National energy efficiency

monitoring report of Saint Lucia

Jeremiah Leslie Serieux

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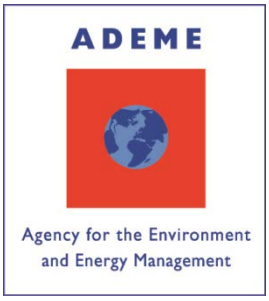

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Abstract

Energy represents a fundamental input for modern economies. Small island developing states (SIDS) are not immune from the pressures of development, and countries such as Saint Lucia face two main threats related to energy. Firstly, inadequate and insecure supplies at affordable prices and secondly the harmful effects on our environment due to the over-consumption of fossil fuels.

The energy sector in Saint Lucia is not unlike other Caribbean countries as there exists a high dependence on fossil fuels. This dependence has traditionally been 100 per cent, and energy consumption is dominated by electricity generation and transportation. With respect to electricity, grid access in Saint Lucia is over 98 per cent, with the electrical utility having an installed capacity of about 88.4 MW. Electricity generation over the years was characterized by total dependence on diesel-powered generators. In the recent years however, there has been significant expansion of the 11kV distribution network as well as diversification into renewable energy (RE) sources, with the recent completion of a 3MW solar Photo-Voltaic (PV) system. With respect to rural electrification**,** the distribution network has been expanded and its carrying capacity increased at various points.

The Government of Saint Lucia continues to take a strategic approach to the development of the energy sector and to this end, in 2010 elaborated a comprehensive national energy policy. In 2018, the country also adopted its National Energy Transition Strategy, which is intended to chart the way forward for the inclusion of RE in the electricity generation mix.

While there has been some attention given to the whole issue of renewable energy and its inclusion in the generation mix, there has not been a similar level of attention paid to the study of energy efficiency and the benefits which are widely available from the implementation of such measures. In fact, not much attention has been paid in the past to the collection and analysis of data on energy use which could be used to identify trends, patterns and other energy statistics. The study of these energy use practices could go a long way in shaping policies for the energy sector which could encourage and promote the sustainable use of all fuels, whether fossil fuel or renewable sources. Such policies could also steer public and private consumption in a direction which is keeping with Governmental policy on renewable energy and energy efficiency.

This study aims to change that and seeks to investigate and present baseline indicators for energy efficiency programs, measures and interventions which have been implemented or practiced on Saint Lucia in the past.

Introduction

The United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), along with consultant firm ENERDATA is supporting a project entitled **Baseline Indicators for Energy Efficiency (BIEE)**. The project is currently being executed in four Caribbean countries, namely Trinidad and Tobago, Guyana, Barbados and Saint Lucia.

The aim of the project is to map energy efficiency (EE) indicators in these countries in order to present a baseline scenario, which could then be used to determine the scope for future energy efficiency actions, and to measure energy efficiency progress and savings going forward. The indicators draw on data from general macro-economic statistics as well as data from specific sectors including transportation, industry and services in order to obtain a realistic picture of the energy efficiency landscape in the Caribbean. Consultants have been retained in each of the participating countries to work with the National Energy Agency and focal point to gather the necessary data, manipulate as required and enter into a bespoke spreadsheet which will analyse and present the output information on EE trends in the region.

The project is expected to result in the production of a baseline set of energy efficiency indicators for the island. This would inform on past and current metrics for energy efficiency and reveal the extent to which opportunities and scope for further EE interventions exist, with the possibility of significant cost savings for the Government and people of Saint Lucia.

In implementing this project, secondary information was obtained from available sources and partner agencies. Such sources included:

(i) Economic and Social Reviews published by the GOSL Central Statistics Unit

(ii) Saint Lucia Population and Housing Census 2001 and 2010, conducted by Central Statistics Unit

(iii) Energy Division, GOSL

(iv) Transport Division, GOSL

(v) Customs and Excise Department, GOSL

(vi) LUCELEC Annual Reports

(vii) World Bank Country Statistics

(viii) OLADE Energy Balances for Saint Lucia (2010-2012)

(ix) Enerdata and UNECLAC

Data for the Project were obtained from all of the above stated sources and verified by Enerdata. The United Nations Economic Commission for Latin America and the Caribbean (UNECLAC) was the implementing partner agency for the Project. The matrix of data and information sources used in this report is summarized in Figure 1.

Figure 1
Matrix of Data and Information Sources for EE Database – Saint Lucia

Source: BIEE program.

I. The background to energy efficiency

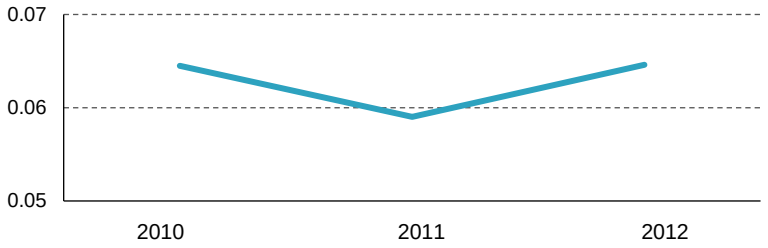
The use of fossil fuels for energy has been ongoing for centuries. Scientific evidence has shown that if not curbed, our appetite for fossil fuels will plunge the world into a period of climactic uncertainty and imbalance, where we will have to deal with the impacts of global warming and other changing weather and climactic phenomena. Immediately, issues such as global warming and sea level increase come to mind.

While the end goal is to replace fossil fuels with more renewable fuel sources, short-term gains are to be had with the frugal use of fossil fuels. This more efficient use of the resource will result in lower carbon and other harmful emissions to the environment.

This project is aimed at assessing current energy efficiency levels in order to determine the scope and appetite for additional EE measures. In so doing, energy efficiency trends in the energy, industry, households and transport sectors were examined. The services sector and agriculture were also targeted but due to the unavailability of data, the report does not include analysis of these sectors.

Before delving into the specific sectors, we will look at the macro-economic level indicators of energy efficiency, starting with the overall primary intensity (Figure 2).

Figure 2
Primary energy intensity
(Ktoe)



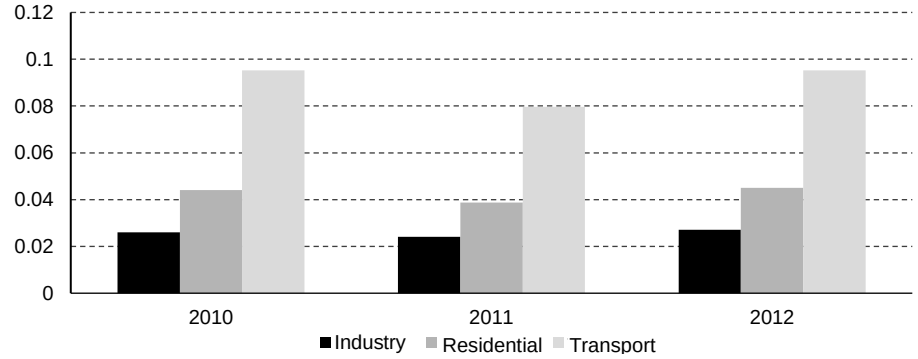
Source: BIEE program.

Figure 2 above shows primary intensity for the period 2010 to 2012, for which data are available. Primary intensity fluctuated over the period, just hovering between a high of 0.064 and a low of 0.059. The dip in intensity (and other indicators) in 2011 will be seen often during the course of this report and reflects the lagged effects of Hurricane Tomas which impacted Saint Lucia in late, 2010. After 2011 most indicators of economic activity saw a rebound in 2012, returning to equal or better than 2010 levels of activity.

A. Primary intensity by sector

Primary intensity of the various sectors of economic activity is presented in Figure 3 below. The sectors for which data are available are industry, residential and transport, also for the period 2010 to 2012.

Figure 3
Energy intensity by sector
(Ktoe)

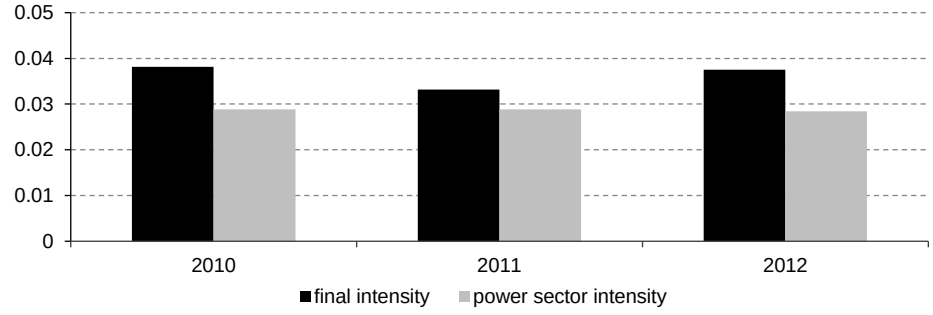


Source: BIEE program.

The graph shows the relative energy intensity of these three sectors, along with changes over the three-year period. Transportation is the most energy intensive sector of the three throughout the period, remaining almost constant at around 0.09. Residential use of energy is next, followed by industrial. These also remained almost constant, but all experienced the temporary dip in 2011, and a subsequent recovery in 2012.

Primary intensity for Saint Lucia can be decomposed into components of final intensity and power sector intensity as shown in Figure 4.

Figure 4
Final and power intensity
(Ktoe)

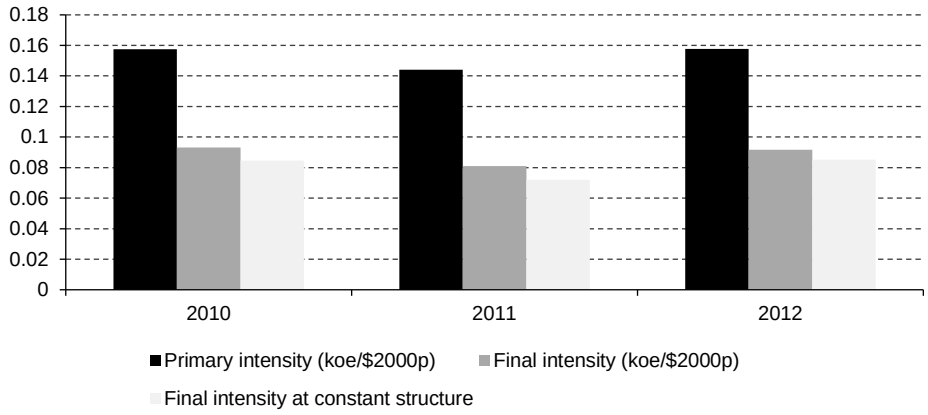


Source: BIEE program.

B. Primary and final intensity

The results above show that the bigger component of primary intensity is power sector intensity, which has remained constant over the period, despite fluctuations in final intensity figures. Primary and final intensity at constant prices and at purchasing power parity have also been presented, with results as follows (Figure 5).

Figure 5
Primary and final intensity
(Koe/2000 ppp)

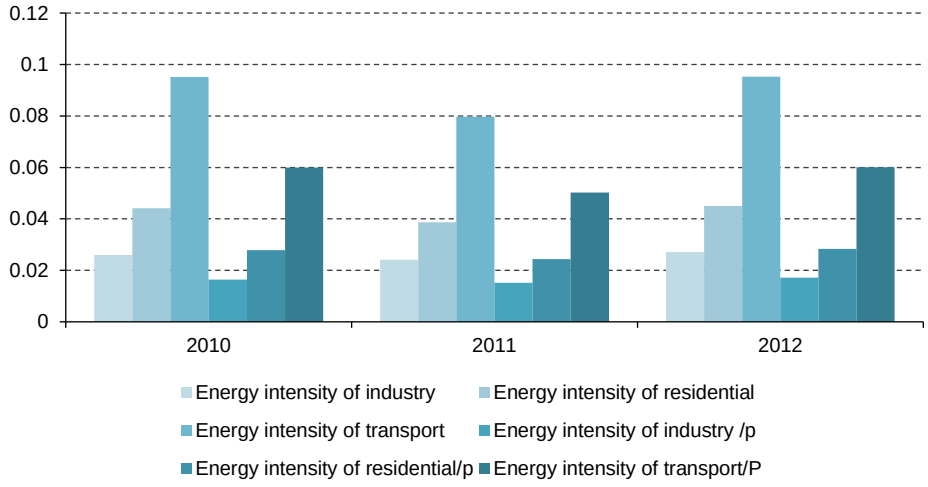


Source: BIEE program.

These results show the relationship between primary and final intensity at year 2000 prices and final intensity at constant structure. All of these indicators have remained relatively constant over the three-year period, but the characteristic dip in 2011 seems to have affected them as well.

C. Energy intensity by main sector

Figure 6
Energy intensity by main sector (with PPP)



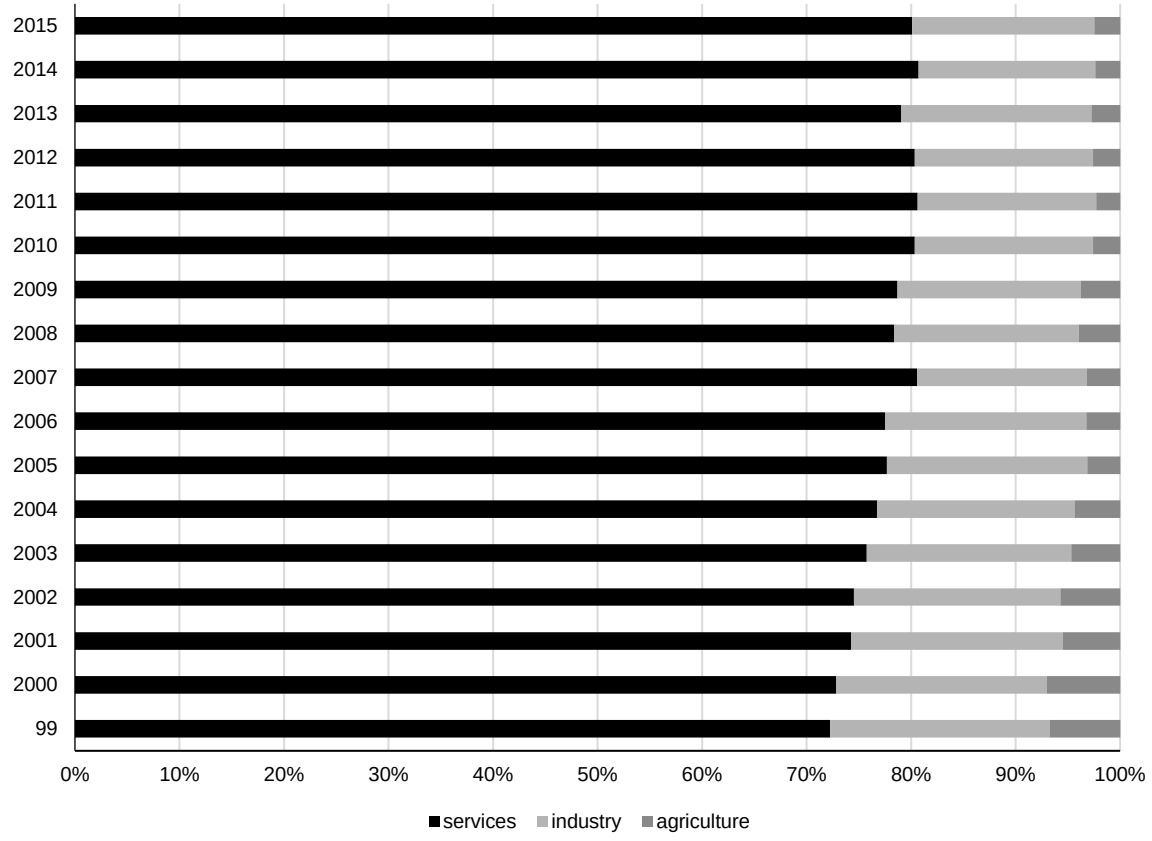
Source: BIEE program.

Figure 6 above energy intensity of the main economic sectors analyzed earlier, but this time also showing intensity at purchasing power parity, which removes the effects of exchange rate differences. The removal of exchange rate reduces the nominal value of the energy intensity figures across the board but has no impact on the relationships between the three sectors; transport continues to dominate, followed by residential and then industry.

D. GDP structure and growth

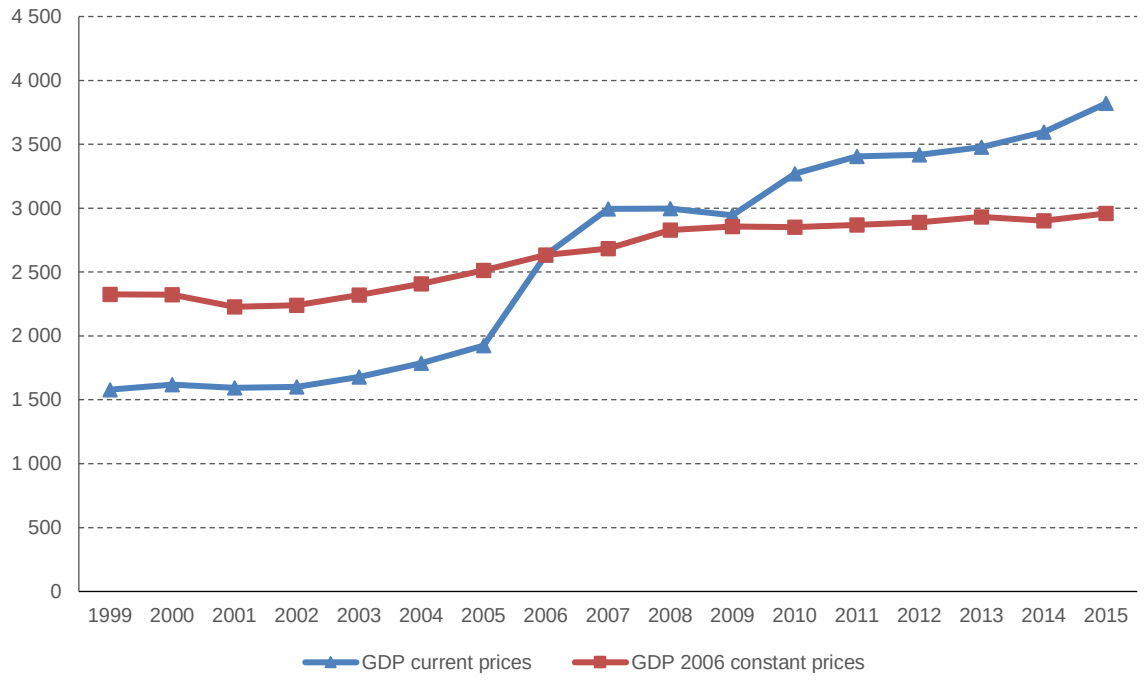
The structure of the economy, in terms of which sectors are contributing to GDP in what proportions, is also important in determining how each sector's performance will affect overall economic performance. Historically, Saint Lucia's economy has been dominated by agriculture. However, since the early 90's this started to change and the tourism industry came to increased prominence, replacing agriculture as the major foreign exchange earner. This created a situation where the services sector is the major economic powerhouse, followed by industry and then agriculture (Figure 7). It is also evident that over the period 1999 to 2015 the contribution of agriculture to GDP has been diminishing while that of services and industry have expanded. The relative contributions of the sectors to GDP are depicted below, which highlights the changing structure of the economy.

Figure 7
GDP Structure over time
(Percentages)



Source: BIEE program.

Figure 8
GDP growth (1999 to 2015)
(Eastern Caribbean dollars)



Source: BIEE program.

Along with demonstrating the structure of the economy, it is also important to show how the economy has been performing, in terms of GDP growth, over the review period. Figure 8 shows GDP growth at current prices and also at 2006 constant prices.

Current prices show GDP increasing at a rapid but unpredictable rate. However, when the effects of inflation are eliminated (constant prices) a much more gradual increase in GDP over the years is apparent, along with less erratic movements from year to year. Overall, the graph shows an economy that is growing year by year at a steady rate.

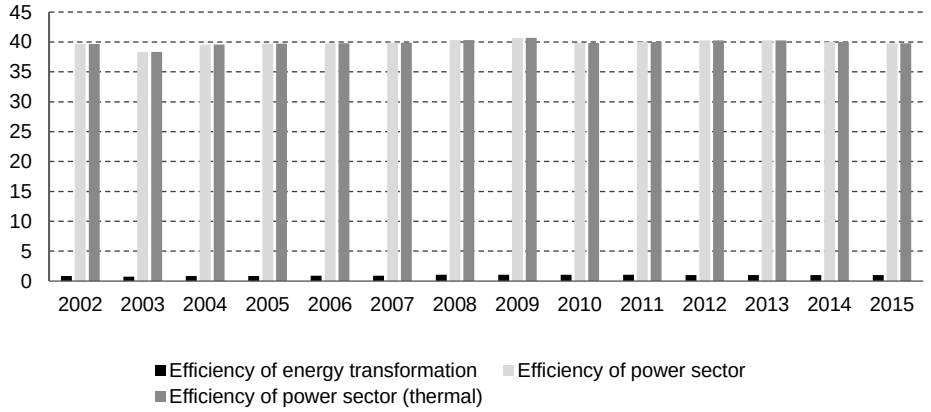
II. Energy efficiency trends in energy sector

A. Efficiency of power generation

The energy sector in Saint Lucia is dominated by fossil fuel use in electricity generation. In the past, 100% of the country's electricity was generated using diesel and /or heavy fuel oil. Only in recent years has there been the inclusion of renewable energy, specifically solar PV, into the energy mix for Saint Lucia.

Thermal Generation accounts for almost all electricity generated on the island. Hence, the efficiency of power generation and the efficiency of thermal generation follow an identical pattern, as illustrated in Figure 9 below.

Figure 9
Efficiency of generation
(Percentages)



Source: BIEE program.

The efficiency of generation has hovered around the 40% mark consistently from 2002 to 2015. Electricity is generated by the sole electric utility on the island, the Saint Lucia Electricity Services Limited (LUCELEC) which has a monopoly on electricity generation and distribution.

LUCELEC has consistently been recognized as one of the most efficient electric utilities in the Caribbean.

B. Share of renewables in power generation

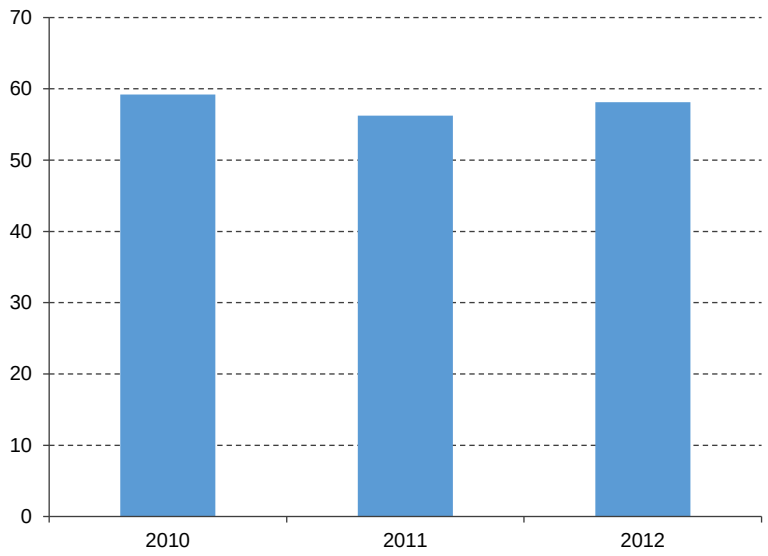
The share of renewables remains negligible in power generation for Saint Lucia. Only in the past two years has the utility included a portion of renewables in the energy mix, and this would not be reflected in the data presented as of 2015. This notwithstanding, a 3MW solar PV facility was completed in 2018, with plans underway for an additional facility.

The Government of Saint Lucia (GOSL) has also recently approved the National Energy Transition Strategy, which focuses on renewable energy (RE) in the forms of solar, wind and geothermal energy, in pursuit of its target of 30% RE in the energy mix by the year 2020.

C. Efficiency of energy transformation

This section explores the efficiency of energy transformation. Data on energy transformation were, however, only available for the years 2010 to 2012. Therefore, the figures presented on energy transformation are for that period only.

Figure 10
Efficiency of energy transformation
(Percentages)

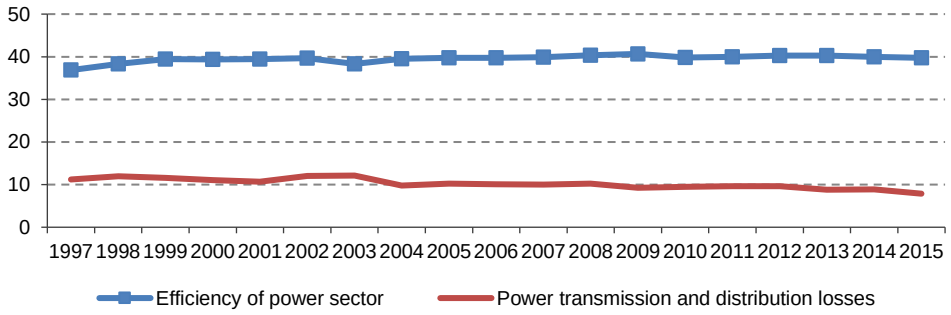


Source: BIEE program.

Figure 10 above shows that energy transformation efficiency between 2010 and 2012 was quite consistent, between a high of 59.4% in 2010 and a low of 56.3 % in 2011.

D. Efficiency of power sector

Figure 11
Efficiency of power sector and T&D losses transformation
(Percentages)



Source: BIEE program.

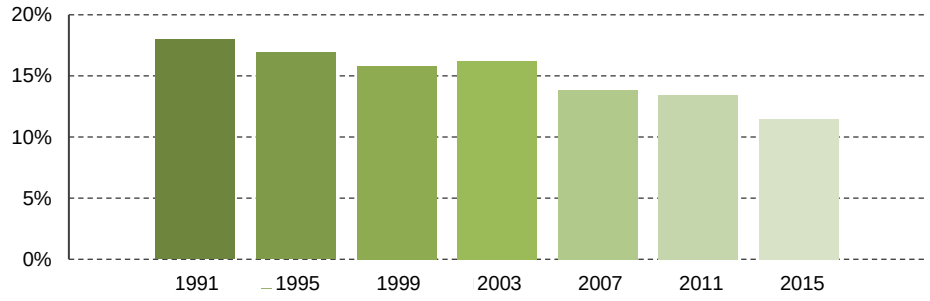
As shown in Figure 11, the efficiency of the power sector has hovered between 36% in 1998 and 41% in 2015. This shows a high level of consistency in the efficiency of power generation by the utility. An efficiency rate of 41% for diesel generation is among the best in the Caribbean and the wider world.

A positive performance in terms of power transmission and distribution losses is also apparent from Figure 11. This measure has shown a gradual decline over the period 1997 to 2015, with minor anomalies, notably between 2001 to 2003 when an increase was registered. From 1997 to 2015 transmission and distribution losses have ranged from a high of 12% in 2002 to a low of 8% in 2015. When considered in tandem with generation efficiency, this trend presents a positive picture of the overall operations of the electricity sector.

E. Share of electricity in final consumption

The share of electricity in final consumption shows a steady decline from 1991 to 2015 (Figure 12). 2013 was the only year which registered an increase over the prior year's performance. This indicates that over the years, electricity's share of final consumption figures has been on the decline.

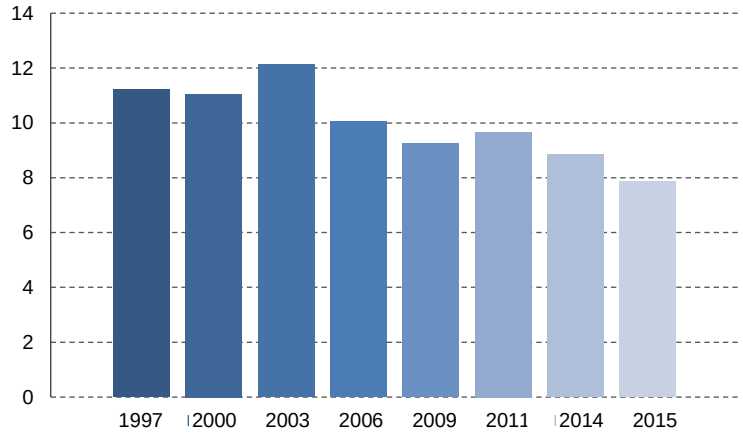
Figure 12
Share of electricity in final consumption
(Percentages)



Source: BIEE program.

Transmission and distribution (T & D) losses also characterize all electricity generation and transmission operations, and every utility aims to reduce these losses to as close to zero as possible. From 1997 to 2003 this rate was in excess of 10%, but decreased to under this rate in subsequent years, 2006 to 2015 (Figure 13).

Figure 13
Transmission and distribution losses
(Percentages)



Source: BIEE program.

Overall, the power sector continues to register consistently high levels of efficiency while simultaneously posting declines in T & D losses. This combination contributes to the high efficiency of the sector overall. Although there is always room for improvement, this is one area where gains due to increased efficiency would not be very significant.

III. Energy efficiency trends in industry

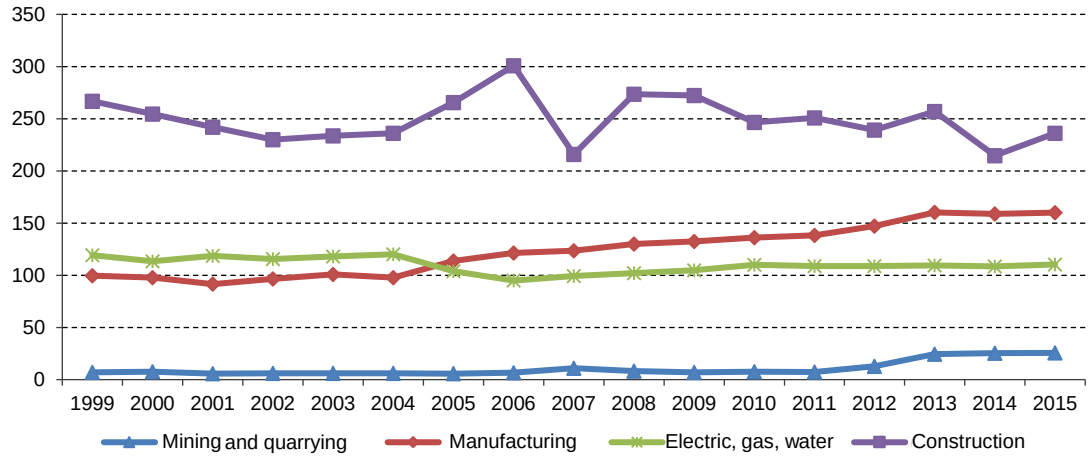
A. Value added by sector

With respect to the industrial sector, the largest economic contributor is from construction. However, construction value added has been erratic as times, especially over the period 2004 to 2008 (Figure 14). Overall, despite some years of growth, during the period 1999 to 2015 the contribution of construction to the economy experienced a decline.

The contribution of utilities (electricity, gas and water) remained about constant from 1999 to 2004, when it was higher than that of manufacturing. But during the period 2004 – 2006 utilities experienced a sharp decline, which for the first time in the period, saw it contributing less than manufacturing in terms of value added. Subsequent to 2006, utilities saw a gradual annual increase, but did not regain prominence over manufacturing or its contribution levels prior to 2004.

Manufacturing, in comparison, held relatively constant from 1999 to 2004, but from 2005 onwards this sub-sector saw impressive jumps in performance until levelling out again from 2013 to 2015. The contribution to value added in 2013 was more than 50% greater than that in 1999.

Figure 14
Value added by sector
(Millions)

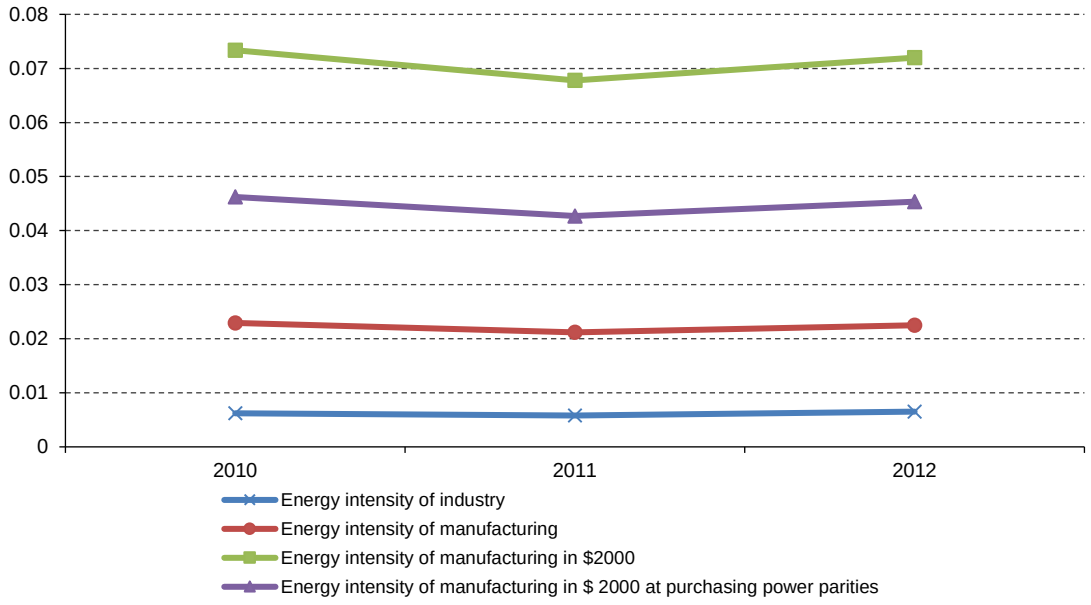


Source: BIEE program.

B. Energy intensity by activity

Energy intensity is another metric that has been estimated for the energy sector in Saint Lucia. Figure 15 presents energy intensity levels of industry and manufacturing from 2010 to 2012 in current prices and in base year 2000. It shows that industry is much less energy efficient than manufacturing over the period. The graph also shows the consistency over the three-year period, of all the measures represented. The measure with the greatest variance is the energy intensity of manufacturing in year 2000 dollars, but the change was still less than 10 percent in 2011.

Figure 15
Energy intensity of industry and manufacturing
(Koe/XCD2006)

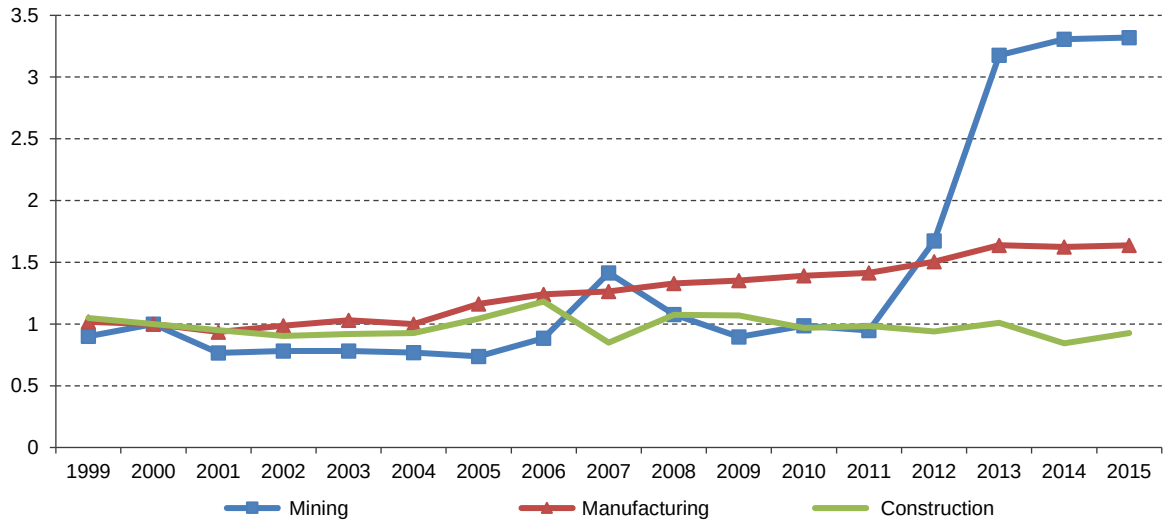


Source: BIEE program.

These results all indicate relatively low levels of efficiency across the board in industry and manufacturing. This also means that there are opportunities for securing considerable energy savings by undertaking measures aimed at increasing the efficiency of these sectors. The availability of baseline information will be invaluable in assessing the impact of interventions aimed at increasing energy efficiency.

C. Production index

Figure 16
Production index by sector
(Index 2000=1)



Source: BIEE program.

The production index of mining, manufacturing and construction is shown in Figure 16. This measure is generally similar for all sectors except for mining, which showed a sharp increase in 2012. This is possibly on account of the opening of a new quarry in Saint Lucia during that year.

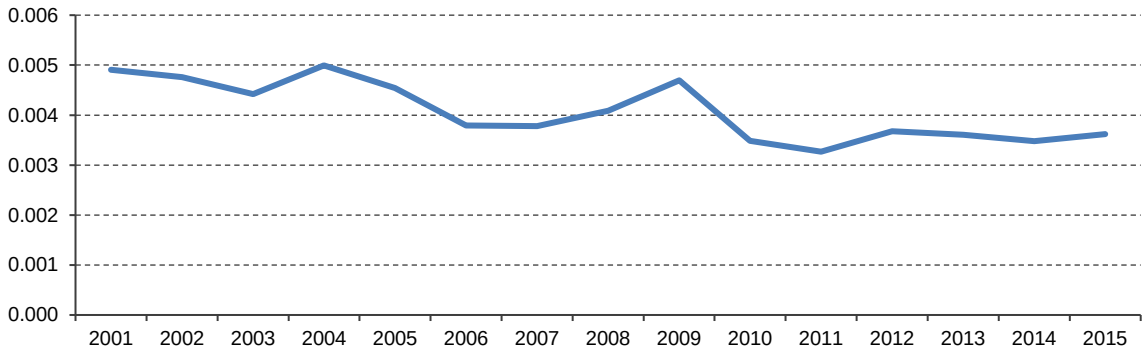
In 2007 there was also a dip in construction along with a spike in mining. Manufacturing also showed steady increases throughout the period with the index increasing by over 50% over the period 1999 to 2015. Although it remained mostly constant between 1999 and 2004, it experienced steady growth from 2005 to 2013.

IV. Energy efficiency trends in households

A. Electricity consumption per unit of private consumption

Considering energy efficiency trends in households, Figure 17 shows electricity consumption per unit of private consumption from 2001 to 2015.

Figure 17
Electricity consumption per unit of private consumption
(Ktoe/XCD2006)



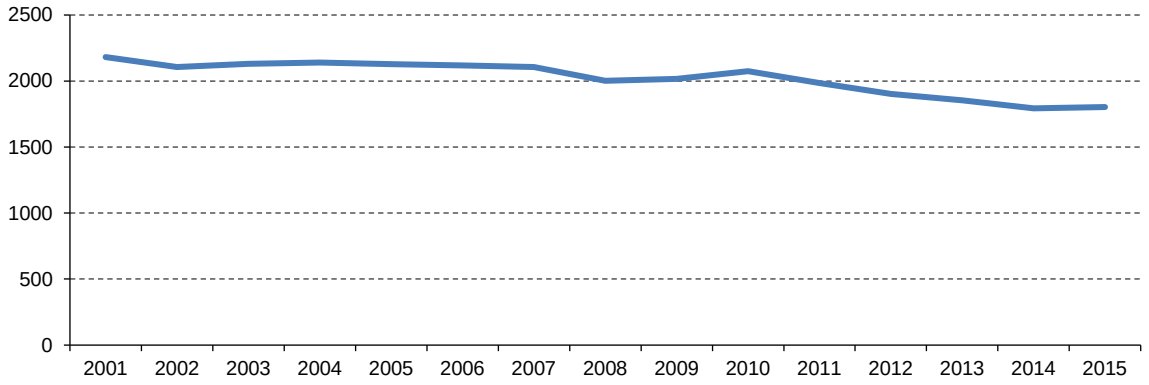
Source: BIEE program.

According to the figures, this measure showed erratic results from year to year but resulted in an overall decline from 2001 to 2015. This suggests that electricity overall was forming a smaller part of total private consumption over time. The primary reason behind this is likely the changing cost of electricity. The spikes from year to year, as seen in 2004 and 2008 correspond to times of high oil prices and therefore fuel prices, which were passed on to the consumer by the utility in the form of a fuel surcharge on electricity bills. However, this explanation would be plausible only if consumption was measured in terms of expenditure on electricity and not in units of electricity actually used.

B. Electricity consumption per electrified households

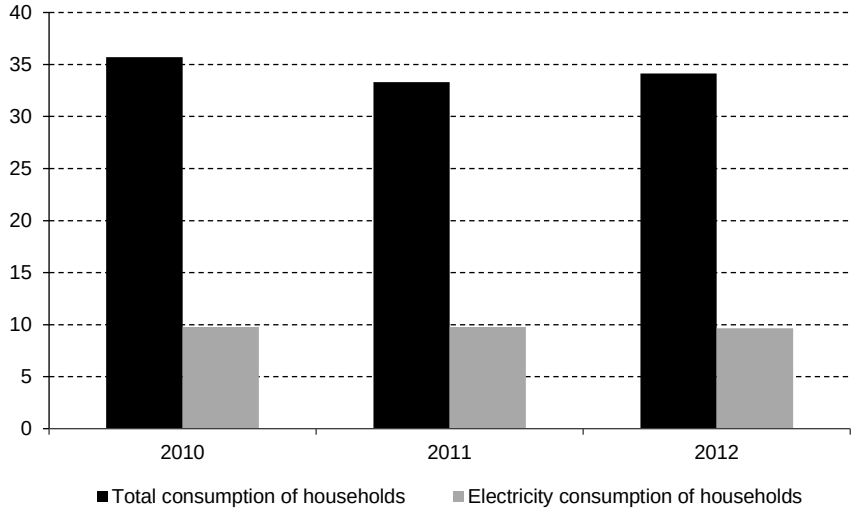
Figure 18 displays electricity consumption per electrified households from 2001 to 2015. Over the period, this measure has shown constant but gradual decline. However, there was a pocket of increase, from 2008 to 2010, which was followed by another period of constant decline up to 2015. This result suggests that households are using less energy on an individual basis. Given that there are not many options for the substitution of electricity in Saint Lucia, this result is somewhat baffling, unless, as cited above, the measure of consumption is based on expenditure on electricity and not actual units of electricity used. Another possible reason for the decline would be the use of more energy efficient appliances along with increased use of solar energy for water heating. However, these are only speculation as the empirical data to support these claims are not available. This highlights the need for proper data collection on energy sources and energy consumption in Saint Lucia.

Figure 18
Electricity consumption per electrified households
(KWh/household)



Source: BIEE program.

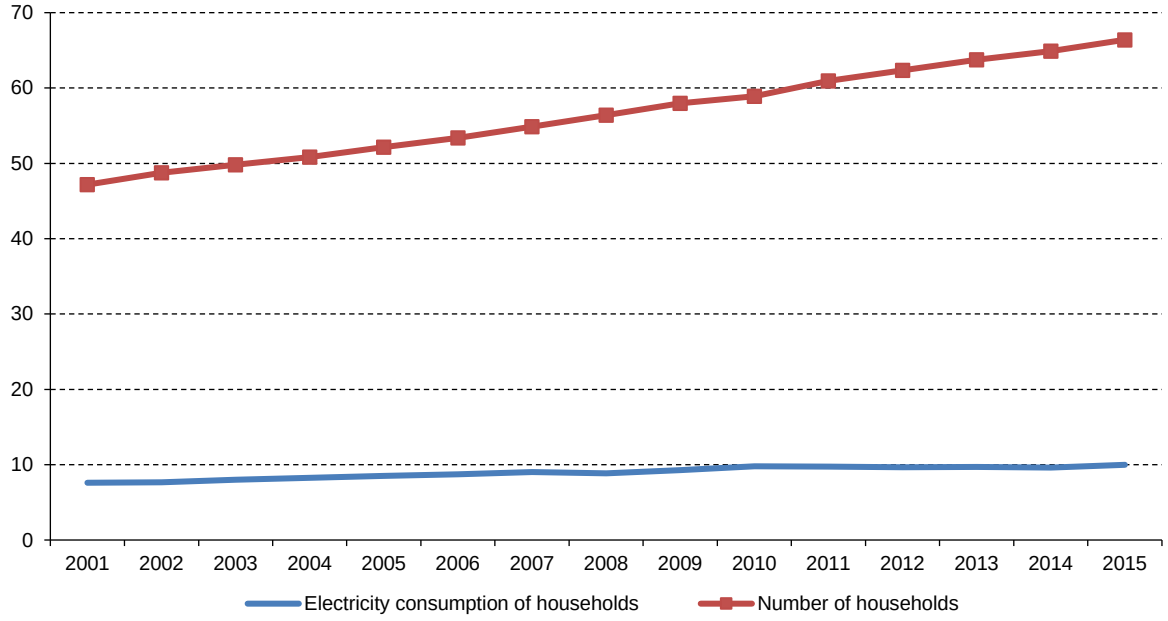
Figure 19
Total vs electricity consumption in toe
(Toe)



Source: BIEE program.

In analysing households, total electricity consumption of households is compared with electricity consumption of households in Figure 19. Electricity consumption appears to be constant over the three-year review period, while total consumption shows a slight decline in 2011 and a subsequent recovery in 2012. The percentage contribution of electricity to total consumption moved from 28% in 2010 to 30% in 2011 and then to 29% in 2012. These changes are subtle enough for the relationship to be considered constant over the period.

Figure 20
Electricity consumption and number of households
(Toe)



Source: BIEE program.

A further analysis of the energy efficiency trends in the household sector involved the comparison of electricity consumption of households with the number of households over the period 2001 to 2015 (Figure 20). Electricity consumption of households is seen to remain almost constant over the period, with a total increase of 20% over the 15-year period. Upon closer inspection, it is apparent that the period 2001 to 2010 saw slight increases in electricity consumption of households, but that number remained constant from 2011 to 2015.

At the same time, the number of households showed a steady increase over the period, with a total increase of approximately 41%.Electricity consumption of households does not, therefore, appear to be closely correlated with the number of households on the island.

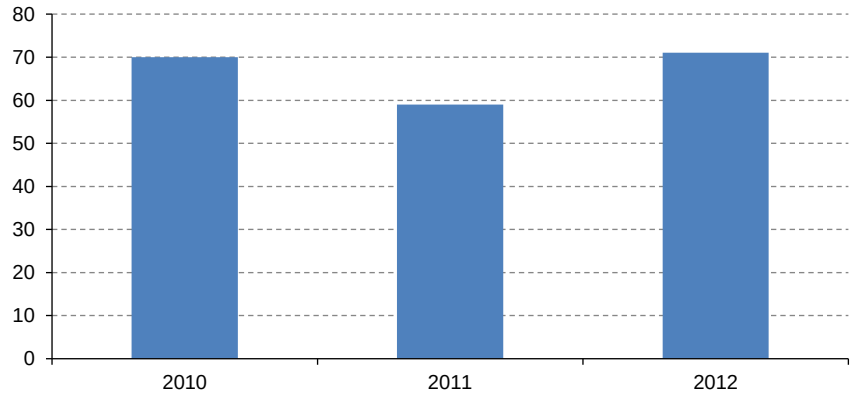
V. Energy efficiency trends in transport sector

A. Consumption in transport

The transportation sector is one of the heaviest users of fossil energy. Hence energy efficiency in this sector is of utmost importance and presents a great opportunity for energy savings which can in turn have a significant impact on energy consumption figures.

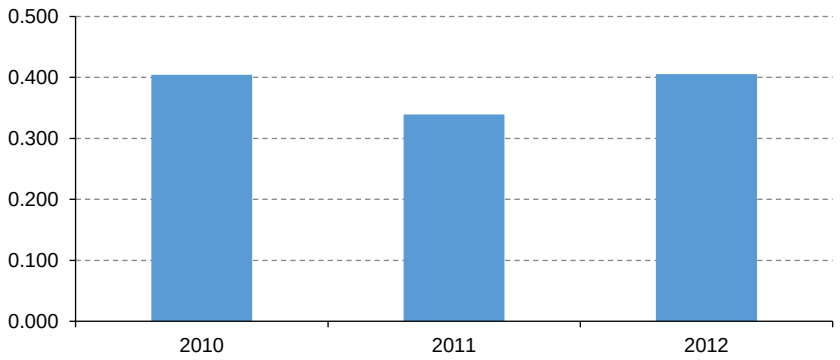
Unfortunately, much of the data which would be useful for determining energy usage in the transportation sector is not readily available in Saint Lucia. The analysis is therefore limited to fuel consumption and energy intensity.

Figure 21
Final energy consumption of transport
(Ktoe)



Source: BIEE program.

Figure 22
Consumption per capita
(Toe/per capita)



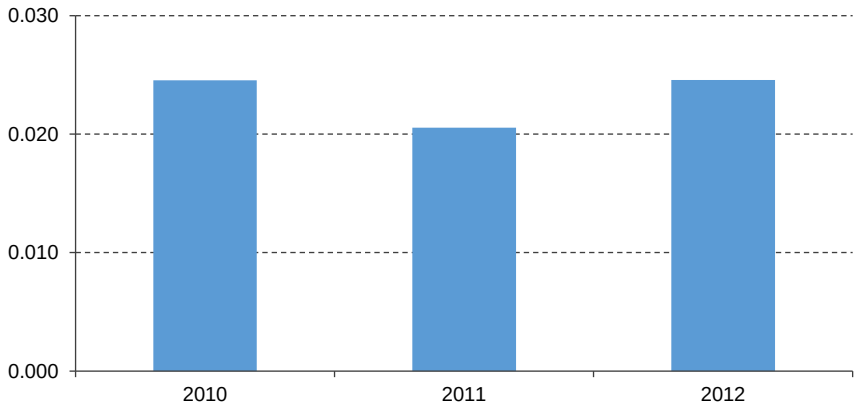
Source: BIEE program.

Figures 21 and 22 show final energy consumption and energy consumption levels per capita of the transportation sector, over the three year period 2010 to 2012.

Once again the now familiar trend of a slight decline in 2011 in comparison to the two other years is evident. As noted before, this pattern is likely attributable to the effects of Hurricane Tomas on the transport infrastructure of the island. This effect is reflected in both measures indicated above. For instance, final consumption moved from 70 to 59 to 71 ktoe over the period, while consumption per capita followed a similar pattern, moving from 0.405 in 2010 to 0.339 in 2011 and back to 0.406 in 2012.

B. Energy intensity of transport

Figure 23
Energy intensity of transport
(Koe/XCD2006)



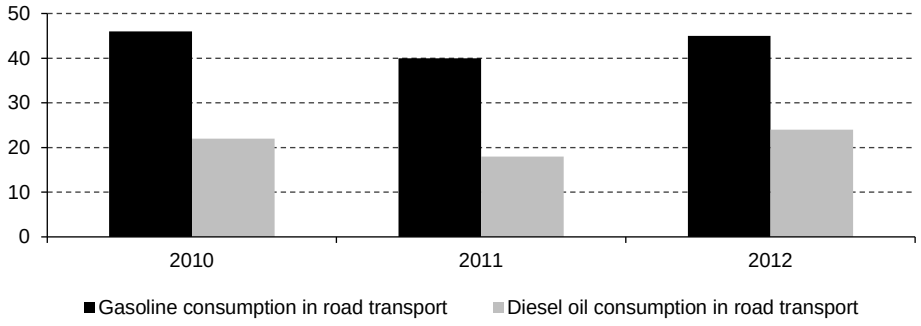
Source: BIEE program.

In terms of energy intensity, overall, the transportation sector utilizes the most energy in Saint Lucia. Over the three-year review period it remained largely constant save for the slight dip in 2011, reasons for which have been explained previously (Figure 23).

C. Fuel consumption of transport

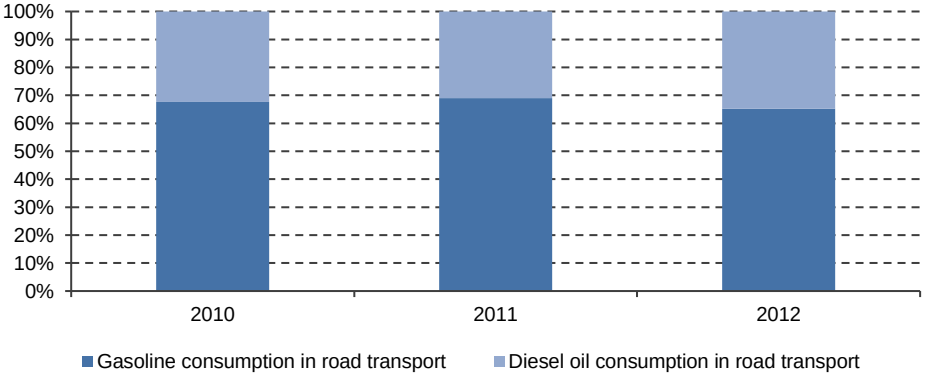
The fuels used for transportation in Saint Lucia are limited to primarily gasoline and diesel, with vehicles powered by electricity having such a very low penetration of so as to make it negligible.

Figure 24
Fuel consumption of transport
(Ktoe)



Source: BIEE program.

Figure 25
Diesel and gasoline consumption compared
(Percentages)



Source: BIEE program.

Gasoline is the more popular energy choice by consumers by a margin of 2 to 1 (Figure 24). This preference is more clearly illustrated in Figure 25, which shows percentages of usage of gas and diesel. Diesel consumption, while growing slightly over the period, is still far outranked by gasoline consumption.

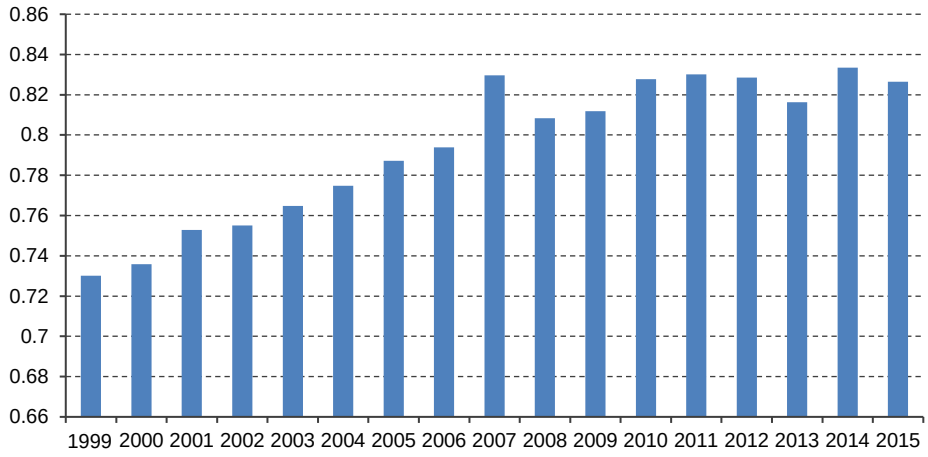
Additionally, although there has been a slight increase in diesel consumption, it is not possible to identify whether the increase is due to increased importation of diesel vehicles or a higher intensity of diesel consumption. The transport department of the GOSL does not record vehicles by fuel type and nor does this variable feature in the Customs Department's database of vehicle imports. For any meaningful analysis of this sector to be possible it is imperative that the statistics on fuel type in relation to vehicle imports be collected. This information could be used to guide policy decisions in a number of areas, including the study of the possible transition to electric vehicles by the Government of Saint Lucia.

VI. Energy efficiency trends in services sector

A. Share of services in GDP

For more than two decades, the services sector has been the primary driver of economic activity in Saint Lucia. The main contributor continues to be the tourism industry, which has taken over from agriculture which continues to show signs of decline. As Figure 26 shows, the share of services in GDP has increased consistently over the period 1999 to 2015.

Figure 26
Share of services in GDP
(Percentages)

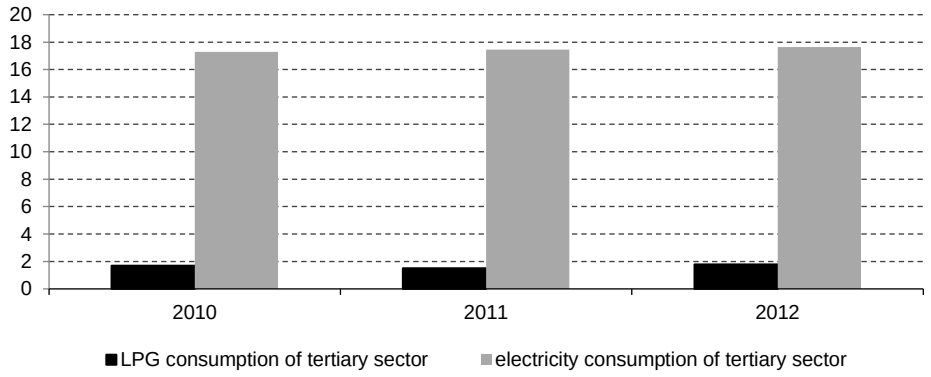


Source: BIEE program.

B. LPG and electricity consumption of services

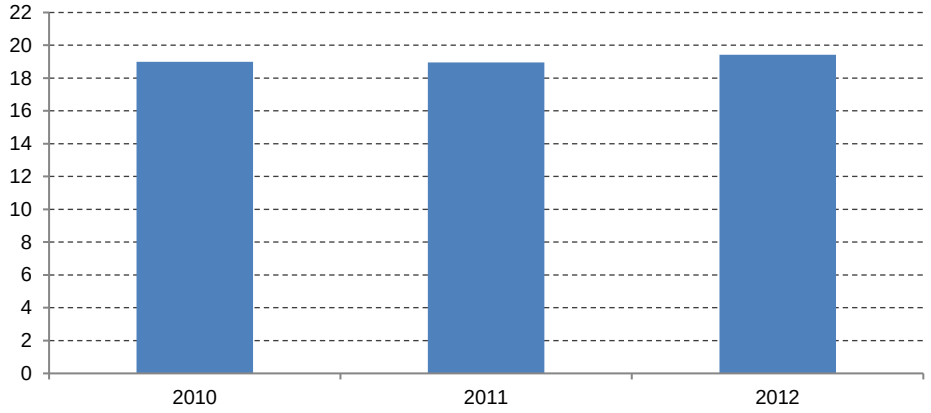
Unfortunately, data on energy efficiency specific to the services sector are not available to enable a detailed analysis. Available data pertain to mostly LPG and electricity consumption for the period 2010 to 2012 (Figure 27).

Figure 27
LPG and electricity consumption
(Ktoe)



Source: BIEE program.

Figure 28
LPG and electricity total consumption
(MWh)



Source: BIEE program.

There is a significant preference for electricity over LPG in the services sector.

In terms of absolute usage, electricity consumption has seen a slight increase while LPG appears to have remained almost constant over the period, with a slight dip in 2011.

Based on this consumption pattern it follows that any initiatives to improve energy efficiency in the services sector should focus on electricity consumption rather than LPG.

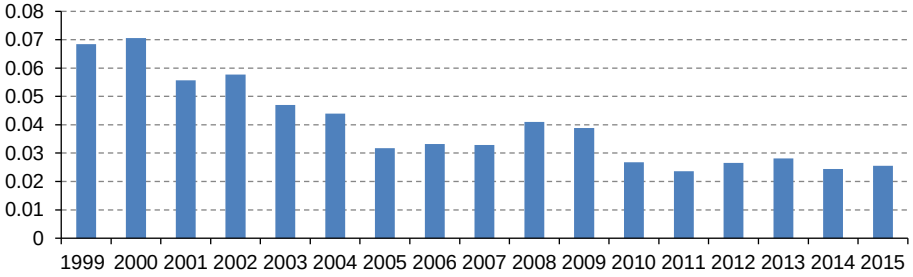
Total consumption of electricity and LPG in industry is shown in Figure 28. Over the period this figure has remained mostly constant, with slight growth. However, as Figure 27 suggests, the growth has been more in electricity consumption rather than that of LPG.

VII. Energy efficiency trends in agriculture

A. Share of agriculture in GDP

Prior to the mid 1990's agriculture was the main contributor to economic activity in Saint Lucia, spearheaded by the banana industry in the 80's. However, with the loss of preferential access to the UK market, the banana industry could not sustain its lead status and despite repeated attempts at agricultural diversification, no other crop has come close to replacing bananas as the major economic contributor that it has been Saint Lucia agriculture's contribution to GDP has consistently declined since the late 1990's (Figure 29).

Figure 29
Share of agriculture in GDP
(Percentages)



Source: BIEE program.

While much data on the agriculture industry are being collected, most if not all of which relates to production. As previously noted for other sectors, energy related information is not being collected. This dearth of data makes it impossible to do any meaningful analysis on energy consumption patterns and make recommendations for energy efficiency in the agricultural sector.

VIII. Conclusions and recommendations

The Baseline Indicators for Energy Efficiency (BIEE) Project is the first initiative of this kind, aimed at mapping energy consumption levels and characteristics in the Caribbean region. The importance of this project cannot be overstated as information derived from it will be extremely useful in planning for initiatives aimed at reducing or shaping energy consumption patterns in participating countries. In Saint Lucia, the Energy Unit of the Government plans to use the information provided from this study to determine how best to tailor its programmes and policies on energy efficiency for the future.

This information will also determine which sectors will be targeted for the greatest effect, as well as which specific activities could have the greatest impact on the selected measures of energy efficiency.

For Saint Lucia, the transport sector is the largest consumer of energy, and initiatives targeting this sector should be implemented. Of paramount importance in the design and tracking of any such initiatives though is the need to capture data on the type of fuel consumed by vehicles entering the country. This would give insights into consumption by vehicle type and size, which would allow for informed policy decisions on what vehicle imports should be encouraged of discouraged.

In many countries, electricity generation and distribution are carried out at quite inefficient levels and improvements in this area would be beneficial in controlling energy intensity figures. However, in Saint Lucia the local utility continues to operate at world class levels of efficiency given the current fuel mix. Perhaps the opportunity to increase efficiency in this area lies in the substitution of fossil fuels such as diesel with renewable energy sources such as solar PV.

The energy intensity and consumption levels of households also present opportunities to impact overall consumption levels. Electricity continues to be the main source of energy for households and future initiatives in this area would have to focus on the efficiency of use in order to be successful. Increased use of efficiently generated electricity and/or electricity from renewable sources would also be helpful in positively affecting intensity levels.

The energy intensity of manufacturing and industry is low compared to more industrialised economies. Measures can be put in place to tackle this issue and increase overall level of energy intensity. The baseline data which were collected can be used as a benchmark to evaluate the success of such initiatives.

Historically, agriculture in Saint Lucia has not been an energy intensive activity. However, this conclusion is based on anecdotal evidence as data on energy use in this sector are not currently being collected. The collection of such data should be a natural extension to ongoing efforts aimed at enabling farmers to operate in a more business-like and professional manner. Energy consumption should be considered as an input into the production process and recorded accurately. This would enable the design of energy efficient means of production, in order to reduce the overall cost of production in this sector, the success of which would then contribute to the much-desired reduction in the country's food import bill.

Energy efficiency initiatives in the services sector, especially tourism, would have a great effect on consumption in this sector which is the leading contributor to GDP in Saint Lucia.

Once again, for this sector, there is a lack of recording/reporting of energy consumption data which would facilitate useful analysis.

Thus far, the BIEE project has been useful at identifying some trends in energy consumption but also in identifying the numerous gaps which exist in the data currently being collected on energy intensity and consumption. For this initiative to fulfil its intended purpose of affecting energy consumption patterns it is absolutely imperative that current data collection methods and templates across the board be revised and amended to include statistics relevant to energy consumption. One pertinent example of this for the transportation sector is that the data collected on vehicle registrations and importations should include breakdowns on the fuel type of the imported /registered vehicles. This is currently not the case.

Overall, the BIEE Project has been very useful and should be continued with a component of primary data gathering as well as training for the analysis of energy statistics. This would enable participating countries to extract the maximum benefit from the project's activities.

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The Government of Saint Lucia continues to take a strategic approach to the development of the energy sector and, to this end, elaborated a comprehensive national energy policy in 2010. The country also adopted its National Energy Transition Strategy in 2018, which is intended to chart the way forward for the inclusion of renewable energy in the electricity generation mix.

While the government has given consideration to the issue of renewable energy and its inclusion in the electricity generation mix, energy efficiency measures and their benefits have been generally overlooked, in large part because little data were available on energy use which could be used to identify trends and patterns and to produce other energy statistics.

This study seeks to change that by investigating and presenting baseline indicators for energy efficiency programmes, measures and interventions which have been implemented in Saint Lucia.

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