

Trends in data analytics

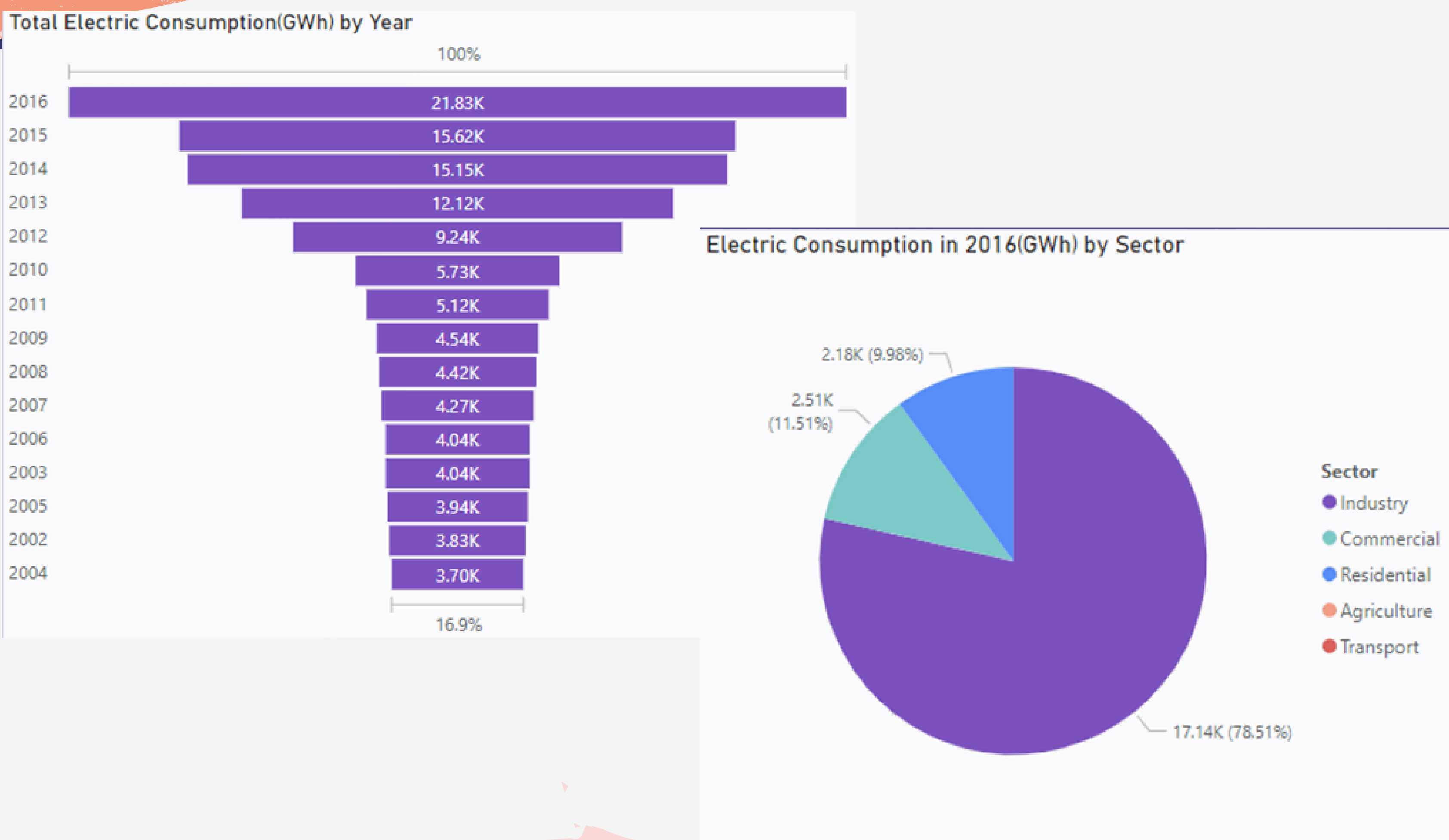
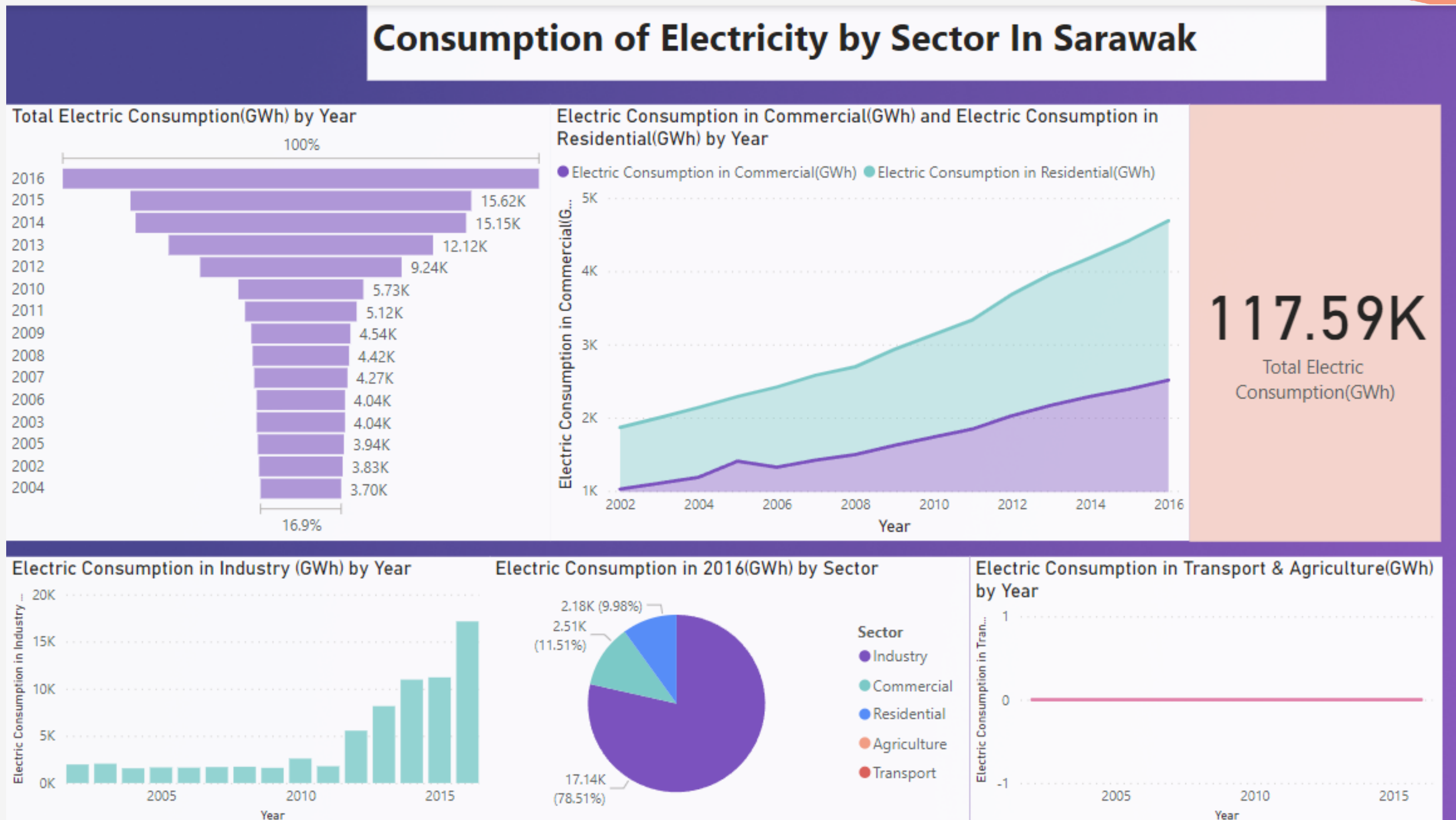
One of the current trends in data analytics is an increase in Natural Language Processing (NLP). As the name implies, NLP is started as a subset of artificial intelligence (AI) which processes natural language into usable data in order to find patterns and trends. As an example, by implementing NLP, a company can process reviews or public opinions on multiple websites automatically in order to understand the social sentiment of their company. After that, predictive & prescriptive analytics tools are also current trends in data analytics. Predictive analytics refers to extracting information from current datasets in order to forecast future probabilities. Prescriptive analytics goes more in depth by determining what steps should be taken in order to achieve a specific goal. These tools utilize artificial neural networks in order to forecast the future with high accuracy. Overall, current trends in data analytics are utilizing more and more Industrial Revolution 4.0 technologies such as artificial intelligence, machine learning and big data in order to achieve greater accuracy and efficiency in analyzing data.

Reflection Industrial Talk 7

On 23rd December 2021, an industrial talk was given by Mr. Ismail Redha. The topic of the talk was Introduction to Data Visualization. Over the course of the talk, four main topics were discussed, which were introduction to data visualization, visual design & presenting the findings, chart types & design practices, and an introduction to Microsoft Power BI. Microsoft Power Bi is a cloud-based interactive data visualization software developed by Microsoft with the primary focus on business intelligence. It is capable of turning data from multiple sources into a single dataset which can then be used for visualization, evaluation and analysis. The software supports a multitude of data sources such as SQL Server, Excel and Azure. Power Bi is used by companies to gain insight into their data. The explanations given were very insightful into the importance of understanding and identifying any given data in order to create a proper visualization. In addition, explanations on how to create a proper visualization based on the data types were incredibly helpful during the creation of this assignment.

DATA VISUALIZATION

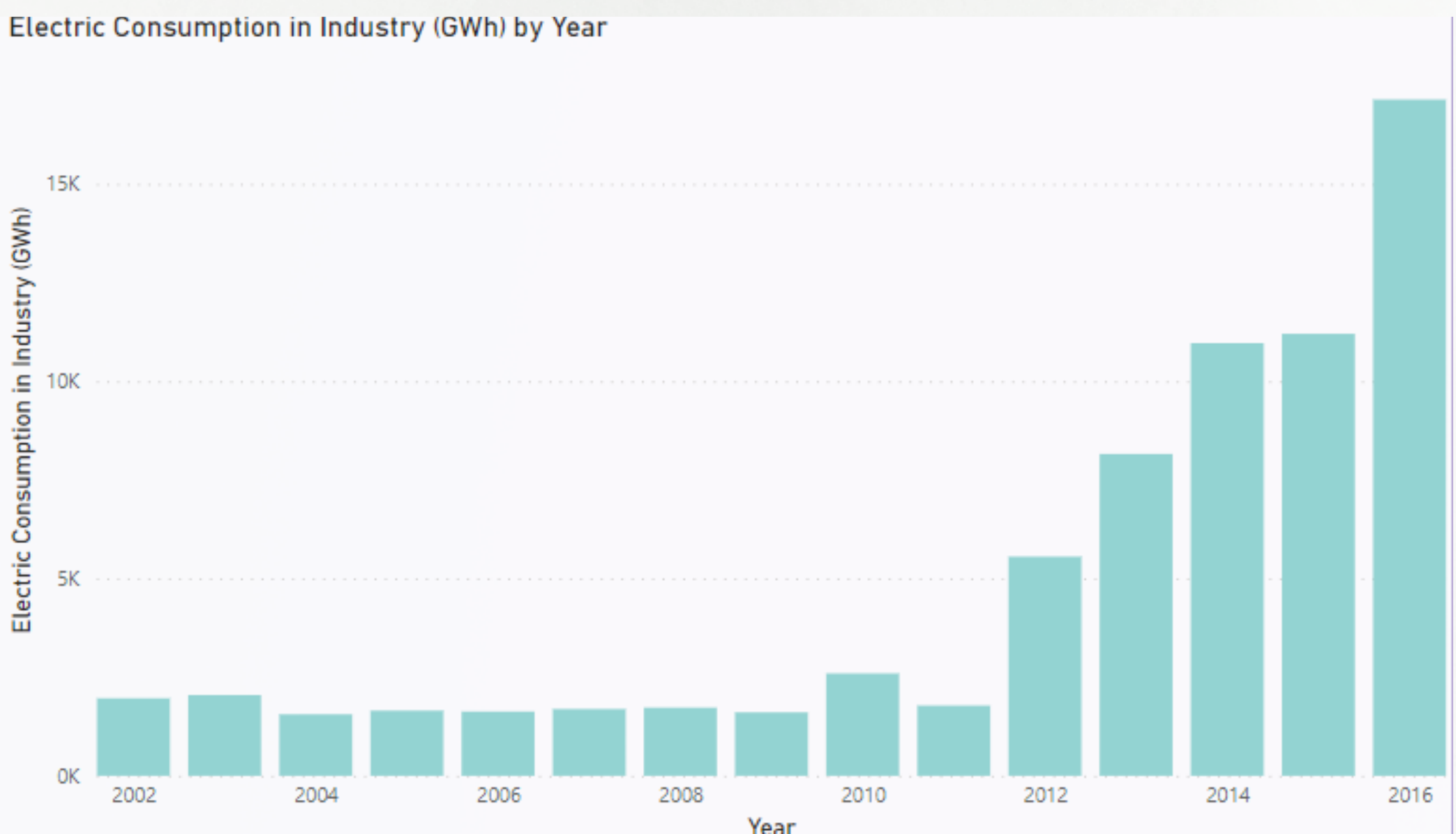
Energy in the form of electricity is integrated into modern society. It wouldn't be a stretch to say that we can't live or function properly without it. However, as any other form of energy, it is not infinite. How much electricity do we consume as a society every year? Which sector uses the most electricity? Is the demand for electricity consumption rising and why? These are the questions that we want to answer. Data analysis can be done as we can have an in-depth look into trends of electricity consumption and consumer habits, deploying solutions and methods to prevent further electricity waste. Data for electricity consumption of various sectors in industry, agriculture, commercial, residential and transport is visualize using Microsoft BI. The variable is transformed into 2 decimal places. The variable also is transformed into percentage for easier comparison between the electric usage in different sector. The categories are also combined such as combining categories between Transport and Agriculture as well as Residential and Commercial.



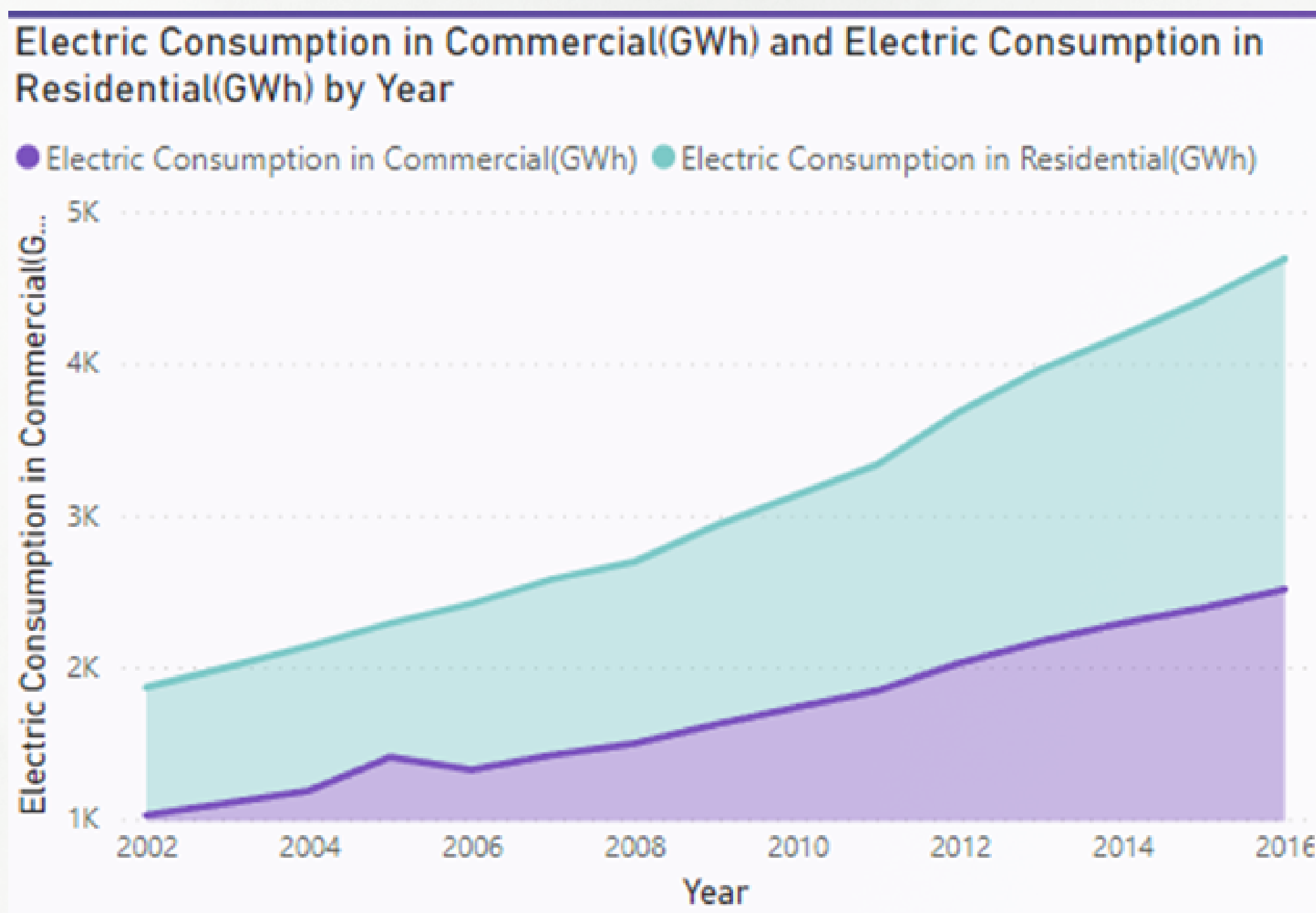
The energy consumption is rising from year to year as we can see in the bar graph. In 2016, the energy consumption is much more than the other year which is 21,830.84GWh compared to 2015 which is 15,624.47GWh. We can see that if 2016 is 100%, 2004 is only 16.9% which is a great growth.

Let us discuss why this increase in electricity consumption. As we move towards technology, more electricity is required. This shows that Sarawak is continuously developing.

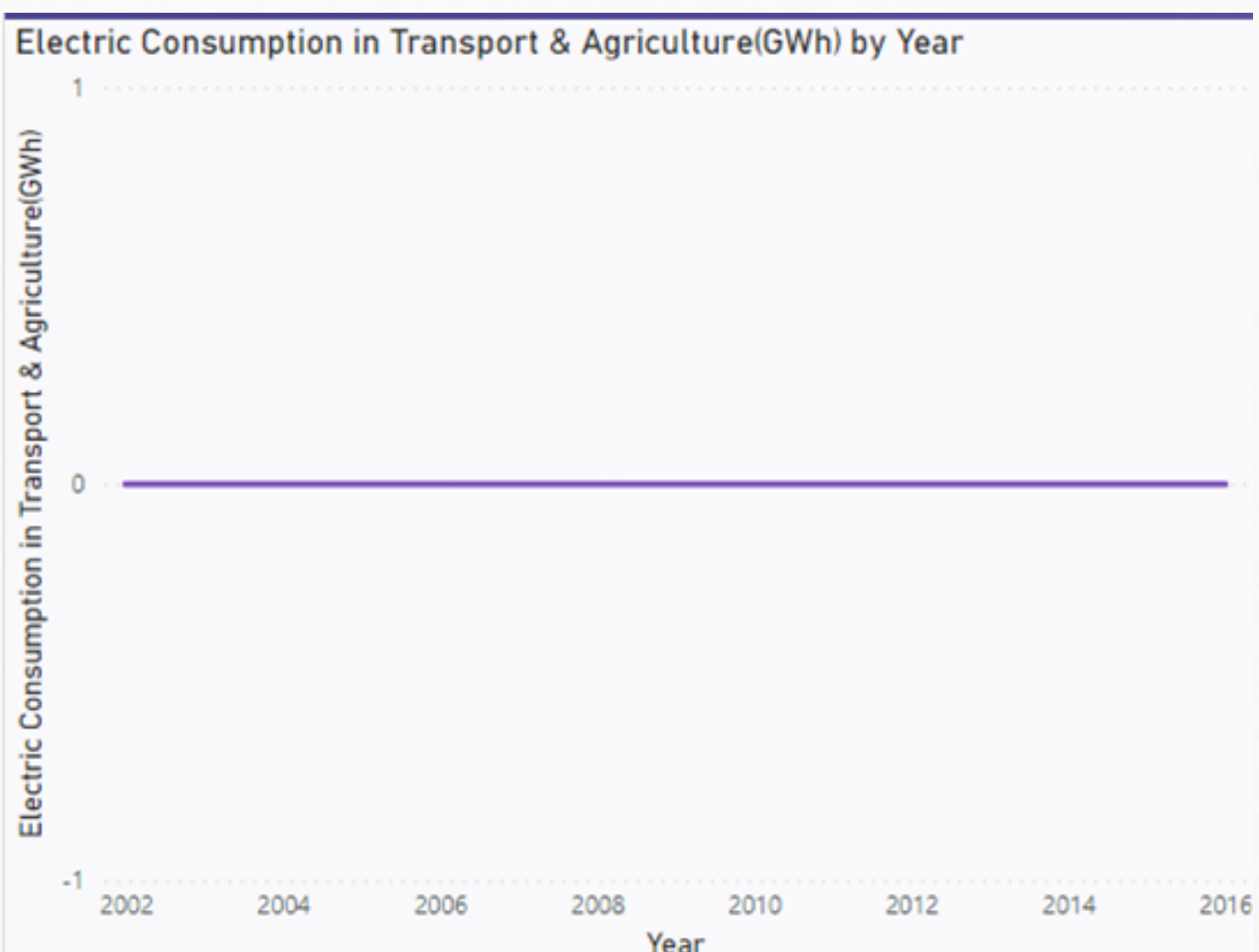
The industry has the highest electric consumption which is 78.51% in 2016 which accounted for more than half percentage. This is followed by commercial sector and residential sector which is 11.51% and 9.98%. In the era of industrialization, so many new and different technology come into the industry, therefore raising the industry's electricity consumption.



We have data for electricity consumption of industry as shown in the diagram and chart from 2002 to 2011, it has been fluctuating for 9 years and changed from 1557.38GWh to 2593.34GWh however from 2011 to 2016 it's rising from 1779.09GWh to 17140.03GWh and it's rising sharply from 2011 to 2013, 2015 to 2016, this is due to the fact that in this period, a lot of factories open and the population increases. For example, there are a lot of energy-intensive manufacturing including food and construction material such as iron, steel and concrete. This means that the daily electricity consumption increases due to the needs of the people resulting in the rise of industry's electric consumption from 2002 to 2015.



For Commercial sector as we see from the diagram that electric consumption is increasing from 2002 (1,025.00 GWh) to 2016 (2,512.64 GWh) by approximately 145% in 14 years, and the main use of electricity in commercial sector is lighting , then computers and office equipment and that has increased over time as we see more technology is used for commercial over years. In addition to that we see from the same diagram how the usage of electricity is increasing in the residential sector in 14 years by approximately 159% from 2002 (840.50 GWh) to 2016 (2,178.17 GWh), when we think about the reasons of that rising we find that global warming is a huge issue and that's leading to use more electricity over years in cooling and heating devices/air conditioning, we also can't forget about the increase of population and that means more electricity is needed. we think these numbers will increase way more than that especially when people and governments are replacing fossil fuels and by that we will rely more on electricity at homes for instance using microwave, electric cooker.



As for Electric Consumption in Transport & Agriculture, it's zero from 2005 to 2015 for Transport & Agriculture because the vehicles and machines mostly runs on gasoline and petrol. The lack of modern technology in agriculture causes almost zero usage of electricity as human labour is the primary driving source.

CONCLUSION

The demand for electricity is indeed rising as we can see in the total electric consumption graph in Sarawak from the year 1997 to 2016. Starting in 2012, we can see a drastic spike in electric consumption. The 2 driving factors of this pattern are the industry and residential use of electricity.

As for the increase in residential electric consumption. This is probably due to the fact that technology is advancing rapidly and a lot more electricity hungry devices are made available to the public at an affordable price. The industry in Sarawak uses the most electricity as many manufacturers purchase machines for automation in their factories. This pattern shows no signs of stopping and it most likely will continue in the coming years.

The industry uses the most electricity as we can see in the data. The reason is obvious, manufacturing uses a lot of electric hungry machines to ensure the process of manufacturing goods in factories goes smoothly. The industry sector is the main source of supply to keep up with the high demands of a developing society like Sarawak. These are the questions that we want to answer.

Data analysis can be done as we can have an in-depth look into trends of electricity consumption and consumer habits, deploying solutions and methods to prevent further electricity waste. From the data that we analysed, the demand for electricity is getting larger every passing day as our society develops. Hence, the government and related bodies must either provide energy saving solutions or develop new technology to keep up with the rising demand.

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