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Energy Manager on Industrial Edge

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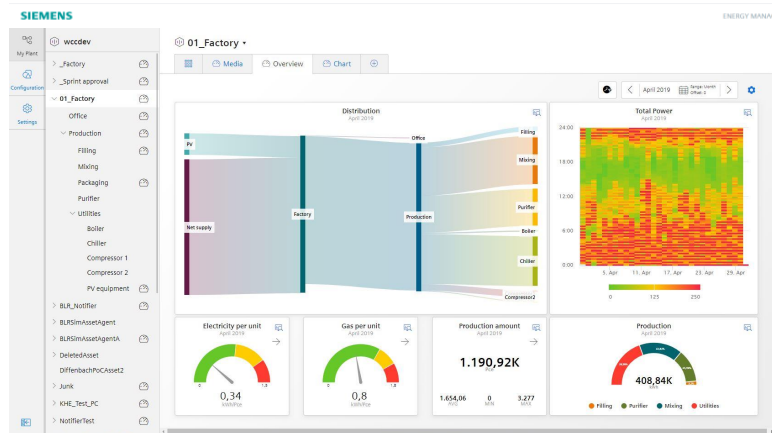
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Energy Manager on Industrial Edge App

Product Overview

Energy Manager on Industrial Edge

Transparency - Obtain the greatest value from data



The Energy Manager allows to keep track energy consumers. No matter if we talk about machines, lines or whole sites.

Benefits

- ▶ Energy transparency supporting ISO 50001
- ▶ Flexible KPI definition and user specific dashboards providing a holistic view about the energy consumption and can be used to derive energy efficiency measures
- ▶ Transparency about energy costs, consumption and CO₂ Emission from the machine level to the complete site
- ▶ Get the most valuable information for precise decision-making to optimize energy efficiency

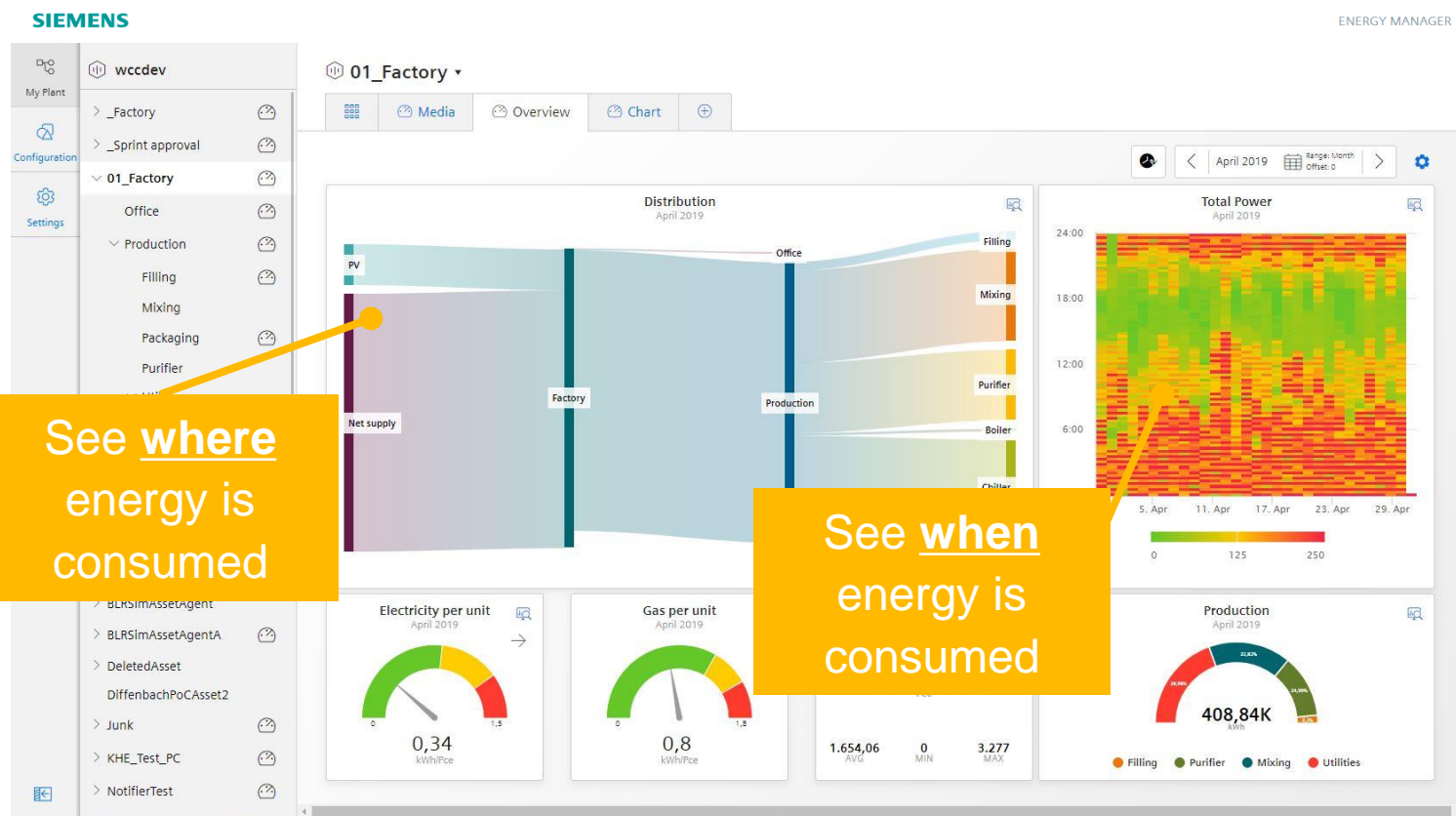
Features

- ▶ Out of the box energy media analysis (consumption, costs, CO₂ Emission)
- ▶ Flexible dashboard configuration with detail views for fast analysis
- ▶ Support of different widgets (charts, pie, gauge, Sankey, heat map, value, duration curve) to visualize energy performance indicators

Industry focus

Cross industry based on flexible dashboard and KPI calculation

Energy Manager on Industrial Edge Dashboards - Transfer data to information



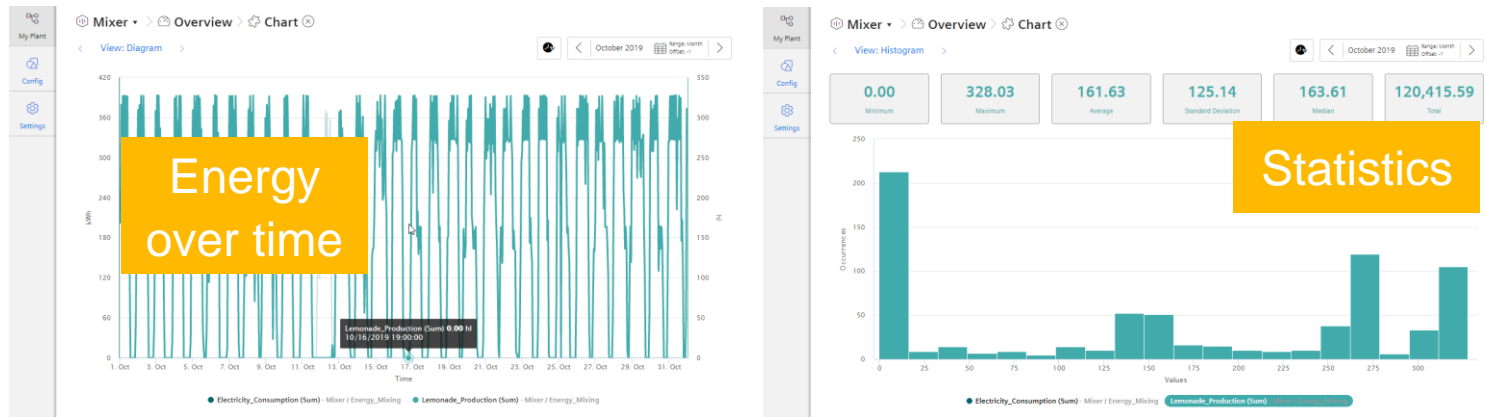
Benefits

Using custom dashboard with energy related widgets to transfer data to information

- Sankey Diagram provides an overview about the energy flow → see where energy is consumed
- In the heat map the value is represented as color. → see when energy is consumed.
- Additional Widget types like Gauge, Pie Chart, Value, Chart are used to display KPIs in a way that measures can derived immediately.

Energy Manager on Industrial Edge

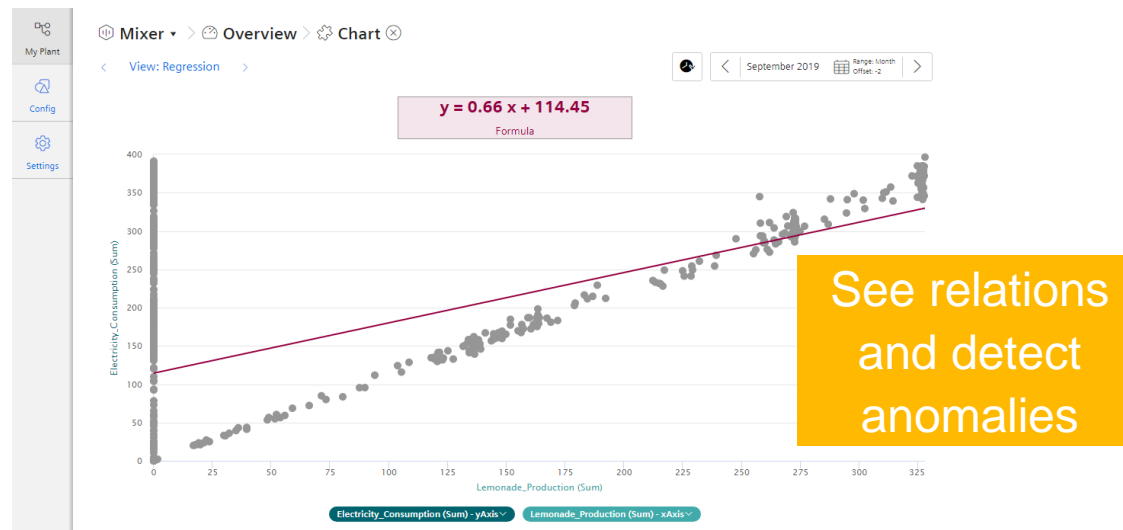
Out of the box analytic



Benefits

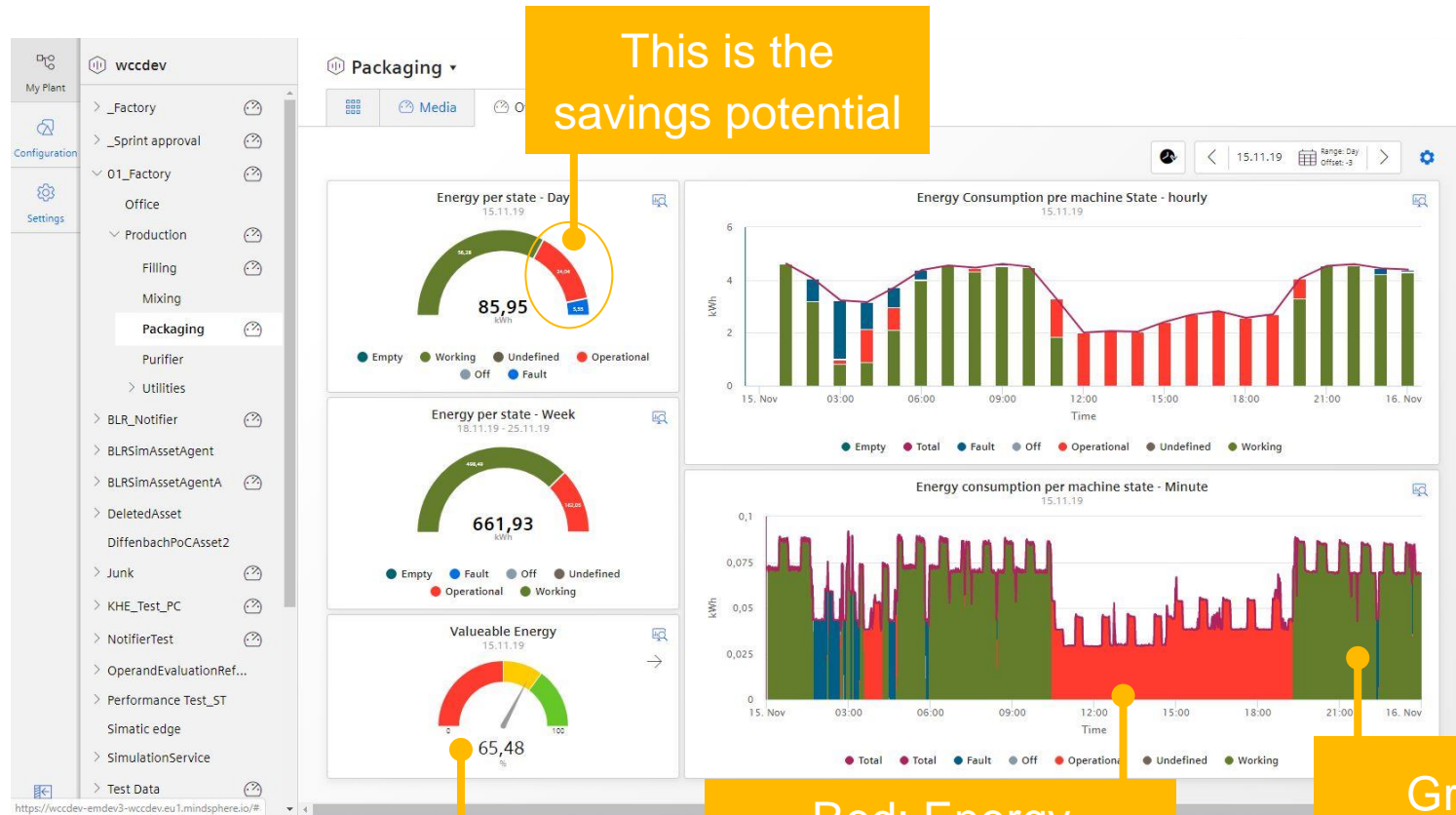
Detailed information for each widget in the dashboard

- The diagram view provides detailed information in a configurable resolution (e.g. 1h) to see any anomalies like peaks,..
- Statistic view provides a histogram for each parameter including the statistic. (min, max, average, median, standard deviation and sum)
- Regression view provides the possibility to display the data in a x-y chart including a trend representing the plant characteristic.



Energy Manager on Industrial Edge

Transparency on machine level



Benefits

Transparency about energy consumption in the different machine states (Working, Operational, Standby, Off,...)

KPI representing the operation of the individual machine.

- Valuable energy (Working / Total)
- Losses caused by inefficient machine operation

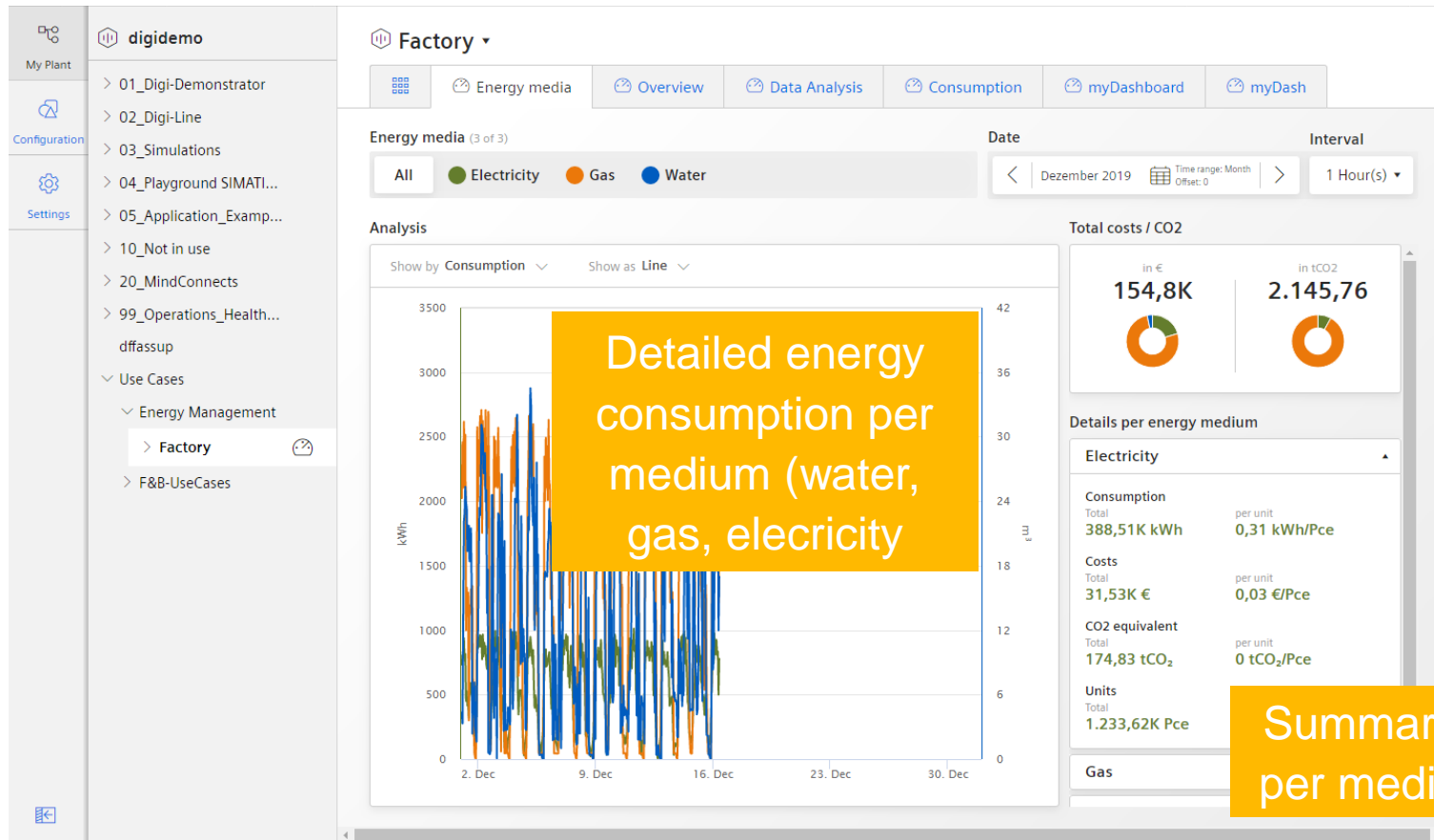
Degree of efficiency

Red: Energy consumption in idling mode = Energy wasted

Green: Energy consumption in working mode = Energy used

Energy Manager on Industrial Edge

Energy transparency for all levels in the factory



Benefits

Simple configuration providing with a high value

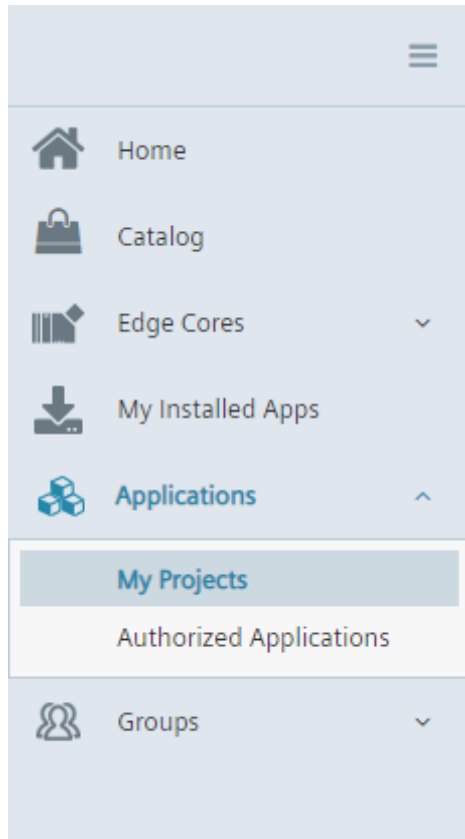
- Details about each consumed media in the chart (consumption, costs, CO2 and these KPIs per unit)
- Summary of each media display the most important KPIs (consumption, costs, CO2 and these KPIs per unit)
- The donut charts represents the total costs and the total CO2 emission and the distribution to the several media

User Management Industrial Edge Management

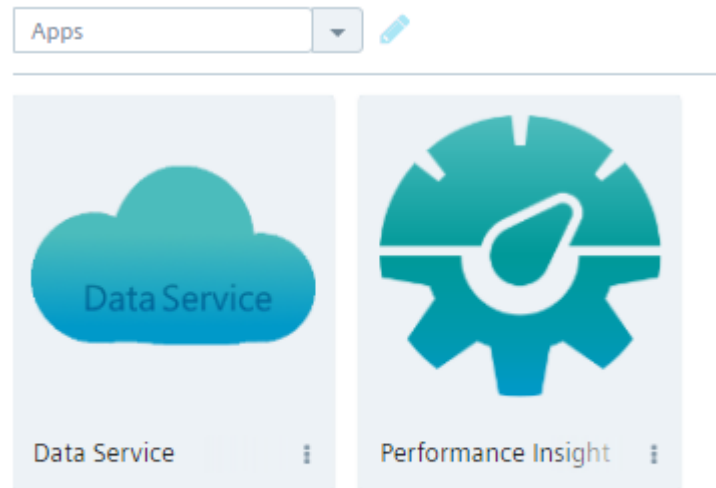
Assign Roles to users & Add Apps to the User Groups

Assign Roles in Industrial Edge Management

- 1 Open “My projects” in the Industrial Edge Management



- 2 Check, that the Data Service is under “My Projects”



Make sure, that the App is available in “My Projects”

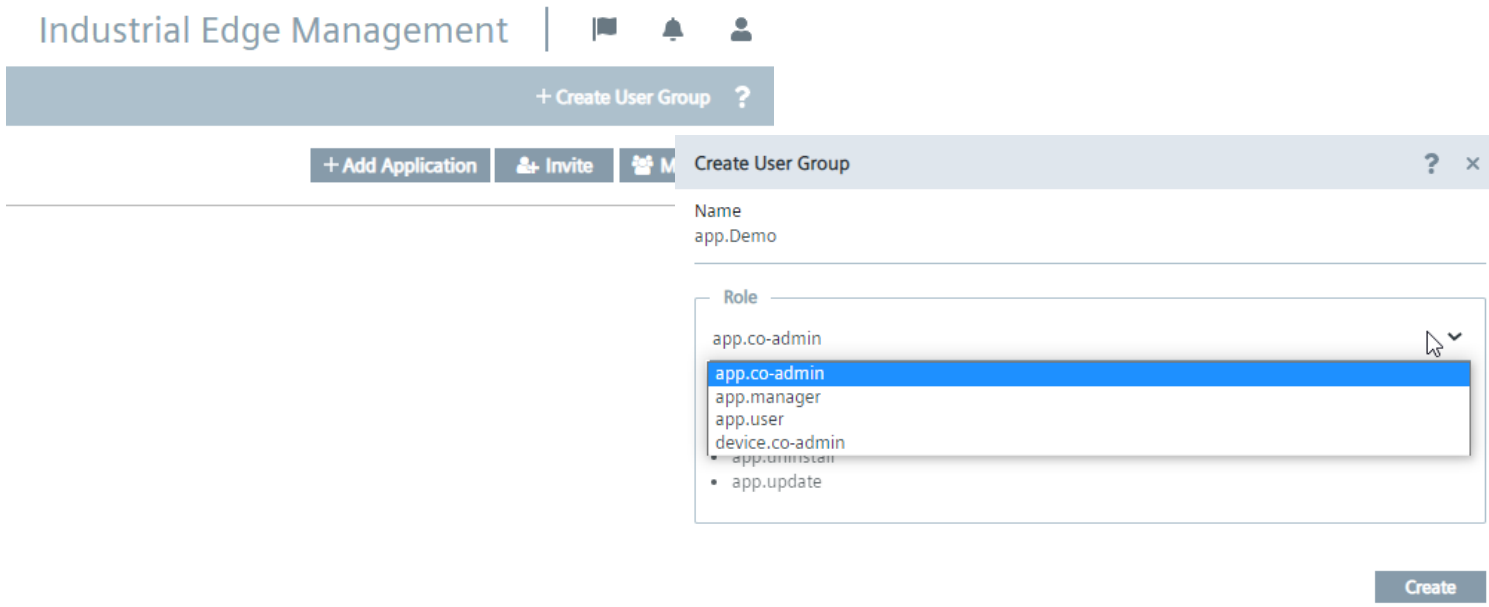
Assign Roles to users & Add Apps to the User Groups

Assign Roles in Industrial Edge Management

- 1 Open “My User Groups” in the Industrial Edge Management



- 2 Create User Groups and assign the roles



A user with tenant admin privileges can assign the appropriate app to a Industrial Edge user

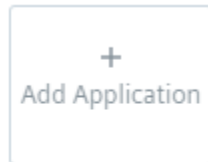
Following steps are required:
Open “My User Groups” in the Industrial Edge Management

- Create a User Group
- Admin role: app.co-admin
- User role: app.user

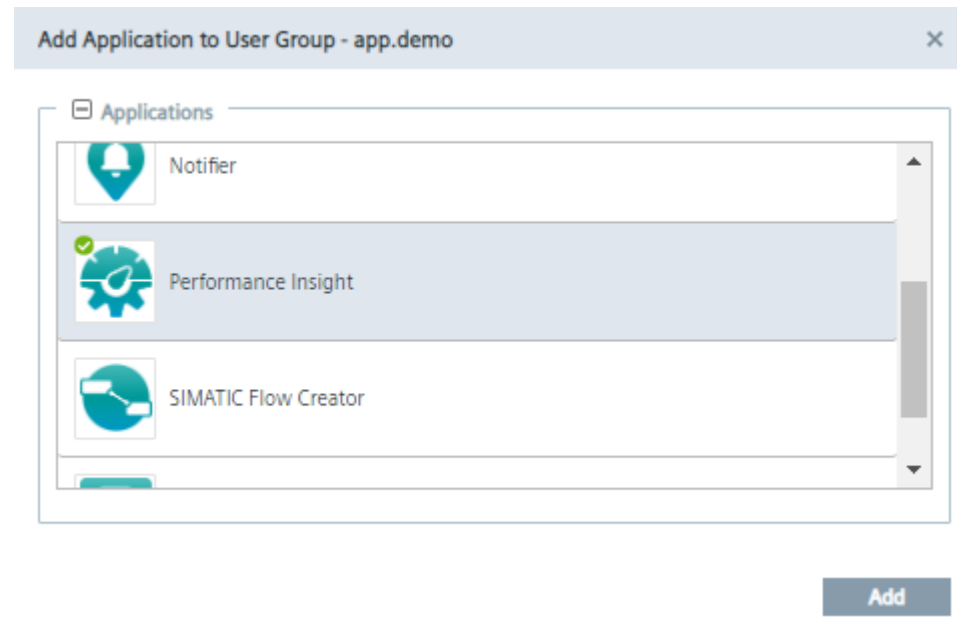
Assign Roles to users & Add Apps to the User Groups

Add Apps to the User Groups

- 3 Add the Application to the User Groups



Click ? for help.






The Apps must be available in
“My projects”

- Add a new App
- Select the App from the selection



Assign Roles to users & Add Apps to the User Groups

Add Apps to the User Groups

4 Invite the User to the Group


Industrial Edge Management |   

+ Create User Group ?

+ Add Application  Invite  Members

Invite to User Group - app.Monitor ×

Email +

| Email | Action |
|---------------|---|
| test@test.com |  |

Invite

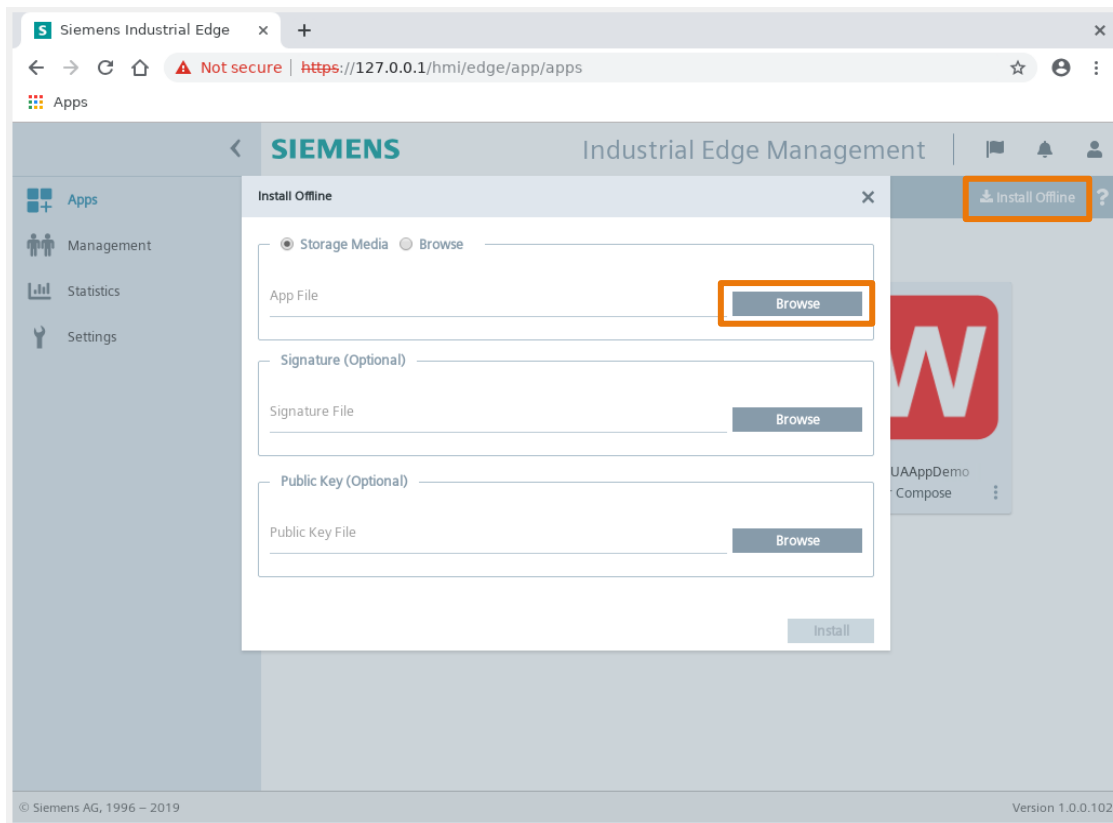
Invite the members to the Group

Install and start the Apps on the Unified Comfort Panel Overview

Install the App on the Unified Comfort Panel

Install Offline

- 1 Click the “Install Offline” Button
- 2 Browse the *.app file

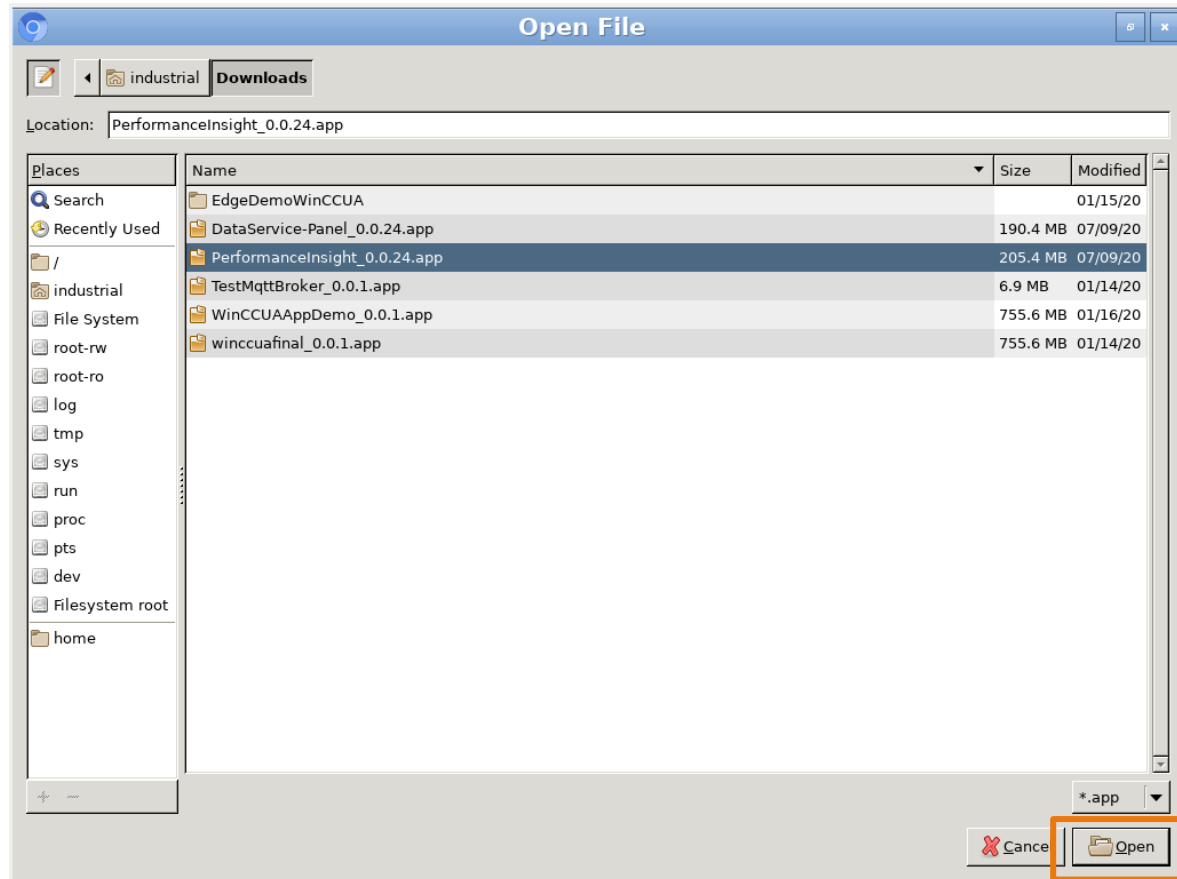


To install the App on the Unified Comfort Panel you need to save the *.app file on the USB Stick and plug it into the slot

- Click on “install Offline”
- Browse the *.app File

Install the App on the Unified Comfort Panel Install Offline

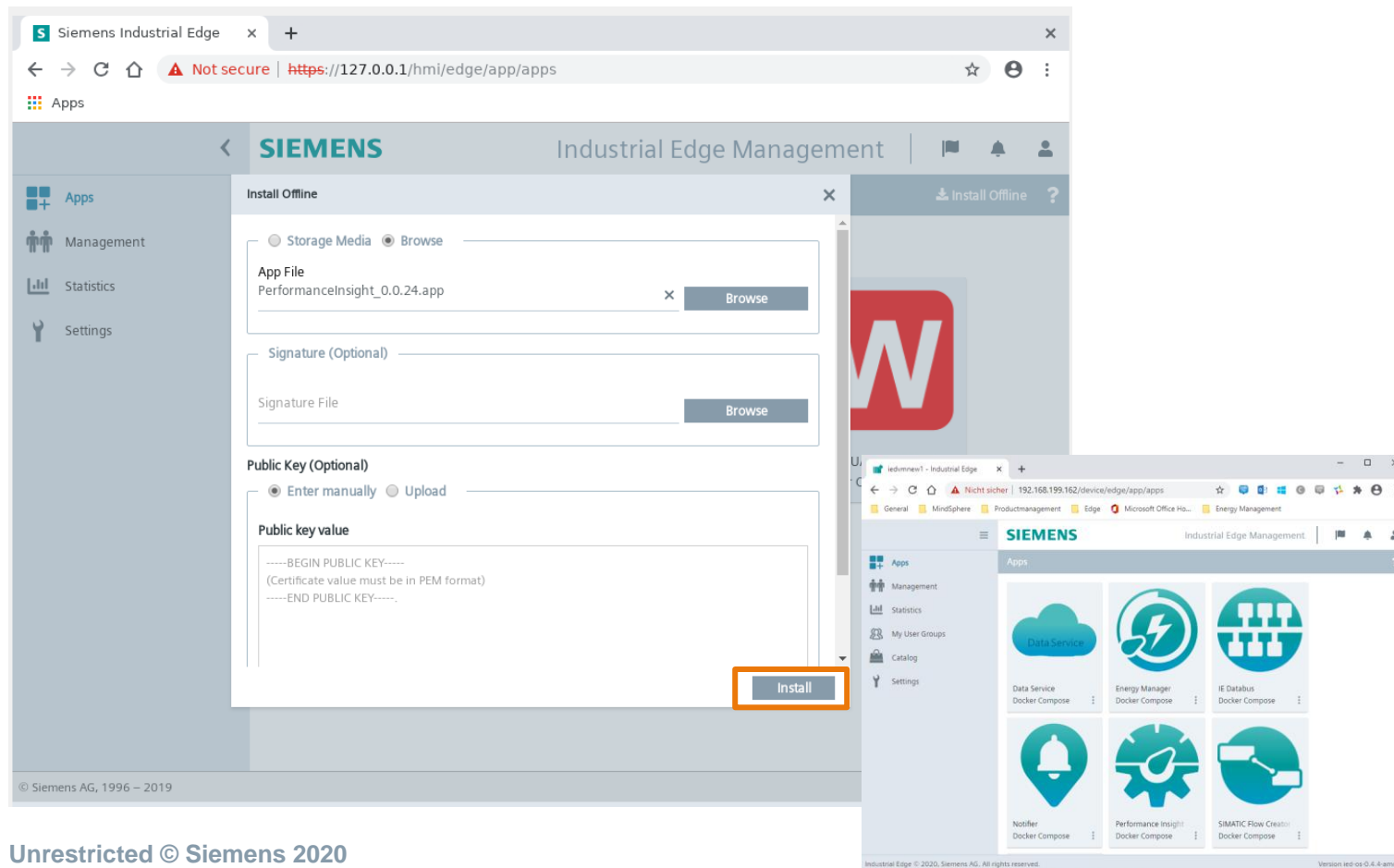
- 3 Select the *.app file
- 4 Open the *.app file



To install the App on the Unified Comfort Panel you need to select and open the *.app file.

Install the App on the Unified Comfort Panel Install Offline

5 Install the *.app file



To install the App on the Unified Comfort Panel you need to install the App on the UCP.

After the successful installation, the App Home screen appears

Start the App on the Unified Comfort Panel

Start the App

6 Start the App

The screenshot shows the Siemens Industrial Edge Management web interface. The browser address bar indicates the URL is 192.168.199.162/device/edge/app/management. The left sidebar has the 'Management' tab selected and highlighted with an orange box. The main content area shows a list of running applications, including Data Service, IE Databus, Notifier, Performance Insight, SIMATIC Flow Creator, and SIMATIC S7 Connector. Below this list, there is a section for '1 Stopped' applications, where the 'Energy Manager V 0.0.24' app is listed. The 'Energy Manager' app details are shown on the right, including its status (Stopped), CPU and memory usage, and storage information. The 'Start' button is highlighted with an orange box.

| Name | Action |
|---|--------|
| energymanager_db-edge-apps-energymanager-volume | — |
| _data | — |
| PG_VERSION | ↓ |
| base | — |
| 1 | — |
| 112 | ↓ |

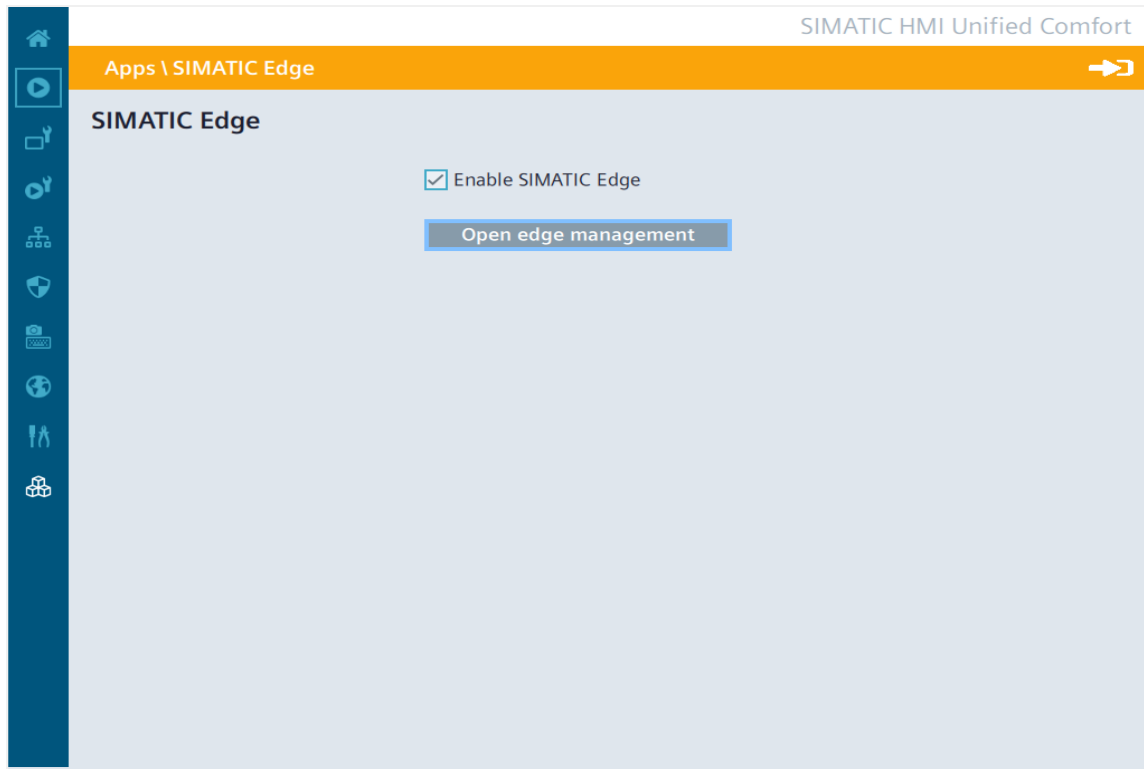
To start the App, go to the “Management” view and start the App.

User Management Unified Comfort Panel

Add Users to the Panel and open the Edge Management

Add Users to the Panel

- 1 Create the User in the TIA Portal project
- 2 Download the project to the Panel
- 3 Open the SIMATIC Edge on the Unified Comfort Panel

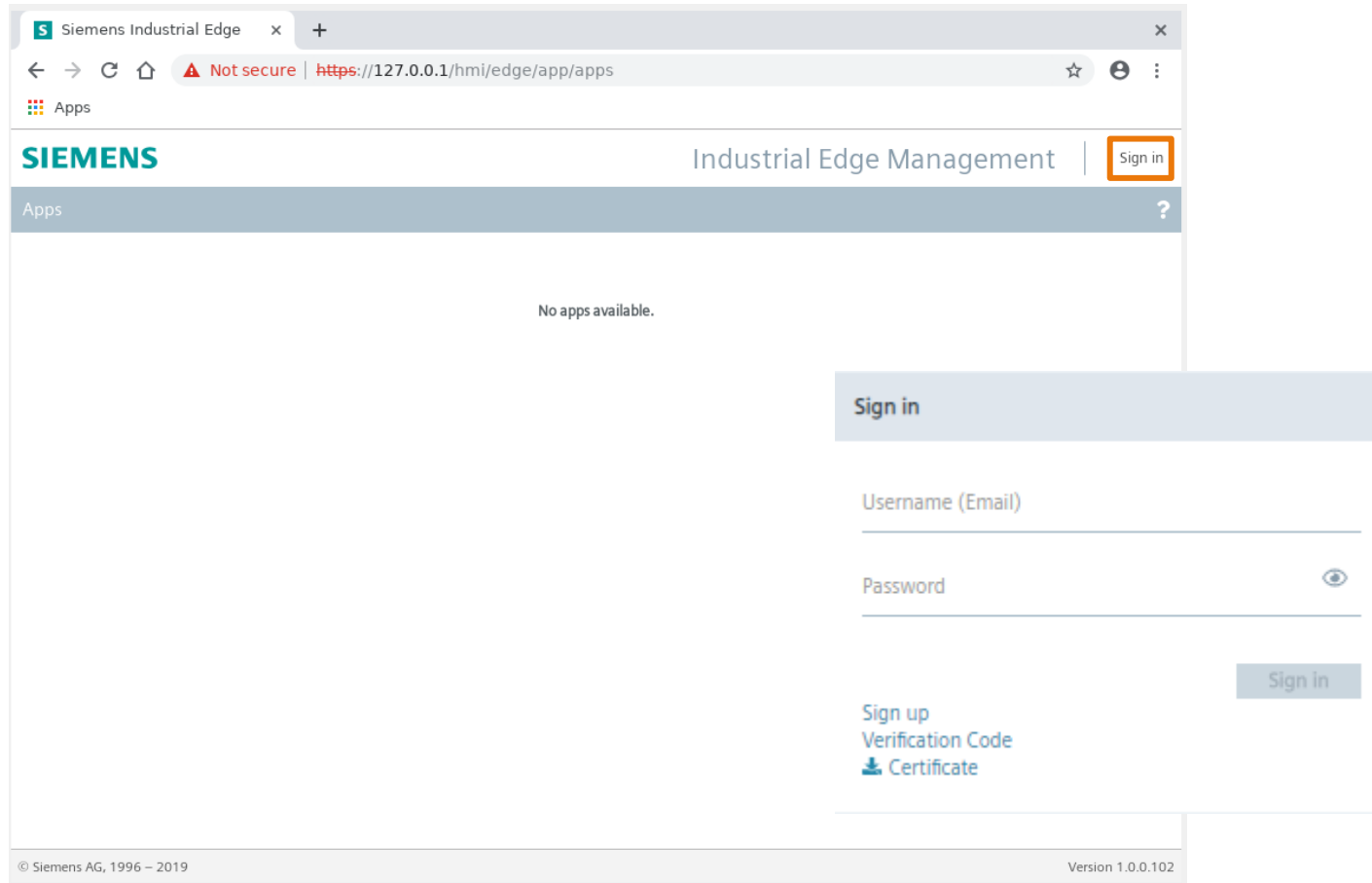


The Users for the Apps on the Unified Comfort Panel need to be created in the TIA Portal project.

The Industrial Edge Management is opened via the Board.

Add Users to the Panel and open the Edge Management Login to the Industrial Edge Management

4 Login to the Unified Comfort Panel



The screenshot shows a web browser window with the URL `https://127.0.0.1/hmi/edge/app/apps`. The page header includes the Siemens logo, the text "Industrial Edge Management", and a "Sign in" button. Below the header, there is a section for "Apps" with a question mark icon and the text "No apps available." A modal dialog box is open over the page, titled "Sign in". It contains input fields for "Username (Email)" and "Password", a "Sign in" button, and links for "Sign up", "Verification Code", and "Certificate". The footer of the browser window shows "© Siemens AG, 1996 – 2019" and "Version 1.0.0.102".

The Users created in the TIA Portal project are the same Users that the apps on the Unified Comfort Panel work with.

User Management Energy Manager

Energy Manager on Industrial Edge Settings

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Settings

- User information**
Show user profile
- Usage information**
Information on resources in use
- User list**
User list

Module “Settings”

- The topics as follows can be addressed in the settings area
- User information
- Usage information
- User list (only visible with admin privileges)

Energy Manager on Industrial Edge Settings/ User Information

The screenshot displays the Siemens Energy Manager interface. On the left, there is a navigation sidebar with three main sections: 'My Plant', 'Configuration', and 'Settings'. The 'Settings' section is currently active. The main content area is titled '< Settings' and contains three sections:

- User information:** A form with fields for 'First name: Admin', 'Last name: Edge', and 'Email: [redacted]'. To the right, there are labels for 'Language: English' and 'Locale: English'.
- User roles:** A section titled 'admin' with a description: 'As an administrator, you can create and instantiate KPI types, as well as create dashboards and widgets.'
- User account:** A section with a yellow background and a warning icon, containing the text 'Deregister from Performance Insight' and a 'Deregister' button.

Module “Settings/User information”

- The user gets following information:
- User information
- Selected language
- Selected locale defining the data/time format and the separator
- Roles for usage of the app (admin or user)
- User has the possibility to deregister from the app

Energy Manager on Industrial Edge

Settings / User list

SIEMENS

< Settings

User list

Search

| First name | Last name | Email |
|------------|-----------|-------|
| Admin | Edge | |

Module “Settings/User list”

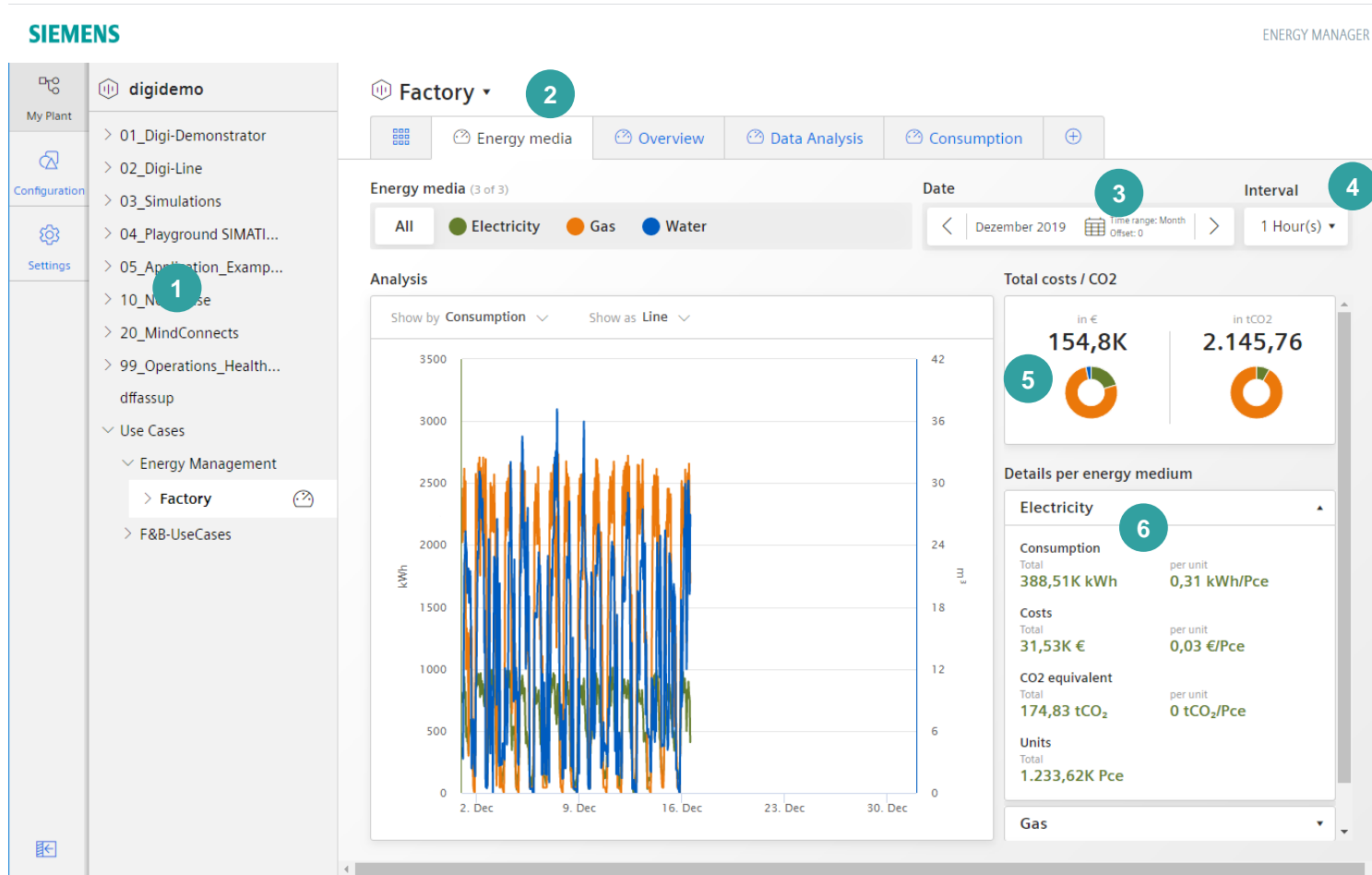
- After first login, user information is stored in the app data base.
- The app administrator gets an overview of all registered users and has the option to edit these users.

Data Analysis

”My Plant “

Energy Manager on Industrial Edge

My Plant / Energy media dashboard

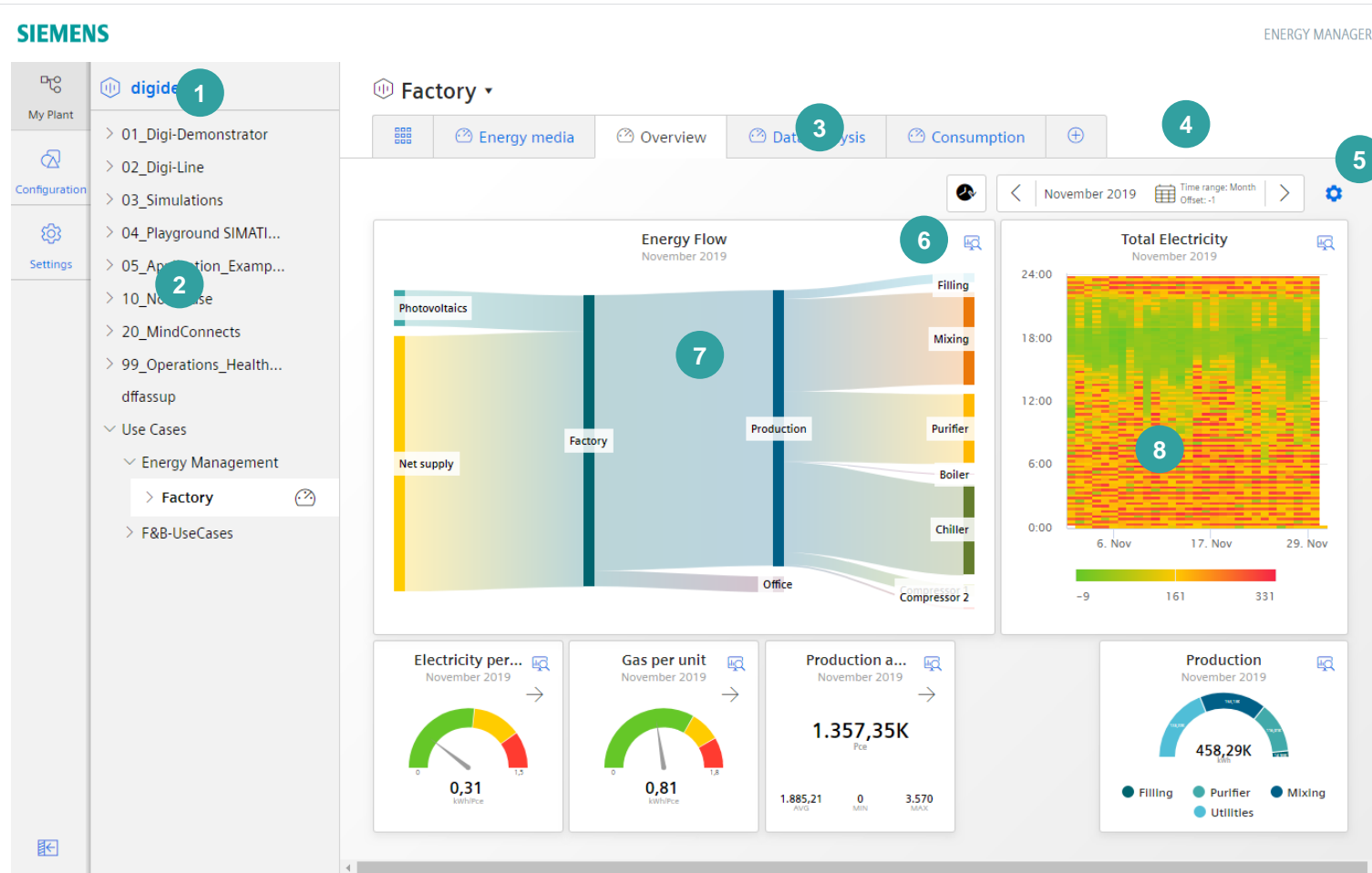


1. Asset model (as defined in the data service)
2. Pre defined Dashboard Media Analysis
3. Dashboard time picker
4. Interval in which the data is displayed
5. Balance for total costs and total CO2 emission
6. Balance for one individual media

Energy Manager on Industrial Edge

My Plant / custom Dashboard

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1. IOT Value Plan Name (Tenant)
2. Asset model (as defined in the MindSphere asset manager)
3. Up to five Dashboards per Asset
4. Dashboard time picker
5. Change to Dashboard edit mode
6. Open Detail view for the widget
7. Sankey Widget
8. Heat map Widget

Energy Manager on Industrial Edge Dashboard (edit mode)

The screenshot displays the Siemens Energy Manager interface in edit mode. At the top, there's a navigation bar with 'Factory' and tabs for 'Energy media', 'Overview', and 'Data analysis'. Below this, a toolbar includes 'New widget', 'Edit dashboard', and 'Finish'. The main area shows two widgets: 'Energy Flow' (December 2019) and 'Heatmap' (December 2019). An 'Edit dashboard' modal is open, featuring a sidebar with 'My Plant', 'Configuration', and 'Settings'. The modal includes a 'Back' button, a 'Dashboard name' field (currently 'Overview'), and 'Date settings' for 'Time range' (Month), 'Date (from)', 'Time (from)', and 'Offset' (-1). A 'Use current date' checkbox is checked. At the bottom, there are 'Save', 'Cancel', and 'Delete' buttons.

In Dashboard edit mode the user can:

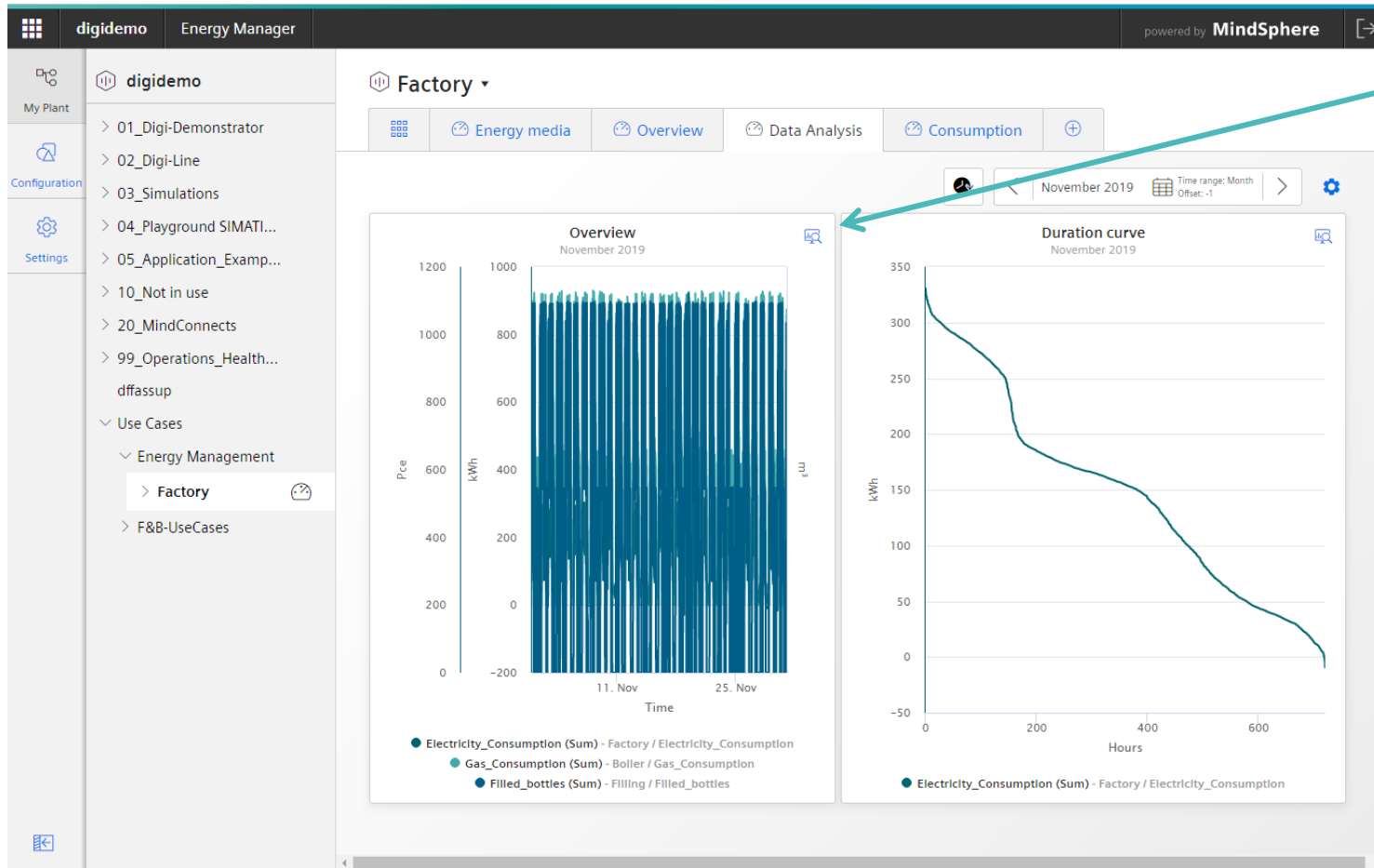
- Configure the Dashboard settings (name, time picker)
- Add, modify or delete widgets
- Change the size of the widgets
- Move widgets

Energy Manager on Industrial Edge

My Plant & Dashboard (detailed view)



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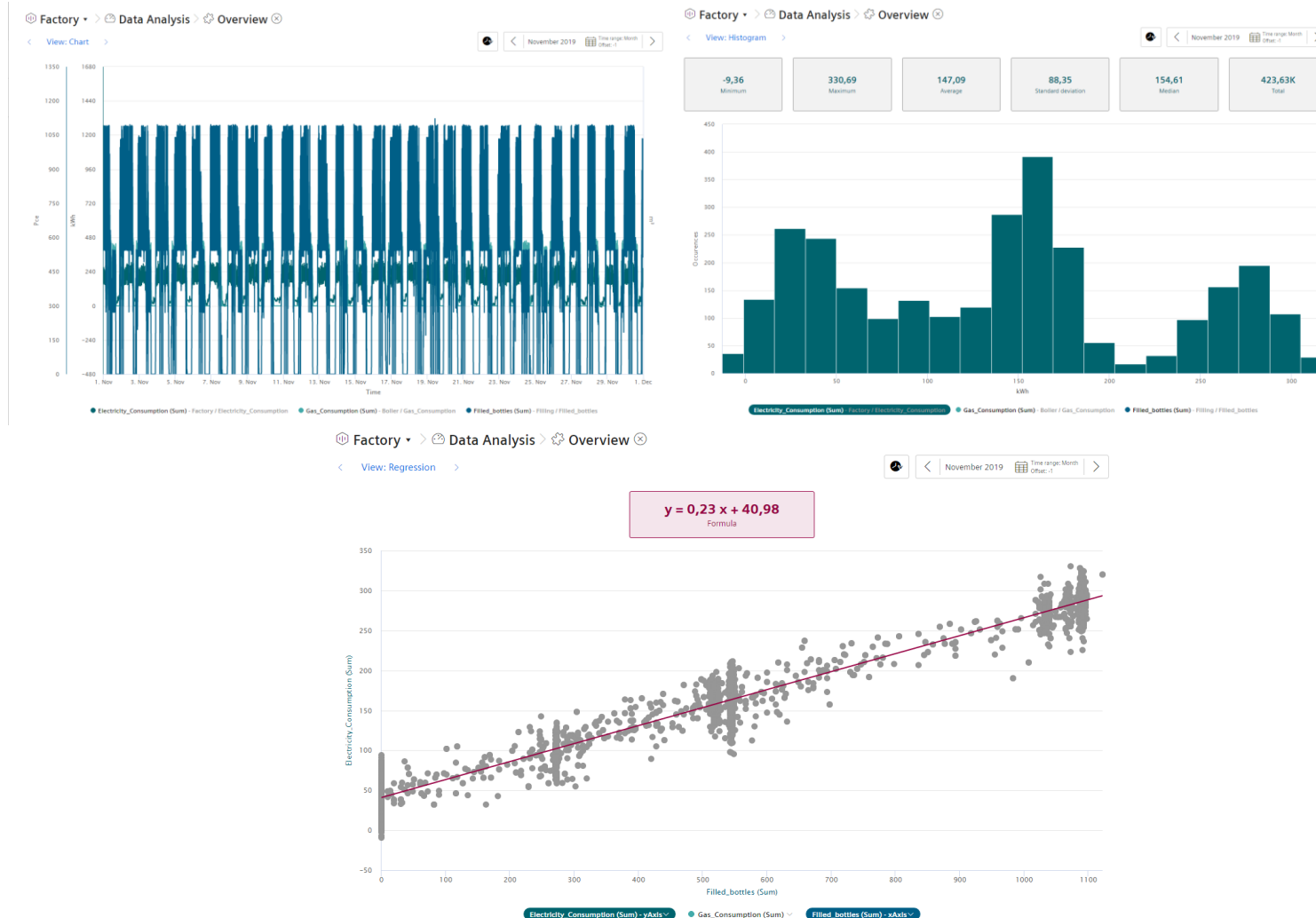
To open the “detailed view”, click on the icon in the right top corner

Energy Manager on Industrial Edge

My Plant & Dashboard (detailed view)



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The following detail views are available

- Main view in full screen for widgets where it provides added value (Chart, Heatmap, Sankey)
- Chart view
- Statistic / Histogram
- Regression analysis for widgets holding more than one parameter

General settings

“Configuration/Status mappings

Energy Manager on Industrial Edge Configuration / Status Mapping - Overview

The screenshot displays the 'Configuration' section of the Energy Manager interface. The left sidebar contains navigation options: 'My Plant', 'Configuration', and 'Settings'. The main content area is titled 'Configuration' and lists four categories: 'Status mappings' (List of all available status mappings), 'KPI types' (List of all available KPI types), 'Energy media' (List of all available ene...), and 'Delete unuse' (List of all unused KPI i...). An inset window shows the 'Status mappings' configuration page, which includes a search bar, a '+ New status mapping' button, and a table with columns 'Name' and 'Description'. The table contains two entries: 'Mapping type a' and 'my status mapping', each with edit and delete icons.

| Name | Description |
|-------------------|-------------|
| Mapping type a | |
| my status mapping | |

List of all status mapping tables

- Admin Users can add, modify or delete a status mapping table which is used in Gantt chart widgets.



Energy Manager on Industrial Edge

Add or modify status mapping table

Edit "my status mapping"

Name *
my status mapping
The status mapping name must be unique.

Description
Description

| Color * | Value * | Label * | Description |
|---|---------|---------|-------------|
|  | 0 | stopped | Description |
|  | 1 | running | Description |

+ New row

* These fields must be filled out.

Save Cancel Delete

Add or modify a status mapping table

- Admin users can add a status with a color, a value, a label and optionally a description.
- If no match between the received value and the definition in the status mapping table is given, a state "undefined" with color white is used.
- User can change the order in the status list to define the order in the Gantt chart detailed view.

General settings

“Configuration/Energy media

Energy Manager on Industrial Edge

Energy Media configuration

The screenshot displays the Siemens Energy Manager interface. On the left, a navigation sidebar includes 'My Plant', 'Configuration', and 'Settings'. The main area is titled 'Configuration' and contains four options: 'Status mappings', 'KPI types', 'Energy media', and 'Delete unused KPI'. The 'Energy media' option is selected, leading to a detailed configuration page. This page features a search bar, a 'New energy medium' button, and a table of configured energy media.

| Energy medium name | Color | Unit | | |
|--------------------|--------|----------------|--|--|
| Cold | Blue | kWh | | |
| Compressed Air | Grey | m ³ | | |
| Electricity | Green | kWh | | |
| Gas | Orange | kWh | | |
| Heat | Red | kWh | | |
| Steam | Brown | t | | |
| Water | Blue | m ³ | | |

List of all configured media

- Admin Users can add, modify or delete a energy media
- The media is defined by a name, a unit of measure and a color
- It is used in the media analysis

General settings

“Configuration/KPI Type”

Energy Manager on Industrial Edge KPI Type

The image shows two overlapping screenshots of the Siemens Energy Manager web interface. The top screenshot displays the 'Configuration' page with a sidebar containing 'My Plant', 'Configuration', and 'Settings'. The main content area lists four configuration options: 'Status mappings' (List of all available status mappings), 'KPI types' (List of all available KPI types), 'Energy media' (List of all available energy media), and 'Delete unused KPI instances' (List of all unused KPI instances). The bottom screenshot shows the 'KPI types' configuration page, which includes a search bar, a '+ New KPI type' button, and a table with one entry: 'Valuable energy' with edit and delete icons.

List of all KPI Types
Admin Users can add, modify or delete a KPI Type

Note:
A KPI Type can only be deleted if there is no linked KPI Instance available

Energy Manager on Industrial Edge

KPI Type to reuse the algorithm several times with less effort

SIEMENS ENERGY MANAGER

My Plant
Configuration
Settings

< Back

Edit "Valueable energy"

Name *
Valueable energy

Unit *
%

Formula editor *

+ - ÷ × () Add constant Add operand

Working / Total * 100

* These fields must be filled out.

Save Cancel Delete

A KPI Type is defined by its Name, its unit of measure and its formula
Within the formula the user can add operands, constants and calculation operations
Example:
"Valuable energy" = Working / Total *100
The name of the operands can be changed as well. An operand can be copied to be used several times in the same formula.
Operands are placeholders for the real variable assigned in the KPI Instance.

Configuration in My plant

Asset configuration for media analysis

Energy Manager on Industrial Edge

Asset configuration - Settings for media analysis

Assignment of energy medium

Here, you can link the parameter with the energy medium used. Additionally, you can define the reference value that is used for the KPI calculation.

Contract information

List of all energy media with the corresponding prices and CO2 equivalents.

Energy media assignment

You can edit the energy media in the navigation under "Configuration": [Energy medium](#)

Assign parameters of the energy medium
For each assignment, you can aggregate either one asset below the selected asset (sub-asset) or you can select a new asset in My Plant.

Costs for energy media assignments
Assets using energy media analysis cause additional costs.

| Energy medium * | Parameter that represents the energy medium * | Reference that represents the energy medium |
|-----------------|--|--|
| Electricity kWh | Sub-asset: VAR Electricity_Consumption Electricity_Consumption | Sub-asset: VAR Filled_bottles Filled_bottles |
| Gas kWh | Sub-asset: The value is aggregated from sub-assets. | Sub-asset: VAR Filled_bottles Filled_bottles |
| Water m³ | Sub-asset: The value is aggregated from sub-assets. | Sub-asset: VAR Filled_bottles Filled_bottles |

* These fields must be filled out.

Save Cancel

In the Asset Configuration, the admin user can define the settings for the media analysis

- Assign the consumed media and link the parameter representing the consumption as well as the reference for calculating the unit consumption. Optionally, the parameter can also be calculated by summing up the sub assets
- Define the costs and CO2 equivalent for each individual media in the section "Contract information"

Energy Manager on Industrial Edge

Asset configuration - Define the contract information

The screenshot displays the 'Contract information' configuration page for '06_Factory (Energy Manager)'. The interface includes a left-hand navigation menu with options like '01_Digi-Demonstrator', '02_Digi-Line', '03_Simulations', '04_Playground SIMATI...', '05_Tobi', '06_Factory (Energy M...', '10_Not in use', '20_MindConnects', '98_Others', 'COVID 19', 'demo', 'etnsief1', 'Factory', 'Subtenant_1', and 'Subtenant_2'. The main content area shows the breadcrumb path: '06_Factory (Energy Manager) > Asset Configuration > Contract information'. Below this, there is a note: 'You can edit the energy media in the navigation under "Configuration". [Energy medium](#)'. A 'Currency' dropdown menu is set to 'Euro (EUR)'. Two sections are visible: 'Electricity (2)' and 'Gas (1)'. Each section contains a table with columns for 'Contract valid from', 'Costs', and 'CO2 equivalent'. The 'Electricity' table has two rows: one for '01.01.2020' with costs of 0,08118 EUR/kWh and 0,00033 tCO2/kWh, and another for '01.01.2019' with costs of 0,08115 EUR/kWh and 0,00045 tCO2/kWh. The 'Gas' table has one row for '01.01.2019' with costs of 0,12 EUR/kWh and 0,002 tCO2/kWh. Each table row includes a trash icon and a 'Save' button. There are also '+ Add contract' buttons and a 'Save' button at the bottom of each table.

| Contract valid from | Costs | CO2 equivalent |
|---------------------|-----------------|------------------|
| 01.01.2020 | 0,08118 EUR/kWh | 0,00033 tCO2/kWh |
| 01.01.2019 | 0,08115 EUR/kWh | 0,00045 tCO2/kWh |

| Contract valid from | Costs | CO2 equivalent |
|---------------------|--------------|----------------|
| 01.01.2019 | 0,12 EUR/kWh | 0,002 tCO2/kWh |

The admin user can define the costs as well as the CO2 equivalents for each media

- The contract consists of a Contract valid from date, a Currency, the costs and the CO2 Equivalent.
- The unit of measure is given by the media in combination with the currency.
- The contract is inherited to all sub assets. The contract for an asset can also be unlinked in case if another setting for the asset including the sub assets is required

Configuration in My plant

Parameter view / Variable Configuration /
KPI Instance

Performance Insight on Industrial Edge

Parameter view

The screenshot shows the Siemens Parameter view for 'Machine 1'. The left sidebar contains a navigation menu with categories like 'My Plant', 'Configuration', and 'Settings'. The main area displays a table of parameters for 'Machine 1'. The table has columns for 'Name', 'Aspect name', and 'Unit'. Parameters are categorized as 'VAR' (Variables) or 'KPI' (Key Performance Indicators). Each row includes an edit icon (pencil) and a delete icon (trash can). A search bar and filter tabs ('All', 'VAR', 'KPI') are at the top of the table. A 'New KPI instance' button is also visible.

| | Name | Aspect name | Unit | |
|-----|----------------------|---------------------|---------|--|
| VAR | Energy_Consumption | Energy_Manager | kWh | |
| VAR | Water_Consumption | Energy_Manager | m3 | |
| VAR | Good_Counter | Machine_Monitor | pcs | |
| VAR | Machine_Mode | Machine_Monitor | mode | |
| VAR | Machine_State | Machine_Monitor | state | |
| VAR | Produced_Pieces | Machine_Monitor | x | |
| VAR | Target_Machine_Speed | Machine_Monitor | pcs/min | |
| VAR | Temperature | Machine_Monitor | x | |
| VAR | Total_Counter | Machine_Monitor | pcs | |
| VAR | Working_Houres | Machine_Monitor | x | |
| VAR | Workload | Machine_Monitor | x | |
| VAR | Alarm_ID | Notifier | ID | |
| VAR | Bad_Counter | Performance_Insight | pcs | |
| VAR | Good_Counter | Performance_Insight | pcs | |
| VAR | Machine_Status | Performance_Insight | state | |
| VAR | Temperature | Performance_Insight | °C | |
| VAR | Total_Counter | Performance_Insight | pcs | |
| VAR | Workload | Performance_Insight | % | |
| KPI | AE_Quality | | % | |

In the Parameter view you can see all the Variables of the Assets. And you can see all the KPI-Instances which are created in this asset.

You can edit the Uploaded Variables and the KPI-Instances.

Performance Insight on Industrial Edge

Parameter view – Variable settings

SIEMENS

My Plant

Configuration

Settings

< Back

Edit variable "Energy_Consumption"

General

Variable name
Energy_Consumption

Unit
 Unit from Mindsphere: kWh
Unit of measurement

Acquisition category *
ProcessValue
Select a category

Cycle
 The value is aggregated.
The value represents the end of the time range.

* These fields must be filled out.

Save Cancel

Define additional variable settings

- The admin user can define a new unit, if the unit is not defined well
- The acquisition category allows a classification which is linked to a default aggregation algorithm
- Define if the value is aggregated or not
- If the value is not aggregated, the values are continuously (actual values) transferred to the Data Service when the value changes. The transferred value is valid until the next value is transferred to the Data Service.
- If the value is aggregated, the value represents a period, e.g. 15 minutes.

Performance Insight on Industrial Edge Parameter view – Variable settings (Counter)

The screenshot shows the Siemens parameter view for the variable "Energy_Consumption". The main form is titled "Edit variable 'Energy_Consumption'" and has a "Back" button. The "General" tab is active, showing the variable name "Energy_Consumption", unit "Unit from Mindsphere: kWh", and acquisition category "Counter". A "Cycle" checkbox is checked, indicating that the value is aggregated. Below this, a list of counter definitions is shown, with one entry: "Valid from 01.01.20, 00:00". An "Add new definition" button is present. A "Save" button and a "Cancel" button are at the bottom. A red asterisk indicates that some fields must be filled out.

Counter (1)

Valid from 01.01.20, 00:00 Delete

Date (from) * dd.mm.yy Time (from) * hh:mm:ss

Counter constant * Value for the up and down counter

Counter type * Up counter Up & Down counter

Reset behavior Triggered reset The counter is reset per cycle or by an event.

Range start Limit range end

Value at installation Value at replacement

+ Add new definition

* These fields must be filled out.

Save Cancel

Define the settings for a counter (Acquisition category "Counter")

- Define the installation date/time
- Define the counter constant
- Define the counter type
- Define the overflow behaviour
- Triggered reset means that the counter starts from 0 without an overflow limit consideration
- If you define the start and end range, the overflow takes place at the overflow limit.
- Define the value at installation and value at replacement if necessary

KPI Instances

Create KPI Instance

The screenshot shows the Siemens digidemo interface. On the left, a navigation menu is visible with 'My Plant' and 'Settings' sections. Under 'My Plant', 'Machine 2' is highlighted with an orange box. The main area displays the 'Machine' module with the 'Parameter' tab selected, also highlighted with an orange box. A search bar and filter tabs ('All', 'VAR', 'KPI') are present. A 'New KPI instance' button is highlighted with an orange box. Below the search bar is a table of KPIs.

| | Name | Aspect name | Unit | |
|-----|----------------------|---------------------|---------|-------------------------------------|
| VAR | Energy_Consumption | Energy_Manager | kWh | ✎ |
| VAR | Water_Consumption | Energy_Manager | m3 | ✎ |
| VAR | Good_Counter | Machine_Monitor | pcs | ✎ |
| VAR | Machine_Mode | Machine_Monitor | mode | ✎ |
| VAR | Machine_State | Machine_Monitor | state | ✎ |
| VAR | Produced_Pieces | Machine_Monitor | x | ✎ |
| VAR | Target_Machine_Speed | Machine_Monitor | pcs/min | ✎ |
| VAR | Temperature | Machine_Monitor | x | ✎ |
| VAR | Total_Counter | Machine_Monitor | pcs | ✎ |
| VAR | Working_Hours | Machine_Monitor | x | ✎ |
| VAR | Workload | Machine_Monitor | x | ✎ |
| VAR | Alarm_ID | Notifier | ID | ✎ |
| VAR | Bad_Counter | Performance_Insight | pcs | ✎ |
| VAR | Good_Counter | Performance_Insight | pcs | ✎ |
| VAR | Machine_Status | Performance_Insight | state | ✎ |
| VAR | Temperature | Performance_Insight | °C | ✎ |
| VAR | Total_Counter | Performance_Insight | pcs | ✎ |
| VAR | Workload | Performance_Insight | % | ✎ |
| KPI | AE_Quality | | % | ✎ 🗑 |

To create an KPI instance go to the tab “parameter” in the module “My Plant”

KPI Instances

Different typed and type less KPI Instance

The screenshot shows the 'Add KPI instance' configuration interface. It includes a 'Back' button, a 'My Plant' sidebar, and a 'Configuration' section. A warning message states: 'Costs for one KPI: The creation of a KPI instance incurs costs.' The 'KPI instance name' field contains 'KPI_instance_Name'. Under 'Select a KPI basis', the 'On basis of a KPI type (typed)' radio button is selected. The 'Select KPI type' section shows 'AE_Quality' selected in a dropdown. The 'Formula preview' shows 'Good_Pieces / (Good_Pieces + Bad_Pieces) * 100'. The 'Link operands' section shows 'Good_Pieces' and 'Bad_Pieces' linked to 'Find parameter' buttons. A red asterisk note at the bottom says '* These fields must be filled out.' and there are 'Save' and 'Cancel' buttons.

The screenshot shows the 'Add KPI instance' configuration interface for a typeless KPI. It includes a 'Back' button, a 'My Plant' sidebar, and a 'Configuration' section. A warning message states: 'Costs for one KPI: The creation of a KPI instance incurs costs.' The 'KPI instance name' field contains 'KPI_instance_Name'. Under 'Select a KPI basis', the 'Without KPI type (type less)' radio button is selected. The 'Unit' field contains 'pcs'. The 'Formula editor' shows '(Counter_1 + Counter_2) * 50'. The 'Link operands' section shows 'Counter_1' and 'Counter_2' linked to 'Find parameter' buttons. A red asterisk note at the bottom says '* These fields must be filled out.' and there are 'Save' and 'Cancel' buttons.

On basis of a KPI type

You can create a KPI-Instance on base of a KPI-Type. This is when you need one calculation in different KPI-Instances.

Without KPI type

When you need the Calculation only one time, you can use a type less KPI. So you don't have to create a KPI-Type.

KPI Instances

Edit / Delete

The screenshot shows the Siemens digidemo interface. On the left is a navigation tree with 'Machine 1' selected. The main area displays a table of KPI instances for 'Machine 1'. The table has columns for Name, Aspect name, and Unit. Each row includes a 'VAR' or 'KPI' indicator and an edit icon. The 'AE_Quality' row is highlighted with a red box, showing both an edit icon and a delete icon.

| | Name | Aspect name | Unit | |
|-----|----------------------|---------------------|---------|--|
| VAR | Energy_Consumption | Energy_Manager | kWh | |
| VAR | Water_Consumption | Energy_Manager | m3 | |
| VAR | Good_Counter | Machine_Monitor | pcs | |
| VAR | Machine_Mode | Machine_Monitor | mode | |
| VAR | Machine_State | Machine_Monitor | state | |
| VAR | Produced_Pieces | Machine_Monitor | x | |
| VAR | Target_Machine_Speed | Machine_Monitor | pcs/min | |
| VAR | Temperature | Machine_Monitor | x | |
| VAR | Total_Counter | Machine_Monitor | pcs | |
| VAR | Working_Houres | Machine_Monitor | x | |
| VAR | Workload | Machine_Monitor | x | |
| VAR | Alarm_ID | Notifier | ID | |
| VAR | Bad_Counter | Performance_Insight | pcs | |
| VAR | Good_Counter | Performance_Insight | pcs | |
| VAR | Machine_Status | Performance_Insight | state | |
| VAR | Temperature | Performance_Insight | °C | |
| VAR | Total_Counter | Performance_Insight | pcs | |
| VAR | Workload | Performance_Insight | % | |
| KPI | AE_Quality | | % | |

User can edit the KPI Instances.

It is possible to link the operands to other parameters.

It is also possible to delete the KPI-Instances, when it isn't in use anymore.

Backup Information

Aggregation algorithm - KPI Calculation

Performance Insight on Industrial Edge

Available aggregation algorithm

| Algorithm | Description |
|---------------|---|
| Average | Calculates the time-weighted average value of the read values. |
| Min, Max | Minimum, Maximum value in time range |
| Sum | Summarize all values |
| Last | Last value in time range |
| Counter | Counts all positive value changes; Counter difference (last – first value) considering counter resets. |
| Timer | The Timer calculates the time interval in which the variable was not 0. Unit = milliseconds. |
| EnergyToPower | A consumption value can be converted into power. This aggregation function can only be selected in combination with the acquisition category consumption value (Energy) and Counter. |
| PowerToEnergy | Power can be converted into a consumption value. This aggregation function can only be selected in combination with the acquisition category power value (Power). |
| AmountToFlow | An amount (per hour) can be converted directly into a flow value. This aggregation function can only be selected in combination with the acquisition category amount value (Amount) and Counter. |
| FlowToAmount | A flow value (amount/h) can be converted directly into an amount value. This aggregation function can only be selected in combination with the acquisition category flow value (Flow). |

Aggregation algorithm:

The user can define the aggregation algorithm at each place where the variable can be selected.

- Widget configuration
- Asset media assignment
- KPI Instance configuration

KPI Instances

Consequence of “value is aggregated”

- "Counter" aggregation function

| "The value is aggregated" = not activated | "The value is aggregated" = activated |
|---|---|
| | |
| Calculation example: The calculation period is from 00:10 to 00:50. Result: 1 + 1 + 1 + 1 = 4 | Calculation example: The calculation period is from 00:10 to 00:50. Result: 1 + 1 + 1 + 1 = 4 |

- "Average" aggregation function

| "The value is aggregated" = not activated | "The value is aggregated" = activated |
|--|--|
| | |
| Calculation example: The calculation period is from 00:10 to 00:50. $(10 + 20 + 30 + 40) / 40 = 2.5$ (average value across the calculation period) | Calculation example: The calculation period is from 00:10 to 00:50. $(20 + 30 + 40 + 50) / 40 = 3.5$ (average value across the calculation period) |

+ "Min", "Max" and "Last" aggregation functions

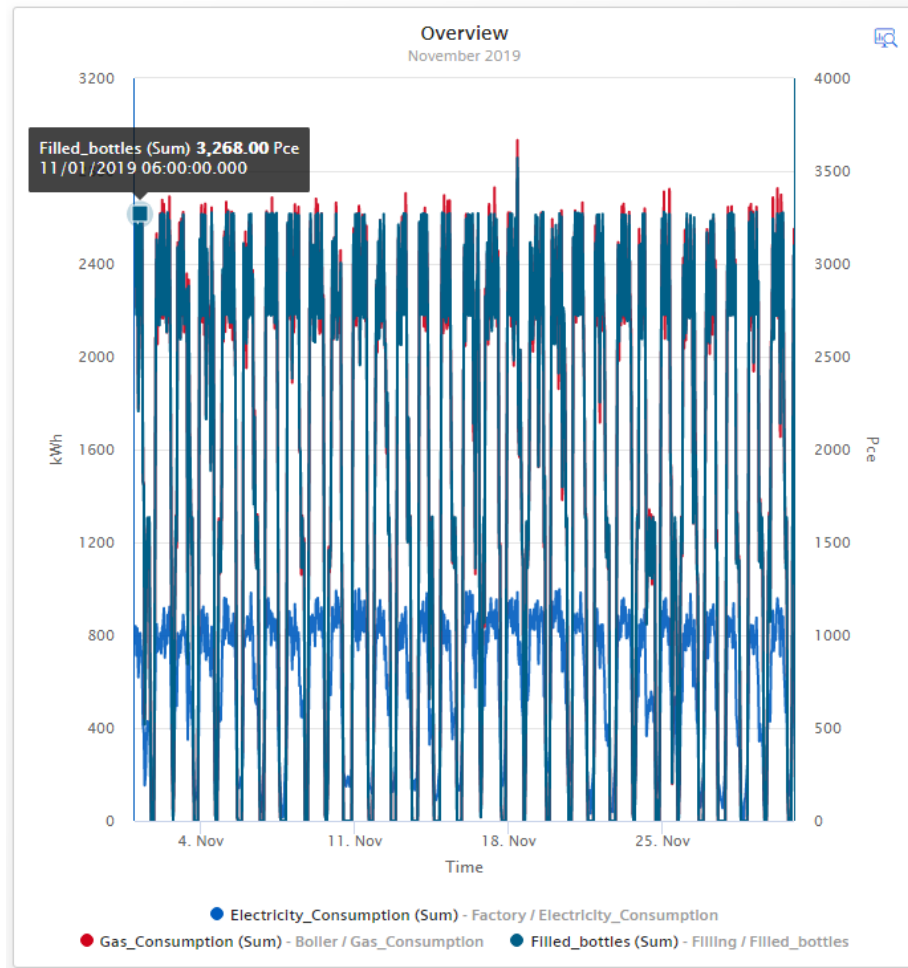
- "Sum" aggregation function

| "The value is aggregated" = not activated | "The value is aggregated" = activated |
|--|--|
| | |
| Calculation example: The calculation period is from 00:10 to 00:50. $1 + 2 + 3 + 4 = 10$ | Calculation example: The calculation period is from 00:10 to 00:50. $2 + 3 + 4 + 5 = 14$ |

What does “value is aggregated mean

- If the value is not aggregated, the values are continuously (actual values) transferred to the Data Service when the value changes. The transferred value is valid until the next value is available
- If the value is aggregated, the value represents a period, e.g. 15 minutes. The timestamp is always at the end of the period

Performance Insight on Industrial Edge Data reduction algorithm



Example scenario:

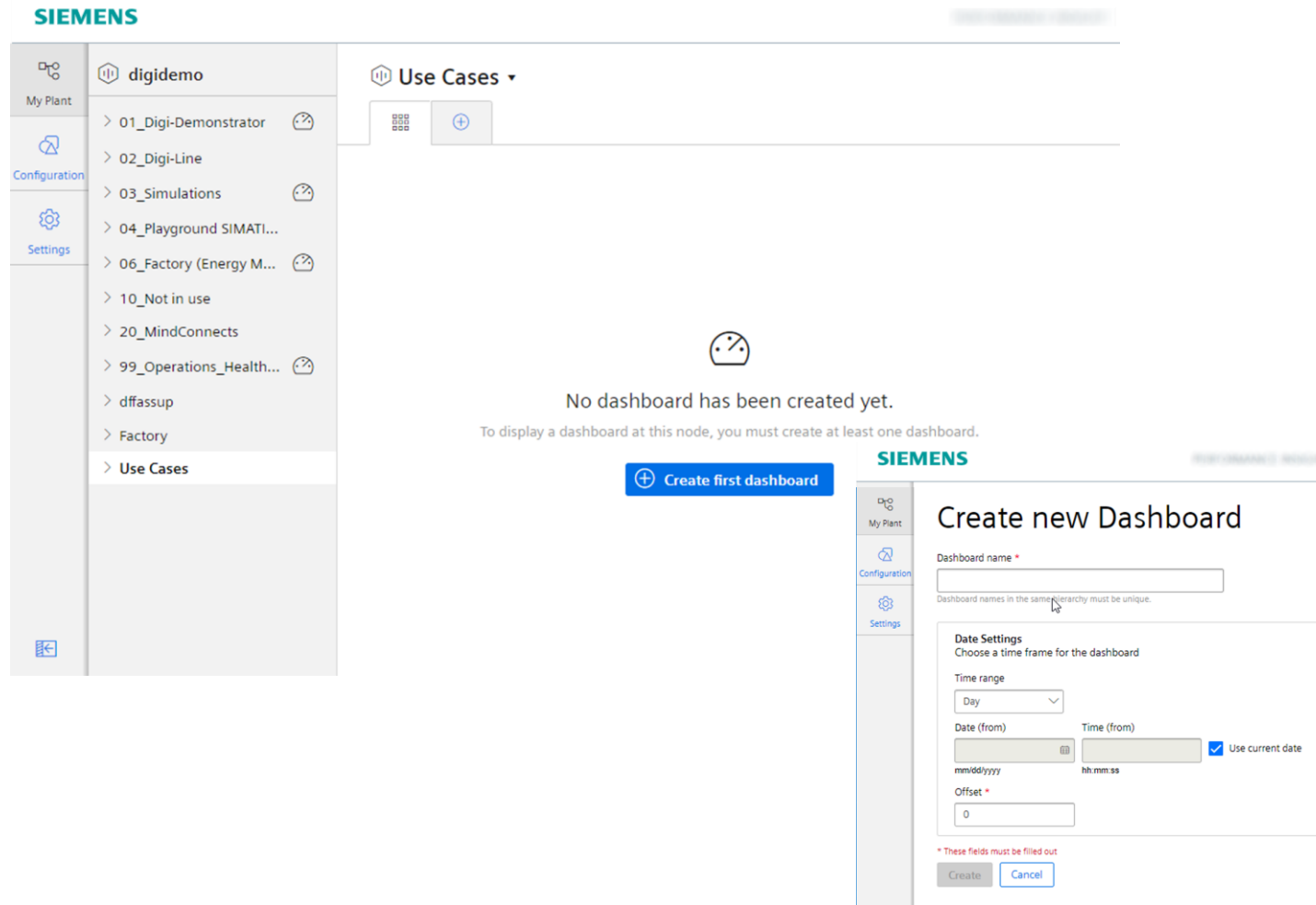
The user is interested in a large time range with high frequency data

- A variable value is stored every minute in the Data Service. (Values per day = 1440; Values per year = 512640 ~ half million).
- To reduce the amount of transferred data a reduction algorithm is applied which takes the available pixel into account.
- To reduce the amount of data the requested time range is divided into sections (number of pixels). From each of this sections the minimum and the maximum value is calculated and transferred

Dashboard and Widgets

New Dashboard

Add a Dashboard



The screenshot shows the Siemens dashboard interface. On the left, there is a navigation menu with 'My Plant' selected. The main area displays 'Use Cases' with a grid icon and a '+' button. Below the grid, a message states: 'No dashboard has been created yet. To display a dashboard at this node, you must create at least one dashboard.' A blue button labeled '+ Create first dashboard' is visible. Below this, a 'Create new Dashboard' form is shown, including fields for 'Dashboard name', 'Date Settings' (Time range, Date (from), Time (from), Offset), and a 'Use current date' checkbox. The form has 'Create' and 'Cancel' buttons at the bottom.

The plant structure is defined by the Data Service asset model. For each asset you can define up to 5 dashboards

Creating a dashboard:

- Click the button “Create first dashboard” or click the + in the tab.
- Define the name of the dashboard.
- Define the time picker settings. With the Offset you can move the time range to the past.

New Dashboard Time Picker



Range: Day
Offset: 0

| From | To | Range |
|----------------------|----------------------|------------------|
| October 2019 | October 2019 | User-defined ✓ |
| Su Mo Tu We Th Fr Sa | Su Mo Tu We Th Fr Sa | Day |
| 29 30 1 2 3 4 5 | 29 30 1 2 3 4 5 | Week |
| 6 7 8 9 10 11 12 | 6 7 8 9 10 11 12 | Month |
| 13 14 15 16 17 18 19 | 13 14 15 16 17 18 19 | Year |
| 20 21 22 23 24 25 26 | 20 21 22 23 24 25 26 | The last 3 hours |
| 27 28 29 30 31 1 2 | 27 28 29 30 31 1 2 | The last 7 days |
| 3 4 5 6 7 8 9 | 3 4 5 6 7 8 9 | The last 14 days |
| ^00 v : ^00 v ⊗ | ^00 v : ^00 v ⊗ | The last 30 days |

OK Cancel

Time picker for showing the dashboard in the desired time range

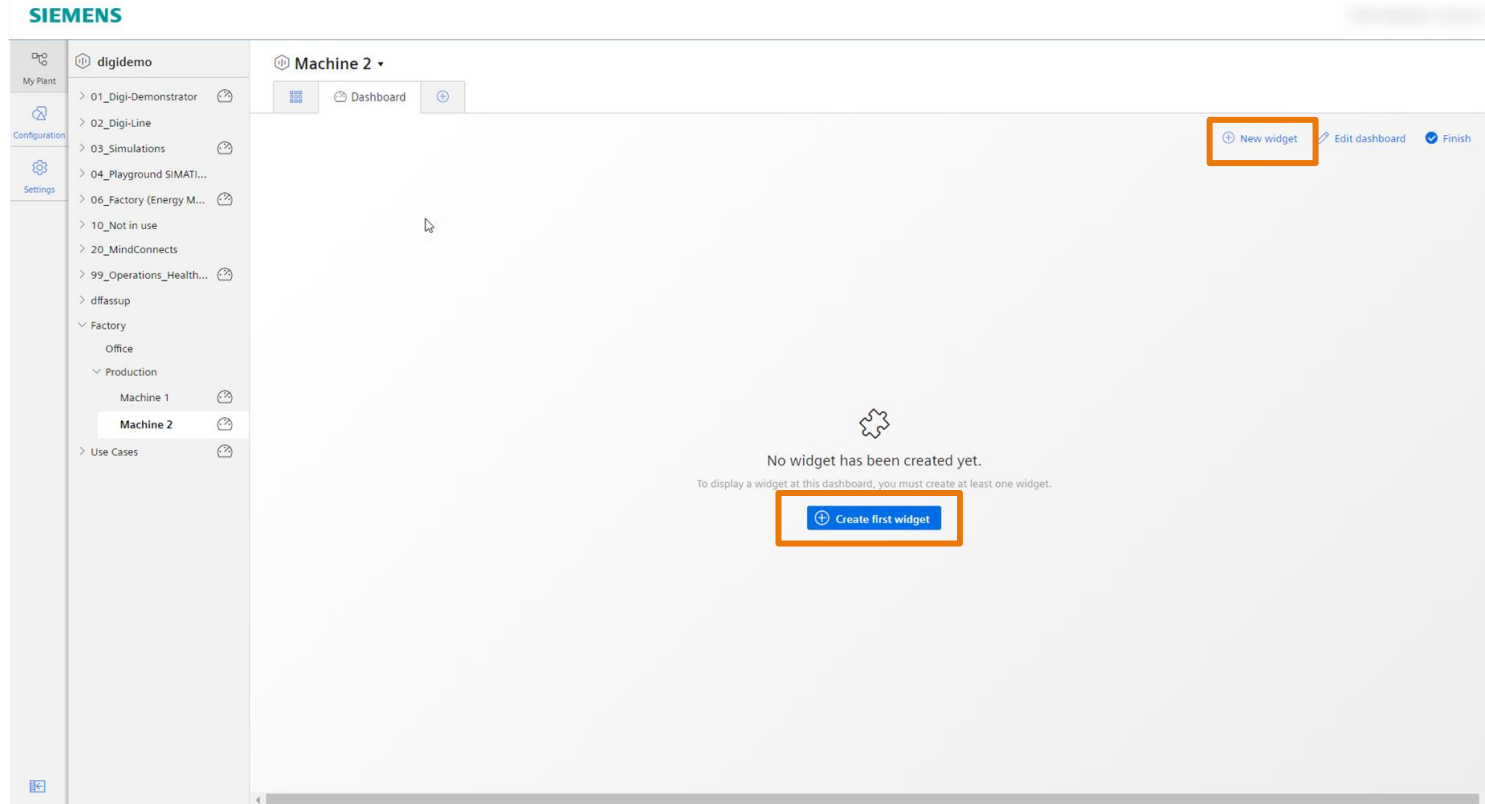
The initial time picker configuration can be defined in the dashboard configuration

Supported time ranges:

- User-defined: the begin & end date incl. time can be defined
- Day: 00:00 – 00:00
- Week: Monday – Sunday
- Month: 1st – last day of month
- Year: January – December
- The last 3 hours, last 7 days, last 14 days, last 30 days

Add Widgets to the dashboard

New Widget



To add a widget press the button “Create first widget” or change to the dashboard edit mode and click the button “New widget”

Energy Manager on Industrial Edge

Add a widget

SIEMENS ENERGY MANAGER

My Plant Configuration Settings

× Cancel ① Type ② Details ③ Parameter Continue >

1. Select widget type

Select one of the widget types to visualize your data.

- Diagram
- Value
- Gantt
- Gauge
- Pie
- Heatmap
- Sankey
- Duration Curve

“Create first widget” or change to the dashboard edit mode and click the button “New widget”

Create the widget:

Select the widget Type

Define the details like name and time picker behavior

Select the parameter which should be displayed

Define the parameter specific settings like limits, color, decimal places or an alternative name

Define the widget specific settings like line type, visibility or if the lines shall be stacked

Add Widgets to the dashboard

2. Define the details

The screenshot shows the Siemens dashboard configuration interface. At the top, there is a navigation bar with the Siemens logo and a breadcrumb trail: < Cancel > 1 Type > 2 Details > 3 Parameter > 4 General display options > 5 Diagram - Display options. Below the navigation bar, there is a sidebar with 'My Plant', 'Configuration', and 'Settings' options. The main content area is titled '2. Define details' and contains the following fields and options:

- Widget name ***: A text input field containing 'Overview'.
- Date settings**: A section with a checked checkbox labeled 'Use the date settings from the dashboard.'
- Interval for the time range**: A section with a 'Calculation period *' field containing '1' and a dropdown menu set to 'Hour(s)'. Below this is the text 'Define the interval for the corresponding time range.'

A red asterisk at the bottom left indicates: '* These fields must be filled out.'

Step 2: Define the details
Enter a unique name for the widget
Define the date/time settings:

- Use the date settings from the dashboard
- Dedicated date & time definition by selecting the time range and optionally an Offset.
- The interval for the time range is used for the KPI calculation or the Variable aggregation

Add Widgets to the dashboard

3. Select the parameter

The screenshot shows the Siemens dashboard configuration interface. The breadcrumb trail is: Create new widget > Diagram > Overview. The current step is '3. Select parameter'. Below the title, it says 'Select KPI instances or tags.' There is a table with three rows:

| ID | Name | Path | Type | Aggregation |
|----|--------------------------|---|------|-------------|
| 01 | Gas_Consumption (S...) | digidemo / 06_Factory (Energy Manager) / Office | VAR | Sum |
| 02 | Water_Consumption (...) | digidemo / 06_Factory (Energy Manager) / Office | VAR | |
| 03 | Electricity_Consumpti... | digidemo / 06_Factory (Energy Manager) / Office | VAR | |

Below the table is a search bar: 'Select an additional parameter.' and a section for 'New KPI instance' with a '+ New KPI instance' button. A modal dialog titled 'Select parameter' is open, showing a list of available variables:

- VAR Gas_Consumption
- VAR Water_Consumption
- VAR Electricity_Consumption

At the bottom of the modal, it says '3 selected parameter(s)' and has 'Choose' and 'Cancel' buttons.

Step 3: Select parameter
The user can select one or several variables or KPI instances based on the widget type Variable

- Available variables can be selected
- For the variable the user can select the aggregation algorithm. NONE means displaying the raw data which is only applicable in the chart

KPI Instances

- If there is no matching KPI Instance a new KPI Instance can be created

Add Widgets to the dashboard

4. Define the display options

The screenshot shows the Siemens dashboard configuration interface. The top navigation bar includes 'My Plant', 'Configuration', and 'Settings'. The main content area is titled '4. Define general display options' and includes a breadcrumb trail: 'Create new widget > Diagram > Overview'. Below the title, there is a sub-header '4. Define general display options' and a description: 'Define the general display options for the selected parameters.' The interface displays a list of parameters with their respective settings. The first parameter is 'Gas' (Gas_Consumption) with a path of 'digidemo / 06_Factory (Energy Manager) / ...', type 'VAR', and aggregation 'Sum'. The settings for this parameter are: 'Alternative label' (Gas), 'Number of decimal places' (2), and 'Color' (blue). Below these settings, there is a 'Limits' section with a description: 'Optional. The limits are used to display general restrictions.' The limits are defined by four thresholds: 'Low limit alert' (0), 'Low limit warning' (0), 'High limit warning' (1200), and 'High limit alert' (1400). A horizontal bar below the limits shows the corresponding alert levels: Alert (red), Warning (yellow), OK (white), Warning (yellow), and Alert (red). The second parameter is 'Water_Consumption' and the third is 'Electricity_Consumption', both with similar settings.

Step 4:
The User can define general settings for each parameter in the Widget:

- Set an alternative label which is used in e.g. the legend
- Set the number of decimal places
- Set the color of the graphs
- Set the lower and higher limits

Add Widgets to the dashboard

5. Define display options

The screenshot shows the Siemens dashboard configuration interface. The top navigation bar includes 'My Plant', 'Configuration', and 'Settings'. The main content area is titled '5. Diagram - Define display options' and includes a breadcrumb trail: 'Create new widget > Diagram > Overview'. Below the title, there are steps: '1 Type', '2 Details', '3 Parameter', '4 General display options', and '5 Diagram - Display options'. The main configuration area shows a table with columns for 'Type' and 'Further options'. A dropdown menu is open under the 'Type' column, showing options: 'Line', 'Spline', 'Area', 'Bar', and 'Scatter'. Below the table, there are two 'Y-axis' configuration panels. The first panel is for 'kWh' and the second is for 'm³'. Each panel has fields for 'Name', 'Low limit', and 'High limit', and a list of parameters to assign to the axis. The 'kWh' panel has parameters for 'Gas' and 'Electricity_Consumption (Sum)'. The 'm³' panel has a parameter for 'Water_Consumption (Sum)'. A 'New Y-axis' button is at the bottom.

Step 5:

The User can set the display option for each parameter in the Widget:

- Line Type (Line, Spline, Area, Bar, Scatter)
- Visibility
- Stacked

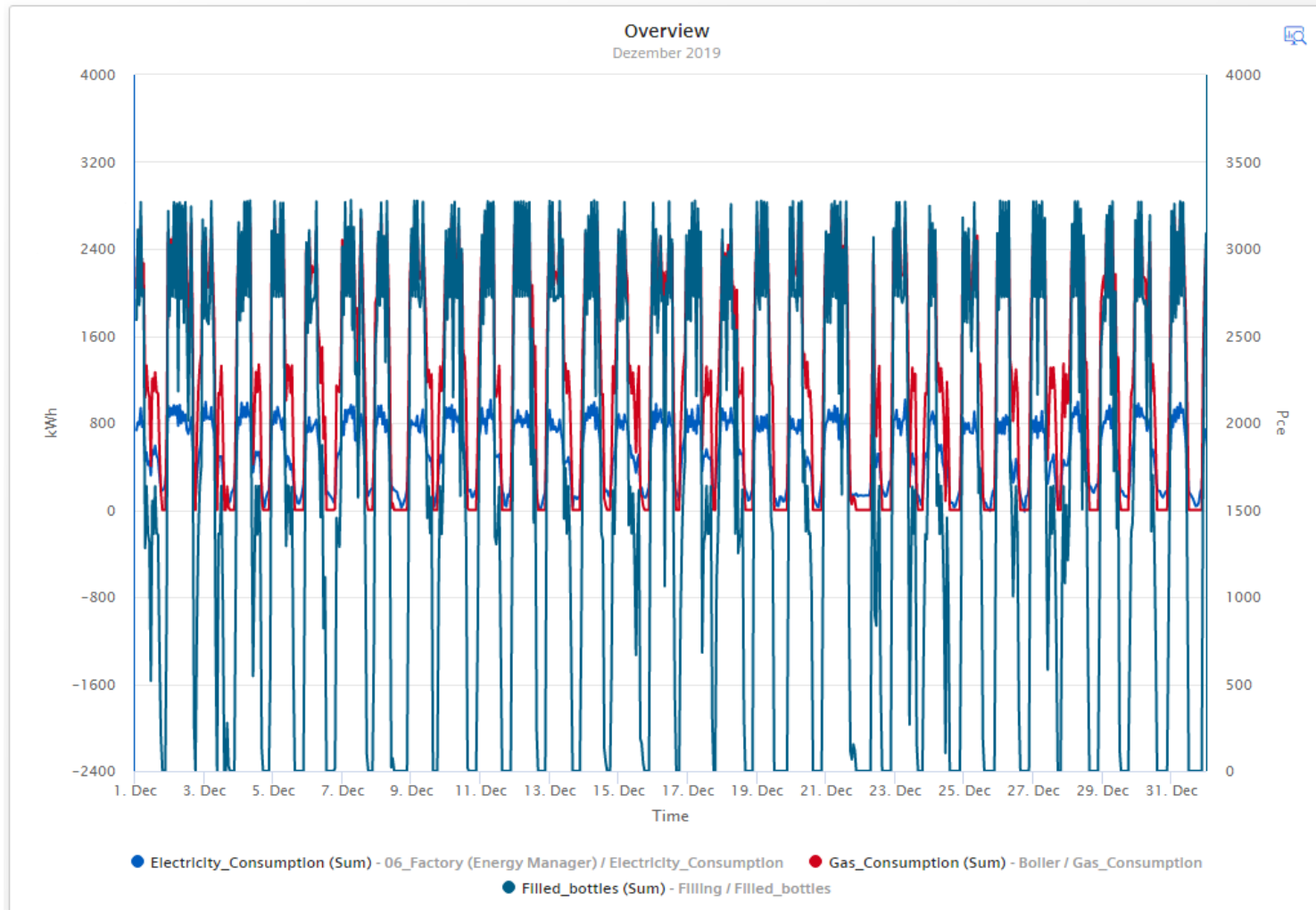
The user can define up to 5 y-axis and can configure the scaling option

- Autoscaling (two blank fields)
- 0 Point scaling (Lower Limit = 0)
- Fix Range (e.g lower limit, 10 upper limit 100)

Widgettypes

Widgettypes

Diagram - Chart widget



User can perform data analysis by using the functions as follows:

- Changing time range, Using the zoom functionality
- Hide or unhide a graph; show the limits for an individual parameter
- Use the tooltip for the exact value
- Using up to 10 variables and up to 5 Y-Axis

The following detailed views are available

- Chart displaying detailed data
- Histogram including statistic values
- Regression analysis

Widgettypes

Value widget



User overview about the KPI or aggregated variable:

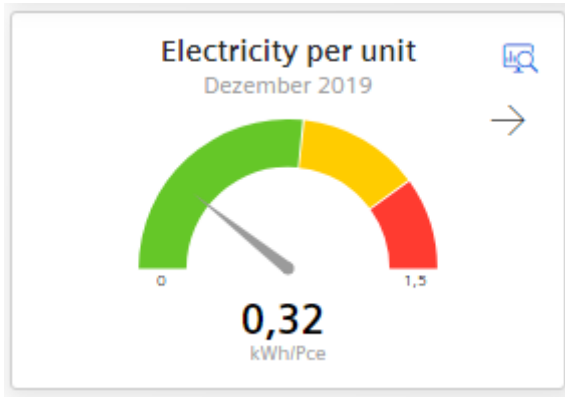
- Display the statistic (Note: The statistic is based on the KPI or variable aggregation based on the interval for the time range)
- The arrow represent the trend of the displayed value compared to the previous period

The following detailed views are available

- Chart displaying detailed data
- Histogram including statistic values

Widgettypes

Gauge widget



With the Gauge Widget the user gets an overview about higher and upper limits of values

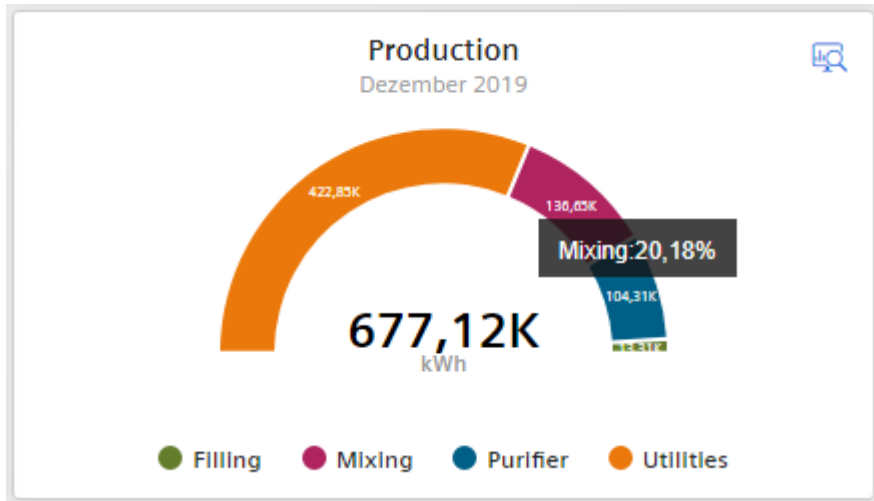
- The user can define the limits for the sections whereby the limits for the parameter are used.
- The arrow represent the trend of the displayed value compared to the previous period

The following detailed views are available

- Chart displaying detailed data
- Histogram including statistic values

Widgettypes

Pie widget



With the Pie Widget the user gets an overview about the distribution of quantities

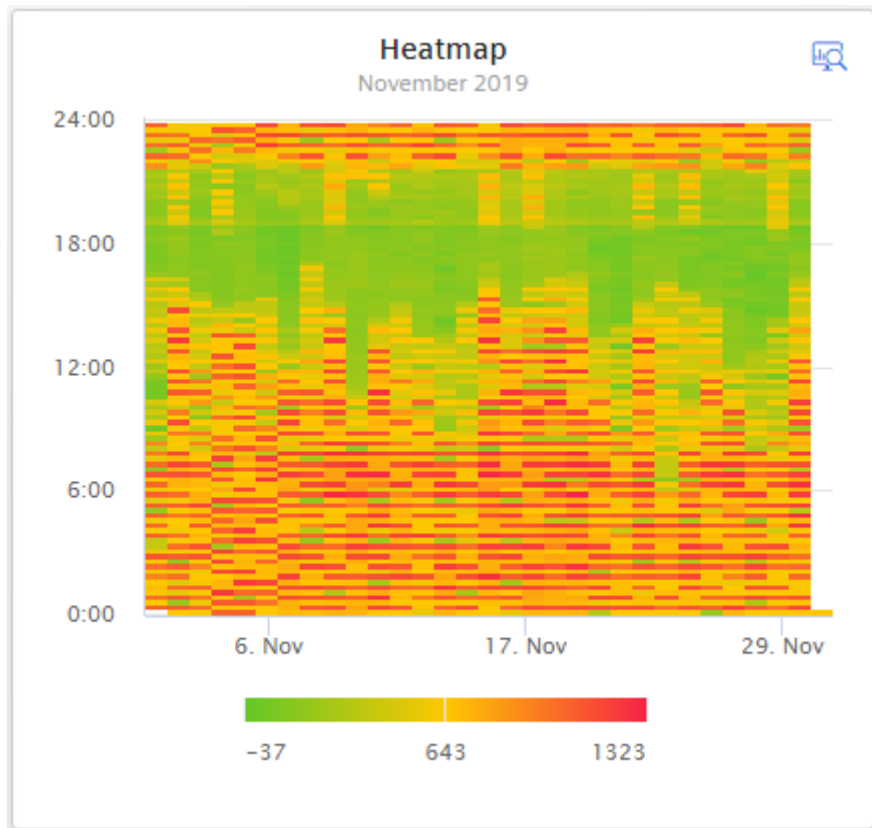
- With a click on the section the section is highlighted and user gets the corresponding value

The following detailed views are available

- Chart displaying detailed data
- Histogram including statistic values
- Regression analysis

Widgettypes

Heatmap



With the Heatmap Widget the user gets an overview about when (time of the day) the peaks appear. The value is represented by a color

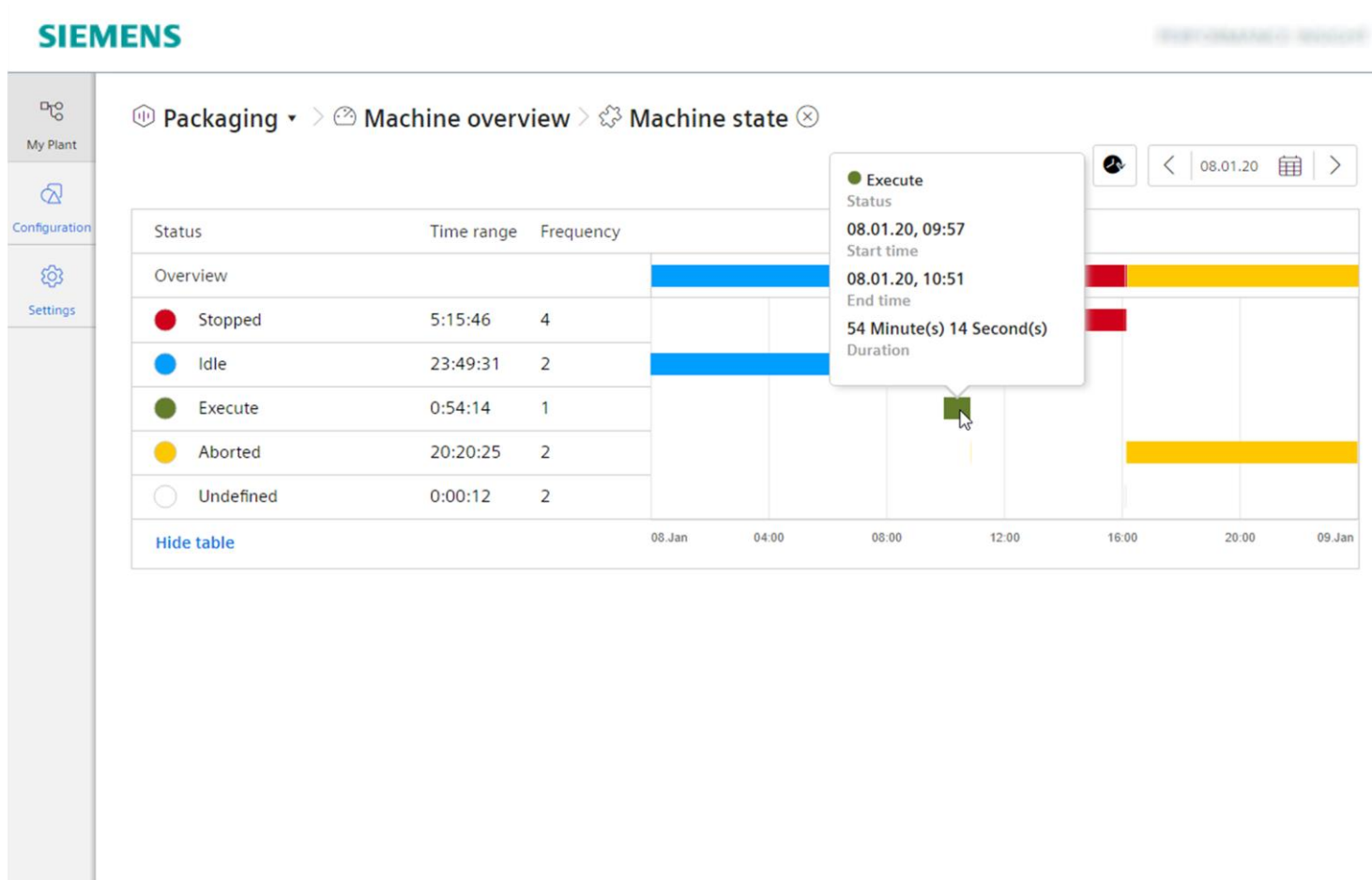
- Zoom in to get details
- A tooltip provides the exact value

The following detailed view is available

- Heatmap
- Chart displaying detailed data
- Histogram including statistic values

Widgettypes

Gantt chart



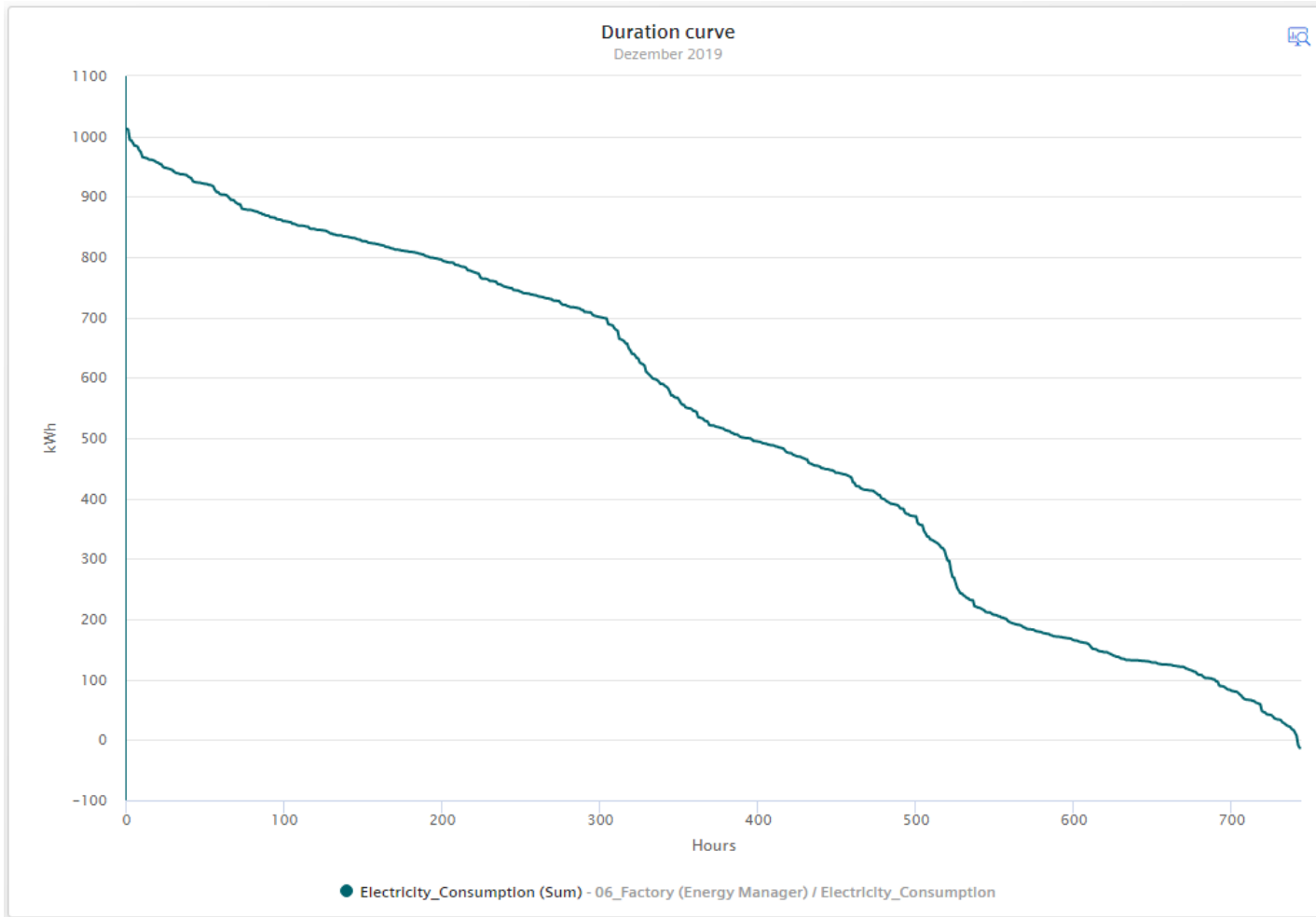
With the Gantt Chart Widget the user gets an overview about the machine state

- User can change the time range
- Use the tooltip for the exact values
- Use the Advanced Gantt View to see in detail, how often and how long the machine was in the different defined machine states
- Use “Show table” to show the time range and frequency

Note: For the first and the last state period, the actual start and end time is used. Also in cases if this is out of the observation period. This is the reason why the sum of all time ranges can be greater than the observation period.

Energy Manager on Industrial Edge

Overview – Duration curve



With the Duration curve Widget the user gets a sorted load curve. The highest value is on the top left and the lowest value is on the right bottom

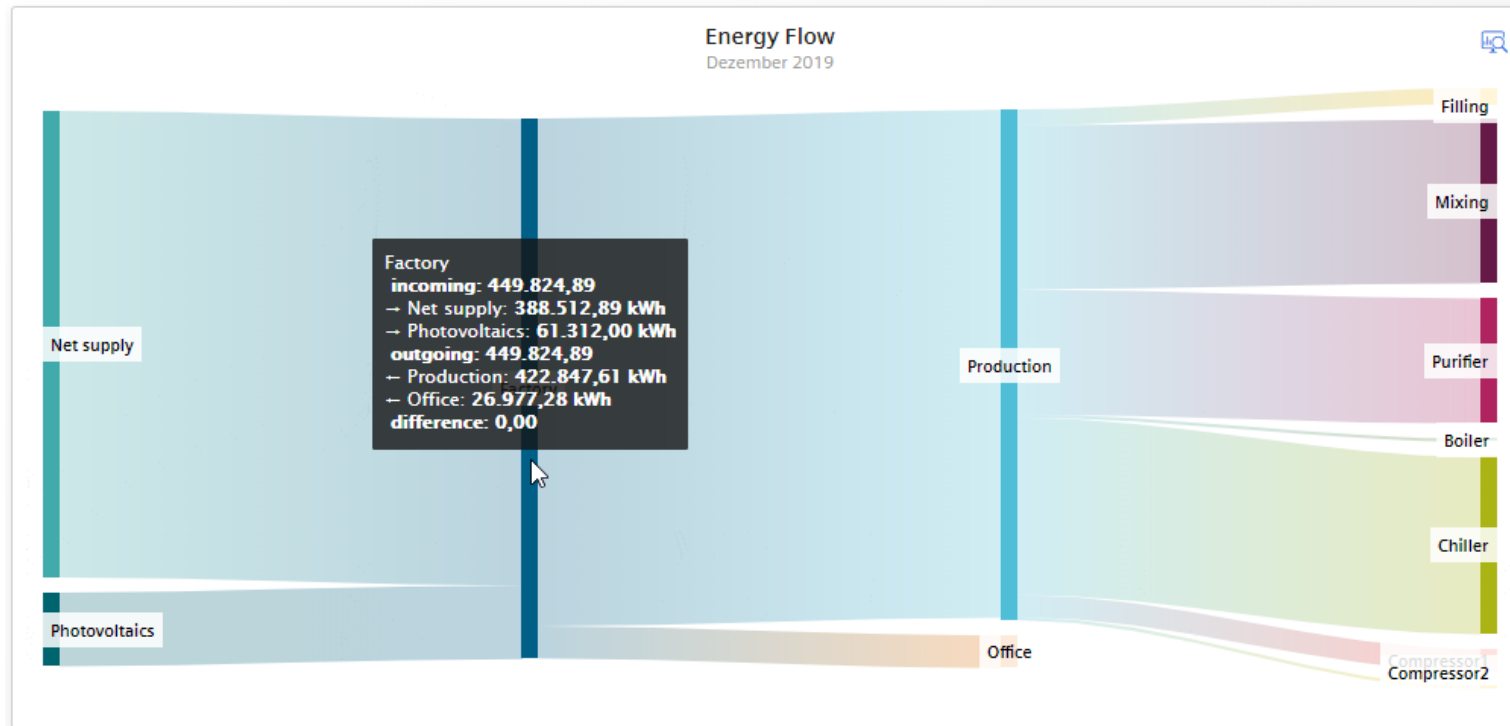
- Zoom in to get details
- A tooltip provides the exact value

The following detailed view is available

- Chart displaying the sorted load curve but only the top n values. The amount of displayed values can be configured in the widget configuration

Energy Manager on Industrial Edge

Overview – Sankey diagram



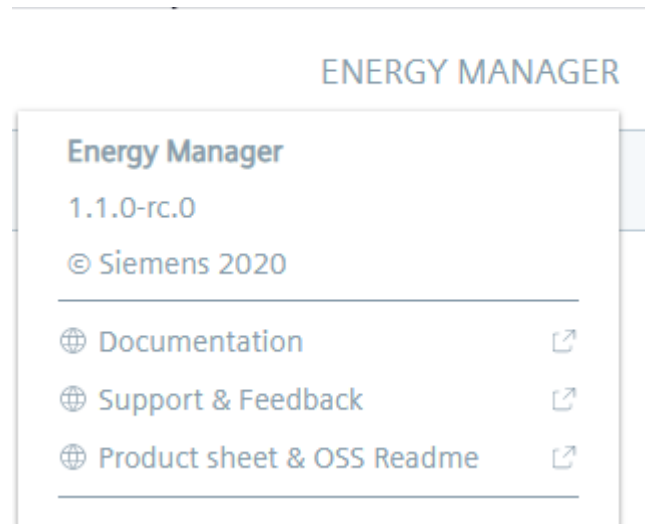
With the Sankey Widget the user gets an overview about the energy flow

- The width of the bar represents the value
- The user can configure nodes which are connected by links
- A link represents a parameter (Variable or KPI)
- A tooltip provides the additional information

Edge App OS bar

Energy Manager on Industrial Edge

Edge App OS Bar



Use the Edge app OS bar to access information about Energy Manager

- Version Information
- Copyright
- Documentation
- Support & Feedback
- Product sheet & OSS Readme

Service, Support and Training

Service and Support



Online documentation

EN: <https://support.industry.siemens.com/cs/ww/en/view/109780728>

DE: <https://support.industry.siemens.com/cs/ww/de/view/109780728>

SIOS

<https://support.industry.siemens.com>

Support

For support contact your regional contact person.

For support contact your regional contact person.

They will forward your request to the responsible person

Thank you for your attention!

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