Engineer's Workshop:

A Simpson

Assessing Demand

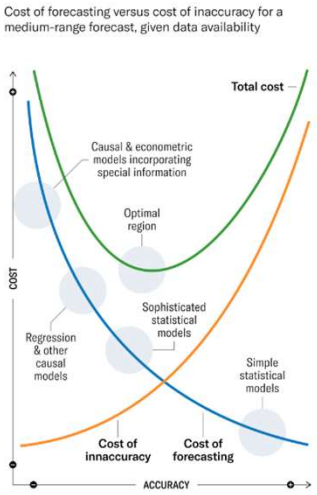
1

Forecasting Demand?

- Planning production and grid capability for future demand.
- Understand the underlying factors that are driving demand
- Periodic testing and review of forecast model

2

Forecasting Demand



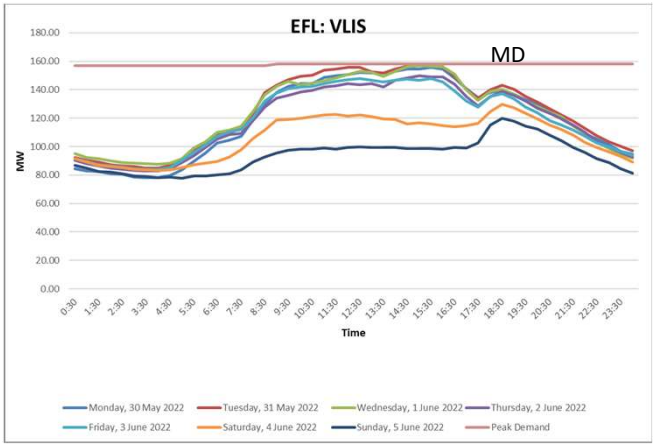
1. What is the purpose of the forecast? Long term, short term,
2. What are the dynamics and components of the system for which the forecast will be made?
3. How important is the past in estimating the future?

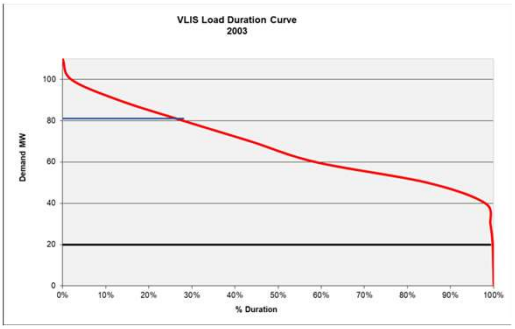
Three basic types of forecast:

1. qualitative techniques. Expert opinion, information about events that may or may not take the past into consideration.
2. Time series analysis and projection. Focus on pattern and pattern changes. Past is important
3. Causal models. Uses highly refined and specific information about relationships between system elements. Past is important.

3

Demand Characteristics





$$Load\ Factor = \frac{Energy\ (MWH)}{MD\ (MW)\ x\ Period\ (hrs)}$$

$$Capacity\ Factor = \frac{Energy\ Supplied\ (MWH)}{Capacity\ (MW)\ x\ Period\ (hrs)}$$

4

Process: Example

Regression Modelling: VLIS – Fiji

1. Forecast each tariff category separately
2. Regression modelling using historic energy data and other factors such as GDP, Price of electricity & Population.
3. Forecast GDP, Price & Population
4. Use regression model to forecast energy and add specific known energy demand expected to be connected to the grid.
5. Total up energy forecast for each sales category
6. Forecast loss
7. Add loss to get total energy generated
8. Forecast load factor
9. Forecast maximum demand
10. Do a low, high and most likely forecast scenario.

Exercise in Forecasting

Some key Information!

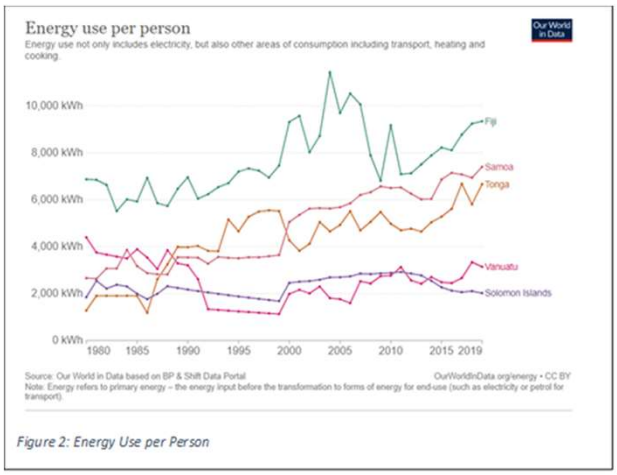
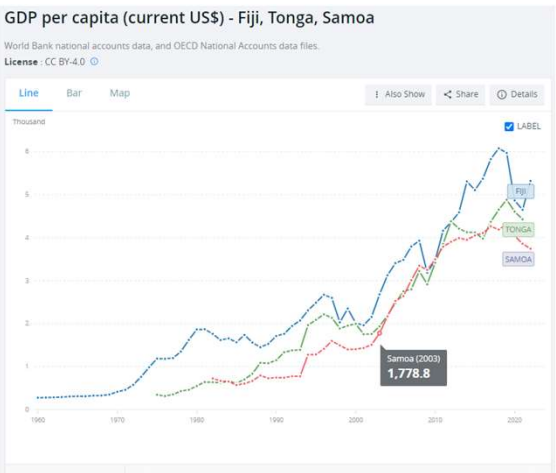


Figure 2: Energy Use per Person

https://ourworldindata.org/



https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=FJ-TO-WS&name_desc=false

Exercise

- Take your historic annual energy sales for each sales category , loss and generated energy and maximum demand.
- Use historic population data to determine forecasting methodology to use
- Forecast sales energy
- Forecast loss energy (include non-revenue energy – streetlights, utility office, etc.)
- Forecast generated energy
- Forecast MD