Agenda

• Who we are

• Project Case Study: Energy User 1

• What is important for you to know

• Questions
Cova Advisory and Associates

• We are an advisory consulting firm specialising in Government Grants and Incentives.

• We also advise on matters related to green finance, as well as carbon and energy policies and strategies.

• We are a SANAS Accredited Measurement and Verification Inspection Body (EEMV0007)

• Cova has secured over R1 billion in after tax grants and incentives for clients in the last three years.

Tumelo Chipfupa
Director: Energy Team

Pieter de Villiers
Senior Energy Manager
Case Study: Energy User 1

• **Project:** Increasing Manufacturing Capacity of the Plant (expansion project)

• Two existing manufacturing lines

• The project includes the addition of a third manufacturing line

• The new (third) manufacturing line includes Installation of modern energy efficient equipment
Main energy sources used:
- Natural Gas
- Electricity

Largest energy source is natural gas
The biggest energy consumers on the manufacturing lines is machine 1 and 2.
Machine 1 and 2 consume more than 75% of the total energy consumption.

Metering:
- Natural gas – hourly data available
  - Machine 1 and 2
  - Whole site
- Electricity consumption – half-hourly data available
  - Machine 1 and 2
  - Whole Site
- No separate metering on in rest of manufacturing lines and other plant areas
Case Study: Energy User 1

- **Measurement Boundary:**
  - The options for the measurement boundaries include:
    - Whole Facility; or
    - Retrofit Isolation
  - A retrofit isolation approach with key parameter measurement was chosen as measurement boundary option.
- **Energy baseline models developed for each Machine separately**
  - Energy governing factors for Machine 1 and Machine 2 were different
  - Machines 1 and 2 account for over 75% of the overall site energy consumption
  - Robust baselines for Machine 1 and 2 is important
- **Energy baseline model was developed for the remainder of the site**
Case Study: Energy User 1

- Each Machine’s energy drivers are Machine specific

Possible Energy Governing Factors

- Production
- Moisture content in raw materials
- Ambient temperature
- Machine age / Insulation
- Product changes
Case Study: Machine 1

Machine 1: Multivariable Regression Analysis

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### Machine 2: Multivariable Regression Analysis

#### Regression Statistics

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#### Coefficients and P-Values

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Case Study: Energy User 1

Machine 1 Model Fit

Machine 2 Model Fit
Case Study: Energy User 1

Rest of the Site: Production was not a good energy driver for the remainder of the site

Electricity consumption for the remainder of the site was assumed to be constant
In order to determine the Energy Savings – Average Baseline of Machine 1 and Machine 2 is compared with the new machine, Machine 3.
Case Study: Energy User 1

• Key challenges with the project:

  • The energy savings expected was difficult to achieve, although the new equipment was more energy efficient.
  • The market demand for the product changed. When making a different product (due to the different raw material mix), the new equipment did not operate as optimally.
  • During the commissioning, the plant experienced problems. Under the conditions again, the new equipment did not operate optimally.
What is important for you to know?

• The quality of energy data is very important for building an energy baseline equation and determining energy savings.

• Direct or online metering is more accurate.

• The more energy metering for different sections of your facility or equipment, the better.

• The more granular the data, the better (i.e. daily is better than yearly).

• Annual calibration of metering equipment is a requirement for Section 12L.
Questions?

Contact Us

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