

# DV CA1

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## ENERGY SECTOR OF JAMAICA

## Energy Sector of Jamaica

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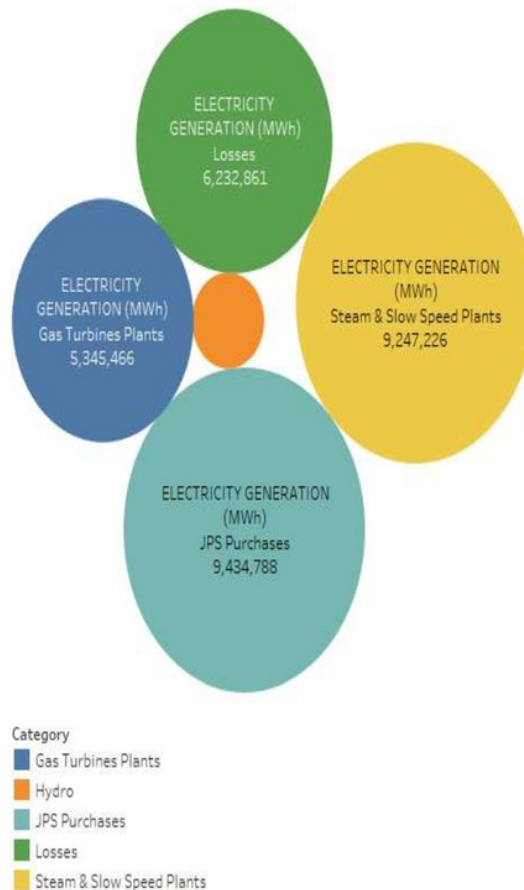
## Introduction

Energy is important sector which contributes to Development of any country. Its fourth basic needs of any people leaving the countries. The industrial sector totally depends upon the energy it receives from energy any interruptible energy leads to financial loss which can affects countries economy. For every sector like tourism, airport, transportation, banking energy is required, and plays even more important role if Country is small like island Jamaica is there with population of 2.9 million, where analysis of energy requirement should be known according to people so optimization can be done. For this energy generated from sector like hydro power, coal, steam gas turbine is analysed and its impact on country. Renewable energy the current trend helping Jamaica to revive its economy and how it can cope with energy loss is shown by statistical data. Reports released by Jamaican government states country 90% energy is fulfilled by fossil fuel consumption which is imported from its partner countries which shows it over dependency on particular energy like petroleum. Electric price have shoot up during recession in 2008 because of increase import price. After that Jamaica has changed its policy and focussing on renewable energy to meets its demands. The best part of Jamaican policy is focussing on mix energy consumption and no restriction on use of choice of energy. Jamaica Public service is providing electricity to 2.7 million people. Five years data with visualisation is shown in magazine.

## Performance of various Energy Sector

Steam & slow speed plants are still used to generate electricity in Jamaica as it largely contributes to energy sector and match to same as JPS purchase which is import of crude products for electric generation. Gas turbine plants generates more than half of energy of above two sectors. Hydro sector generates least amount electricity. The figure below shows energy produced by each sector from year 2010-15 in Jamaica. The hotel and tourism sector require constant electric supply therefore cost of electricity is high for hotel and restaurants." **The biggest consumer of electricity in Jamaica is National Water Commission which consumes 40% of its power".**

Electric generation by sectors.



## Alternative Fuel consumption

Jamaica uses alternative fuel which is different than above use fuel. Only leaving fuel all fuel are renewable fuel like bagasse, coal, wind energy & Hydro energy. Bagasse has been use in large volume to generate electricity after that coal comes into second and moderately hydropower and wind energy is used to match the energy requirements. As time goes on there is no change in usage of such renewable energy, its only increasing with respect to time. From the figure below it is seen that Jamaica has certainly developing interest in using renewable source as major component to meets its country energy requirement. There was marginal decline in bagasse consumption from year 2006-2010 but

## Petroleum Production

Petrol is fuel which is daily requirement to fulfil industrial requirement from time to time. Different industries have different petrol requirements according to that types of petrol are produced from crude oil. More than 5 millions litres of heavy fuel oil is produced for industrial use. Auto diesel production is 1 million litre to meet requirement of transportation industry. After that same amount of gasoline production is done, but still it's no match with heavy fuel oil. Propane, Butane, Naphtha production is low from crude oil which is considered negligible. Fig 3 displays trend in production of petrol from crude oil from year 2010-2015. Its shows the heavy dependent on crude oil import to serve different industry purpose. There is sharp decrease in

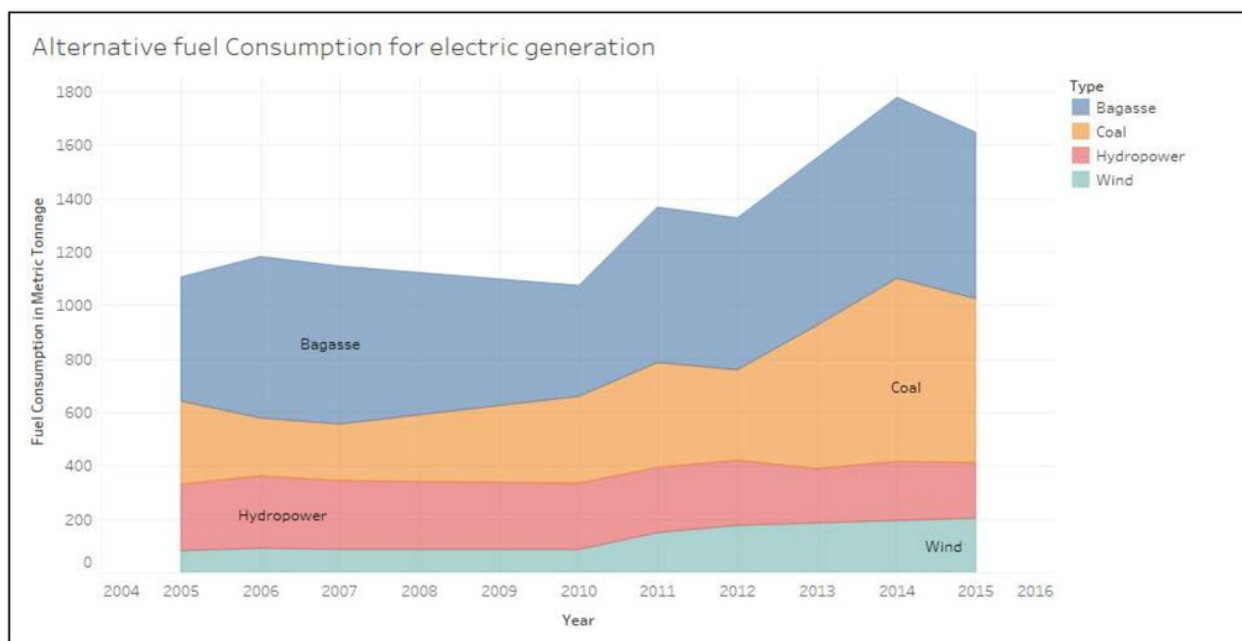


Figure 2- Alternative Fuel

After that its certainly matched to other alternative fuel production. Coal consumption just went down for one year. All alternative fuel usage is higher in year 2015. The energy produced by these fuel is taken into KW/Hr value.

heavy oil, auto diesel oil & gasoline in between 2011-2013. But after that there is steep rise in production of same petrol with coming years. This shows that overall industrial growth of Jamaica totally depends upon the usage of oil and vice versa.



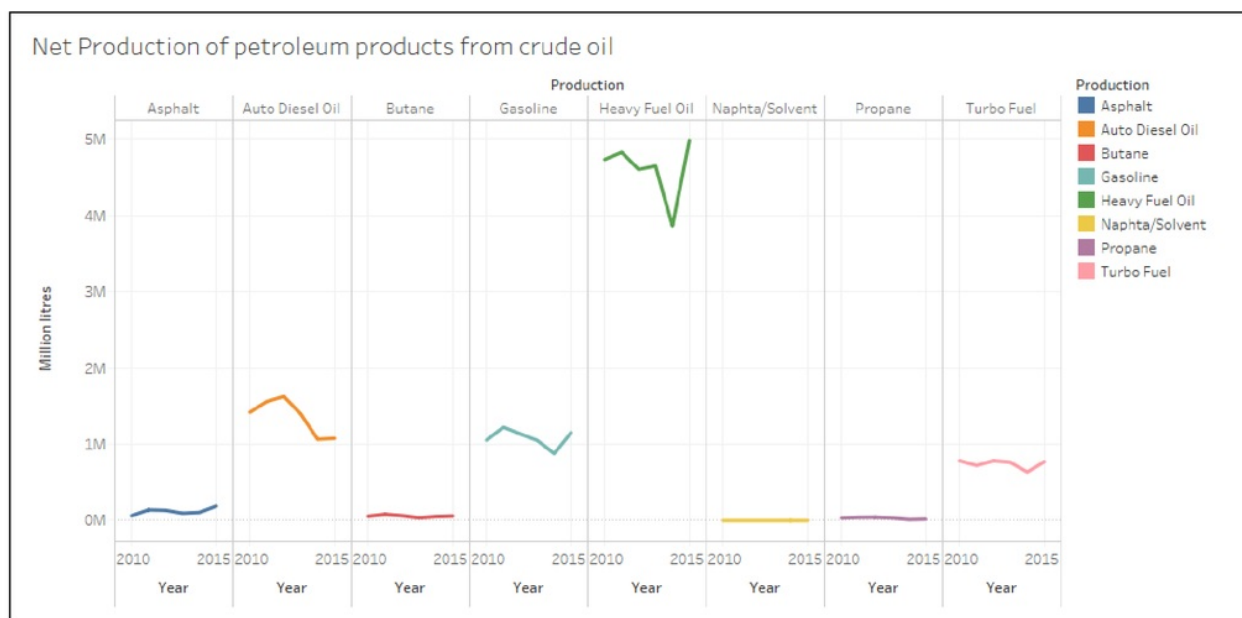


Figure 3– Production of different petroleum goods

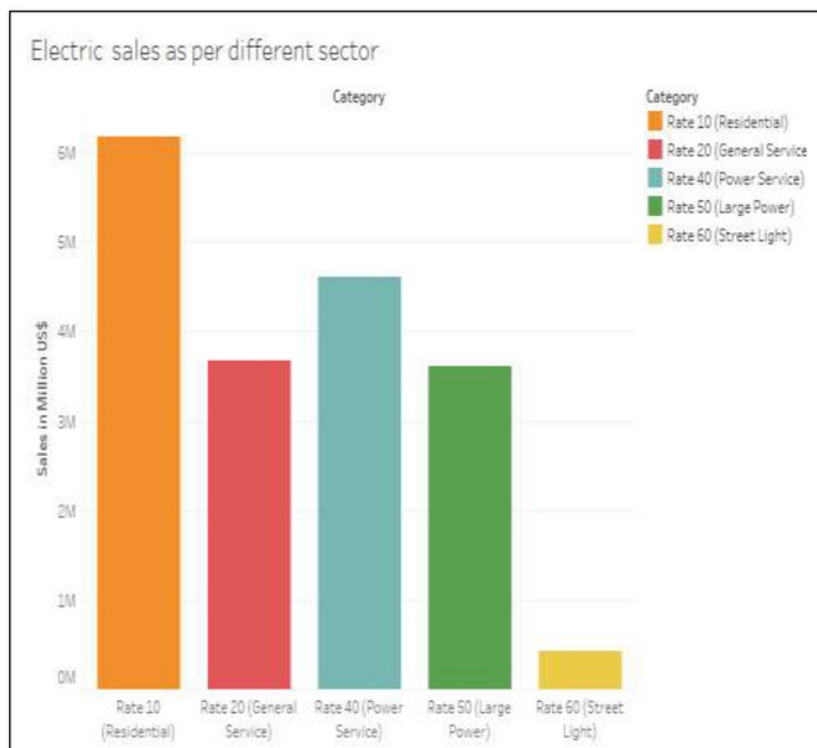


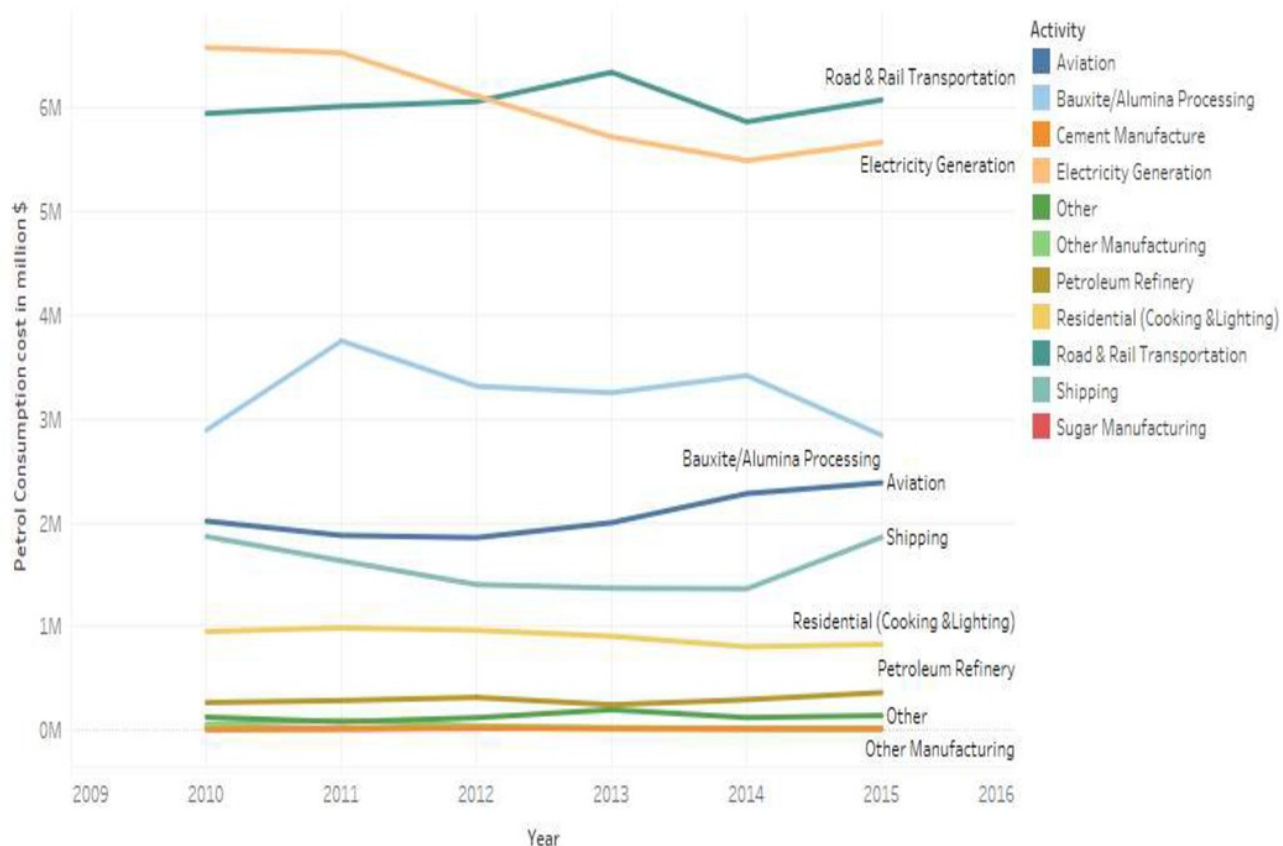
Figure 4– Electric sales across different sector

## Electric Charges Breakdown

As there are lot of sector requires electricity based on that electric charges are classified into 5 types. Rate 10 is for Residential consumer where largest sale collection of electricity happen more than 6 million. Rate 20 is for general service consumer which contributes to more than 3.5 million electricity sales. Power service consumer comes under category of rate 40 which has optimum usage plus electric sales which contribute 2 million more than the rate 20 customer in Jamaica total electric sales from year 2010-2015. Rate 50 is for large power sector consumer which matches to rate of 20 consumer ,but important things to notice is that large power has less number of consumer compared to general service consumer but still it has same electric sales in comparison to it. Rate 60 consumer are street light on road of Jamaica which is least compared to all 4 consumer with which it differentiates. The vital point is industrial sector is largest consumer of electricity at different rates set by Jamaica Public Ltd (JPL) board.

The Industries in Jamaica use petrol as main source for transportation, cooking, mineral processing, electricity generation & even petroleum refinery. Road & rail transportation consume largest amount of petrol and cost is more than 7 million \$. Electricity generation cost sum upto more 6 million \$ of petrol, which is huge loss. Aviation organization is only sector where never there has been never drop in consumption of petrol. In 2015 it used 2.5 million \$ cost for its aviation. Bauxite and alumina industry has shown decline in purchasing petroleum products as its major source of fuel it might be they have found renewable products as there fuel. There has been increase in cost of purchasing in year 2014 only rest all year has shown

declining trends. Shipping industry purchasing power has increased with moving years. This Shows that transportation of goods through ships has increased. It has shown declining trend for purchase in Year 2010 continued till 2013. But after that it has achieved stable growth for 3 years and steep increase till 2 million. Spending on petroleum products. Residential, petroleum refinery industry, cement manufacturing are using petrol but not to that extent as used by transportation and electrical generation sector.



## Export Business

Any countries in world depend upon its foreign reserve and its only gained through export. Export is strength of any countries it shows power in particular sector. Jamaica Energy sub sector petroleum industry is one doing quite good in export areas. HFO has highest rate of export value around 1.8 million followed by Turbo fuel up to 1.6 million dollars. Asphalt has least export value compared to others.

ADO-Bauxite and ADO (bunker) Has same export value till 2015 0.2 millions. Export trends has shown increase in petroleum sector, but important part is can alone HFO and Turbo fuel can alone compensate for whole countries economy. The trend of HFO petroleum export rate shows that in coming years It would decide future of other petroleum products.

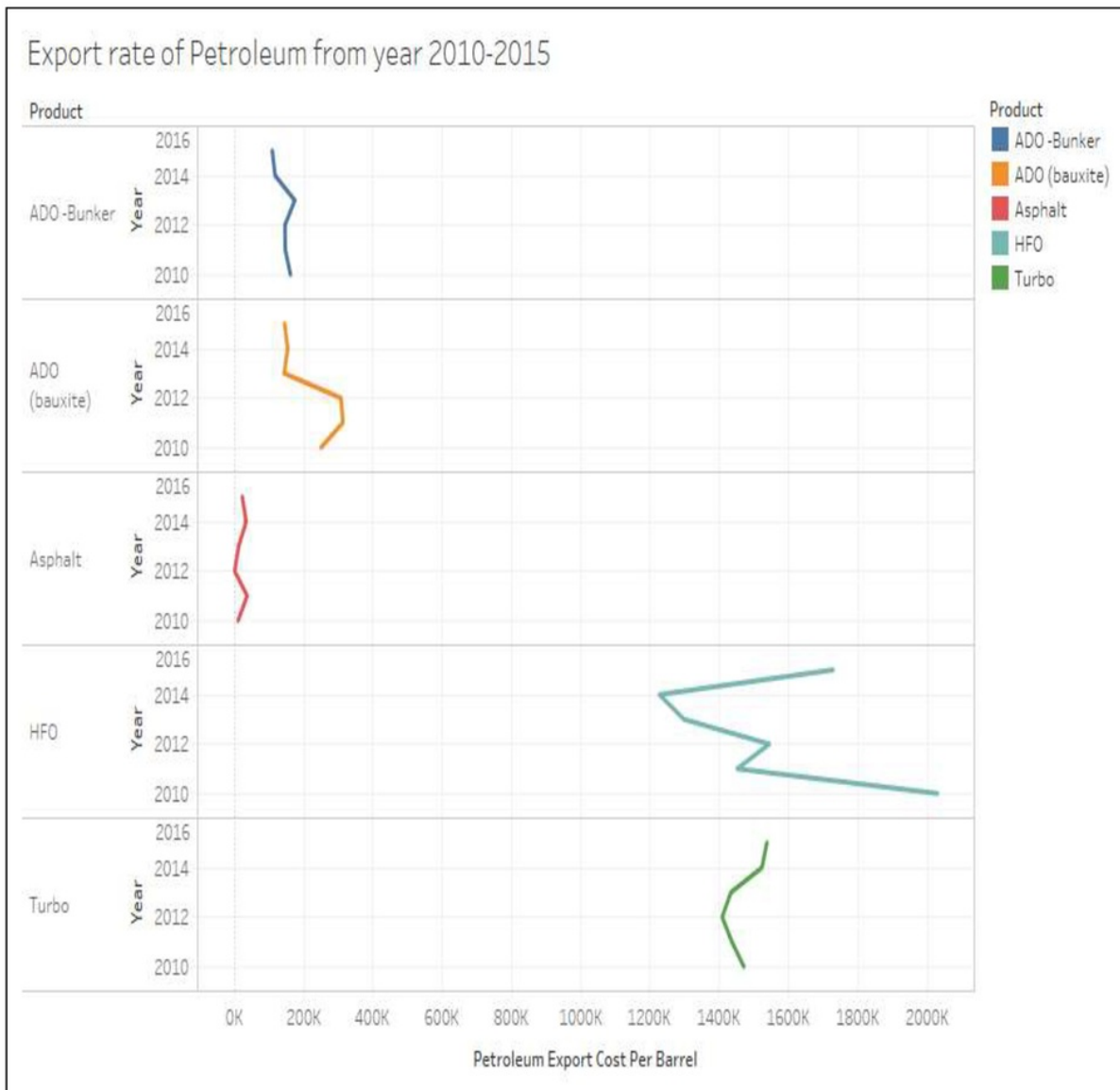


Figure 6 – Export of petroleum goods by Jamaica.

## Import Business

As discussed earlier there are major companies in Jamaica and according to their requirement companies' import petroleum. Bauxite companies, marketing company and refinery companies are major importer of petrol products. Refinery companies have alone imported petroleum worth over more than 5 billion US \$ from year 2010-2015. It's more than double than two other companies like bauxite and marketing importing close to 0.9 billion US\$ each. Major products like crude oil and refined products worth over four billions each is ordered by refinery companies. Marketing companies also order refined products close to 0.9 billion of its total imports. Bauxite companies has ordered 1 billion worth low vanadium and Bunker C around 0.8 billion of its total import. Lubricants is least ordered when it comes to import.

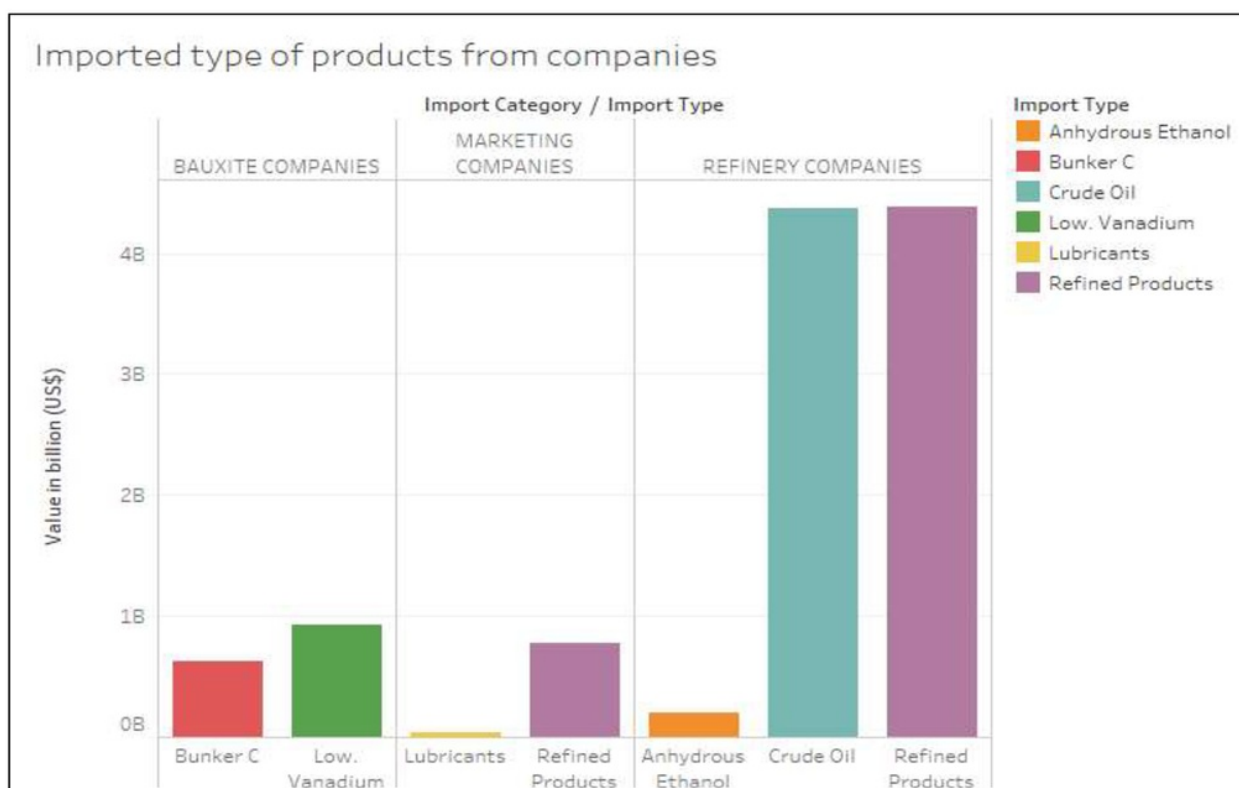
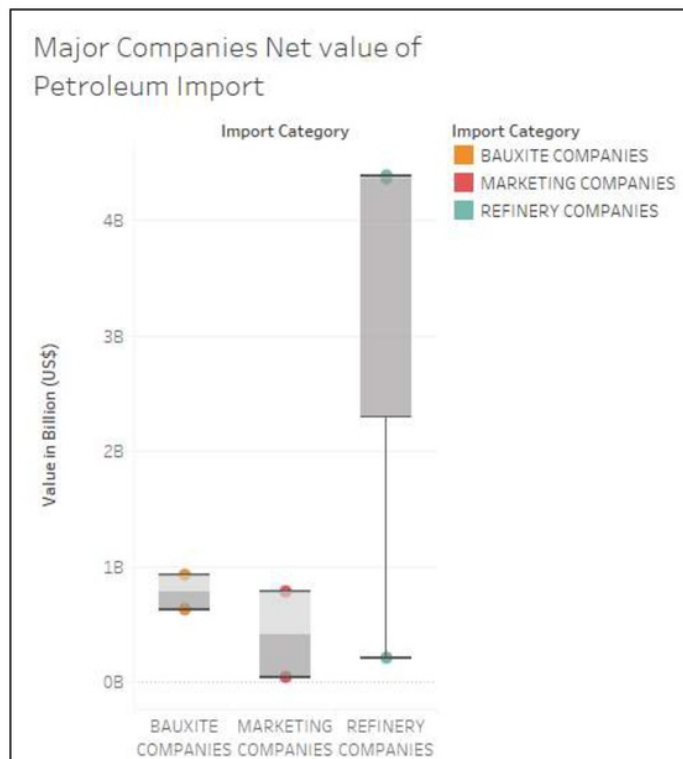


Figure 8- Import types of petroleum products.



Market Scenario

Market is place goods are sale by including margin in bought product for profit. Petroleum products are no exception from it. First the crude oil comes into refinery plants which where production cost and transportation cost is included and then passed to next refinery plant for removing impurities so input cost increases and after that when passed to retailer where actual market price is labelled. As seen from the graph below that fuel type like A.D.O, E10-87,L.P.G, ULSD, E10-90, Kerosene, have shown a surge in retail price after being processed

Retailing a product is part of business. But do business should not be done on fair basis by including balance margin for profit so even a country can benefit from it. Leaving fuel oil from market it might be case that rest other fuels are high in demand in that country, therefore maximum profit is exploited by companies, but transparency should be there in price of petroleum products so ultimate benefits can reaped by customer. LPG and fuel oil products has minimal charge on processing from crude oil by refining companies.

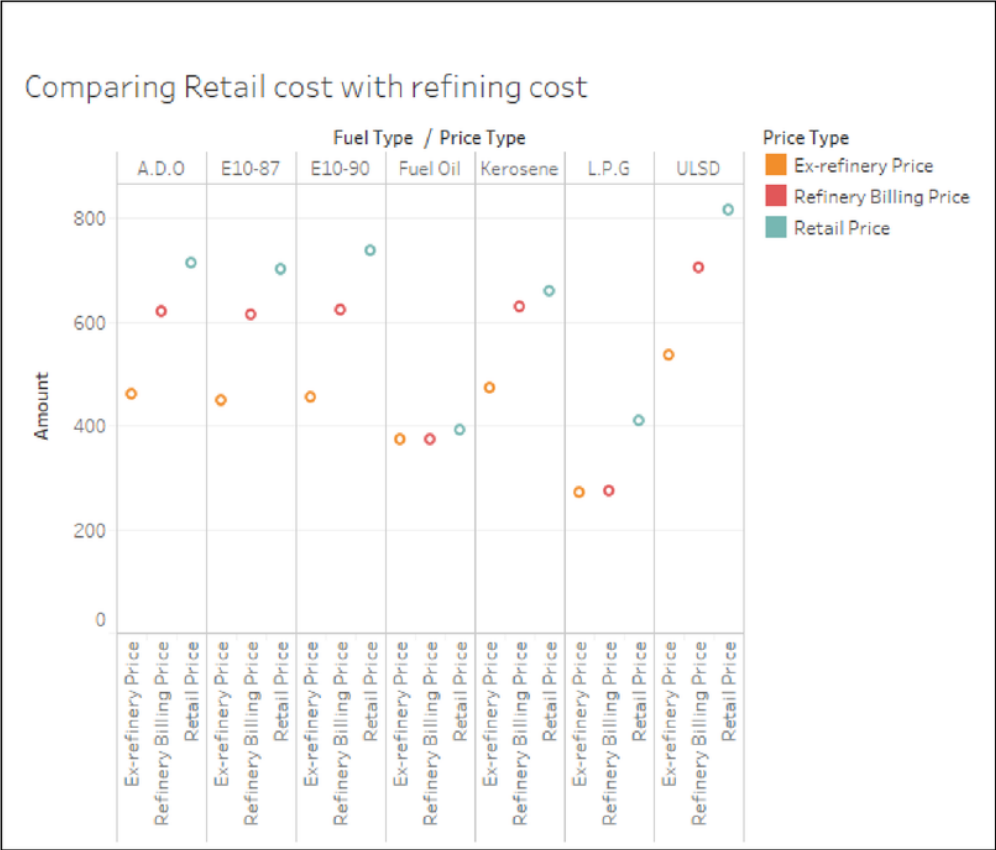
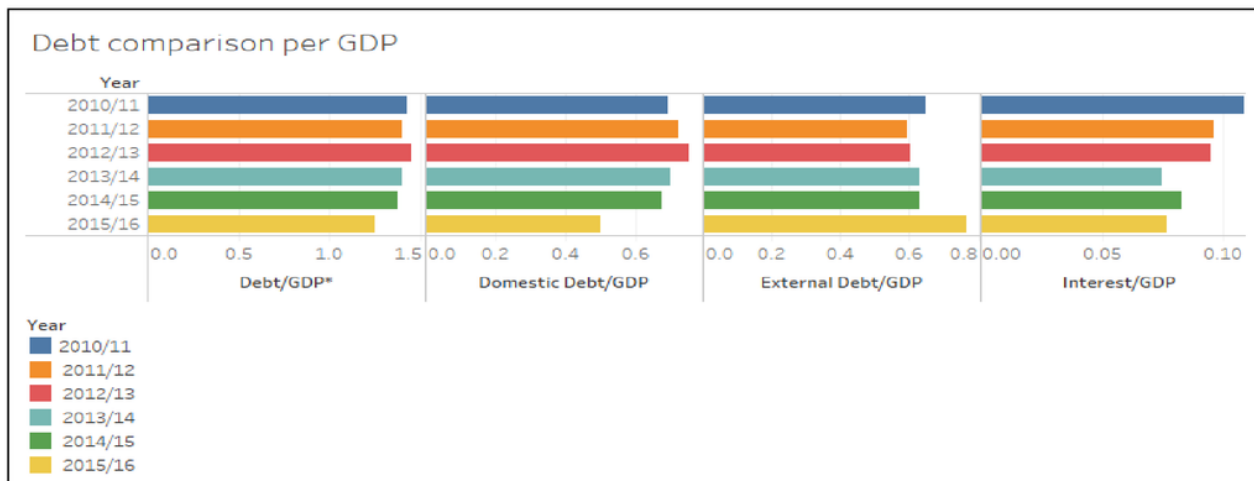


Figure 9– Retail cost of petroleum goods in market.

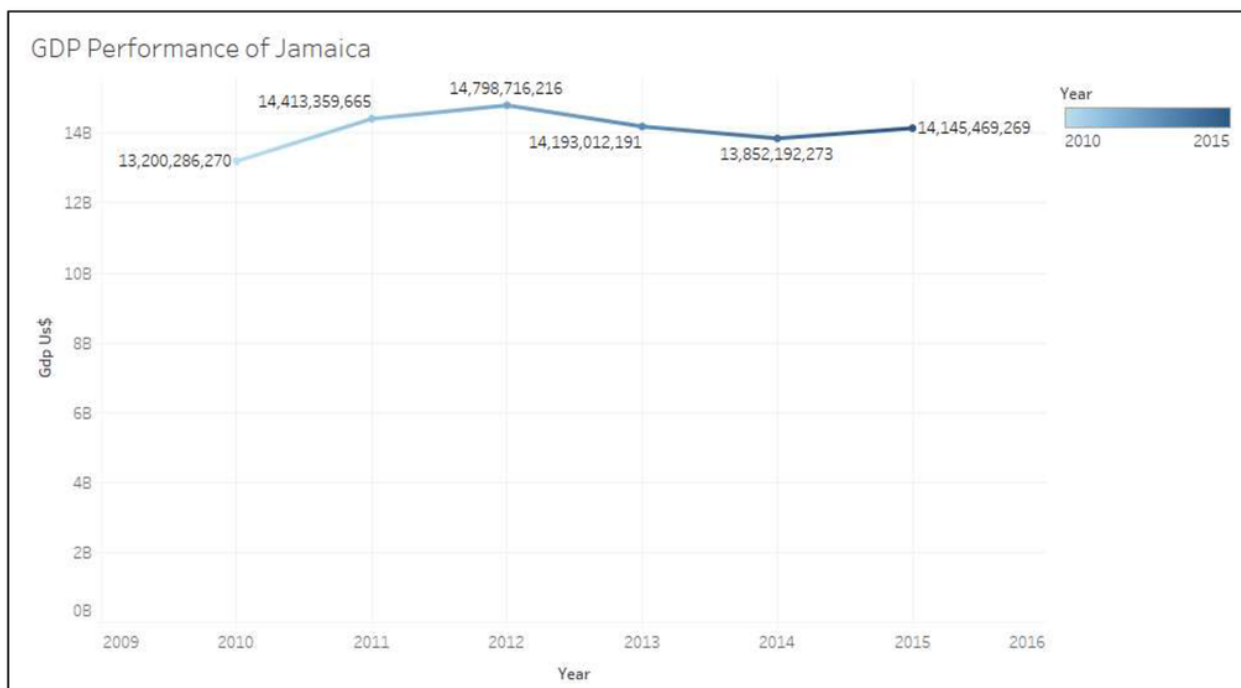
from refinery plants. The only fuel which has shown stable increase in price is fuel oil after being delivered into retail market.

## Debt Ratio of Jamaica



Debt ratio defines any countries progress. The Jamaica debt is classified into 3 types with respect to GDP domestic, external debt, interest debt from year 2010-2015. Total debt is highest in year 2012/13 which is largely contributed by domestic debt in that same year. External debt/gdp is highest in year 2015/16 but still overall debt is quite less than previous years. Interest rates/gdp is highest in 2010-11 and to

some extent it has contributed to debt ratio per GDP. This give us some idea that domestic sectors need to perform and government should domestic sector by giving industrial compensation so that debt can be reduced, from chart its seen that external debt is only increasing and there is no control on it.

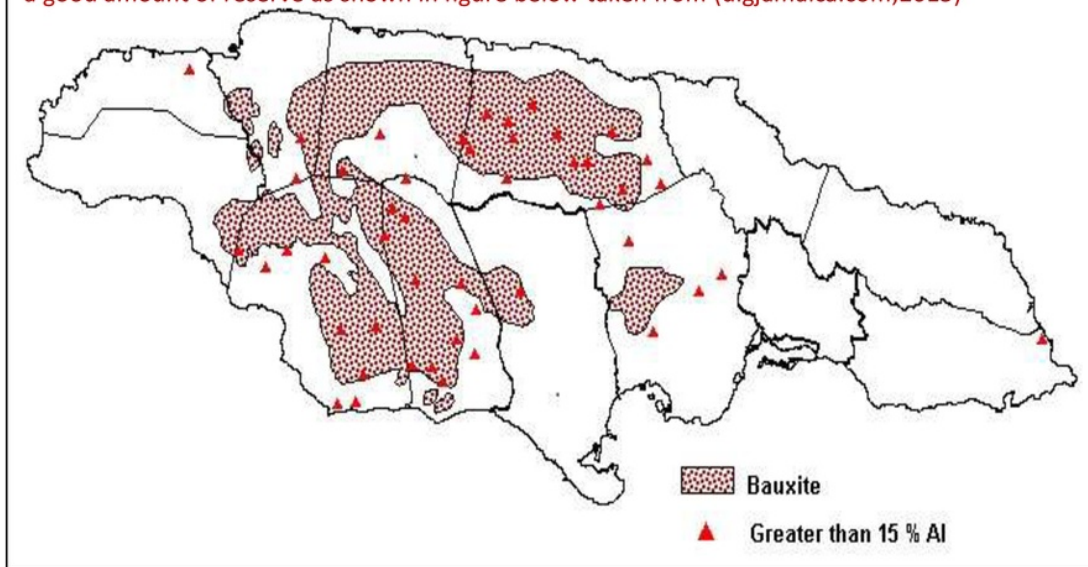


## Conclusion

The visualization helps in making understand the Jamaican economy is doing quite reasonable when comes to energy sector. There is need of revival in refinery sector which consumes lots of petrol. Retail rates are quite high after processing of petroleum products which is major concern. Bauxite industries petrol consumption is less and inversely proportional to its export value which has increased with going years. Electric generation is major cause for import of petroleum products, but need to see major electrical loss occurring. Electric generation through gas & steam is bonus for energy sector. The interesting part knowing its limitation they have focussed on alternative energy for the power generation. Bagasse is major component of alternative fuel but they should focus more on hydro and wind energy. Heavy fuel is large derivative used by petroleum products which is same used by transportation, industrial sector for various purposes.

Road rail & shipping industries surge growth in usage of petroleum products shows that countries transportation sector is improving to lot and they have direction to go in transportation of goods. As shown in fig(8) Bauxite companies do not import any refined petroleum products which shows part of being independent for long term. Marketing companies should try to work on policy of acting together with refinery companies so that import of products can be done jointly which can save lots of money by transportation. The only concern is retail rates of petroleum products which again can be reduced if the consumption to orders are managed. The debt ratio as said will be totally dependent upon the energy sector performance, clear picture is available as energy grows means there is demand which need to be fulfilled but up to what extent? Means you can't just rely on import you need to harness your minerals, trying option of renewable fuels, pollicising act so that debt can be balanced with respect to GDP.

Bauxite is important rare earth element which can give Jamaican economy a boost. An they have a good amount of reserve as shown in figure below taken from (digjamaica.com;2015)



## Appendices A

<https://data.world/jamaica/energy-tables>.

1

<https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=JM>

[http://digjamaica.com/rare\\_earths](http://digjamaica.com/rare_earths)

## Appendices B

Fig.(1) is visualised by Packed bubbles chart which is used to show different sector of electric generation by Tableau tool, because helps in visualisation by showing larger bubble corresponding to larger value of attribute and vice versa for smaller.

Fig.(2) is shown by Tableau area chart tool which is used to show analytical trends of alternative fuel vs years so user can easily predict.

Fig.(3) is made by Tableau tool discrete line chart which is used so that comparison between different production of oil can be visualised with respect to years.

Fig.(4) is made by vertical bar graph by Tableau tool, because only 5 comparison on basis of values were required.

Fig.(5) is made by Tableau continuous line chart tool to consider lot of variable with different values in given space by showing trend of Petrol consumption.

Fig.(6) is again prepared by Tableau vertical discrete line chart tool for comparison of petroleum products export from year 2010-2015.

Fig.(7) Box-whisker plot is made by Tableau because only 3 variables

(company) and there upper, lower & median value (Import value) were required.

Fig.(8) is broader classification of Fig(7) made by Tableau side by side bar chart tool so that different import type of products can be shown.

Fig(9) was prepared as side by side circle chart by Tableau tool to show differentiation of retail price of petroleum from refinery price of last 5 years.

Fig(10) was prepared as side by side vertical bar chart by Tableau tool to compare the debt ratio with years.

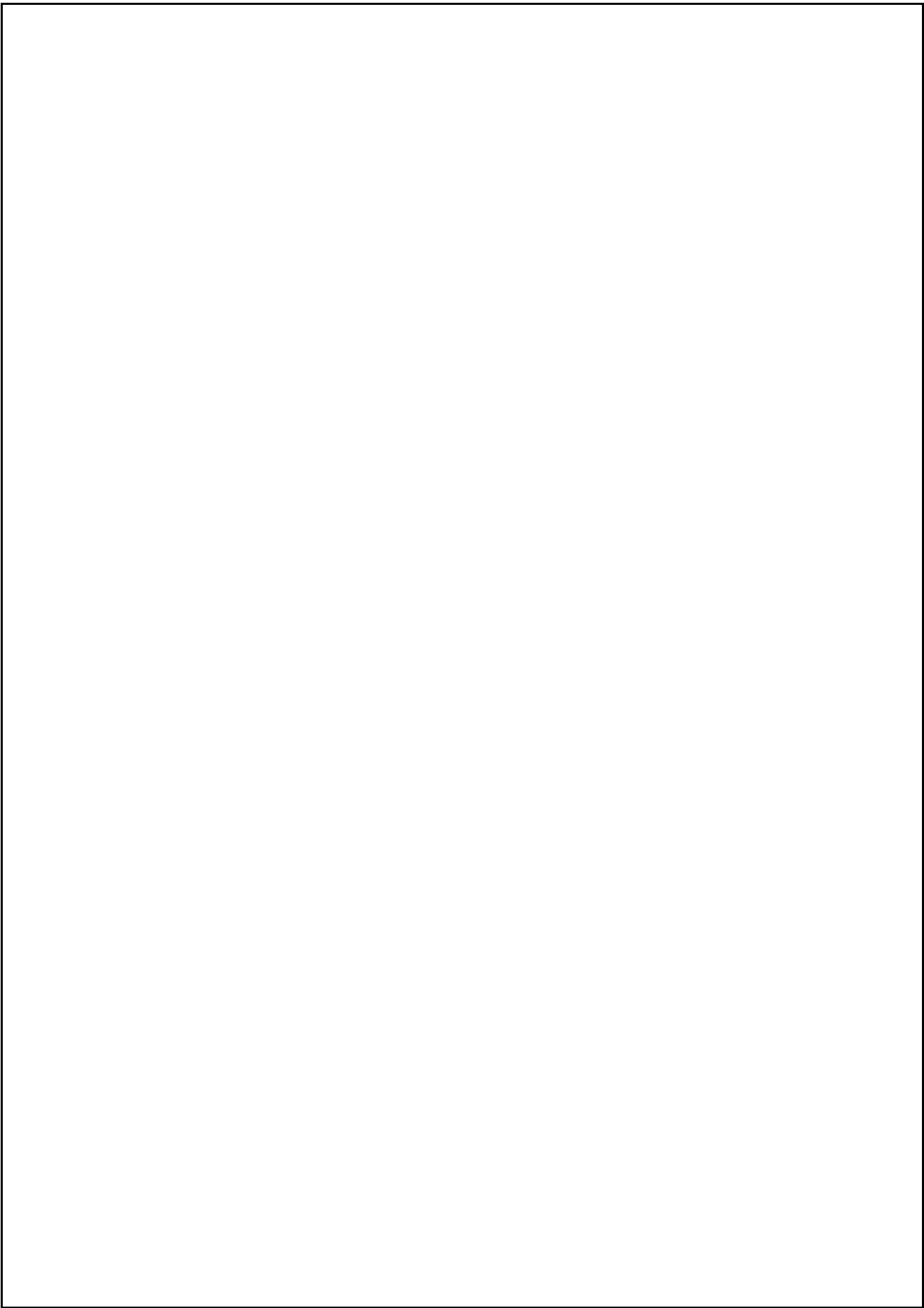
Fig(11) was prepared as continuous line chart by Tableau because there was only one variable (GDP value) was available so no much description was required about it.

Fig(12) is given by OJ, G. (2016).

[image] Available at:

[http://digjamaica.com/rare\\_earths](http://digjamaica.com/rare_earths)  
[Accessed 21 Feb. 2019]. About bauxite contents in different region of Jamaica.





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