**Logo

Description automatically generated with medium confidence**

**Power Monitoring System**

**Introduction**

This proposal outlines the plan for installing a comprehensive power monitoring system at Dalys Seafood. The system aims to monitor the power consumption of various consumers within the factory, track the overall power supply, and assess the impact of the solar photovoltaic (PV) panels on the total power consumption using environmental data. The proposed system includes one LoRaWAN gateway and seven three-phase power monitoring LoRaWAN nodes, along with climate sensors to measure sun intensity, temperature, and cloud cover.

**Objectives**

The primary objectives of the power monitoring system are:

1. **Monitor Power Consumption**: Track individual power consumption for refrigeration plants, air compressors, smokers, heating units, and domestic consumers.
2. **Main Power Supply Monitoring**: Measure the main power supply and calculate the difference between it and the sum of the individual consumers to identify unaccounted power consumption.
3. **Solar PV System Impact Analysis**: Investigate the effect of the solar PV system on total power consumption by correlating it with environmental data such as sun intensity, temperature, and cloud cover.
4. **Optimize Energy Usage**: Provide insights to optimize energy usage and reduce costs by identifying inefficiencies and potential areas for energy savings.
5. **Provide Guidelines**: Provide guidelines for daily operations based on analysis and future forecasts.

**System Components**

**1. LoRaWAN Gateway**

* **Function**: Central hub for collecting data from all LoRaWAN nodes.
* **Placement**: Positioned at a strategic location within the factory to ensure optimal coverage and data transmission.

**2. Three-Phase Power Monitoring LoRaWAN Nodes (7 Units)**

* **Function**: Monitor power consumption for individual consumers.
* **Placement**: Each node will be installed at specific points to measure power consumption of:
  + Refrigeration plants
  + Air compressors
  + Smokers
  + Heating units
  + Domestic consumers

**3. Climate Sensors**

* **Function**: Measure environmental parameters (sun intensity, temperature, and cloud cover) to assess their impact on solar PV power generation.
* **Placement**: Mounted on the roof near the solar PV panels.

**System Design and Implementation**

**1. Data Collection and Transmission**

* **LoRaWAN Nodes**: Each power monitoring node will transmit real-time data on power consumption to the LoRaWAN gateway using wireless communication.
* **Climate Sensors**: Environmental data will be collected by sensors and transmitted to the LoRaWAN gateway.
* **LoRaWAN Gateway**: The gateway will aggregate data from all nodes and sensors and transmit it to the central monitoring system for analysis.

**2. Data Analysis and Monitoring**

* **Central Monitoring System**: A software platform will be used to visualize and analyse the collected data. This system will:
  + Display real-time power consumption for each consumer.
  + Calculate the total power consumption and compare it with the main power supply.
  + Analyse the impact of solar PV panels on overall power consumption using environmental data.
  + Generate reports and alerts for unaccounted power consumption and other anomalies.

**Benefits**

1. **Enhanced Visibility**: Real-time monitoring provides detailed insights into power usage across different consumers, enabling better management and optimization.
2. **Cost Savings**: Identifying and addressing inefficiencies can lead to significant energy cost reductions.
3. **Sustainability**: Understanding the impact of solar PV panels helps in maximizing renewable energy usage and reducing the factory’s carbon footprint.
4. **Data-Driven Decisions**: Accurate data enables informed decision-making for energy management and operational improvements.

**Project Timeline**

* **Week 1-2**: Project planning and procurement of equipment.
* **Week 3-4**: Installation of LoRaWAN gateway and power monitoring nodes.
* **Week 5**: Installation of climate sensors and integration with the system.
* **Week 6-7**: System configuration, testing, and calibration.
* **Week 8**: Training for factory personnel and final deployment.

**Price Breakdown**

|  |  |  |
| --- | --- | --- |
| Charge | Description | Amount |
| Installation | This is a once off charge for the initial installation of 7 Nodes and 1 Gateways. | € 4,750.00 |
| Insurance | Public indemnity insurance to the value of €2.6m, no employees. | € 250.00 |
| Continual Development,  Maintenance and Support | This is 1-year service contract for continual development, maintenance, and assessment of site analytics and data trends. Data sims and data costs included. See below for details. | € 0.00 |
| Total |  | € 5,000.00 |

**Installation**

This is a once off payment and includes:

* The install of 1 gateway, 7 nodes and the setup of infrastructure based on site location and coverage area.
* Programming of the 7 nodes and integration into system.
* Database setup for the 7 nodes and gateway.
* The setup of alerts and monitoring system.

**Continual Development, Maintenance and Support**

This is a 1-year service contract based on 1 gateway and 7 nodes and includes:

* Data warehousing and database maintenance.
* Node and gateway firmware and programming updates.
* Biannual meeting to discuss changes to improve service.
* Bimonthly data assessment to build water consumption profile to improve alert system.
* Monthly client feedback report will be issued to assess feedback posted on the dashboard.

Conclusion

The proposed power monitoring system will provide the Daly’s Seafood with a comprehensive solution for tracking power consumption, identifying inefficiencies, and optimizing energy usage. By integrating solar PV performance and environmental data, the system will enable a detailed analysis of renewable energy contributions and support sustainable energy practices.

We look forward to discussing this proposal further and moving towards the implementation phase to achieve enhanced energy management and cost savings for your factory.