Greenhouse Gas Reporting (IEC)

Track and Report Carbon Emissions

EcoStruxure Power Digital Application

ESXP2GE027EN-05
11/2023

EcoStruxure™ Power

Schneider Electric™

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Table of Contents

Overview

Context of Application

Companies are faced with mounting global pressure to help cut carbon emissions and become more efficient by reducing energy and water consumption and waste. To do this they require accurate and timely environmental reporting.

Problem to Solve

The facility manager needs to:

- Convert energy consumption to greenhouse gas equivalents to communicate the results of reduction efforts to stakeholders (shareholders, public, regulatory bodies).
- Promote a green image.

Purpose of the Application

Track and report carbon emissions and waste

Energy consumption and waste can be converted to carbon emissions and represented, for example, as:

- Equivalent tons of CO_2
- Saved trees
- Kilometers driven

In addition, Schneider Electric's modules can communicate water waste and provide period-over-period usage comparison.

Application Outcomes

Dashboards

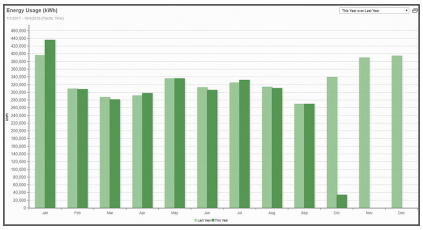
- Energy Equivalency Gadget

  Carbon emissions are reported and segmented by source, scope, and pollutant, and can be indexed to various specified metrics.

Energy Equivalency Gadget

- Period Over Period Gadget

  The greenhouse gas emissions for one period are compared with those for a previous period.



Period Over Period Gadget

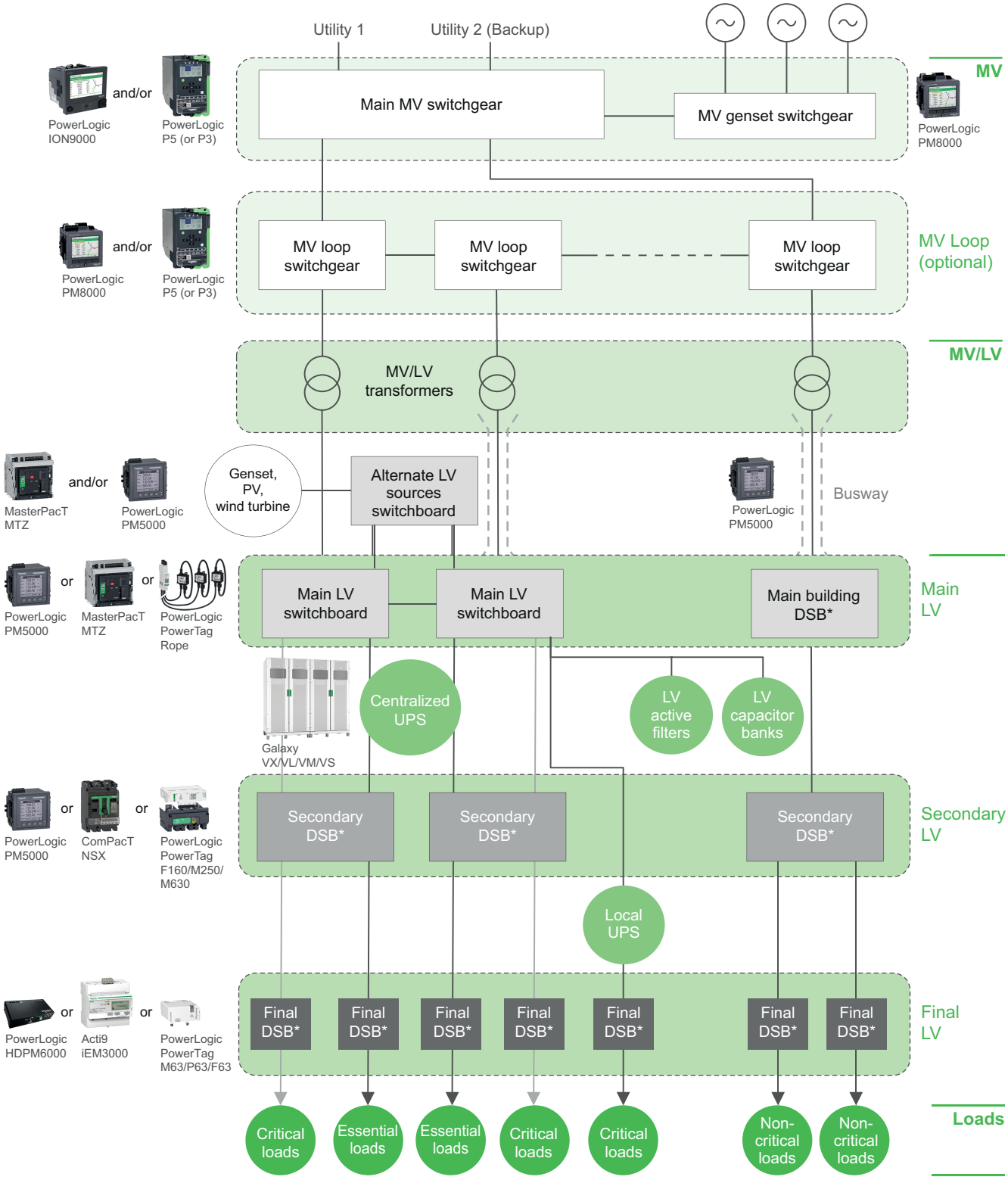
Cloud-Based Analytics and Services

As an option, EcoStruxure Service Plan powered by EcoStruxure Power Advisor provides data quality analytics with recommendations from our Schneider Electric service experts.

EcoStruxure Power Advisor Data Quality Report

Electrical Architecture

The following diagram details the areas of the architecture where the connected products should be installed in order to implement the Greenhouse Gas Reporting application:



* DSB = Distribution Switchboard

Digital Architecture

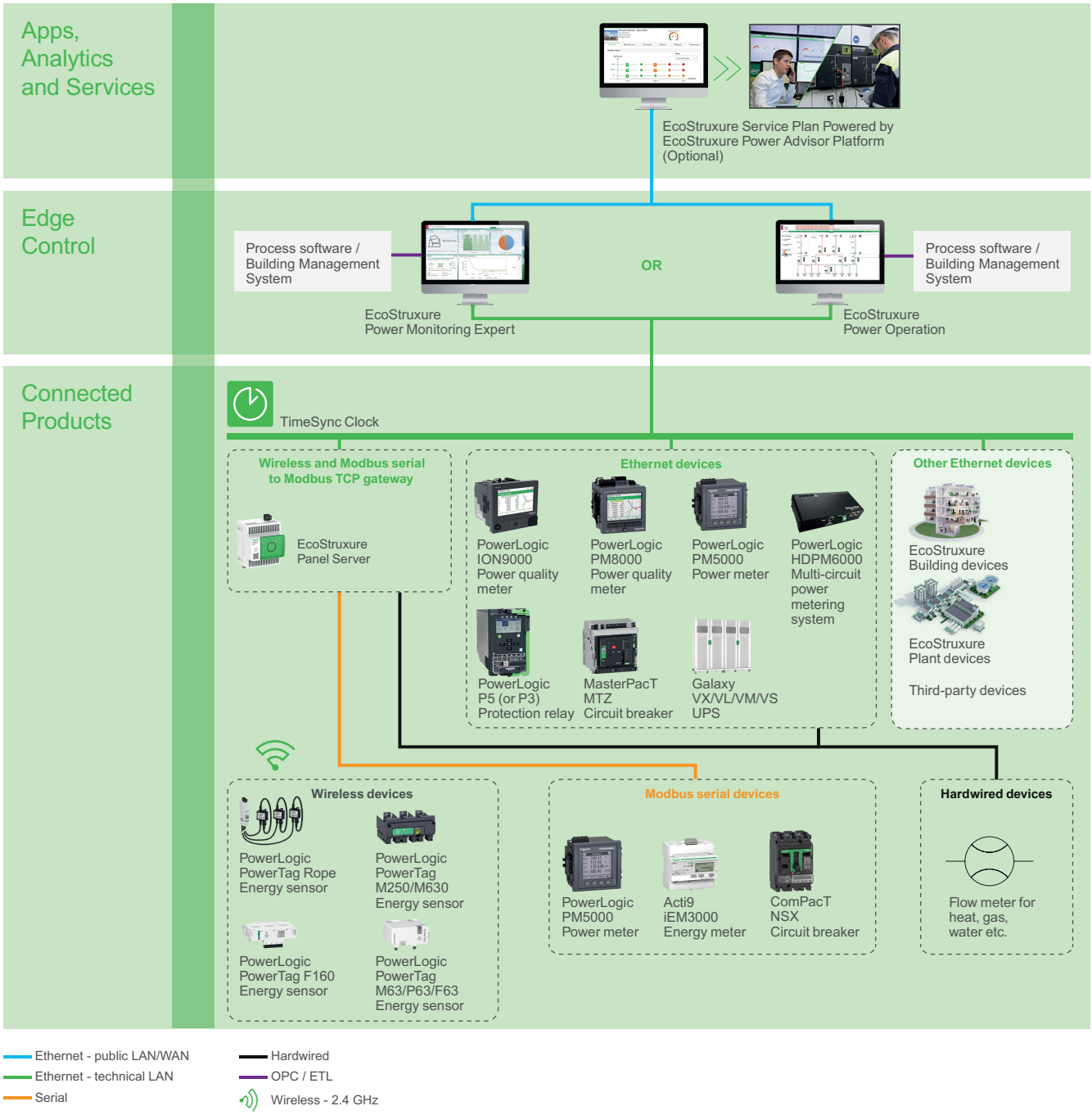
In this architecture, the data is collected from connected products either directly over Ethernet or via gateways (such as the EcoStruxure Panel Server). This data is then recorded and processed by the Edge Control software (EcoStruxure Power Monitoring Expert or Power Operation) for on-premise visualization, analysis, and reporting.

Other utility consumption inputs (WAGES) can also be directly acquired via Ethernet, via serial communication, or through hardwired signals from basic meters and sensors.

To include other process or equipment related data in the analyses, OPC or ETL can be used to acquire data from external process or building management software.

As an option, data from EcoStruxure Power Monitoring Expert or Power Operation can be passed on to the EcoStruxure Power Advisor platform and analyzed by experts as part of the EcoStruxure Service Plan.

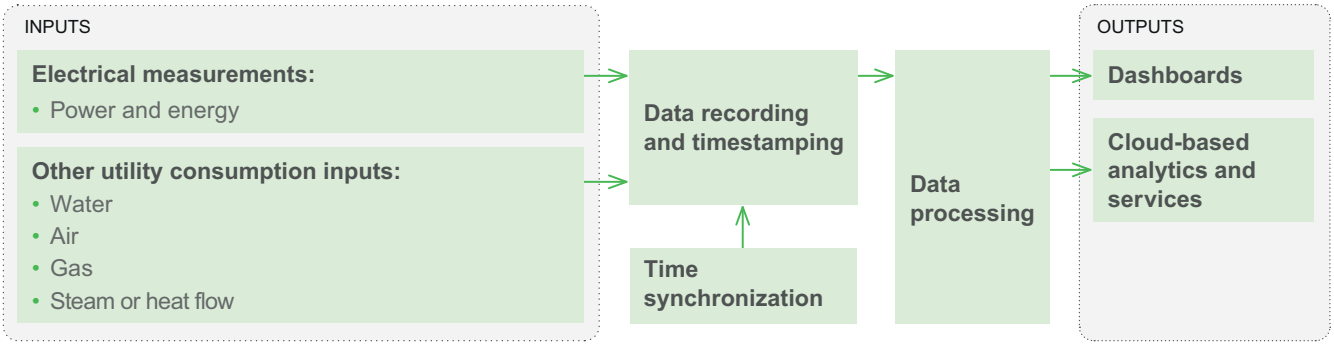
The recommended digital architecture for the application is shown below:



System Description

Data Flow

The Greenhouse Gas Reporting application can be broken down as follows:



Inputs

The following data are required to implement the Greenhouse Gas Reporting application:

Electrical Measurements

The following electrical measurements are collected at each point of interest in the electrical distribution, from Medium Voltage, to Low Voltage, down to Final Distribution.

- Power values (kW, kVAR, kVA)
- Energy values (kWh, kVARh, kVAh)

These data may be acquired from:

- **Power/energy meters** such as PowerLogic ION9000, PM8000, PM5000, HDPM6000, PowerTag, Acti9 iEM3000


PowerLogic ION9000


PowerLogic PM8000


PowerLogic PM5000


PowerLogic HDPM6000


Acti9 iEM3000


PowerLogic PowerTag

- **Devices with embedded metering** such as PowerLogic P5/P3, MasterPacT MTZ, and ComPacT NSX protection devices, or Galaxy VX/VL/VM/VS UPS


PowerLogic P5


PowerLogic P3


MasterPacT MTZ


ComPacT NSX


Galaxy VX/VL/VM/VS

- **Third-party devices (via Modbus)**

Other Utility Consumption Inputs

The following utilities can be monitored:

- Water
- Air
- Gas
- Steam or heat flow

They can be acquired via digital/analog inputs on meters or directly via Modbus from third-party devices.

Data Recording and Timestamping

For the Greenhouse Gas Reporting application, a timestamp accuracy of ±1 second is sufficient.

Advanced power meters such as the PowerLogic ION9000, PM8000, HDPM6000, and some PowerLogic PM5000 models (PM53xx and PM55xx) can timestamp and record onboard energy measurements. EcoStruxure Power Monitoring Expert or Power Operation can then retrieve the records with their original timestamp.


PowerLogic ION9000


PowerLogic PM8000


PowerLogic HDPM6000


PowerLogic PM5000

For other devices (PowerLogic P5/P3, MasterPacT MTZ, Galaxy VX/VL/VM/VS, entry-level PowerLogic PM5000 models, Acti9 iEM3000, PowerLogic PowerTag, etc.) energy measurements are acquired by the connected products and then recorded and timestamped by EcoStruxure Power Monitoring Expert or Power Operation.


PowerLogic P5


PowerLogic P3


MasterPacT MTZ


Galaxy VX/VL/VM/VS


PowerLogic PM5000


Acti9 iEM3000


PowerLogic PowerTag


EcoStruxure Power Monitoring Expert


EcoStruxure Power Operation

When acquiring data from other customer systems, timestamps can also be imported through OPC[1] or ETL[2].

For a comprehensive overview of device recording and timestamping capabilities, refer to Time Synchronization Capabilities of EcoStruxure Power Connected Products.

Time Synchronization

For consistent timestamping of all the data, the date and time should be accurately distributed to connected products and data loggers.

Time synchronization can be performed through various technologies (PTP, NTP, SNTP, etc.). An external master clock may be required and can be connected to a GPS antenna to reach the expected time precision.


TimeSync Clock

Data Processing

The calculation engine in EcoStruxure Power Monitoring Expert and Power Operation provides the ability to convert energy consumption data into greenhouse gas equivalent measurements.

1. OPC = Open Platform Communications
2. ETL = The EcoStruxure Extract Transform Load (ETL) engine is a companion application for EcoStruxure Power Monitoring Expert and Power Operation. It is used to extract historical data from one application (Schneider Electric or third-party), then transform that data so it can be loaded into another application.

EcoStruxure
Power Monitoring Expert

EcoStruxure
Power Operation

Outputs

Outputs are displayed by EcoStruxure Power Monitoring Expert or Power Operation.

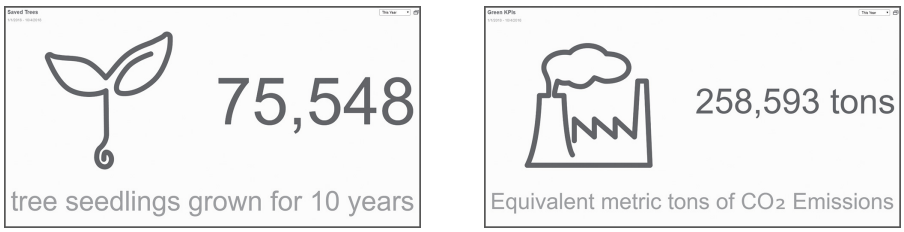
EcoStruxure
Power Monitoring Expert

EcoStruxure
Power Operation

Dashboards

Energy Equivalency Gadget

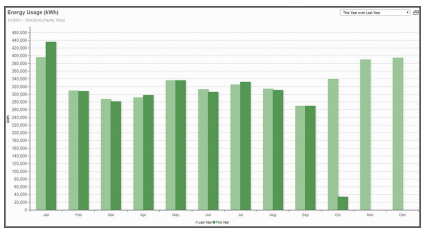
Shows a single value that is equivalent to the aggregated consumption input data, over a selected time period. The value can be scaled or normalized to represent an equivalent consumption measurement. The information is shown as a numeric value with unit, custom text, and a custom graphic.



Energy Equivalency Gadget

Period Over Period Gadget

Can be used to compare the greenhouse gas emissions of one period with respect to a previous period.



Period over Period Gadget

Other Gadgets and Trends

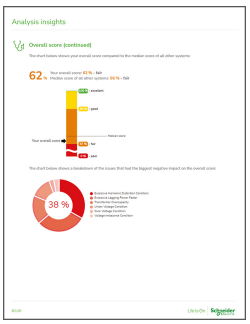
Many other gadgets or trends (such as those discussed in the Energy Monitoring application) can be used to display and analyze greenhouse gas equivalent measurements.

Cloud-Based Analytics and Services

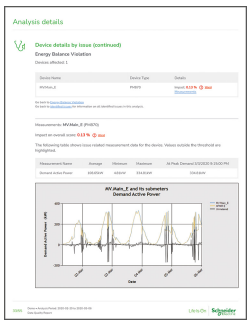
As an option, EcoStruxure Service Plan powered by EcoStruxure Power Advisor provides data quality analytics with recommendations from our Schneider Electric service experts.

For further information, refer to Data Quality Management.

EcoStruxure Service Plan Powered by EcoStruxure Power Advisor Platform



EcoStruxure Power Advisor
Data Quality Report - Overall Score



EcoStruxure Power Advisor
Data Quality Report - Device Details by Issue

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