



# ABB Ability™ Energy Manager – Energy Simulator Add-on

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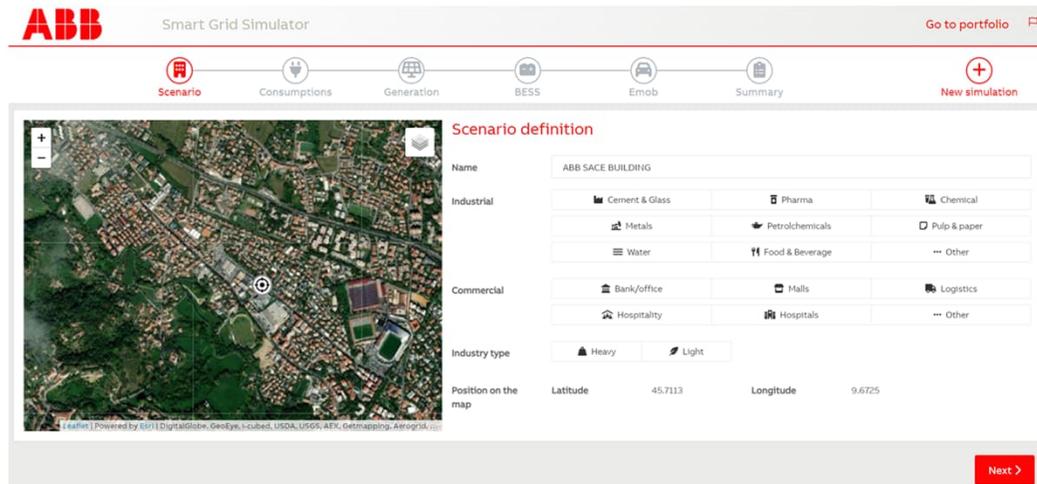
## Value propositions

### How we want to solve the needs

Introducing the Energy Simulator Add-on, a specialized **online** tool which supports the efficient and cost-effective **microgrid design** for your single or multiple sites.

Unique approach for **Energy Service Companies** and **Energy Consultants** to determine the optimal resource combination from finance and sustainability perspectives.

Energy Simulator is available online and hardware-free, enabling the best selection of assets and avoiding concerns over expensive licensed offline tools as an initial point.



### Key Benefits

- ✓ Easy to use, with a user-friendly interface for **unlimited simulations** on each site.
- ✓ Ready for multiple sites such as C&I **energy communities**.
- ✓ Online **SaaS** tool with simulation output in less than 1 minute with multiple user access not linked to laptop hardware license.
- ✓ Design a **microgrid** system that ensures the highest return on investment - **ROI** - or CO2 emission reduction.
- ✓ Optimize different **distributed energy resources** - DER - such as solar, hydro, storage and electric vehicle charging points to minimize the impact on energy costs and gas emissions.
- ✓ Save time and enhance sales with compelling and customized proposals that effectively showcase the value of the system.
- ✓ Save simulations and reports to be shared with on-site **energy managers**.

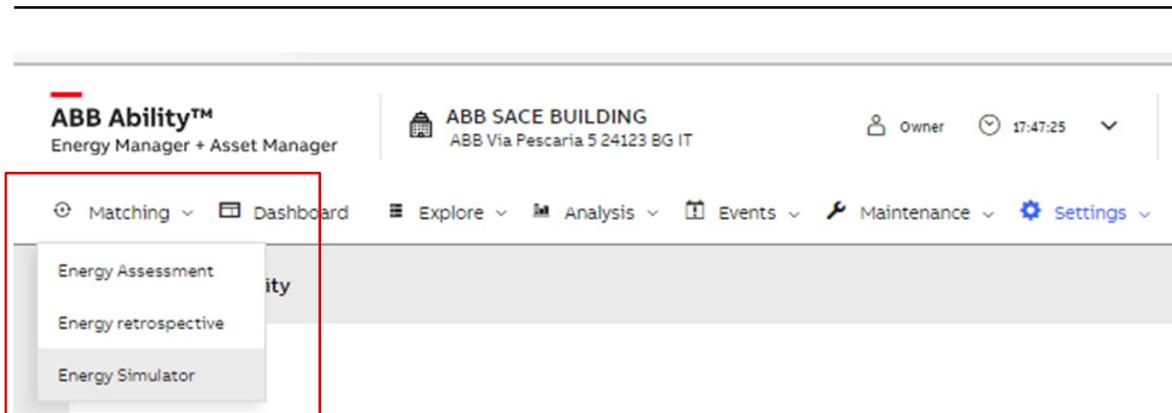
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# **ABB Ability™ Energy Manager Energy Simulator Add-on**

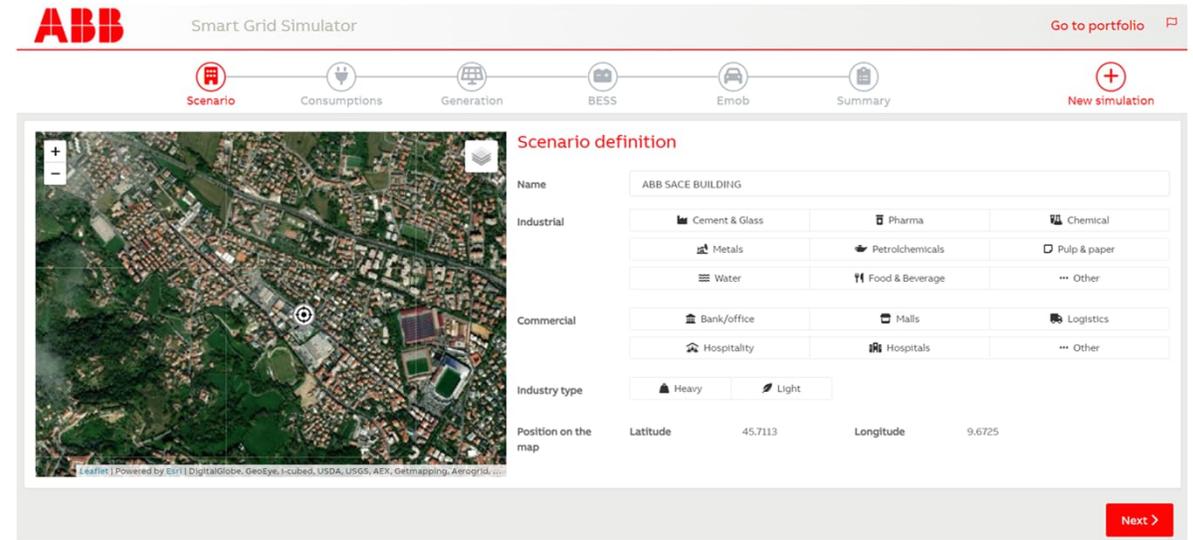
Functionalities explanation

# ABB Ability™ Energy Manager - Energy Simulator Add-on

## How to access



To access the Energy Simulator, simply click on the designated button under the matching tab. Once clicked, you'll be directed to the simulator page.



There are 6 steps :

1. Scenario
2. Consumptions
3. Generation
4. BESS
5. E-mobility
6. Summary

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## Step 1 - Scenario

Smart Grid SimulatorGo to portfolio

Scenario Consumptions Generation BESS Emob Summary New simulation



### Scenario definition

Name	ABB SACE BUILDING		
Industrial	Cement & Glass	Pharma	Chemical
	Metals	Petrochemicals	Pulp & paper
	Water	Food & Beverage	... Other
Commercial	Bank/office	Malls	Logistics
	Hospitality	Hospitals	... Other
Industry type	Heavy Light		
Position on the map	Latitude 45.7113	Longitude 9.6725	

Next >

- 1 Give it a name
- 2 Choose an Industrial segment
- 3 Choose a commercial segment
- 4 Choose the industry type
- 5 Position is transferred from sitemanager

The industry type option is mandatory only if you have previously chosen an industrial segment, for commercial segments it is not required.

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## Step 2 - Consumptions

Smart Grid Simulator Go to portfolio

Scenario Consumptions Generation BESS Emob Summary New simulation

**ABB SACE BUILDING**

Yearly specific production [kWh/kwp]

Photovoltaic	1409
Hydro	3000
Wind	784

### Consumptions calculation

Name	Description	Pmax	Type
<span style="color: red;">+ Add New</span>			Aggregated load Offices Laboratories Compressors & Pumps Machinery Refrigerators Ventilation Heating Lights

### Consumptions configuration

Name:

Load type:

Description:

Max power:

Load curve:

- Predefined
- Predefined
- Customized load profile
- Load from csv

LOAD CURVE SELECTION:

- DEFAULT
- kW
- kW
- kW
- kW

X Cancel

Click on the "add new" button, assign a name to the load and select from various load types.

Please note that you need to specify at least one load to move further. Should you prefer a more streamlined approach, you can add an aggregated load.

Specify the maximum power and choose the load curve that suits your needs.

The simulator offers a default curve for convenience, or you can choose from one of the predefined load curves for greater customization.

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## Customized Load Profile & Load from CSV

**Load curve** Customized load profile

00:00 01:00 Enter power kw 

[Add load time-slot](#)

Allocate power and time slots according to your specific needs. It allows you to define and add multiple time slots.

**Load curve** Load from csv

Period Daily Separator Export template

Choose File No file chosen Import file

Hour (1-8): Power [kW]	Hour (9-16): Power [kW]	Hour (17-24): Power [kW]
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With CSV template option, you have the flexibility to choose between a daily or yearly period, and your preferred separator.

[X Cancel](#) [Modify](#)

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## Step 3 - Generation Configuration: Add New & Existing

### Add New RE Plant

The screenshot shows the 'Add New RE Plant' configuration window. The form includes the following fields and options:

- Name: Test
- Technology: Photovoltaic (selected from a dropdown menu showing options: Photovoltaic, Hydro, Wind)
- Description: Add description
- Position on the map: Latitude, Longitude, and a red button labeled 'Select Point On Map'
- Nominal Power: kWh
- Available surface: m<sup>2</sup>
- System Cost: 910 EUR/kWh
- Installation Year: 2023

At the bottom right, there are 'Cancel' and '+ Add' buttons.

The renewable energy generation section presented with two options: brand new or existing generation .

By selecting "Add New," give your generation configuration a name, and position on the map.

Next, choose the technology that best suits your needs from the options of photovoltaic (PV), hydro, or wind.

Add the nominal power of your generation plant. Even if you're unsure about the exact capacity to install, the system will guide you based on rooftop surface area or other relevant factors.

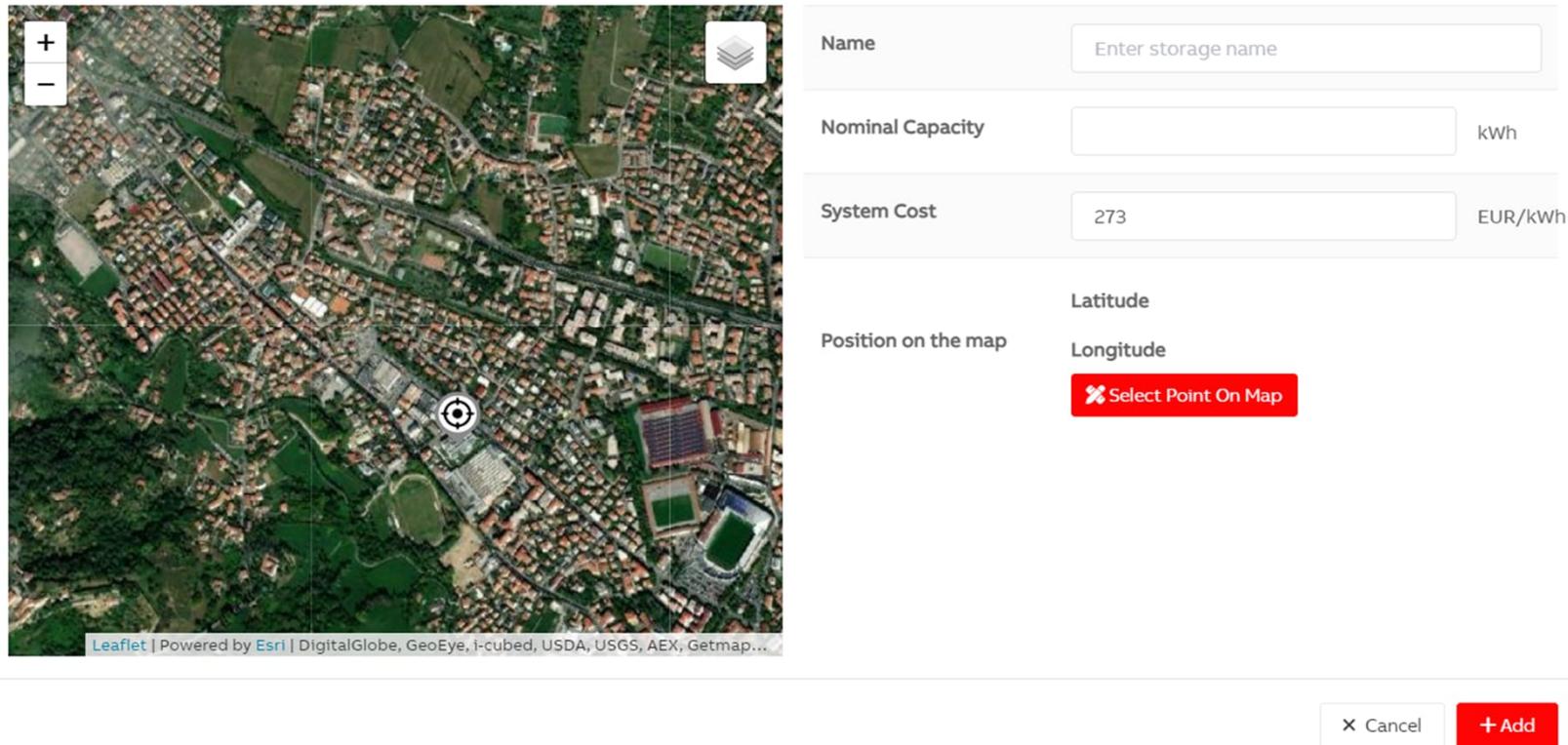
You can input the system cost in terms of euros per kW.

Please note that this step is not mandatory. If you skip it, the simulation can also advise the presence of a solar source but without a starting point.

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## Step 4 - Battery Energy Storage System configuration: Add New & Existing

### Add New BESS



Name	<input type="text" value="Enter storage name"/>
Nominal Capacity	<input type="text" value=""/> kWh
System Cost	<input type="text" value="273"/> EUR/kWh
Position on the map	Latitude Longitude <input type="button" value="Select Point On Map"/>

Whether you have an existing system or are planning a new one, insert the nominal capacity, system cost, and the position of your system on the map.

However, if the battery storage is not suitable for the project or it is possible to choose not to include battery storage information.

The system will acknowledge the preference and design the project accordingly.

Please note that this step is not mandatory. If you skip it, the simulation can also advise the presence of BESS but without a starting point..

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## Step 5 - Electric Vehicles configuration

### Electric Vehicles configuration

The screenshot displays the 'Electric Vehicles configuration' window. On the left is a map with a red location pin. On the right is a form with the following fields and controls:

- Name:** A text input field with the placeholder 'Insert name'.
- Position on the map:** Fields for 'Latitude' and 'Longitude', with a red button labeled 'Select Point On Map' below them.
- Surface or Parking space:** Two radio buttons, 'Surface' (selected) and 'Parking space'.
- Surface:** A text input field with the placeholder 'Enter surface' and a unit indicator 'm²'.
- Personalized Settings:** A red button.
- Charging Points count:** A text input field.
- CP Power:** A text input field with the value '22' and a unit indicator 'kW'.
- System Cost:** A text input field with the value '2000' and a unit indicator 'USD/CP'.
- EVs count:** A text input field.
- Buttons:** 'X Cancel' and '+ Add' buttons at the bottom right.

Please note that, this step is not mandatory.

To begin, give it a name, and specify the position on the map.

In addition, you need to specify either the surface area or number of parking spaces available.

Click on the “Personalized Setting” button to choose charging points count, and EVs count. You can modify the power estimation, and system cost as per your specific requirements.

Please note that this step is not mandatory. If you skip it, the simulation can also advise the presence of EV chargers but without a starting point.

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## Step 6 - Simulation Summary



### Simulation summary

#### 1. Scenario

UAT 1 simulator

#### 2. Consumptions

load 1 ( - PMax: 1000 kW)

#### 3. Generation

UAT 1 simulator t1 - PNI: 1000 kWp - Expected production: 1363.0 MWh/year

PV1 - PNI: 500 kWp - Expected production: 681.5 MWh/year - existing

#### 4. BESS

batt1 (Capacity: 1000 kWh)

#### 5. Emob

EV1 (Charging Points: 10 - CP Power: 22)

Now, you can see a summary of all the information provided to the simulator, encompassing energy generation sources, battery storage, and electric vehicle infrastructure.

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## Start Simulation

### Simulation parameters

Sources to be included:

Photovoltaic  Wind  Hydro

System Cost [EUR/kW]:

910

1365

1365

System Cost BESS [EUR/kWh]:

273

Goal function balancing:



BESS life saving:

Yes  No

Energy price: i

137

EUR/MWh

× Cancel

Start Simulation ▶

For the simulation scope, you have the flexibility to include or exclude specific energy sources by selecting or deselecting them.

Each option comes with its associated system cost, providing you with a clear understanding of the financial implications of your choices. The costs are pre-filled based on database, but they can be edited.

The goal balancing capability considers both sustainability and cost-effectiveness, allowing you to modify it according to your specific needs and objectives. You can move the balance button all the way to the left or right, privileging sustainability or return of investment.

Additionally, when it comes to battery energy storage systems (BESS), we offer you the option to choose whether the system prioritizes life-saving measures.

To further refine your simulation, you can change the relevant energy cost data that is initially pre-filled according to the geographical location.

Once you have provided this information, you can initiate the simulation by clicking on "Start Simulation." It may take a few seconds to create a comprehensive final report .

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## Simulation Result

### Simulation Result

[Download Pdf](#)[Save Simulation](#)[+ New Simulation](#)

User Configuration		Performance			
PV Size	1500.00 kW	ROI		80 %	[7 years and 12 months]
Wind Size	0.00 kW	Self consumption		48 %	[398t/year CO <sub>2</sub> saved]
Hydro Size	0.00 kW	Battery life saving	NOT ENABLED		
BESS Size	1000.00 kWh	Final score		64 %	

Best Configuration		Performance			
PV Size	2500.00 kW	ROI		75 %	[9 years and 9 months]
Wind Size	0.00 kW	Self consumption		63 %	[704t/year CO <sub>2</sub> saved]
Hydro Size	0.00 kW	Battery life saving	NOT ENABLED		
BESS Size	2000.00 kWh	Final score		69 %	

On the left-hand side of the screen, you will find your configuration, showcasing all the information you have provided throughout the simulation setup process. This includes crucial metrics such as return on investment (ROI) and self-consumption based on the defined load. Additionally, you will find the final score, which provides an overall assessment of your energy system design.

On the right-hand side, you will discover the achievable optimum system, dynamically adjusting based on the initial values and your chosen goal setting.

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## Report: Result

### Result

[Download CSV](#)

Config	PV Power [kW]	WD Power [kW]	HY Power [kW]	BESS Capacity [kWh]	Load max [kW]	Yearly Cons. [kWh/y]	Yearly RE Prod [kWh/y]	Total investment [kEUR]	RE Used / RE Prod. Ratio [%]	Self consumption rate [%]	CO <sub>2</sub> saved [t]*	Continuity saving [EUR]	ROI
Existing config	500	0	0	0	1100	3,512,910	731,760	692,000	94 %	20 %	67	0	7 years and 4 months
User config	1500	0	0	1000	1100	3,512,910	2,195,280	1,875,000	76 %	48 %	398	5415	7 years and 12 months
Best config	2500	0	0	2000	1100	3,512,910	3,658,800	3,058,000	60 %	63 %	704	6926	9 years and 9 months
Load +20%	3250	0	0	2800	1320	4,210,550	4,756,440	3,958,900	59 %	67 %	941	6926	10 years and 1 month
Load +40%	4112	0	0	3919	1540	4,908,180	6,018,720	5,049,528	57 %	71 %	1,239	6926	10 years and 5 months

\* CO2 saved with respect to no RE and no BESS scenario

Energy price: 137 EUR/MWh

The result table presenting all the information related to the power, consumption, production, and investment as well as self-consumption rate in percentage. This valuable information sheds light on how efficiently your energy system is utilizing its generated energy, ultimately determining its sustainability and cost-effectiveness.

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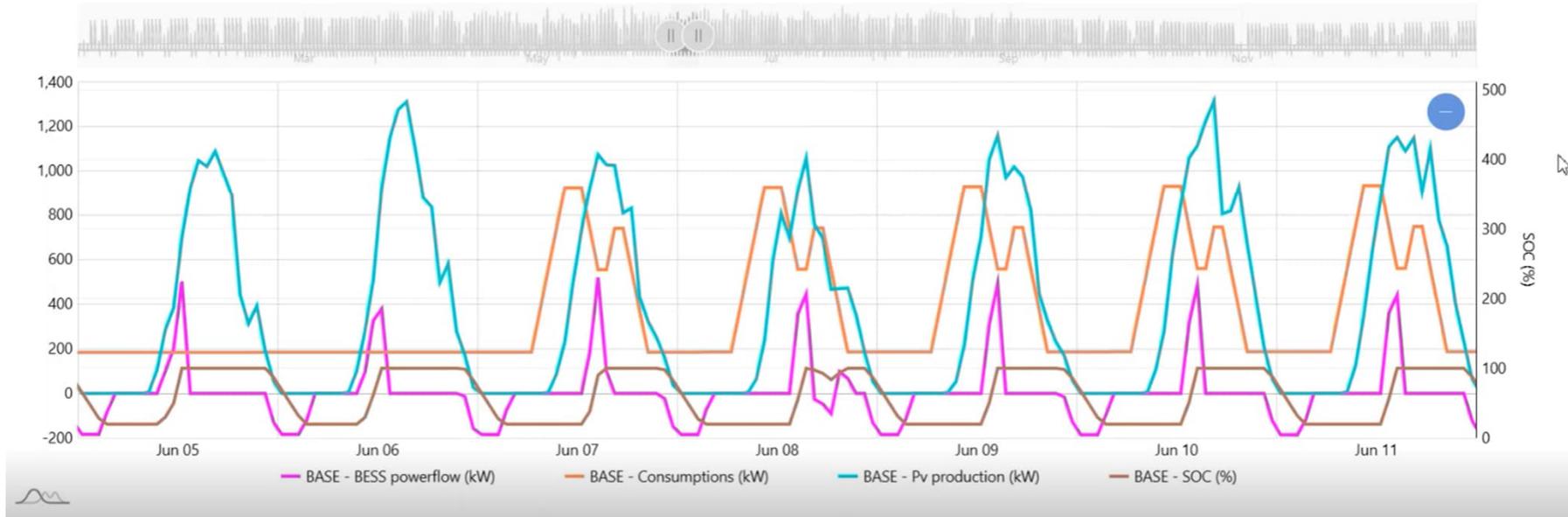
## Report: Time Trends Chart

### Time Trends Chart

Measure

BASE - BESS powerflow, BASE - Consumptions, BASE - Pv production, BASE - SOC

Download CSV



This chart provides you with a range of options to analyze seasonal changes. You can select the desired time range and toggle between different assets such as load, photovoltaics (PV), and BESS. This allows you to visualize various parameters over time.

In addition, you can download the data as a CSV file, allowing you to further analyze and manipulate the information as needed for your specific requirements.

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## Report: Box Plot Charge

### Box Plot Chart

Measure

BASE - SOC AVG



Box plot charge represents the daily production range and months of the year, demonstrating the seasonality of energy consumption.

This visual representation highlights key energy consumption patterns throughout the year, expressed as a percentage of median, average, etc.

By observing trends, you gain insights into the optimal utilization of your energy system throughout the changing seasons.

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You can save the simulation with a unique name with a specific logo for later reference or download the report in PDF.

All the team members invited to the site can see the saved simulation in “portfolio”, re-run the simulation or download a report.

By clicking on “go to portfolio”, it is possible to see all the personal and shared simulations.

The screenshot displays the ABB Smart Grid Simulator interface. At the top left is the ABB logo and the text "Smart Grid Simulator". On the top right, there is a "Go to portfolio" link with a folder icon. Below the header, the main section is titled "Simulation Result". To the right of this title are three buttons: "Download Pdf", "Save Simulation" (which is highlighted with a mouse cursor), and "New Simulation".

Below the buttons, there are two comparison cards. The first card, "User Configuration", shows a PV Size of 1500.00 kW and a Performance ROI of 80% with a payback period of [7 years and 12 months]. The second card, "Best Configuration", shows a PV Size of 2500.00 kW and a Performance ROI of 75% with a payback period of [9 years and 9 months]. Both ROI values are accompanied by money bag icons.

At the bottom of the interface, there is a "Portfolio" section with two tabs: "Personal" and "Shared". Below the tabs is a table listing simulations. The table has columns for Name, Date, Goal function, RE Power [kW], BESS Capacity [kWh], CP Number, and Final score. A progress bar is shown next to the Final score.

Name	Date	Goal function	RE Power [kW]	BESS Capacity [kWh]	CP Number	Final score
UAT 3 Simulator	26/06/2023 22:20	ROI 80% Self consumption 20%	66.00 ⓘ	45.00	225	18%

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**ABB Ability™ Energy Manager  
Energy Simulator Add-On  
Configuration & Shopping list**

# ABB Ability™ Energy Manager - Energy Simulator Add-on

## Shopping List

**You have several options to purchase on ABB Ability Marketplace™**

- [Subscription](#)
- [Voucher](#)
- [Multisite](#)

**Or offline with following ordering codes. Please contact your ABB referent person.**

- Energy Simulator add-on single site 1SDA116084R1
- Energy Simulator add-on multisite site 1SDA116083R1
- Complete Matching Multisite 3YR voucher 1SDA116082R1
- Complete Matching 3YR voucher 1SDA116080R1

**Edition products supporting this add-on for single site :** complete matching ,watching, checking, performing, scanning , building

**Edition products supporting this add-on for multiple sites :**complete matching ,watching, checking, building

**Edition and add-on as a bundle :** complete matching with energy simulator

**ABB**