ISSS608 Visual Analytics and Applications
Electricity Generation in Singapore

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Abstract

Singapore's compact, densely populated landscape and reliance on imported energy demand a critical review of electricity usage. Urbanization, industrialization, and technological advancements drive escalating electricity needs, primarily met by natural gas combustion, posing greenhouse gas emission challenges.

The Energy Market Authority (EMA) and relevant agencies conduct regular reviews to analyze trends, identify challenges, and craft effective policies. Optimizing electricity consumption enhances efficiency, mitigates environmental impacts, and fosters a sustainable energy future.

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NETLIFY

SHINY APP

Introduction

In Singapore, achieving net zero emissions by 2050 necessitates a substantial reduction in electricity consumption across all sectors.

The household sector, accounting for 15% of total electricity consumption, is an important segment to target for impactful change.

Objective

a) Conduct a comprehensive analysis of electricity consumption across various regions in Singapore and formulate policies aimed at reducing consumption, with a specific focus on the area exhibiting the highest electricity usage.

b) Investigate household types associated with both the highest and lowest electricity consumption, and devise tax incentives or rebates to encourage reduced consumption, fostering a more sustainable approach to energy usage.

Methodology

The Shiny App uses visual analytics techniques to enable users to conduct exploratory data analysis and forecast mode. Packages used are as shown below:

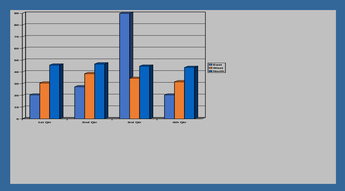
App Concept

Tool 1: Overview:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

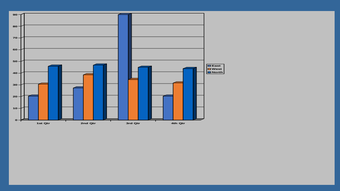
Figure 1. Label in 24pt Arial.

Figure 2. Label in 24pt Arial.

Tool 2: By Dwelling type:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX



Tool 3: By Region:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX



Tool 2: Time Series:
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Figure 1. Label in 24pt Arial.

Figure 2. Label in 24pt Arial.

Insights

Best forecast model…..

Which region has the highest consumption

Which dwelling type has the highest consumption

Future Work

a) To Identify companies contributing the most significant share percentage to overall electricity consumption and propose policies to mitigate and reduce their consumption.

b) To Identify key sectors responsible for the highest electricity consumption and develop targeted strategies to address and optimize energy usage within these sectors.

Data used

1. Electricity data (Singapore Energy Statistics) from Energy Market Authority
2. Master Plan 2019 Subzone Boundary from data.gov.sg