry of Infrastructure, Port Services, and Transport provides oversight with respect to electricity safety and consumer protection.

The process of formulating the National Utilities Regulatory Commission Bill began in December 2013. As part of the energy sector reform efforts, the government presented draft legislation in March 2014 to establish the proposed NURC. The legislation remains in the draft stages. The government hopes that regulatory certainty will facilitate investments in the renewable energy sector and help the government to achieve its ambitious goal of generating 35 percent of electricity from renewables by 2020.

The Ministry for Sustainable Development, Energy, Science, and Technology aims to create a new regulatory entity, which combines the existing utility regulator for the water sector with a newly created regulator for the electricity sector. The NURC will be responsible for setting tariffs, approving utility investment plans, resolving customer dispute settlement, and ensuring quality service by the utility companies (Government of Saint Lucia, 2014b; 2015a).

**Figure 18** Regulatory Framework of the Electricity Sector




**Source:** Author's own work based on Ephraim and Tulsnie (2010); Government of Saint Lucia (2014a; 2015b); Samuel (2013).

## Transmission and Distribution

Electricity on Saint Lucia is distributed at 66kV between LUCELEC's Cul De Sac power station and seven substations located at Cul De Sac, Castries, Union, Reduit, Praslin, Vieux Fort, and Soufriere. Generated electricity leaves the Cul De Sac power station at 11kV where it is stepped up to 66kv by the Cul De Sac substation and transmitted to the other six stations where it is then stepped down to 11kv before being distributed and stepped down by additional transformers to 415 and 240 volts.

To ensure adequate and reliable supply, the substations are located strategically throughout the island. Each station is connected and supplied via two sets of three-phase 66kV lines to ensure sufficient backup capacity. The Cul De Sac substation operates five transformers, with a total capacity of 142.5 mega volt amps (MVA) and a peak demand of 57 MVA. It supplies the communities of Morne Fortune, Hospital Road, Ciceron, Canaries, and Thomazo and transmits 66kV electricity to the other six substations.

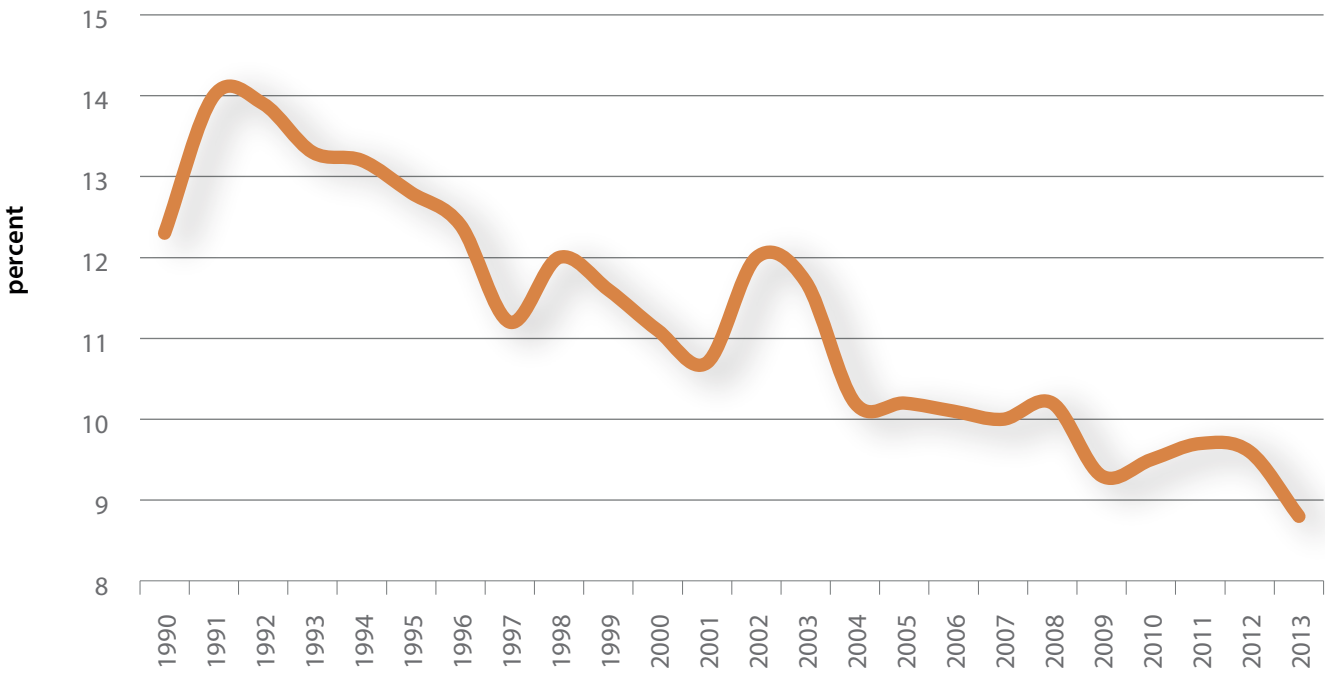
The Reduit substation operates two transformers with a total capacity of 30 MVA and a peak demand of 5.4 MVA. It supplies Gros Islet, Cap Estate, Bonne Terre, Pigeon Island, Club Saint Lucia, and Rodney Bay. The Union substation also operated two transformers with a total capacity of 30MVA and a peak demand of 5.9 MVA. It delivers electricity to Corinth, Ti Rocher, Union, Marisule, and Vide Boutielle.

The Castries substation also comprises two transformers with a total of 30 MVA and a peak demand of 6.1 MVA. It supplies only the Castries Basin. The Soufriere substation consists of 6.5 MVA with a peak demand of 3.2 MVA. It supplies Font Cacao, Font St. Jacques, and Soufriere.

The Vieux Fort substation operates two transformers totaling 30 MVA with a peak demand of 4.4 MVA. It distributes electricity to Coiseul, Pierrot, Vieux Fort, and Augier. The Praslin substation consists of one 6.5 transformer with 2.5 MVA peak demand. It supplies Micoud and Dennery (LUCELEC, 2015b).

LUCELEC's loss rates have continuously decreased over the past 25 years. Losses as a share of net generation peaked at 14.2 percent in 1991 and have since declined steadily to 8.8 percent in 2013.

**Figure 19** LUCELEC Losses Share of Net Generation, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

## Electricity Rate

Saint Lucia is the largest electricity market in the Eastern Caribbean. As a result, LUCELEC benefits from economies of scale in generation compared to its neighboring countries. The utility offers some of the lowest electricity rates in the region.

The tariff rate and the Fuel Surcharge Cost Adjustment are calculated and set according to the ESA and subsequent amendments in 2006. Basic energy rates are adjusted and calculated annually based on the allowable rate of return set in the ESA. Tariff reductions are from time to time assessed based on LUCELEC's rate of return and provided for qualifying customers. No such rebates were in effect in April 2015.

The fuel surcharge cost adjustment (also known as a fuel surcharge) is calculated on a monthly basis and applied to each unit sold. The charge changes depending on the fuel prices and amount of fuel consumed for electricity generation. In April 2015, LUCELEC applied a negative surcharge of EC$0.045 as the current fuel price is lower than the average price paid in the preceding month. Overall, electricity prices have increased sharply since 2003 from close to EC$0.60 to over or near EC$1.00 in 2007 and again since 2011.

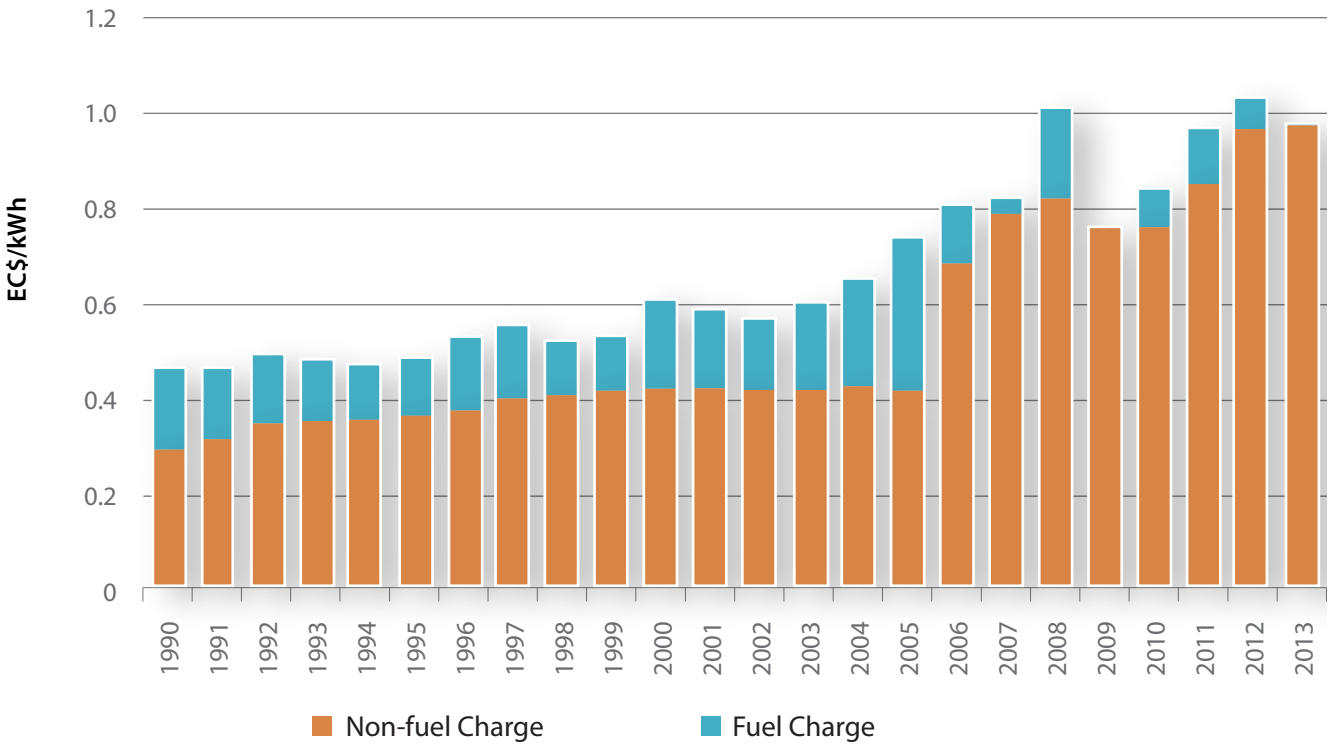
In addition to the basic energy rates and the fuel surcharge, LUCELEC applies minimum monthly charges ranging from EC$5.00 for domestic low-tension connection and EC$30.00 for commercial low and high tension to EC$100.00 for industrial and hotel low and high tension (LUCELEC, 2014b; 2015a).

**Table 8** LUCELEC Electricity Rates 2015 (in EC$ per kWh))

| Charge | Domestic | Commercial | Industrial | Hotels | Street lighting |
|---|---|---|---|---|---|
| Basic energy rates per kW unit | 1-180 units: $0.896<br>>181 units: $0.936 | Low tension: $1.036<br>High tension: $0.996 | $1.036<br>$0.996 | $1.036<br>$0.996 | All units: $1.031 |
| Fuel cost adjustment (April 2015) | -$0.045 | -$0.045 | -$0.045 | -$0.045 | -$0.045 |
| Total | 1-180 units: $0.841<br>>181 units: $0.891 | Low tension: $0.991<br>High tension: $0.951 | Low tension: $0.991<br>High tension: $0.951 | High tension: $0.991<br>High tension: $0.951 | $0.986 |
| Minimum charge | $5.00 | Low tension: $30.00<br>High tension: $30.00 | Low tension: $100.00<br>High tension: $100.00 | Low tension: $100.00<br>High tension: $100.00 | - |

**Source:** LUCELEC (2014b; 2015a).
**Note:** LUCELEC assessed a negative fuel cost adjustment for April 2015, as the current fuel price is lower than the average price of the previous month.

**Figure 20** Average Annual Non–fuel Charge and Fuel Charge, 1990–2013




**Source:** LUCELEC (1999; 2009; 2010; 2011; 2012; 2013).

The government provides no direct subsidies to the electricity sector, but residential consumers benefit from cross-subsidies. Consumption of the first 180kW is provided below the cost of supply paid for by higher tariffs for consumption above 180kW. The ESA also allows a 10 percent discount for government customers, except for street lighting. All fuel costs are passed on directly and equally to consumers, fully exposing low-income customers to the fluctuations of fuel prices. LUCELEC benefits from an indirect subsidy, as in most of the Eastern Caribbean, as it is exempt from import duties.

Both the NEP and the ESB make reference to potential changes to the tariff structure. According to the NEP, the NURC will set the electricity tariff taking into account: (i) the cost of production, including all duties and taxes; (ii) the varying costs of production fuels; and (iii) the long-run marginal costs of supply to all consumer categories at all voltage and capacity levels and at varying times of day.

LUCELEC will be required to provide three comparative price quotes for fuel oil imports, and fuel surcharges will be assessed based on the lowest market rate at which fuel is available. Rates will be set at a level ensuring that LUCELEC's rate of return and earnings are within acceptable margins (Government of Saint Lucia, 2010).

According to the ESB, the NURC will approve tariffs based on: (i) the costs incurred from efficient generation, (ii) the costs from the use of derivatives and future derivatives, and (iii) a reasonable return on capital. The bill does not define a reasonable rate on capital (Government of Saint Lucia, 2015b).

**Table 9** Electricity Sector Tariff Regime, 2015

| Who sets tariffs | Who controls tariff changes | How is the tariff calculated | How are tariff changes calculated |
|---|---|---|---|
| Minister responsible for public utilities | LUCELEC makes annual changes base on ESA formula. Review board reviews basic rates at most every five years and Minister makes changes after consultation with board and utility. | Fair rate based in rate formula set in the ESA. | LUCELEC compares allowed return to actual returns and adjusts basic rate. |
| **Who monitors and enforces fairness of tariff** | **Who can alter terms of how tariff is calculated** | **How frequently is tariff revised** | **Is there a guaranteed rate of return** |
| LUCELEC submits audited reports on which tariffs are based. Certification committee verifies. | Parliament | Basic rates adjusted annually to reflect difference actual rate and allowable return. LUCELEC sets temporary rate annually to account for this and Certification Committee makes adjustment final. General tariff review by review board at most every five years. | Rate of return calculated based on average 12 month deposit rate paid by banks + an additional 10%. Target rate of not less than 15% per year. |

**Source:** Government of Saint Lucia (2005); World Bank (2011).

**Table 10** Table 10 | Matrix of the Electricity Sector

| Generation | Transmission | Distribution |
|---|---|---|
| LUCELEC | LUCELEC | LUCELEC |

# Institutional Structure of the Hydrocarbon Subsector

Currently, as well as under the NEP, the ministry responsible for finance establishes and maintains a pricing regime ensuring that prices of petroleum products remain reasonable and are not exaggerated by excessive transportation, loss and insurance costs. To comply, the government will monitor the current method of adjusting taxes levied on petrol, diesel, and other fossil fuels to accurately reflect international price fluctuations.

Under the NEP, the government aims to diversify the sources of the petroleum supply to reduce dependence on any single source of imports by strengthening bilateral relations with energy-supplying countries. It also provides for a consultation process involving stakeholders from the government and the private sector before any bilateral energy-supplying agreements are signed (Government of Saint Lucia, 2010).

The government of Saint Lucia joined PetroCaribe in 2013 and received its first shipment of fuel under the agreement with Venezuela in the spring of 2014. The government plans to receive 1000 boe/day of diesel and 500 boe/day of gasoline per day, covering about 50 percent of the island's fuel needs. According to the government, it does not intend to open a network of private or government-owned petrol stations, and instead aims to work with existing actors, such as Buckeye Partners and SOL Petroleum (Government of Saint Lucia, 2014).

Buckeye Partners LP is the leading supplier of oil and natural gas on the island and is responsible for the import, storage, and distribution of these products. It operates the only marine facility handling terminal operations for imported fuels. Buckeye purchased the Saint Lucia Oil Terminal, comprising 14 tanks with a capacity of about 10 million barrels, from Hess Oil in December 2013.

The US$850 million deal, involving 20 liquefied petroleum products terminals and total storage capacity of 39 million barrels, was first announced in October 2013. Hess had originally announced in 2008 that it had begun preparatory work for the construction of a refinery in Saint Lucia near the existing oil terminal at Cul De Sac. This development, however, never came to fruition (Government of Saint Lucia, 2014).

In addition to Buckeye, a number of companies participate in the subsequent downstream stages. SOL EC Ltd distributes and supplies fuel oils and liquefied petroleum gas to its network of service stations using the Shell brand name under license. Other companies selling oil products to consumers are Texaco and Island Oil Ltd. (Commonwealth of Nations, 2014).

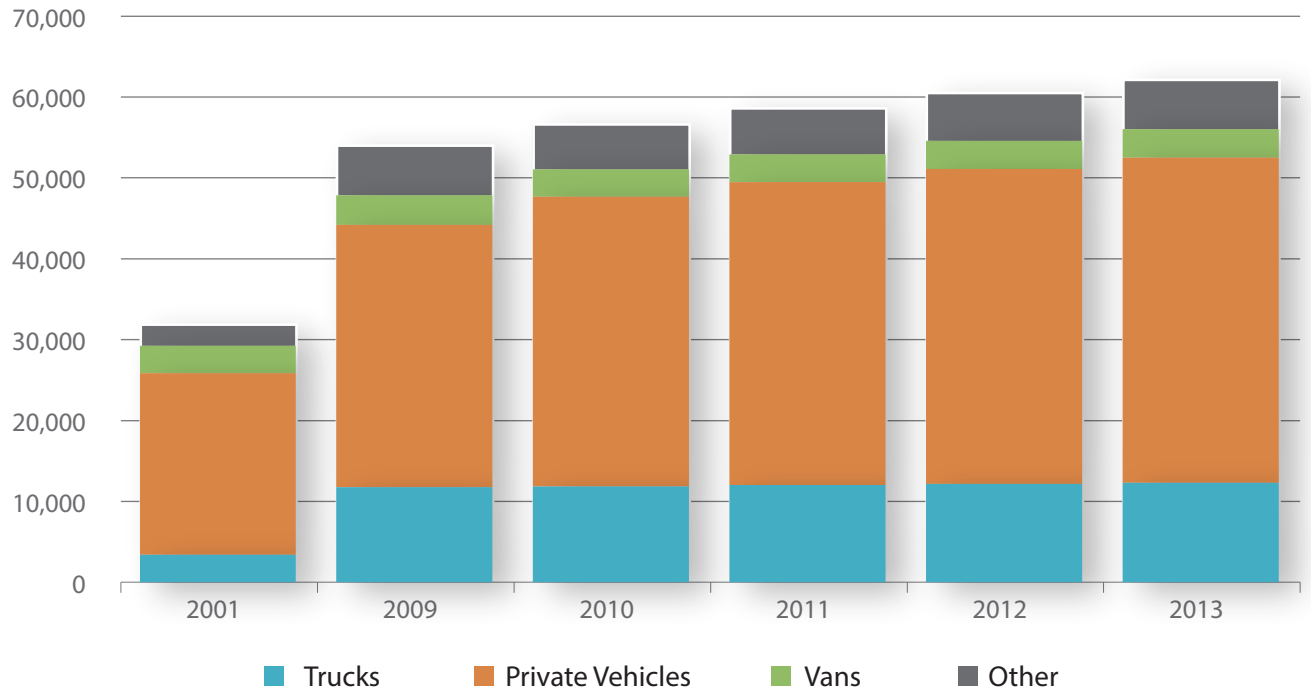
**Table 11** Matrix of the Hydrocarbon Sector

| Production | Imports | Transformation | Commercialization |
|---|---|---|---|
| | PDV Caribe<br>Sol Petroleum<br>Buckeye Partners | | Buckeye Partners<br>Sol Petroleum |

## Transportation

The number registered motor vehicles, especially private cars, has increased rapidly since the liberalization of the motor vehicle import policy in the 1990s and grew by 7.9 percent per year between 1997 and 2000. In 2001, there were 39,416 registered vehicles on the island, including 22,453 private motors cars, 1,894 taxis, 3,387 passenger vans, 3,387 buses and trucks, and 757 motorcycles. By 2013, this number had grown by nearly 60 percent, to 62,145 registered vehicles, including 40,210 private motor cars, 3,507 vans, and 12,293 commercial vehicles (Emanuel and Gomes, 2014).

**Figure 21** Saint Lucia Motor Vehicle Stock, 2001




**Source:** Emanuel and Gomes (2014); Government of Saint Lucia (2010).

Saint Lucia's road network consists of 1,210 km of roads, of which 63 km are paved highways with 1,147 km of unpaved or partially paved secondary roads. The Ministry of Infrastructure, Port Services and Transport maintains the road network. Vehicle import duty is assessed based on engine size, which does not take into account the fact that efficiency is not necessarily correlated with engine capacity (Government of Saint Lucia, 2010).

# Historical Development of the Saint Lucia Energy Sector

The historical development of the energy sector in Saint Lucia evolved primarily around LUCELEC. The utility was founded in November 1964 as a private limited liability company. At its inception, ownership was divided between the Government of Saint Lucia, with 18.7 percent, Castries City Council, with 28.2 percent, and the Commonwealth Development Corporation, with 53.1 percent.

With LUCELEC the island nation transitioned from dozens of small facilities dispersed throughout the island to a centrally managed source of power. As the economy began to grow rapidly during the 1970s, LUCELEC was faced with increasing demand, growing at 30 percent year over year and doubling every three years.

It was during that time that the utility built the 11kV subtransmission network, which still serves as part of the grid today. In order to ensure that LUCELEC had the necessary in-house technical capacity and know-how, it initiated an apprenticeship program, and by the end of the 1980s was able to cover all but certain specific needs with in-house technical experts.

During the 1990s, the company built and opened the new power plant at Cul De Sac and introduced the new 66kV transmission system, reducing system losses. The company then went public and offered its shares to the general public in the countries of the East Caribbean, Barbados, and Trinidad and Tobago (Bank of Saint Lucia, 2003; LUCELEC, 2014a).

# Methodology for Energy Matrix

The matrix was constructed with data from LUCELEC, the Government of Saint Lucia, IRENA and the EIA. The EIA provided the figure on oil imports for 2013. IRENA supplied information about production and consumption of CR&W for the year 2009. It was assumed that the share of CR&W did not fundamentally change between 2009 and 2013 as it also did not change between 2000 and 2009. LUCELEC provided figures on input into electricity generation based on the company's diesel consumption. Final consumption of electricity represents LUCELEC's sales. Sectoral consumption is based on CO2 emission data by sector for the year 2011 based on the government's second national communication to the United Nations Framework Convention on Climate Change (UNFCCC).

| | CR&W | Oil imports | Electricity input oil products | Electricity consumption | Final consumption by sector |
|---|---|---|---|---|---|
| 2013 | 61 boe/day | 3000 boe/day | 2030 boe/day | 563 boe/day | |
| Source | Based on IRENA 2009 figure assuming no significant change | EIA | LUCELEC Annual Report | LUCELEC Annual Report | Based on CO2 emissions from Saint Lucia UNFCCC report 2011 |

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