ABB Ability™ Energy Manager

Checking

ABB Ability™ Energy Manager – Checking

Market needs and use cases

Energy cost efficiency and environmental implications are top priority all over the world, particularly for heavy energy consumers.

They aim to reduce energy costs, improve energy efficiency and manage carbon footprint needs to set up continuous improvement cycles, identify action areas and track the benefits of action done.

- Formula based calculations
- Regression Analysis
- Import data
- Know consumptions

- Configure M&V reports
- Utility bill management
- Analyze Bills

- Operations wastage analysis
- Discover saving opportunities
- Analyze Tariffs and CO_2

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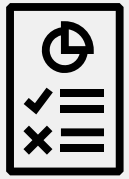
Use cases

Companies that want to achieve or have established mature Energy Management strategies and commitment towards energy efficiency, including energy consultant or ESCos that supports their customer in the journey. ABB Ability Energy Manager Checking Edition can help organizations reduce energy costs, improve energy efficiency, and meet their sustainability goals.

ESCOs, energy managers, and energy consultants to **obtain ISO50001 and LEED certification** for their clients by monitoring their clients' energy usage, identifying areas for optimization, implementing energy-saving measures, generating reports, and providing insights to their clients on energy usage and savings by simplifying the energy efficiency initiatives.

IPMVP M&V Tool to validate savings & Verify the impact of energy conservation measures & generate reports and provide insights on energy usage and savings. Monitor and optimize energy usage across multiple sites by tracking energy usage trends, identify energy-saving opportunities, and implement energy-saving measures.



Evaluate performance over time & Historical data import & Reporting, tariffs, alerts & Formula based meters & What if analysis

Collect and analyze data on energy usage, identify energy-saving opportunities, and develop strategies to optimize energy usage.

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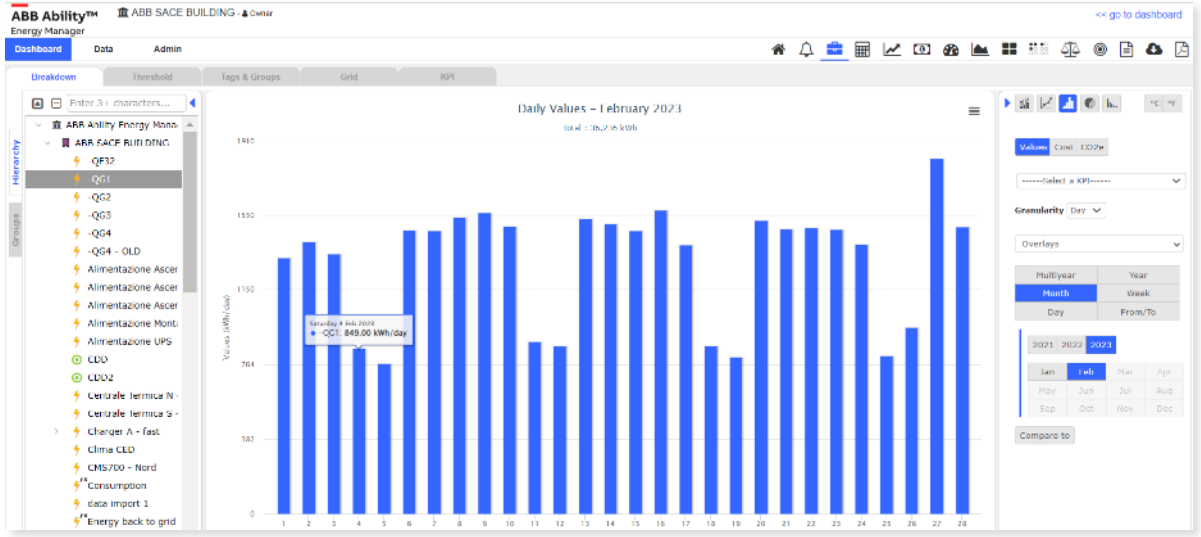
Value propositions

How we want to solve the needs

The Checking subscription has been specifically designed for ESCOs, energy managers, and energy consultants to monitor, optimize, and manage energy usage across multiple sites. It provides a range of features to evaluate energy consumption and verify savings over time that make it easier to obtain ISO50001 and LEED certification and develop effective energy management strategies.



Key Benefits

- Understand energy usage patterns, and energy inefficient operations and easily receive a full picture of your energy portfolio
- Use **formulas** to create custom analysis
- Understand the impact of external variables with the **regression analysis**
- Validate savings achieved with energy efficiency actions in accordance with **IPMVP** procedures by **M&V** tools
- Notification **alerts** for abnormal consumption trends and events
- Monitor and visualize the energy **KPIs** and benchmark for the buildings, and sites
- Export **customizable reports** including billing and activities maps
- Import data from your **bills** and monitor the data & understand costs associated with **peak demand rates**
- Analyze **peak demand** in 15- or 30-min intervals to find when the highest demand in kW/ kVA occurred

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Main functionalities on top of the ones of Complete Matching & Watching

Analyze data

Take advanced features on data analytics, also including:

- Thresholds, Tags and groups
- Grid view, KPI
- Custom formula
- Power peaks

Extract reports

Template base reports enable you to export data with:

- High flexibility in configuration
- Trend analysis
- Top consuming areas
- Billing
- Abnormal consumptions

What if analysis

Identify anomaly energy consumption and calculate the cost of waste based on historical data:

- Prove the need of energy efficiency measures
- Estimate savings based on historical data
- Support decision-making

IPMVP M&V

Verify your Energy Conservation measures projects saving time:

- Find correlation between consumption and other data
- Build a regression model in relation to consumption and other data sources
- International IPMVP standard

Formula Meters & regression

- Apply conditions and formulas to the meters
- Understand the impact of the variables for such as production, and degree days on consumption, and create a model

LEED and ISO 50001 certification

- Accelerate your ISO 50001 certification and LEED process through broad energy review

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Functionalities explanation

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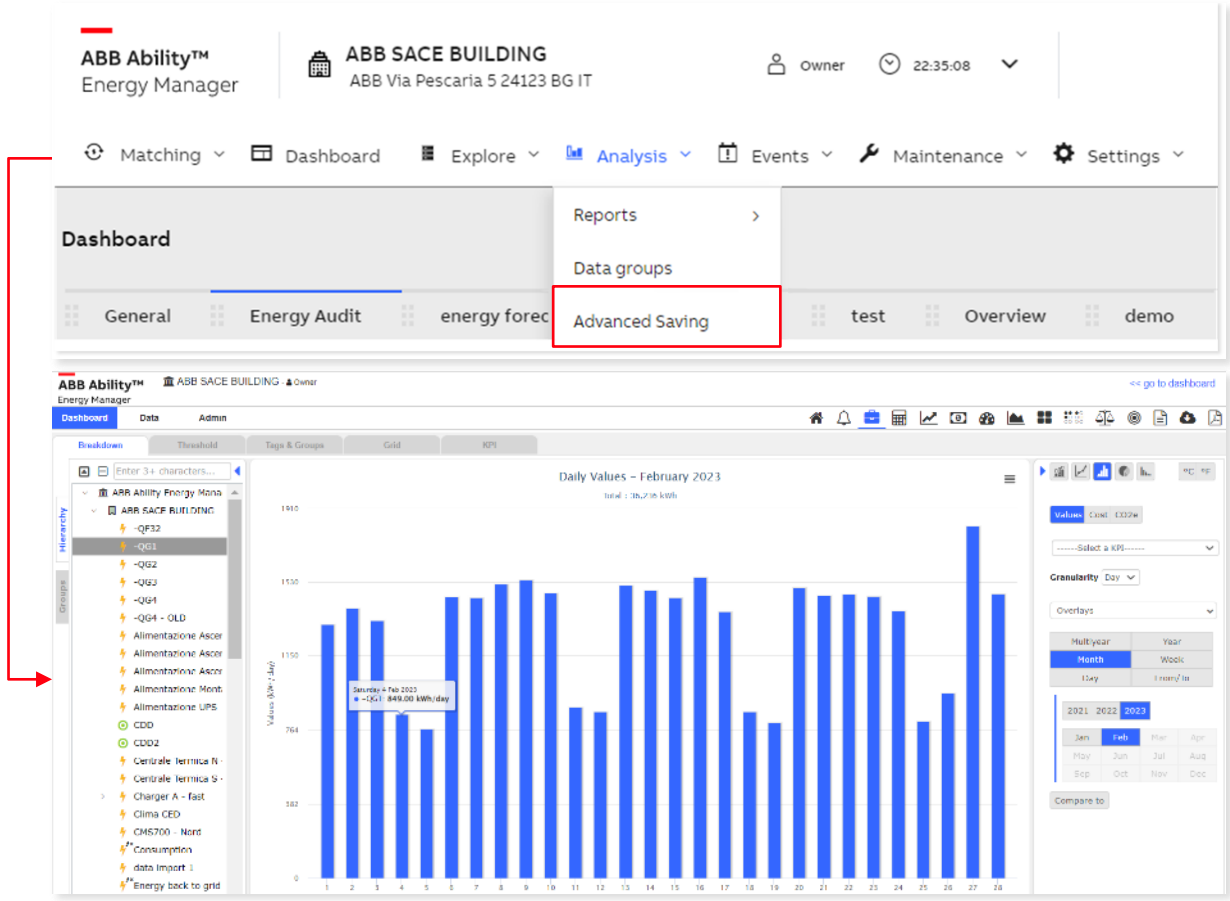
How to Access

Once the ABB Ability Energy Manager – Checking subscription is activated, clicking the **“Advanced saving”** button under the Analysis tab will redirect the customer to the page where new functionalities are available. The upgrades from other subscription data available in the tools will be related to the last year of data. To enable data processing some hours may be needed.



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Functionalities

Dashboard & Home

It is possible to look for specific high-level information related to the site, that you would like to have at your disposal.

Widgets:

Counter: The amount of energy used or the accumulated cost for the selected monitored point over a chosen period

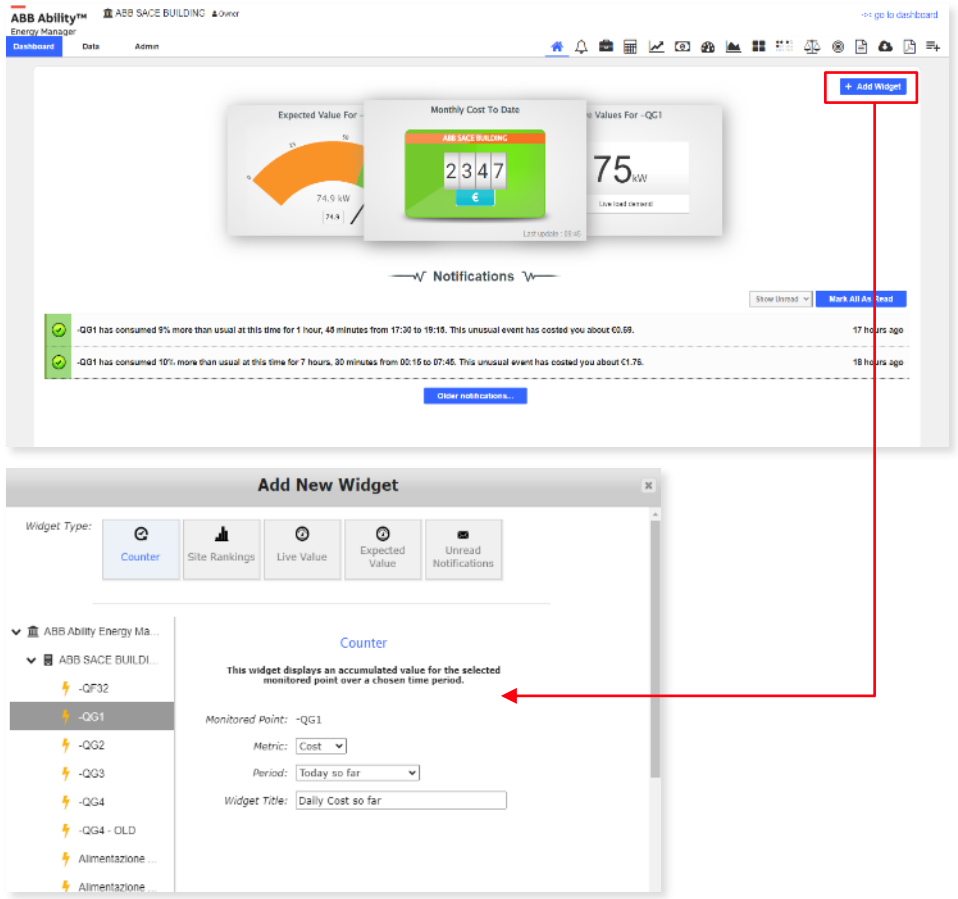
Site Rankings: The selected site's performance ranking compared to other sites within your organization

Live Value: The amount of energy a data point currently is consuming

Expected Value: The live value relative to its expected value

Unread Notifications: The number of unread notifications

Below the widgets, there is the notifications list of unexpected activities



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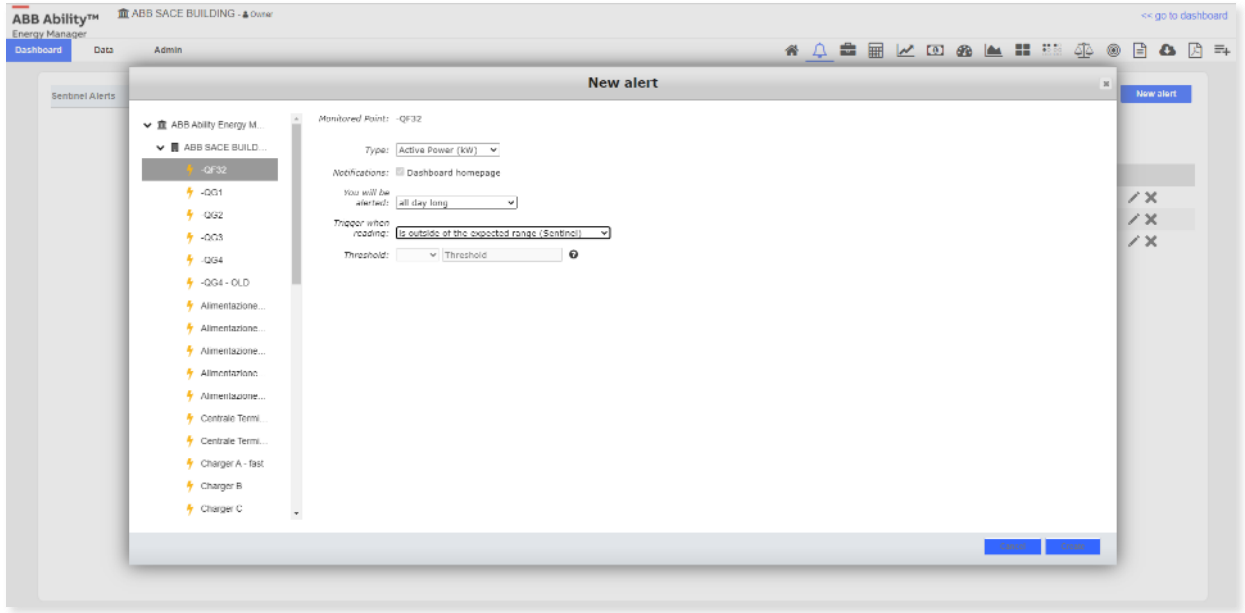
Functionalities

Notifications Settings

- Sentinel Alerts notify you when there is an abnormality on your data points
- Abnormalities are computed thanks to the smart software engine that predicts what the energy usage should be for all your data points and continuously compares the actual energy with the forecasted one to identify unexpected energy performance
- To create a new notification, just click on the “New Alert” button in the top right corner of the page screen and start to customize your alert
- You can see the notifications on the home page under the Notification section
- You can generate a report with all the sentinel notifications



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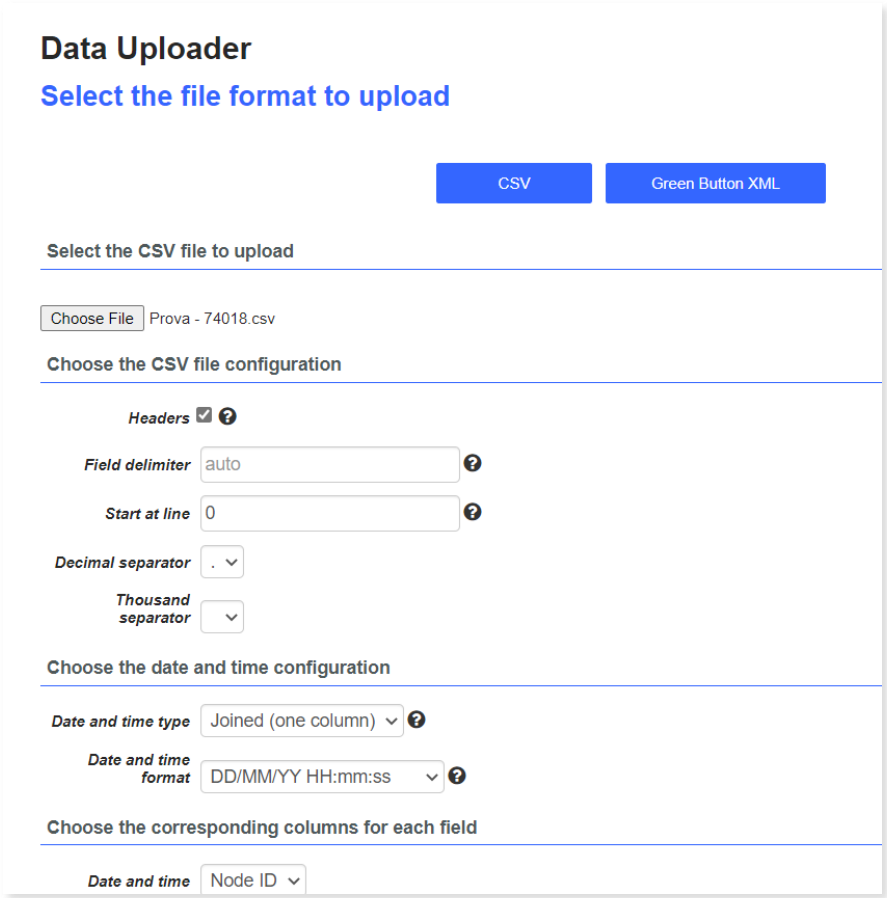
Functionalities

Data

- The Data tab allows users to import data from CSV or Green Button XML file formats, without using a specific template, providing great flexibility to populate your data
- The Data Uploader supports data points collection[1] and should be used to populate one data point at a time
- Through Data Uploader, cost figures can be uploaded along with data

Use Guidelines

- Readings must be in interval format
- Readings must be in kWh (for electricity data points)
- Only single-value readings can be uploaded (i.e. kWh for electricity data points)
- Readings must be snapped to the clock
- It is not possible to upload data to appliances (level 4 entities in tree menu)
- Maximum number of rows per file is 20000
- File size must be less than 10MB



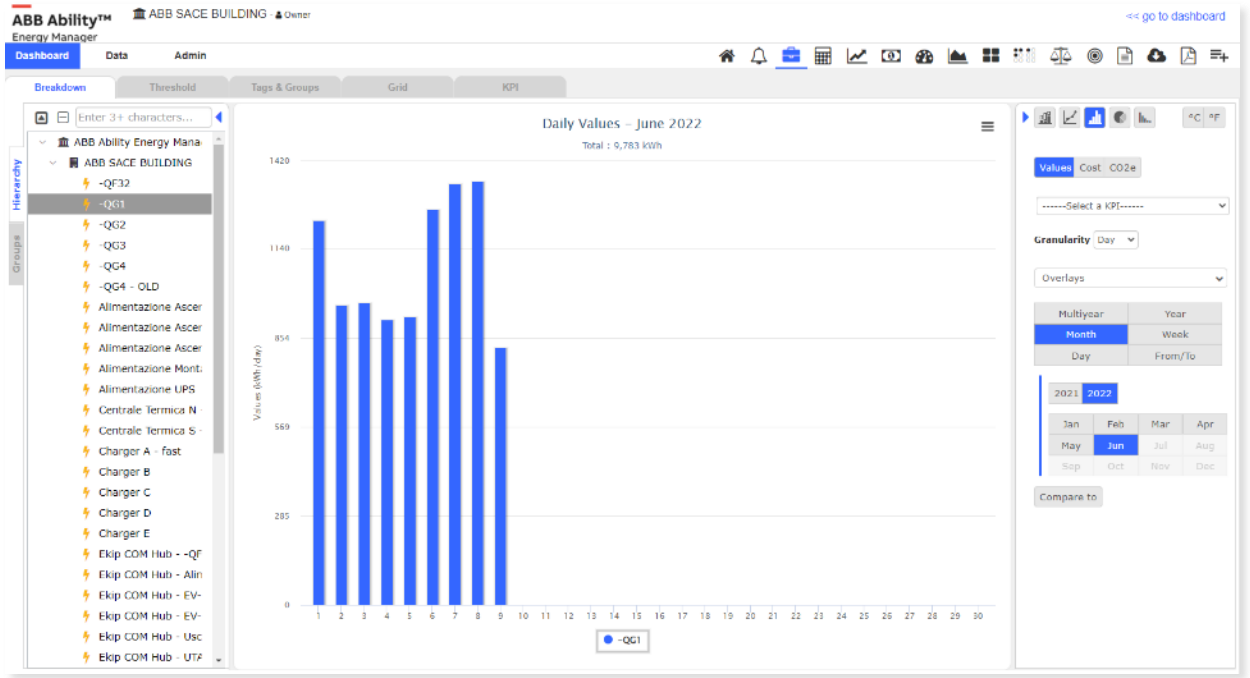
1. Data cannot be over written. Data cannot have date older than the fist available date. Data can be only kWh readings for electricity data.

ABB Ability™ Energy Manager – Checking
Functionalities

Portfolio Analysis

The Portfolio Analysis enrich the dashboard view by including:

Features	Uses
Threshold	Set consumption thresholds that can appear against your energy usage charts.
Tags & Groups	Assign tags to data to directly filter buildings/sites that you wish to compare; group up data to aggregate similar equipment to quickly focus in on your area of interest.
Grid	The Grid functionality allows you to look at your data in a consolidated view, which is particularly useful to support bill validation and tenant recharging.
KPI	Through the KPI it is possible to set fixed factors to create performance indicators that are specific to your organization to better compare consumptions.



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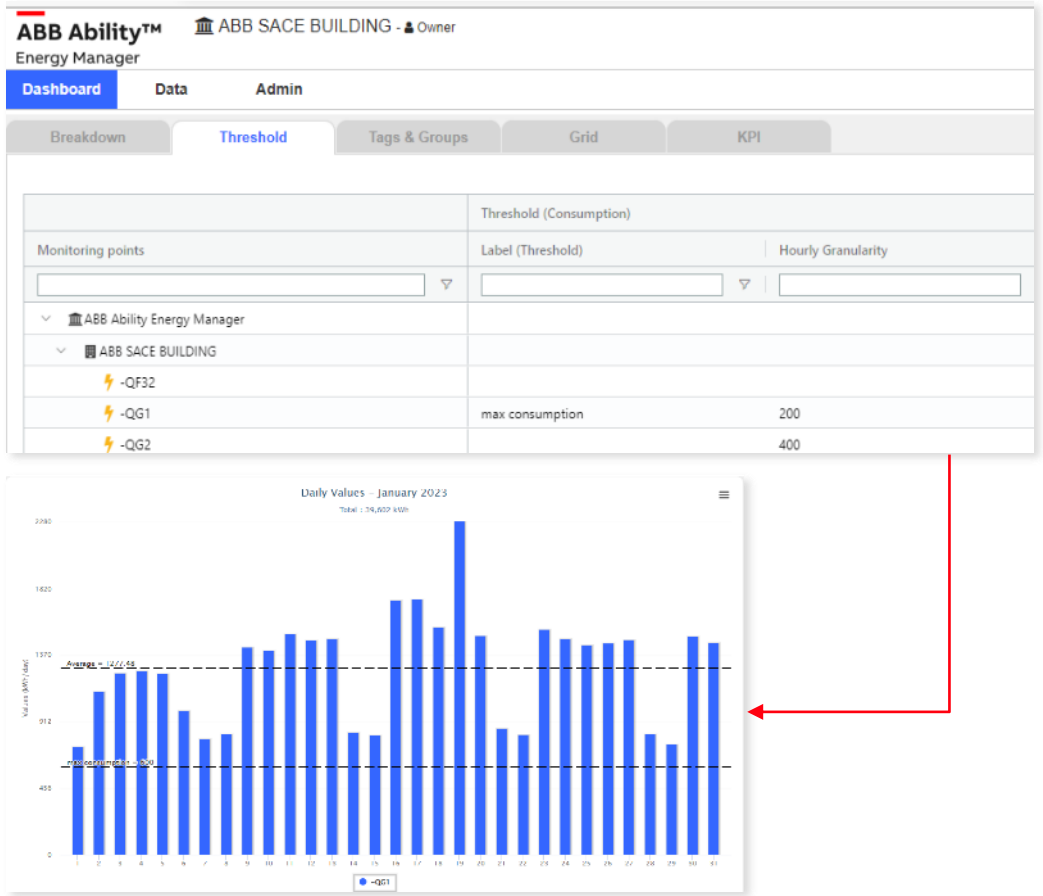
Portfolio Analysis – Threshold

- Set a threshold for your consumption whether per hour, day, month, or year, and see on the consumption graph
- Double click to change the value and drag the cell to copy your data points
- By setting thresholds, you can easily analyze if the consumption is more than the preset limits
- Once set, the thresholds will be displayed in the breakdown by clicking on the “overlays” on the right-side menu

- There you will also find a button to display the average value
- **Only the admin can set up a threshold and the manager can see it**



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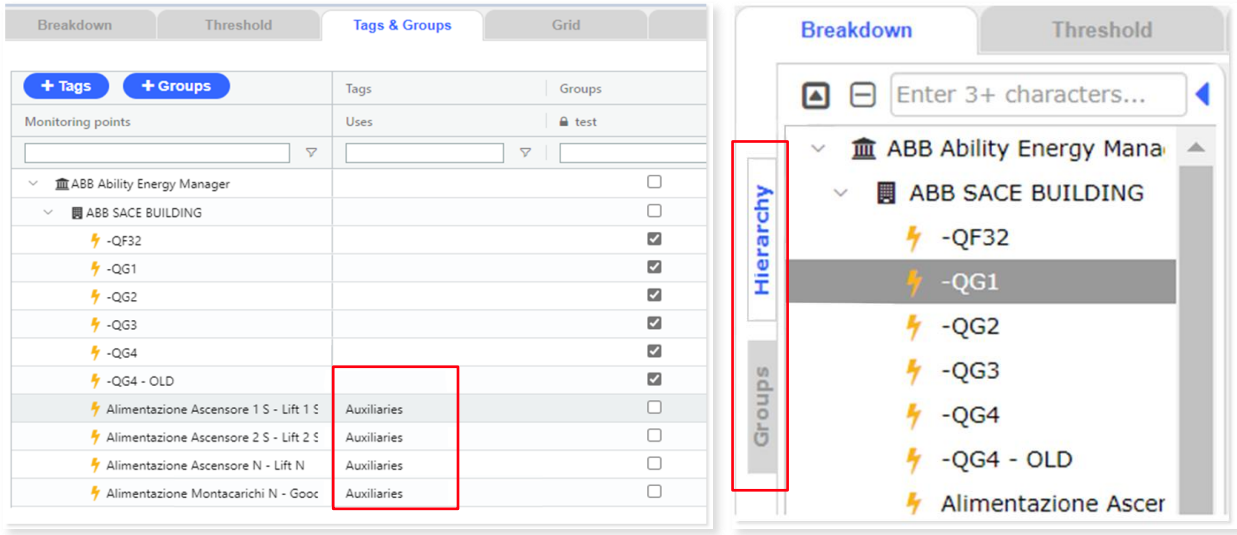
Portfolio Analysis – Tags & Groups

- The Tags section gives you the possibility to specify similarities between the data points
- The group section gives you the possibility to create custom groups for detailed analysis. (Groups won't be visible to the other users, but only who create)
- You can add a new tag by clicking the "**Tags**", typing in the name, and filling in the fields for the data points
- By clicking the "**+ Groups" button**, you can create your group. A new column will be added to the table where you can tick or untick to add a monitored point to that particular group
- Once you select the group and you return to the breakdown tab, you will be able to re-organize your list of monitored points by groups, instead of the usual hierarchical way



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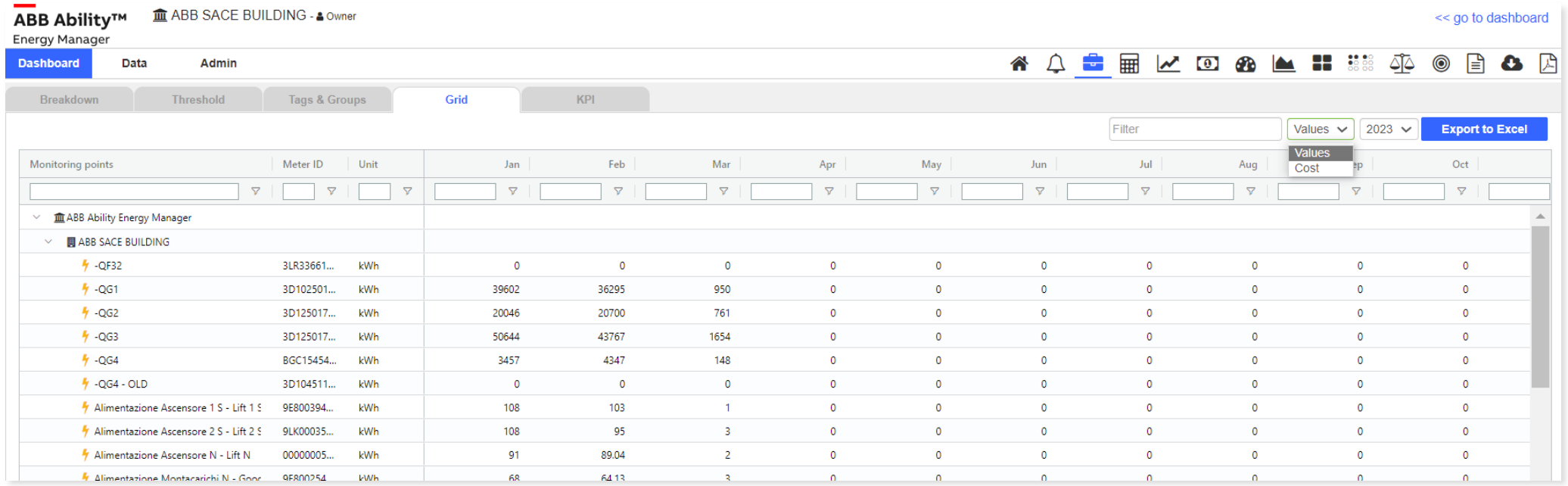
Portfolio Analysis – Grid

- It shows the monthly consumption and cost data in a more organized way
- It's possible to specify the year and choose to display the energy consumption or associated costs
- Many filters are available for each column whether by value, name, or even unit of measure. As well as arranging the values in ascending or descending order



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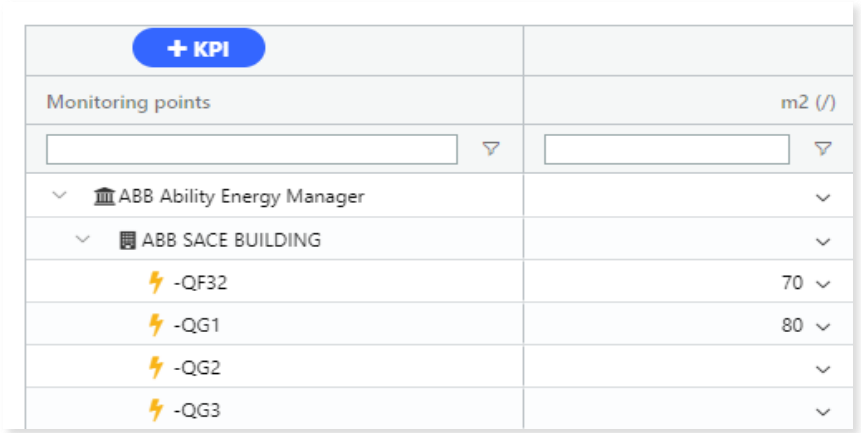
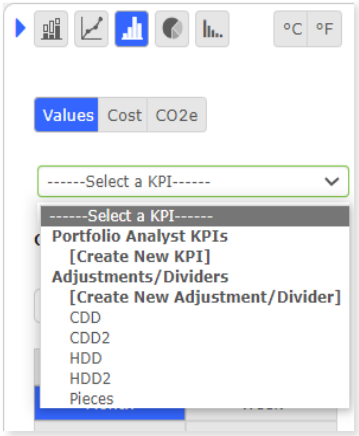
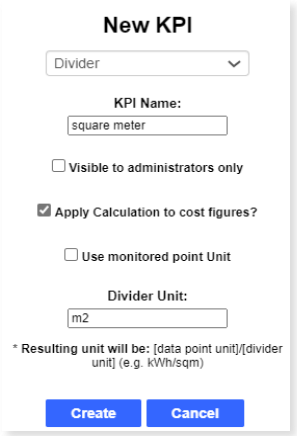
Portfolio Analysis – KPI

- The KPI section gives you the possibility to create customized energy performance indicators for different sites to start analyzing and benchmarking performances and take action to achieve your energy efficiency and sustainability targets
- Some very common use cases for normalizations are the evaluation of energy consumption per m^2, degree days, production units, etc.
- To add or select a KPI, CLICK ON "**+KPI**" button. Select the divider or multiplier option and give it a name
- In the breakdown, you will have the option to compare data points for which you set a KPI in terms of normalized figures by selecting the KPI from the drop-down menu in the control panel

Note: Adding KPIs & Tags is available only for admin. Managers can only visualize.







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Functionalities

Formula composer

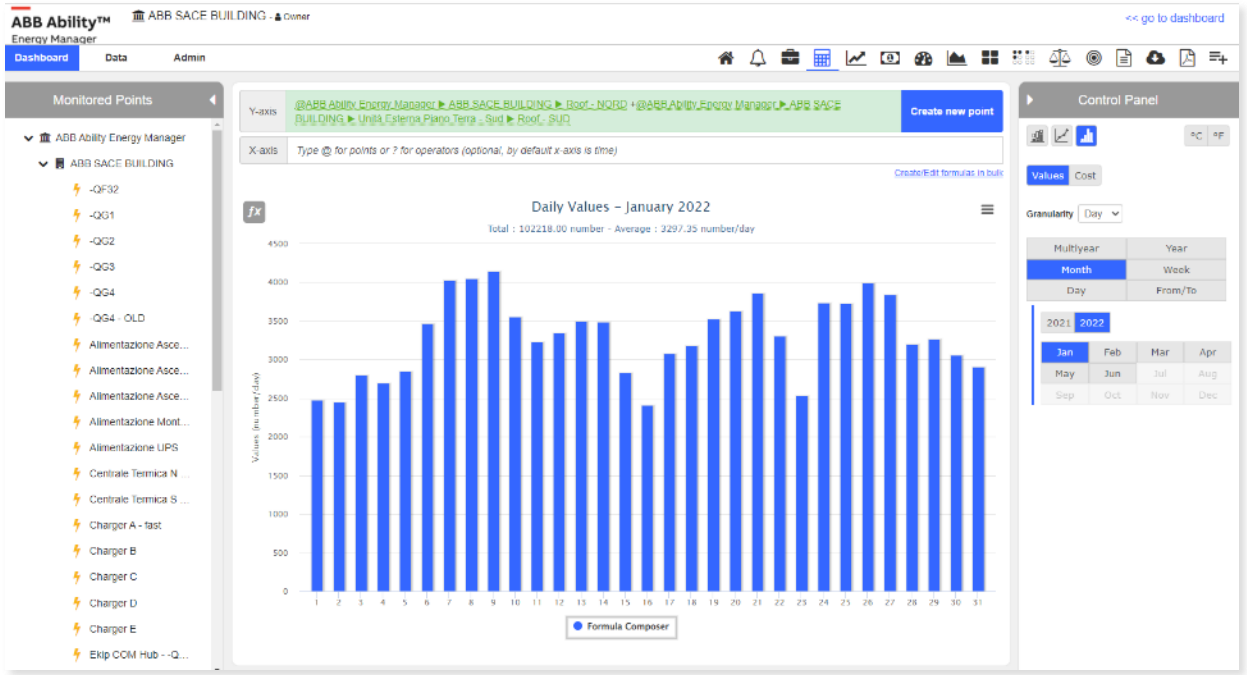
It allows the creation of formulas by doing operations and conditions across real meters, data points, and any numeric value.

Y-axis

Type a formula and see the result of the calculation in the graph below. The new formula meter point will then become a real meter point that can be used across the platform

X-axis

- Find a correlation factor and linear regression formula
- You will be able to observe trends, and dependencies among the variables
- Based on the latest or new baseline measurements, simulate future consumption patterns
- Create formula meters to track particular events through alerts and notifications



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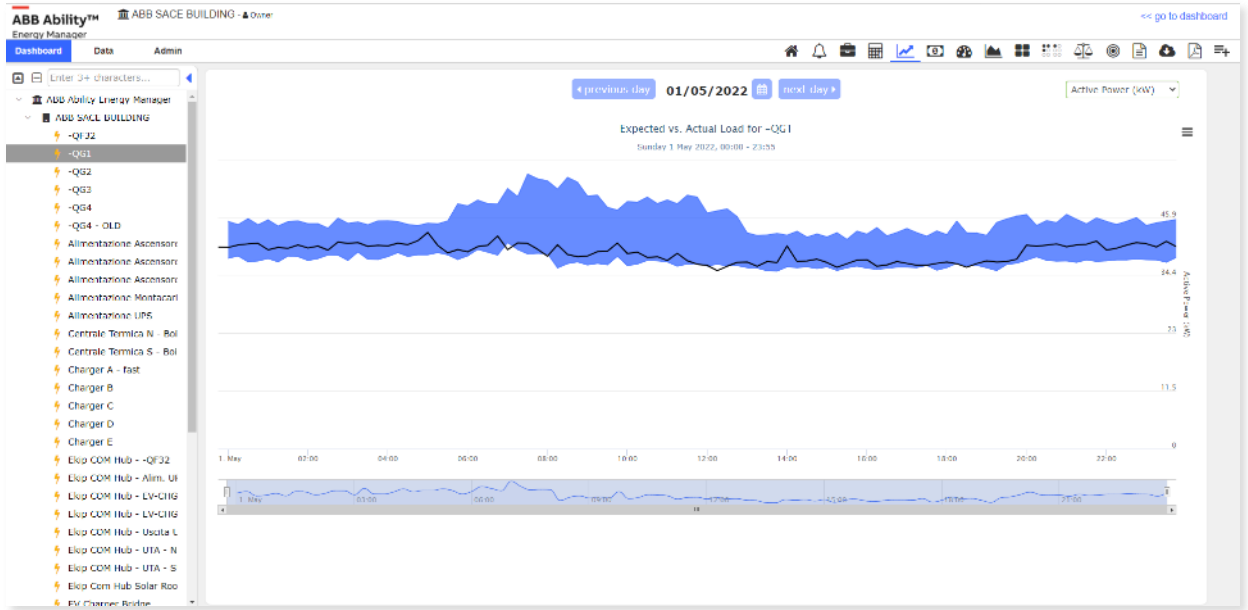
Functionalities

Sentinel Trends

- Sentinel Trends is a smart engine that predicts normal consumption levels and overlay actual consumption with the predicted levels to understand if unexpected behavior are happening
- It projects the amount of energy that each data point will need each day of the week by using data from the last 30 days
- The system can determine the expected load range based on these patterns which are indicated in blue. The actual load is shown by the black line. After you select your data point, you can zoom in to see in detail, the smaller time frame
- In addition to monitoring, alerts settings and dedicated report section are available to get notified and track inefficiencies



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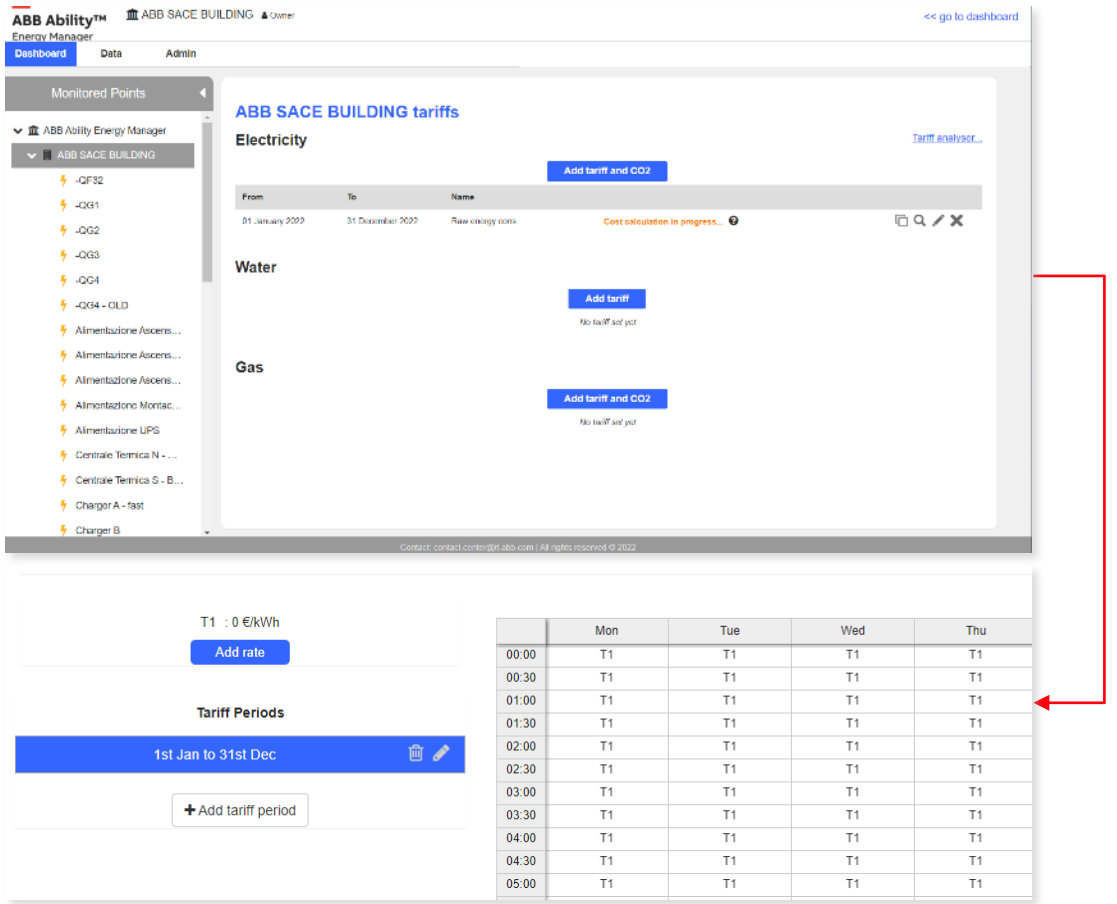
Functionalities

Tariffs and CO_2

- Electricity, gas, and water tariffs (and CO_2 where applicable) can be inserted to convert values (e.g., kWh) into cost figures using the currency of the country where the site is located
- Different rates can be added for even every 30 minutes
- Once tariffs and CO_2 emission factors are added, it is possible to go into the breakdown and see costs and CO_2 emissions associated with the site's data by clicking on the “**Cost**” and “**CO_2** ” buttons in the right control panel
- If you’d like to see what you would have paid using a different utility provider, evaluate different billing plans by clicking the ”Tariff Analyzer” button. Once you save this data, the system will show you a price comparison of the cost from your current utility and the new utility company, and if it would make sense to change the current provider



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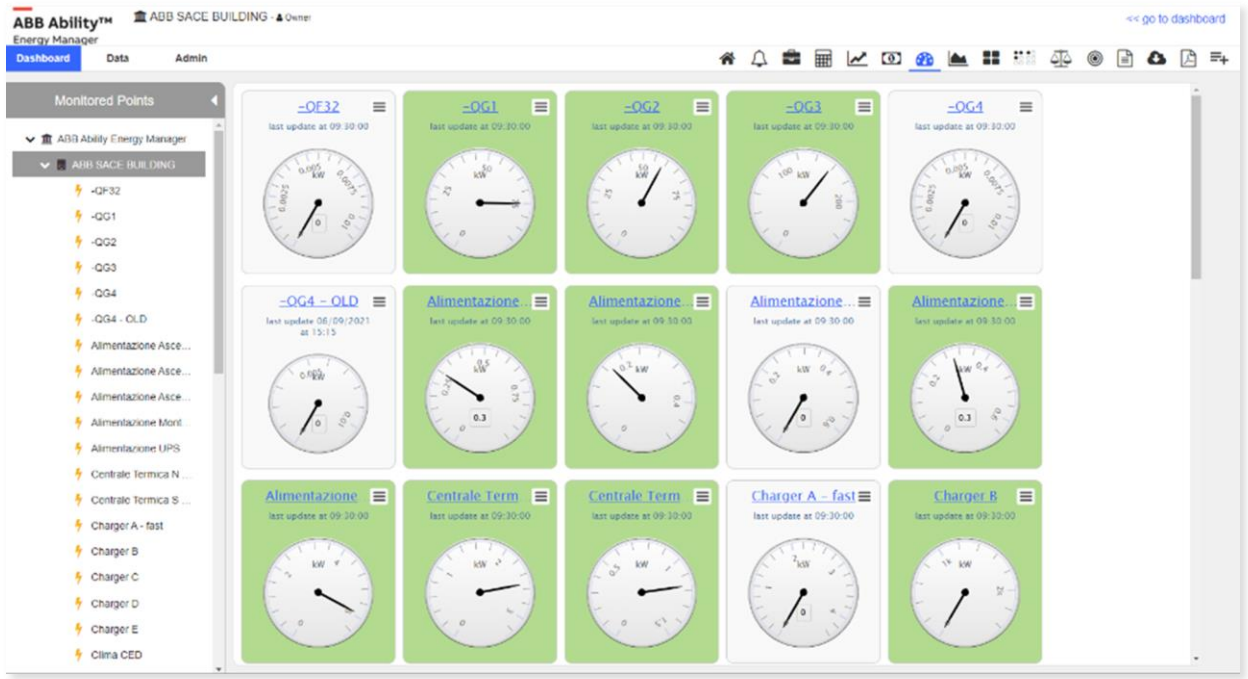
Functionalities

Live

- It provides an overview of our monitored areas for each site
- Each data point shows measurements up to the date and the last updated time
- You can easily see all by clicking on the site, view single data point in full screen, or download its data in different formats (PNG, JPEG, PDF, SVG, CSV, XLS)



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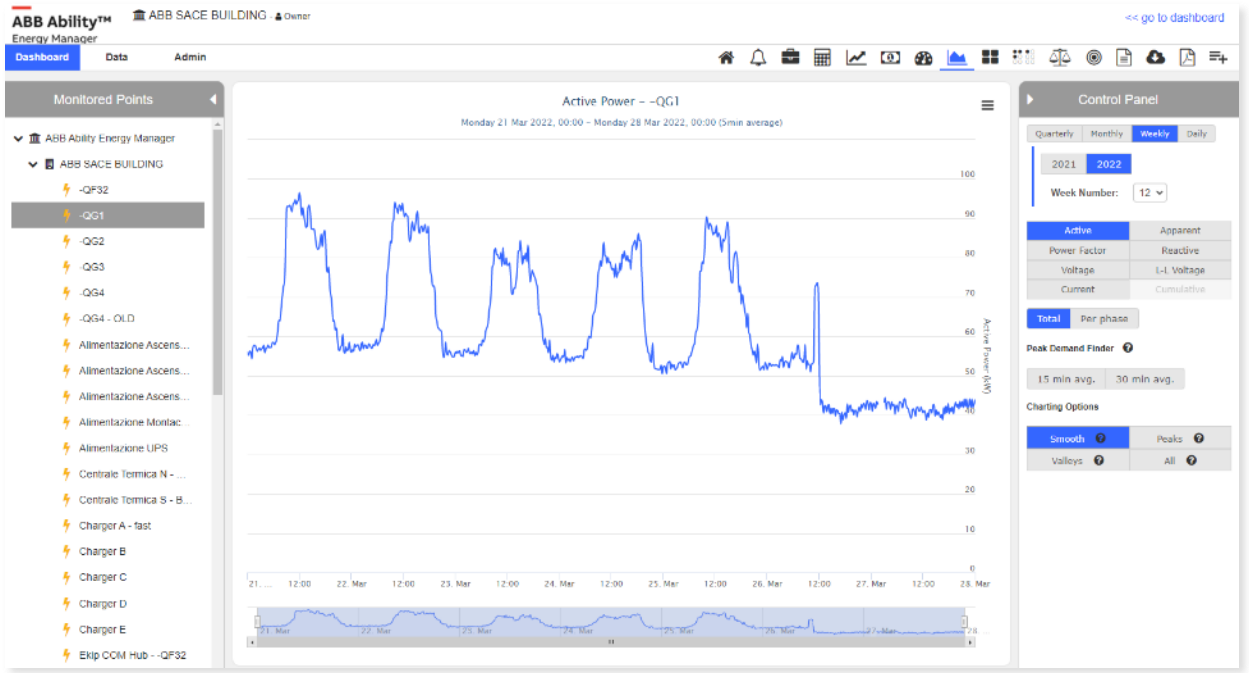
Functionalities

Raw data

- Analyze patterns of consumption and peaks of demand
- Raw, unprocessed measurements that are received directly from the data points provided every 5 minutes. This is in addition to peaks in demand, easily recognizing the highest demand occurred via the peak demand finder
- It's possible to select to visualize peak demands whether for 15 or 30-minute average time intervals, visualize data within different time intervals, and dive deep into our analysis by zooming and narrowing the time window or simply adjusting the sliders at the bottom
- Visualize various types of electrical parameters such as active power, power factor, voltage, current, and others. It’s easy to visualize these data in total or per phase, as well as download these visualizations and values in different formats (PNG, JPEG, PDF, SVG, CSV, XLS)



Smooth: trends Peaks: highest values Valleys: lowest readings

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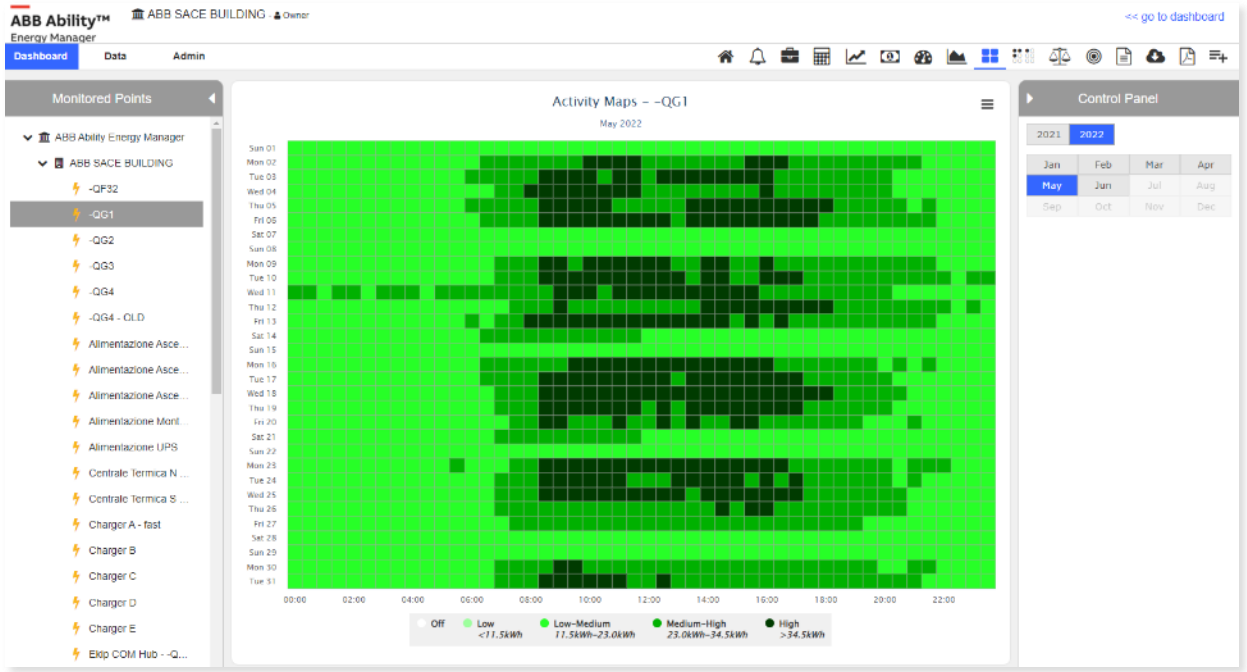
Functionalities

Activity Maps

- The Activity maps show energy consumption, by using different colors and intensities
- As the color gets darker that means higher energy consumption while getting lighter means lower energy consumption. This enables you to identify how a specific equipment or area is used, and more importantly if everything is normal
- With operation time in mind, it gets very easy to understand if the equipment is on even when is not required and identify some improvement areas
- Activity maps are a powerful tool that can help ESCOs identify energy consumption patterns, prioritize energy efficiency measures, evaluate the effectiveness of those measures, communicate energy savings, and identify opportunities for optimization



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Functionalities

Operation analyzer

- The operations analyzer allows you to get a quick evaluation of possible energy savings based on schedule changes and real consumption data
- It is possible to simulate turning off devices for a period in the day
- It helps you to do a what-if analysis on the hours of operation for any device and understand the amount of energy wasted and its corresponding cost by leaving your device working outside working hours
- It can help customers identify and take advantage of energy savings opportunities by reducing peak demand, improving equipment
- By doing this, customers can save money on their Energy bills, improve their overall energy management, and be more environmentally friendly

How?

- **Reducing peak demand:** By scheduling equipment and systems to operate during off-peak hours, customers can reduce peak demand, which can lead to lower energy costs
- **Improving equipment efficiency:** Many types of equipment and systems are more efficient when operated at specific times of the day. For example, HVAC systems are typically more efficient when operated during cooler hours of the day
- **Reducing energy costs:** By scheduling equipment and systems to operate during periods of lower energy costs, customers can save money on their energy bills

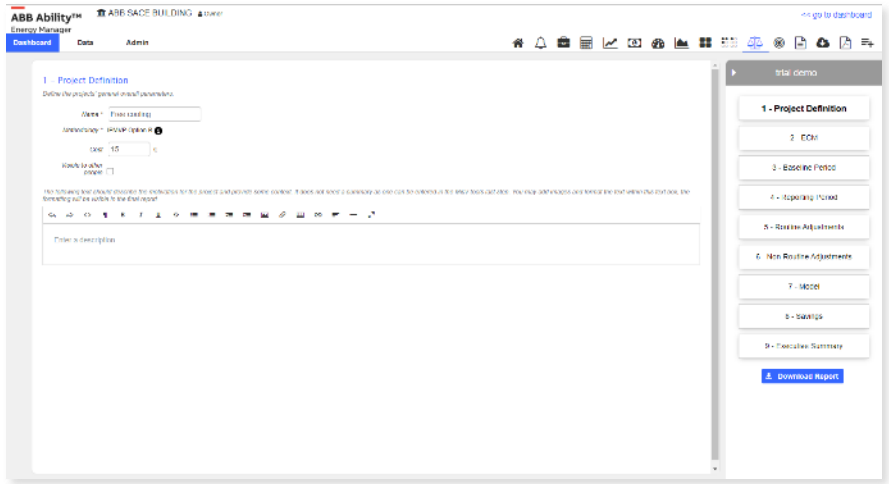
ABB Ability™ Energy Manager – Checking
Functionalities

M&V

M&V report enable to create an M&V project in accordance with the IPMVP following simple steps:

1. Project Definition
2. ECM (Energy Conservation Measure)
3. Baseline Period
4. Reporting Period
5. Routine Adjustments (like HDD & CDD)
6. Non-Routine Adjustments
    - Data Uploading
    - New Independent Variable
    - Correlation Checking
7. Model
8. Savings
9. Executive Summary

When reporting period is ended, there will be the possibility to access final evaluation on benefits.



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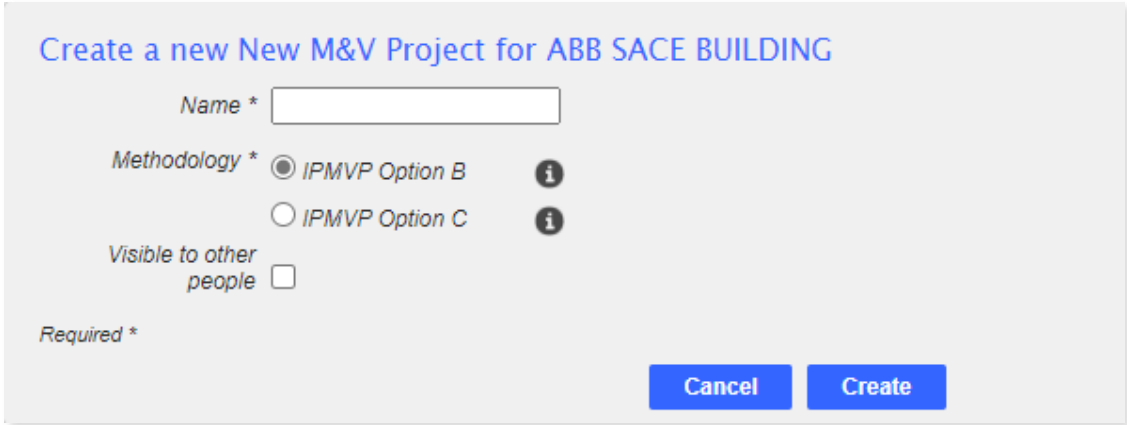
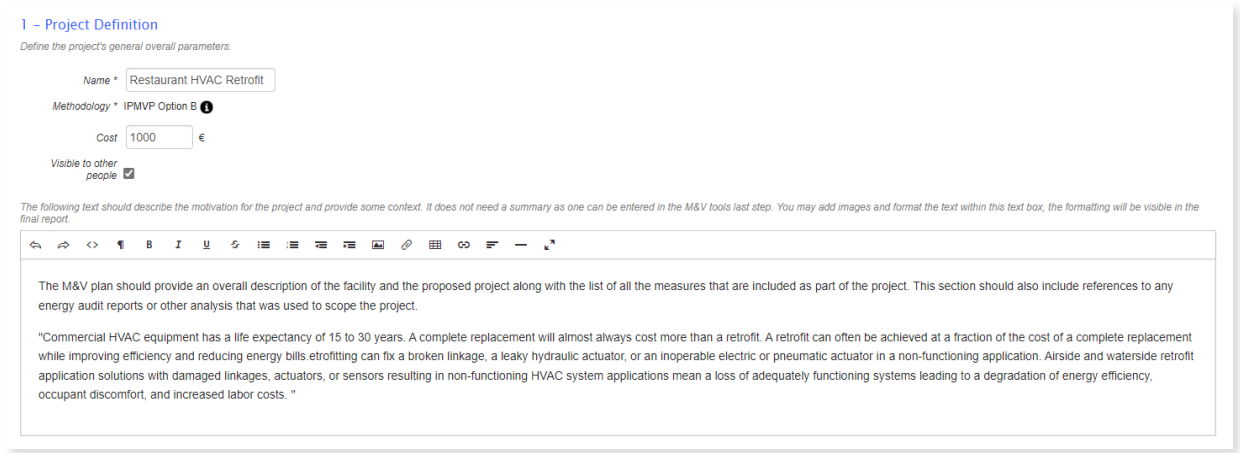
Functionalities

M&V

1. Project Definition

- Enter the name of the project and select option B or C
- Choose **option B** if this project is affecting a part of the plant
- Choose **option C** if it's affecting the whole plant
- Please click on "**visible to other people**" if you'd like to make it visible or not if private to other users
- Please enter the expected cost of this project in the cost field to see the payback period at the end
- The textbox may include project details, pictures or any context for the project that you want to include





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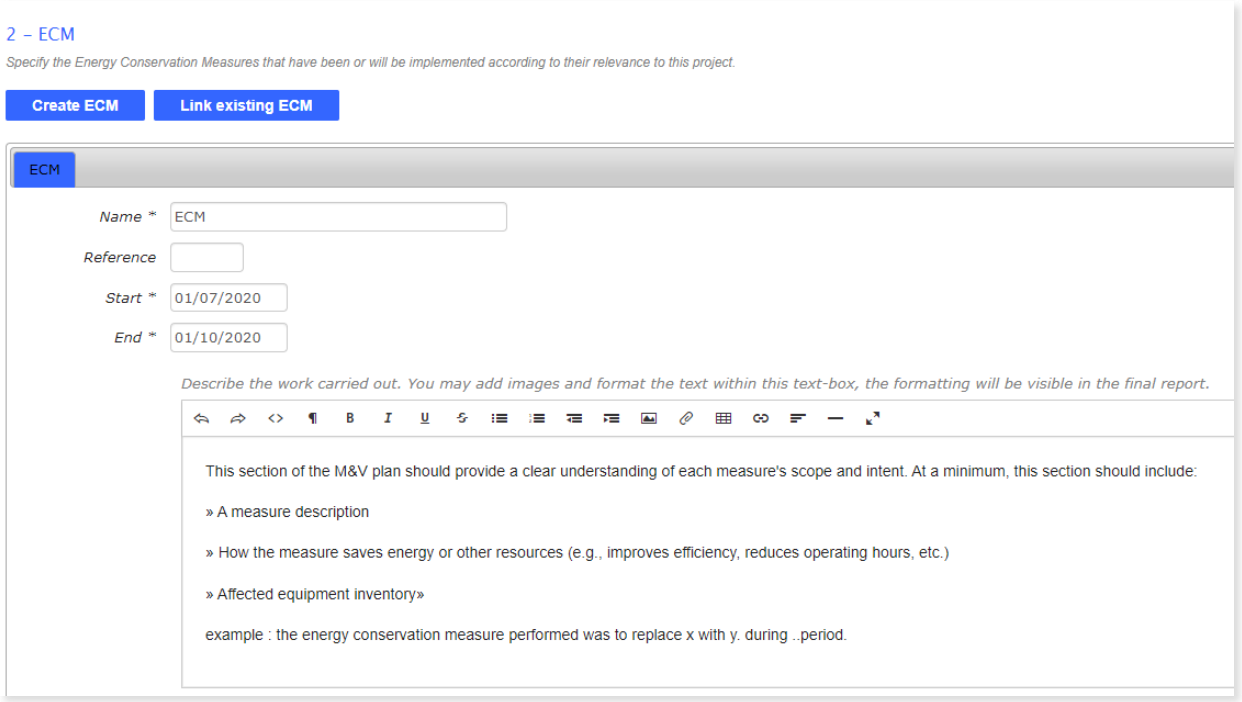
Functionalities

M&V

2. ECM (Energy Conservation Measure)

- Energy conservation measures are installations or upgrades made in this plant. As many ECMs as you desire can be created
- To create a new ECM, please click on the “**create ECM**” button
- Please enter the name, reference, installation start and finish dates, and description
- In the description, you may write down some details such as which equipment you’re replacing, and the dates referring to the time that installation took place
- You can remove this ECM or create more ECMs.
  You can link it to an existing ECM if you want to track multiple projects together



Common types of ECMs can be HVAC improvements, changing the chiller or adding the control system, replacing standard efficiency motors with premium efficiency motors, addition of variable speed drives (vsds) to pumping systems, installing a renewable energy source to produce site energy, etc..

ABB Ability™ Energy Manager – Checking
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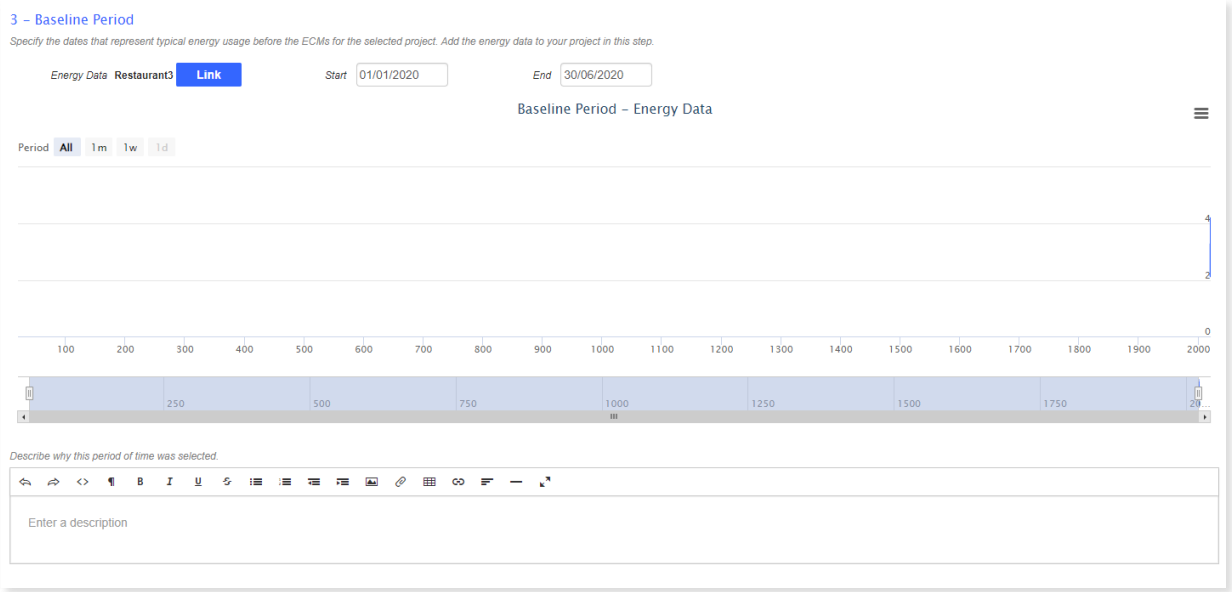
M&V

3. Baseline Period

- The baseline period helps you to characterize the energy used before the ECM
- To do so, you need to link the device, and select the period
- Then you can describe why you selected this date as a baseline period
- You can also import energy use data as a CSV file, if there is no meter monitors the target area or equipment



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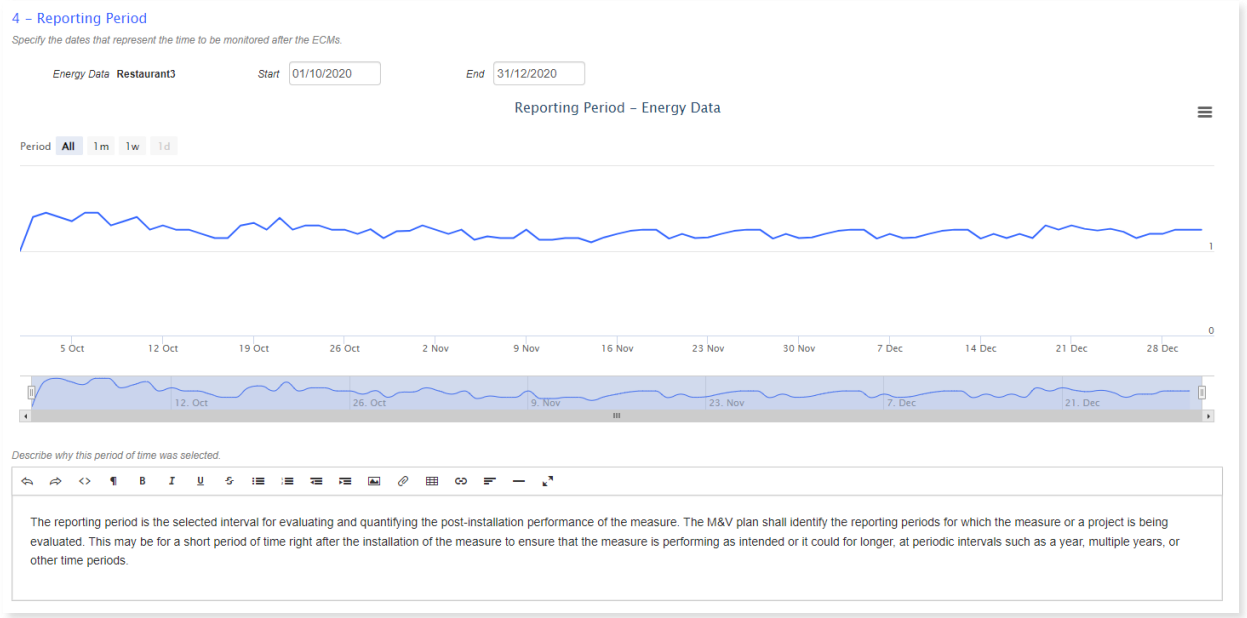
Functionalities

M&V

4. Reporting Period

Once baseline is imported, **the reporting period** will let you decide **how long you want to record and monitor energy use after the energy conservation measure**. You can justify why you want to report for that duration in the description.

The reporting period takes care of the period after ECM. The customer can decide how long to record and monitor energy use after the energy conservation measure took place.



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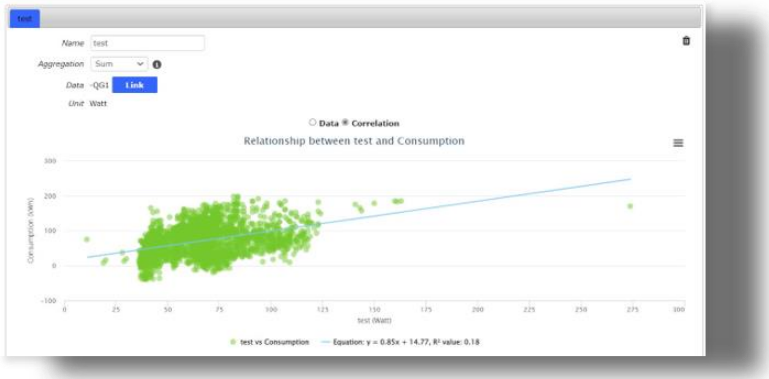
Functionalities

M&V

5. Routine Adjustment

- Import any measurements for factors that routinely change and affect energy use in a significant way
- Click on the new independent variable button and enter a name. You can import more than 1 key independent variable
- By clicking on the “**link**” button, link it to a device, or upload the data via CSV file
- By clicking on correlation, we can see whether the production and the consumption are related or not. For your case, it may be as production increases the consumption also increases. If there is a good correlation, you should use this for our energy calculation. (good correlation means R2 value should be close to 1)

Some examples: occupancy, production levels HDD,CDD



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Functionalities

M&V

6. Non-Routine Adjustment

If you need to create a new static factor, click on the "**new static factor**". You can specify the name, factor, and apply it to the whole reporting period or specific time window.

Examples: changes in the amount of space being heated or air conditioned, type of products being produced or number of production shifts per day, changes in the → building characteristics (new insulation, windows, doors, air tightness), etc.

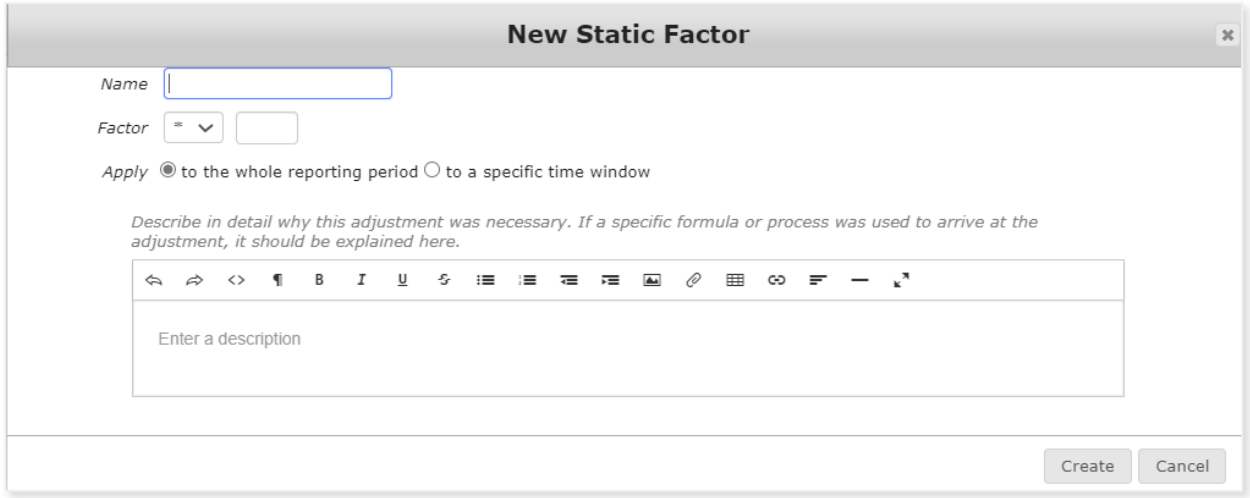

ABB Ability™ Energy Manager – Checking
Functionalities

M&V

7. Model

As a result of the recorded variables, the system is now prepared to develop a mathematical model of your energy use. It determines the overall correlation factor and shows the optimal energy model formula for use in validating your savings. It plots the best formula in terms of energy model to be used for the validation of your savings and calculates the total correlation factor. If you calculated this manually, you can change it here.

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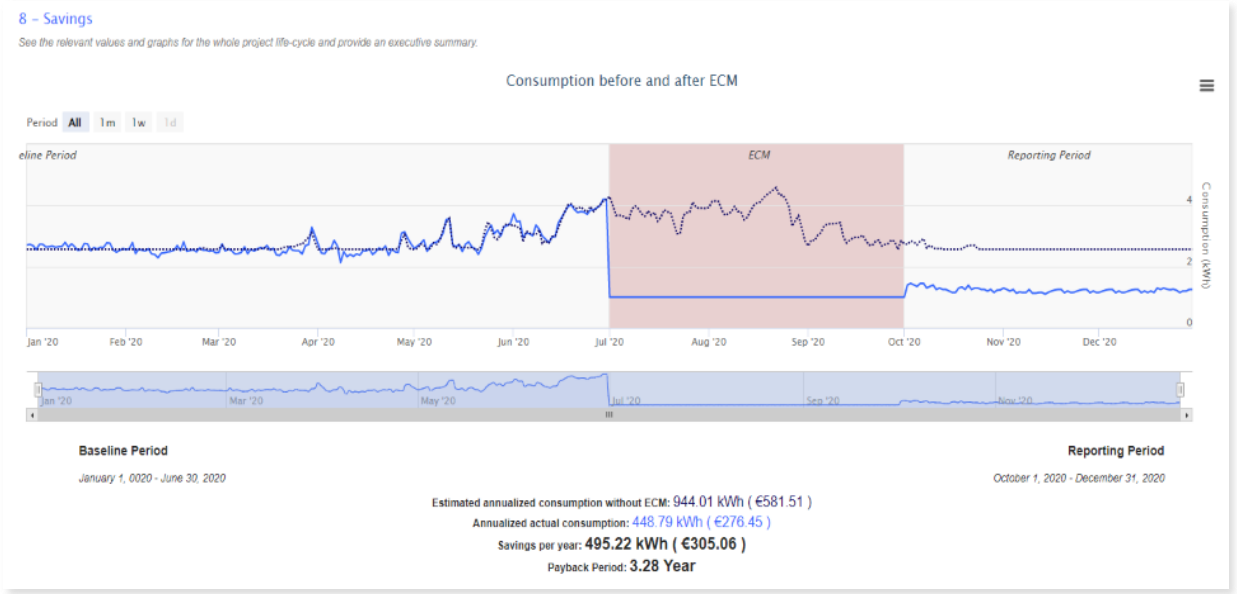
M&V

8. Savings

In the baseline period, the dark blue dots represent the energy use calculated by the mathematical model. In this example we can see that the mathematical model offers an accurate representation of the measured energy use represented in light blue color. In the reporting period the **dark blue dots** represent what the energy use would have been if the Energy conservation measure would not have taken place. The **light blue dots** represent the measured consumption after the energy conservation measure. Below the figure value summarize the annualized energy and cost avoided by the energy efficiency project, which are typically called the savings. It will also tell you the payback period which is calculated using the estimated project costs inputted in step one.



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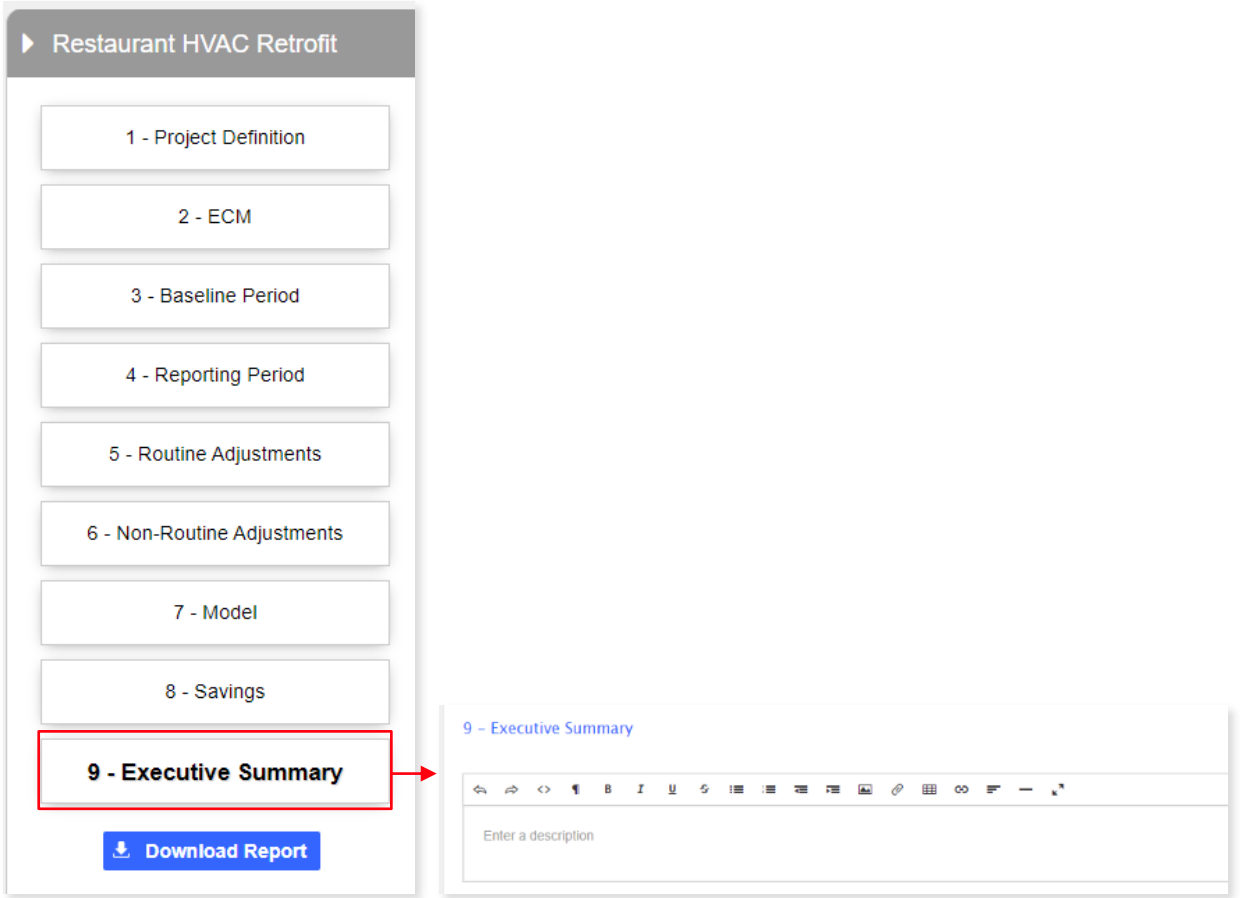
M&V

9. Executive Summary & Report

Additional and final details may be included in the executive summary. You can download the M&V report here or anytime in the main menu for internal review for your customer or for application for white certificates and energy saving credits.



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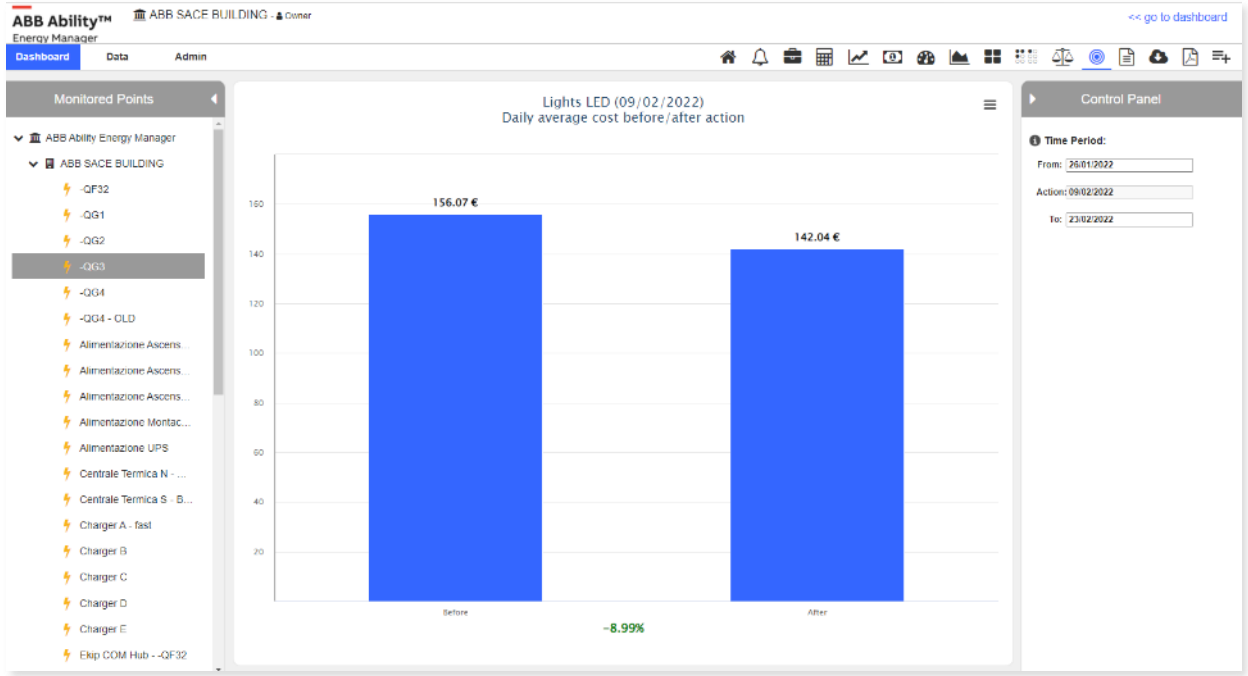
Action tracker

- This tool allows multiple users to annotate and log energy-saving actions as they are implemented
- By clicking on an action, you can see how the daily cost of energy has changed
- This is another way to prove that a project has saved your company energy and costs which is very helpful for ISO 50001 & green building certification such as LEED as well as for other industry certifications & regulatory energy reporting purposes



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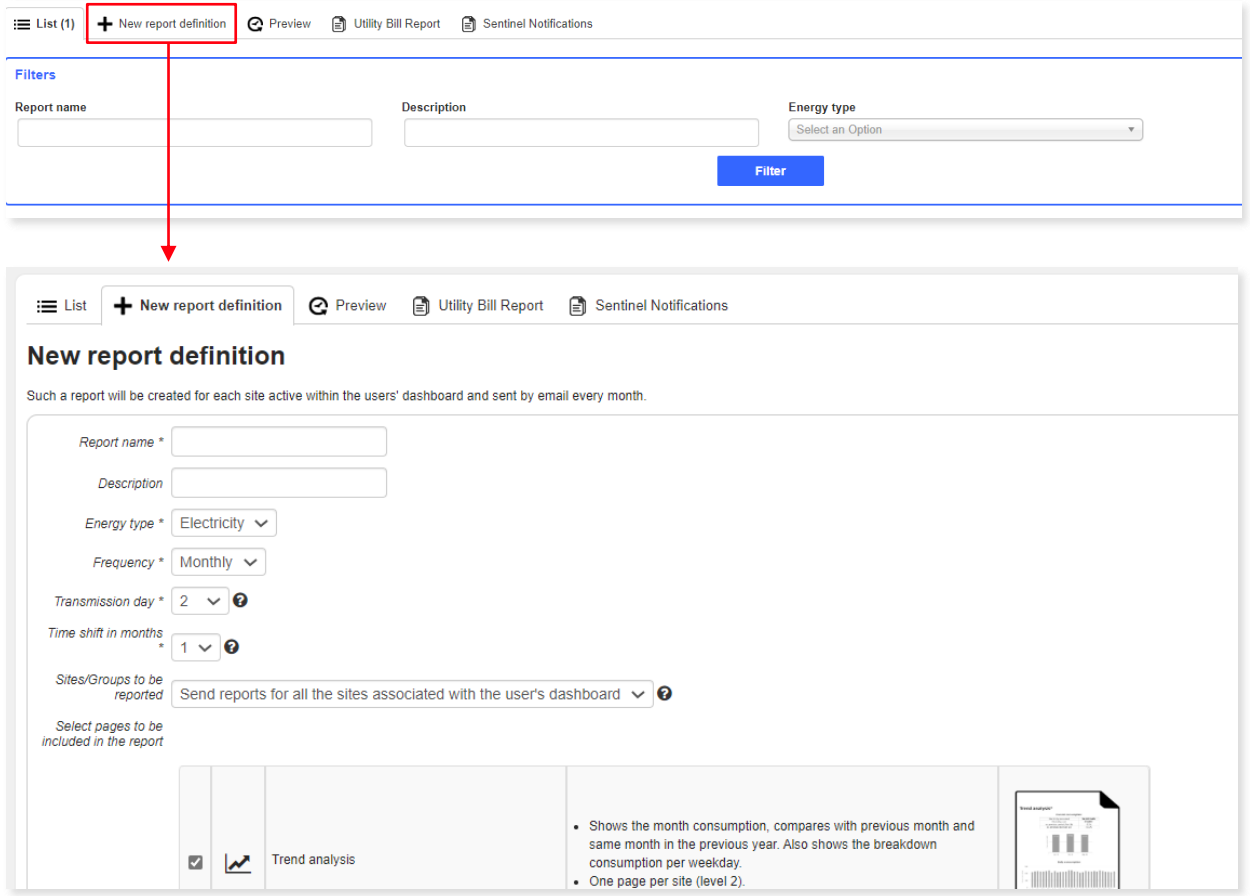
Functionalities

Report Definitions

Report section enable user to create new report template to have it recurrently over time.

Reports can be created by adding different preconfigured sections. Section selection is supported thanks to a dedicated preview and a descriptions.



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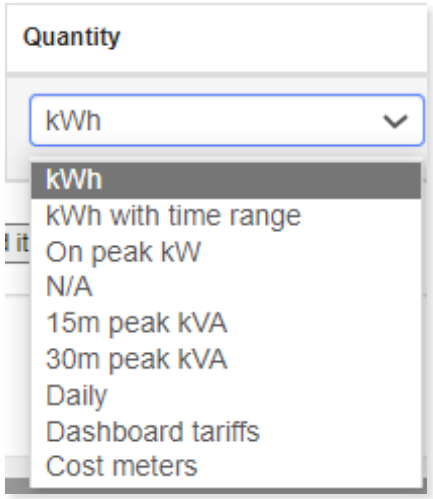
Report Definitions: Billing reports

Billing reports also enable to configure dedicated section to add specific customizable voice, including the ones in the table.

You can add sections to the utility bill report template to include special pricing, such as peak demand or additional charges.



Category	Item	Description
Energy charges (kWh)	kWh	This refers to your flat kWH unit rate total over your entire billing cycle
	kWh with time range	This refers to your kWh rate over a prescribed period of time e.g. peak hours, Day/Night rates etc.
	Dashboard tariffs	Here the cost references the rates as displayed in your dashboard related to time-of-use
Demand Charges (Peak kVA/kWh)	15 min peak kVA	This indicates the max demand (kVA) rate set by your supplier over 15 min periods based on the frequency of your meter interval data
	30 min peak kVA	This indicates the max demand (kVA) rate set by your supplier over 30 min periods based on the frequency of your meter interval data
	On peak kW	Here the cost references peek kW and is calculated as the highest peak in kW multiplied by the rate that is manually set
Other charges	Daily	This reflects any daily charge you wish to associate to a bill and will be multiplied by the number of days in your billing cycle
	N/A	This can reflect any fixed charge that you choose to associate with a bill and is charged with each bill issued e.g. Monthly service charges, meter management costs, etc.
	Cost Meters	It is now possible to create cost meters in your dashboard using the formula composer tool. This allows you to better reflect your tariff structure and associated costs. Once set up as a new data point, these values can be included as an itemized cost in your bill. E.g. You may wish to add the cost of each kWh supplied (if you are charged for this) to the unit cost of the kWh itself

ABB Ability™ Energy Manager – Checking
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Documents

Document section is where all the documents will be store for other platform users.

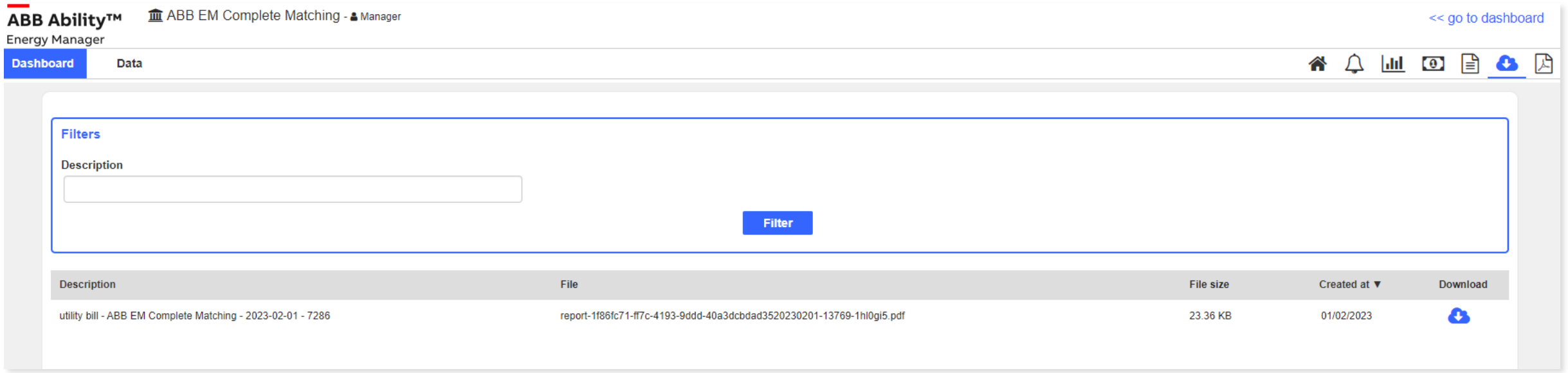


ABB Ability™ Energy Manager – Checking
Functionalities

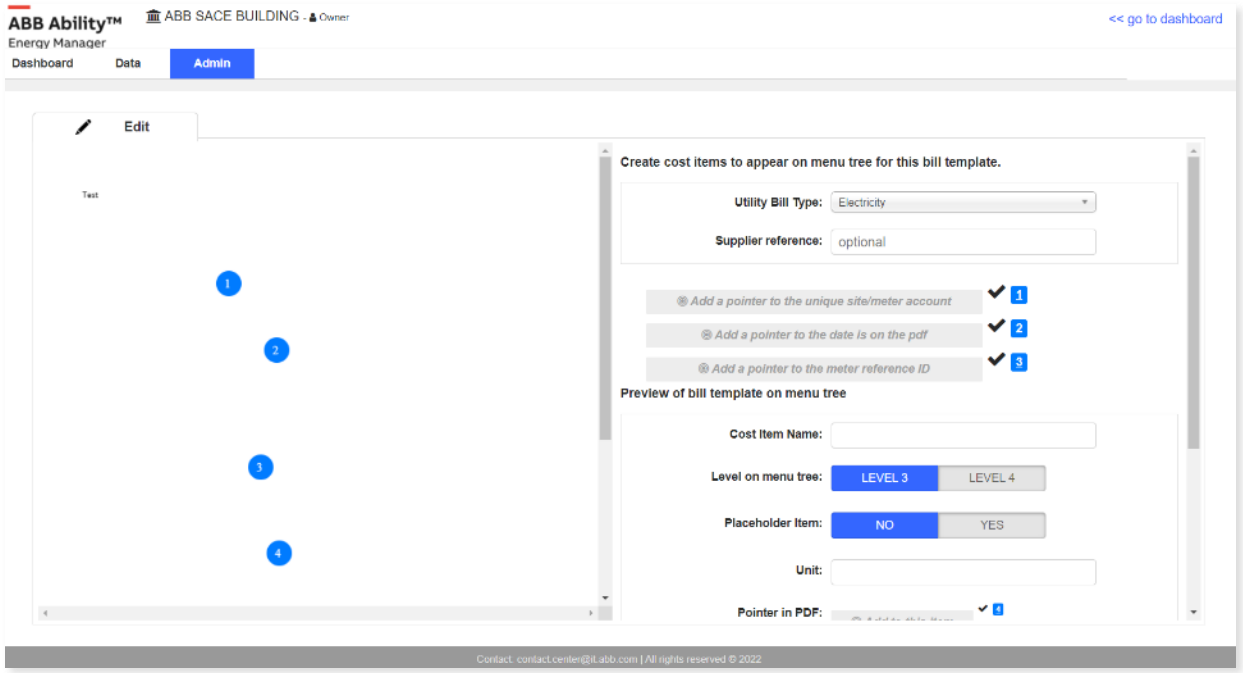
Utility Bill Parsing – Step 1

The Utility Bill management tool allows the user to organize and manage multiple digitized bills and provides an interface to support bill parsing to add them to their Checking dashboard.

There are two steps in the Utility Bill Parsing tab.

The first step is creating a Utility Bill Template:

- Here, it is possible to create bill templates to be used in the Bill parsing section
- On the left side, the pdf bill will be shown, while on the right there is the form to add information related to the bill
- The user needs to drag and drop the buttons on the right to point the place of the info related to the button on the bill template



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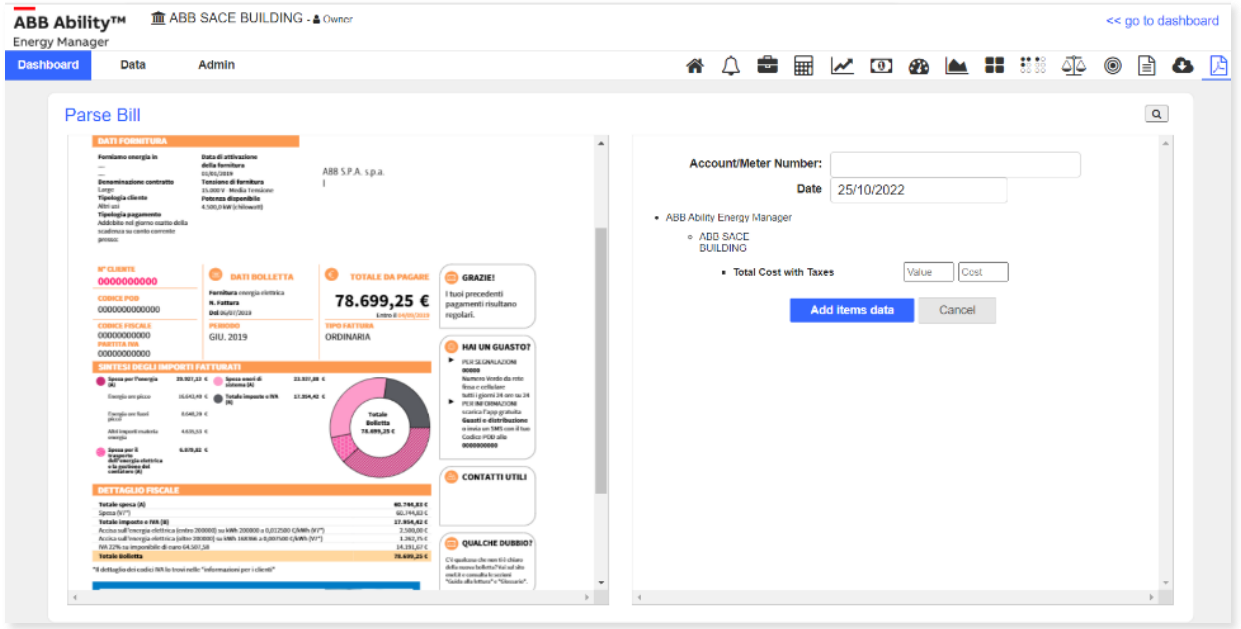
Utility Bill Parsing – Step 2

The second step is the utility bill parsing:

- Here, the actual bills will be uploaded and have their data stored as Checking data points using a template as a reference
- The user is enabled to check the bill values and fill in the parsing information. For each data point, values and/or costs can be added
- If in doubt the user is guided in the parsing, by the template preview with a legend
- Once finished, the user can click on “**Add items data**”
- After this process, the data will be available in the respective data points in the Breakdown

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