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ABB Electrification
Smart Buildings Division

solutions.abb/abb-smart-ems

Additional information
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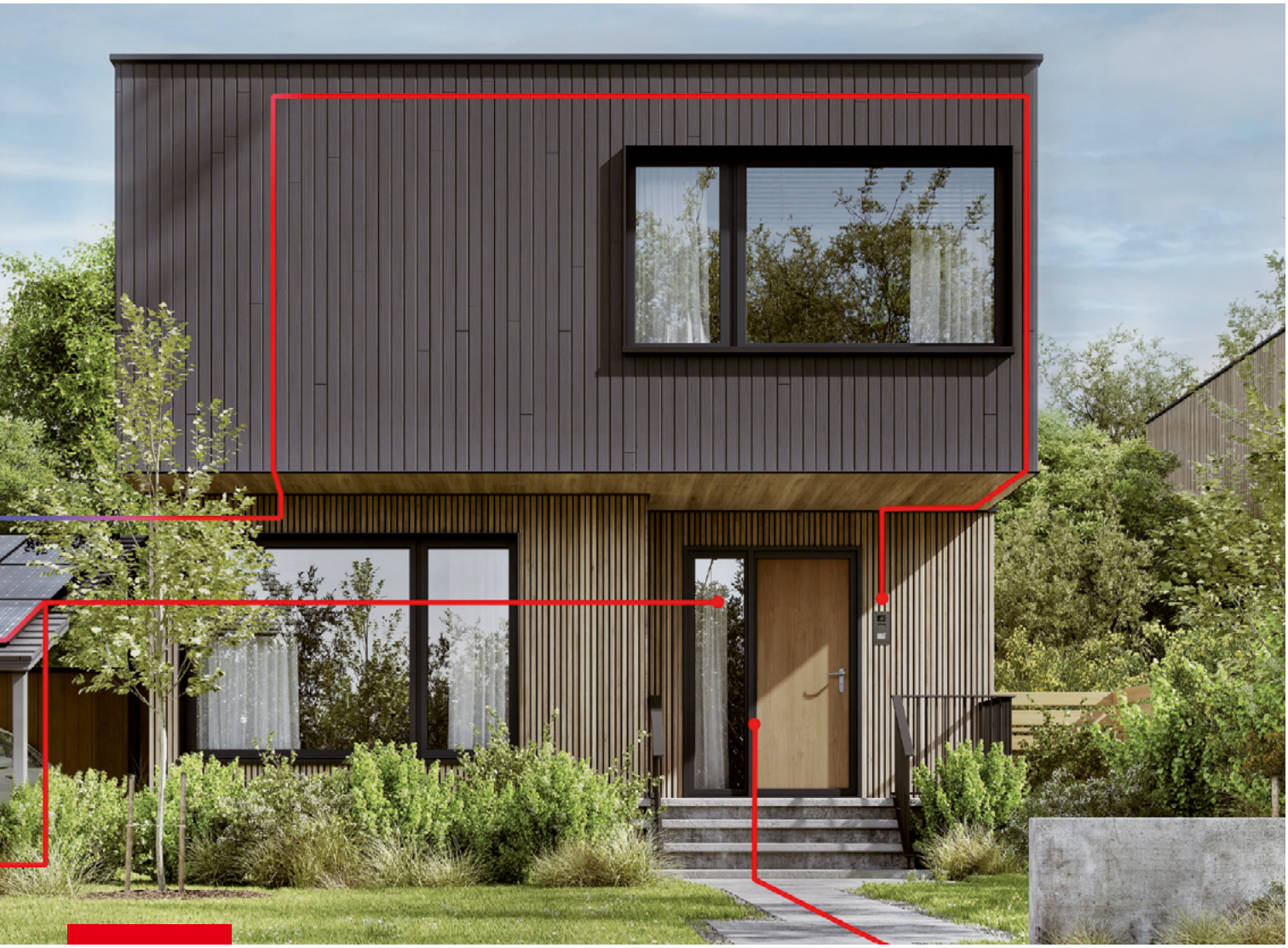
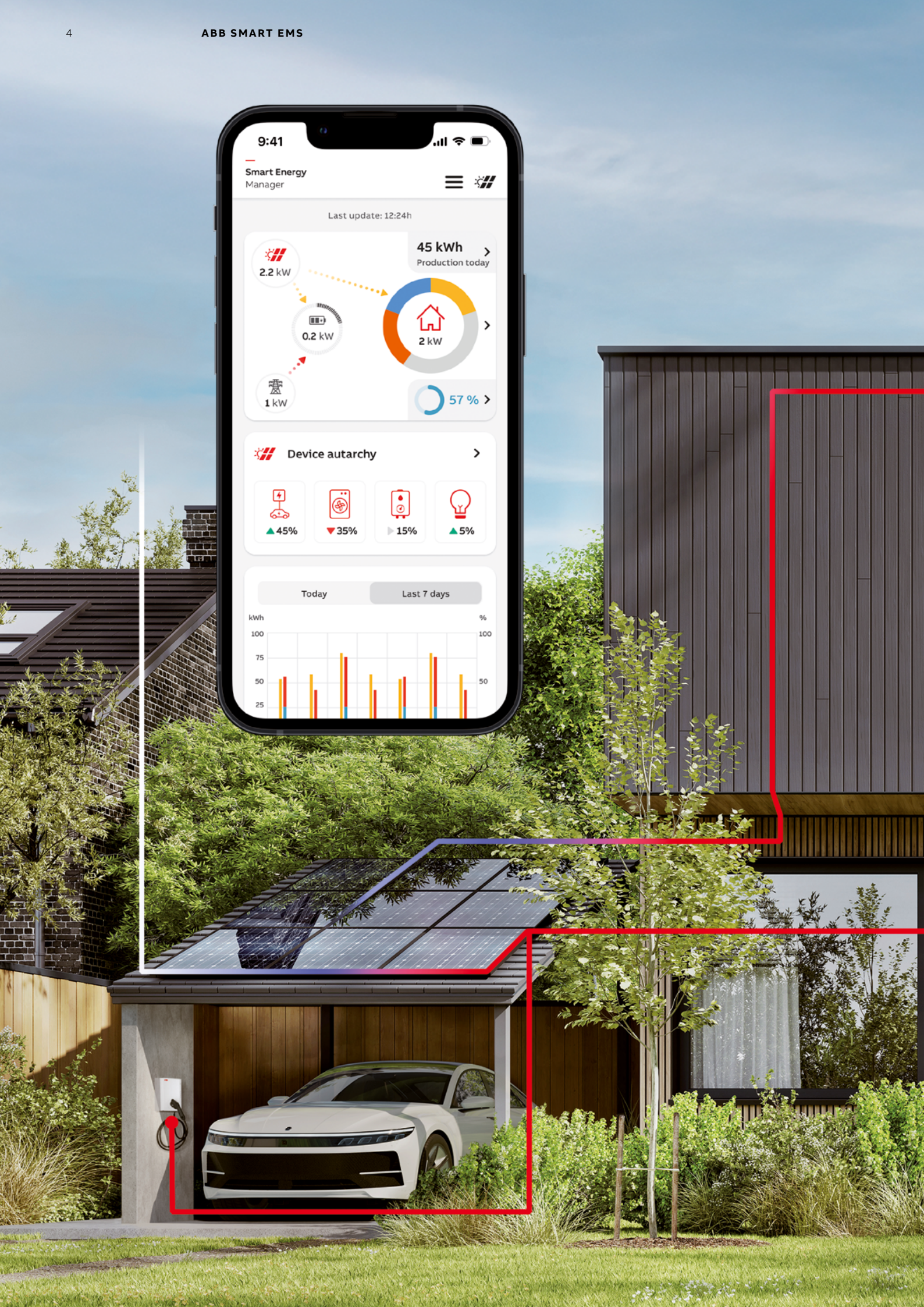


ABB Smart EMS

Home energy management - easier than ever

ENGINEERED
TO OUTRUN

Table of contents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Smart Energy
Manager
Last update: 12:24h
45 kWh
Production today
2.2 kW
0.2 kW
2 kW
1 kW
57 %
Device autarchy
▲45%
▼35%
15%
▲5%
Today
Last 7 days
kWh
%
100
75
50
25
100
50

Envision a world where you can truly relax, assured that your energy consumption is being efficiently optimized and minimized, all while you enjoy the comfort you deserve. With ABB Smart EMS, this is now within your reach.

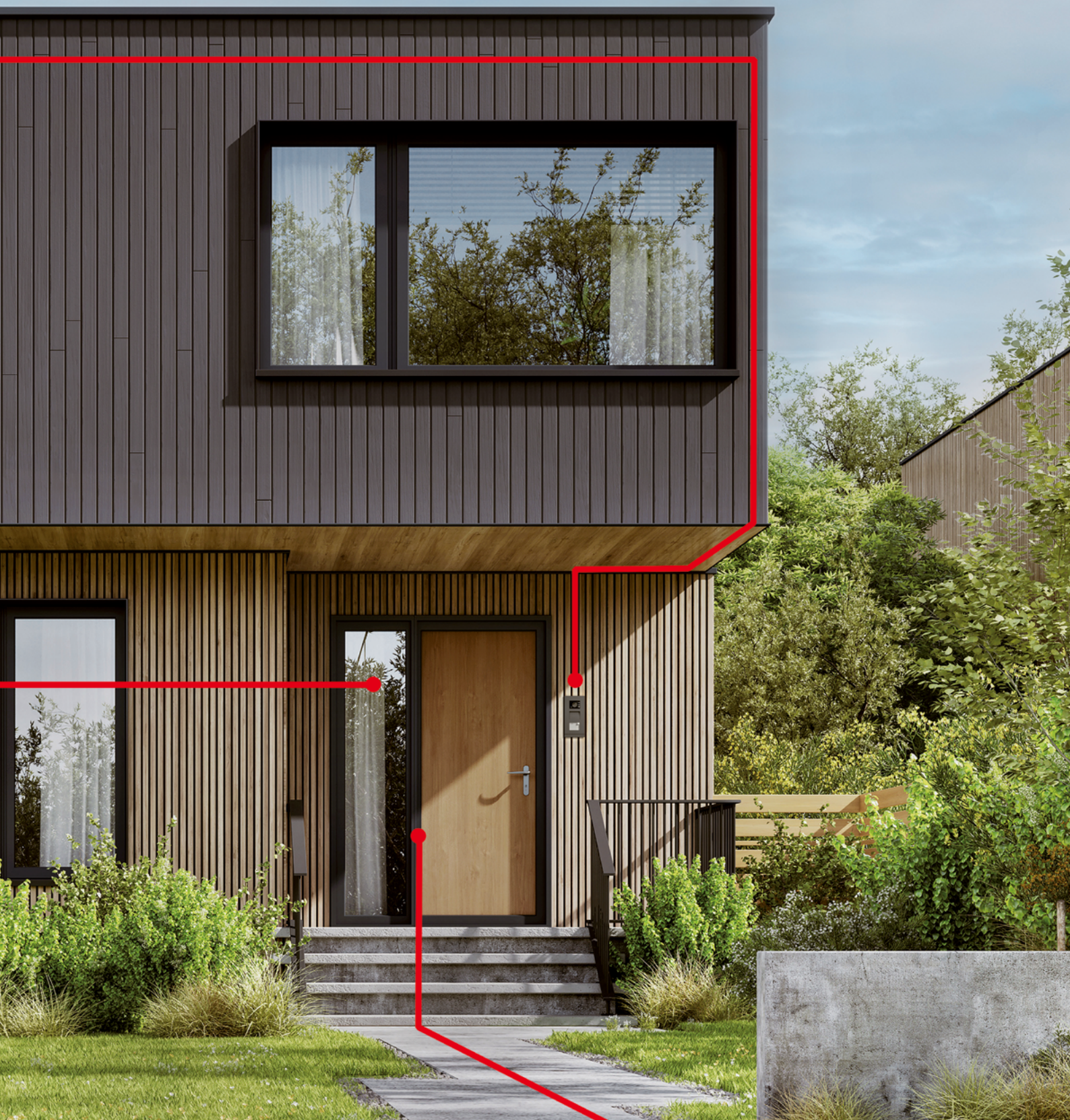


ABB Smart EMS
Your personal energy assistant

In a world where energy efficiency is more important than ever, homeowners are on the lookout for smart solutions to optimize energy use, reduce costs, and enhance sustainability.

The solution? ABB Smart EMS – your dedicated energy assistant, which is always at your fingertips. ABB Smart EMS fully automatically manages and optimizes your energy flows, ensuring you get the most out of every kilowatt, all without lifting a finger.

ABB Smart EMS
Introduction

The beauty of ABB Smart EMS lies in its simplicity and versatility. Designed to be user-friendly and easy to install, it integrates seamlessly with devices from over 300 manufacturers, including electric vehicle chargers, inverters, heat pumps, smart meters and more.

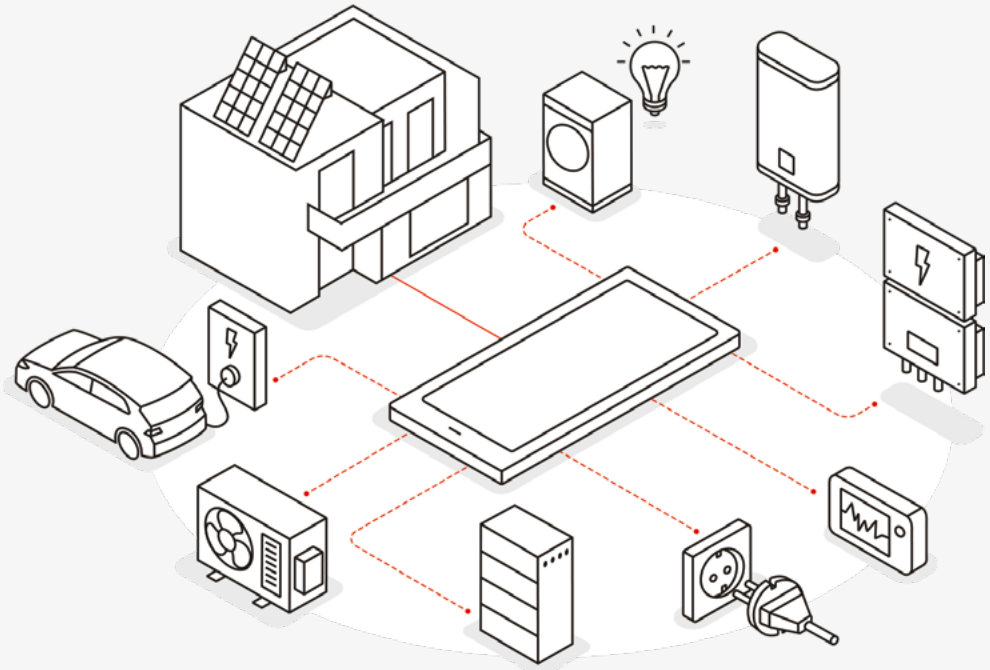
If you're a homeowner looking to streamline your energy use, you can access real-time insights and automated optimization to help you achieve your goals. The intuitive interface offers clear visualization and easy adjustment of your energy setup.

ABB Smart EMS doesn't just help you save energy; it also helps you to save costs by accessing detailed information on energy tariffs and forecasted available power (in case of available PV installation), along with historical data on energy usage. This allows you to make informed decisions about your energy consumption. With the ability to automatically prioritize the operation of energy-intensive devices and manage peak demand, your energy assistant ensures that you're using energy when it's most cost-effective. It also listens to your needs - making adjustments according to your preference is as easy as pressing a few buttons. This intelligent approach to energy management can lead to significant reductions in utility bills over time.

ABB Smart EMS is built for the future. It's a scalable solution that grows with your needs, from single homes to multi-dwellings even into light commercial environments. Its cloud-based platform allows access and control of the system from anywhere, at any time. With ongoing maintenance and system expansion capabilities, it is a long-term partner in your energy management journey.

SOLUTION

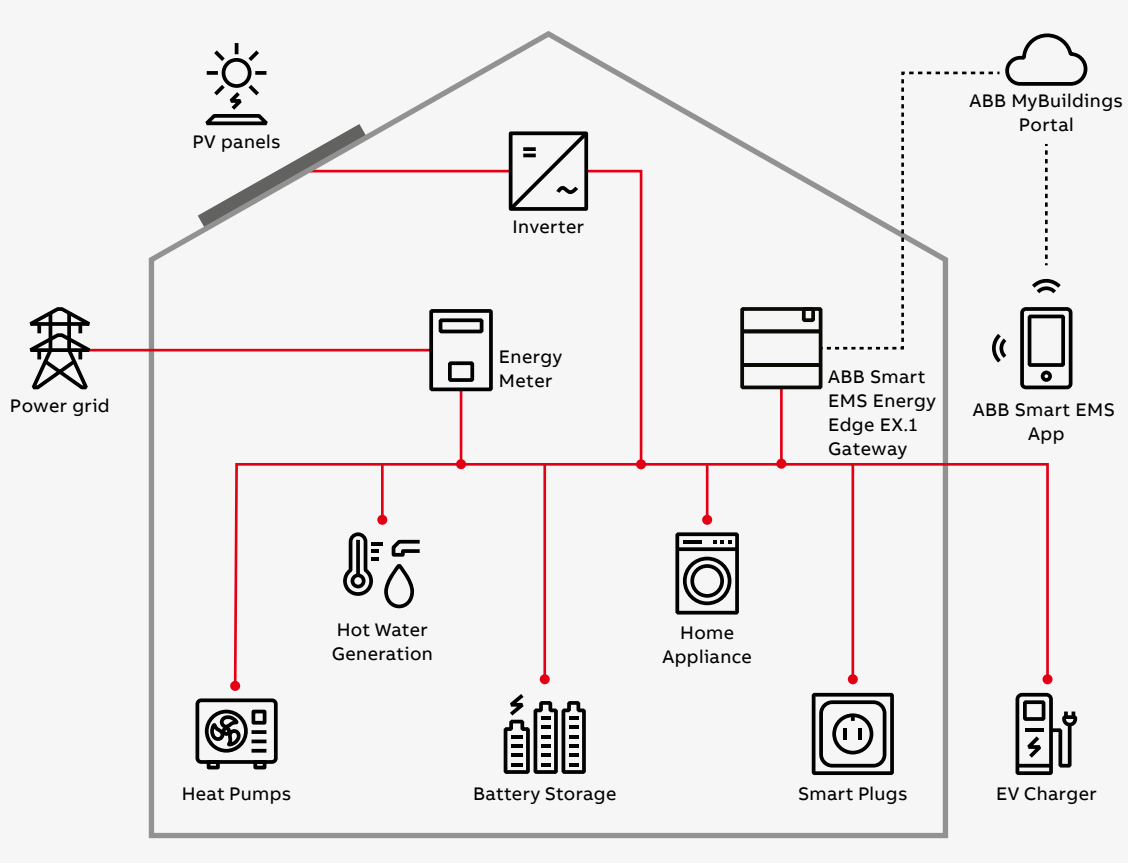
ABB Smart EMS is a smart energy management solution which allows you to increase your energy efficiency and lower your energy costs. Easy to install and configure, supporting with a wide variety of use cases and applications, it is your dedicated energy assistant which optimizes energy consumption in your single- or multi-family building.



SUPPORTED DEVICES

Supports the integration of devices from more than 300 manufacturers in the range of:

- EV Chargers
- Heat Pumps
- Battery Storage
- Hot Water Generation
- Inverters
- Smart Meters
- Smart Plugs
- Home Appliances



This cutting-edge energy management solution is designed to optimize your home's energy consumption and maximize the benefits of your renewable energy sources. Utilizing the available solar forecast for your specific location and dynamic tariff information will help you achieve even higher self-sufficiency and energy cost reduction.

ABB Smart EMS seamlessly integrates with various household appliances and energy systems to provide you with unparalleled control over your energy usage.

Whether you're a homeowner looking to reduce your energy bills or a professional installer seeking the best solution for your clients, ABB Smart EMS offers the tools and technology to make energy management simple, efficient, and cost-effective.

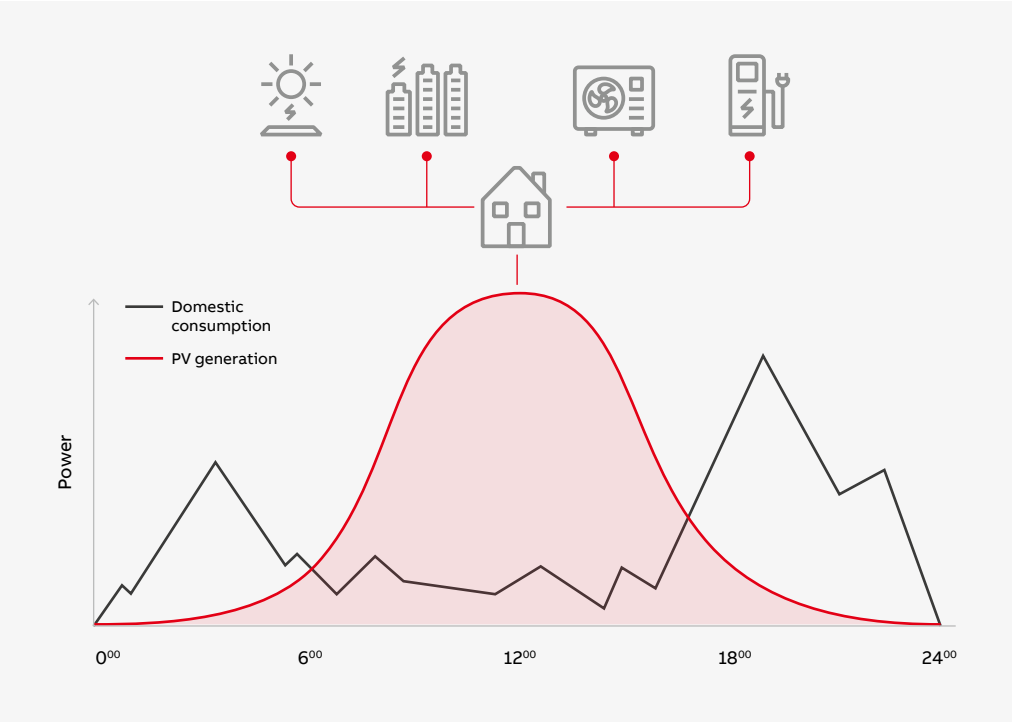
What ABB Smart EMS does for you

- Optimizes energy flows and ensures low utility bills
- Gives you the freedom to integrate a wide range of devices
- Lets you monitor everything through a single easy to use app
- Monitors the consumed and produced energy
- Decides when is the best cost-efficient time to switch large consumer devices on or off
- Allows your installer to troubleshoot your installation remotely in case of an issue

Benefits
For end users

HOLISTIC ENERGY MANAGEMENT

To optimize your energy use effectively, it's essential to manage the biggest energy consumers in your home. Devices like electric cars are great starting points since their batteries can often last a week without daily charging. If you have a solar power system, investing in a smart energy management solution like ABB Smart EMS can boost your self-consumption and reduce payback time. A good system integrates and controls multiple devices to meet your needs, with an easy-to-use app for quick adjustments. With ABB Smart EMS, your energy flow is always at your fingertips, ensuring precise optimization of your energy production and consumption. The solution also ensures protection of the electrical infrastructure thanks to dynamic load balancing & smart management.



SIMPLICITY

ABB Smart EMS is designed for everyone, no matter your technical skills. If you prefer a hands-off approach, your installer will take care of the basic settings and automate energy management for you, enabling the system to automatically monitor, optimize, and control the energy in your home. You can relax while it does the work for you, but you'll always have complete control. The user-friendly app lets you easily adjust your preferences and adapt energy optimization to fit your needs, whether you're at home or away on vacation.

MANUFACTURER INDEPENDENT

Easily integrated with a wide range of devices, ABB Smart EMS gives you flexibility and future-proofs your investment. It connects multiple energy-consuming devices, like heat pumps and charging stations, which can be managed independently and prioritized based on your preferences. Without an energy management system, devices can over-regulate and operate erratically. Choosing ABB Smart EMS means you don't need to replace your existing devices, allowing you to optimize your energy systems without waiting for new products or compatibilities with specific manufacturers.

SMART FORECAST

ABB Smart EMS offers a solar power forecast for every customer, regardless of the inverter's brand. This forecast gives you specific details on expected electricity production over the next few days based on weather conditions. By using solar and weather forecasts along with energy price predictions, your energy assistant can proactively optimize your energy usage, helping you make the most of your energy resources.

ALWAYS UP TO DATE

Continuous updates ensure that your solution is always up to date and equipped with the latest features, keeping you prepared for the future.

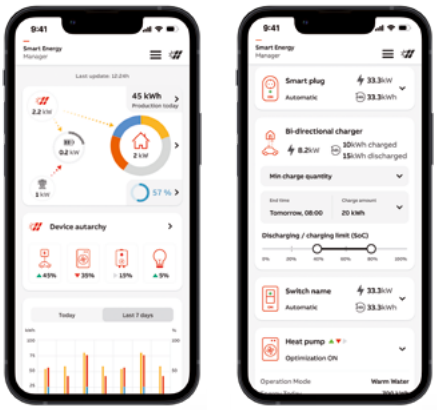
ALWAYS AT YOUR FINGERTIPS

ABB Smart EMS is your personal energy assistant. Future-proof, easily expandable and helping you maximize savings - available always at your fingertips.

Get started with ABB Smart EMS

Download the app or access through the web

User-friendly interface: easily monitor and gain full control over your energy systems.
The intuitive mobile app and web interface make it simple to monitor your energy usage. You'll get a clear overview of the energy produced and consumed in your home, and with the web-based solution, you can check your energy consumption from anywhere, at any time.

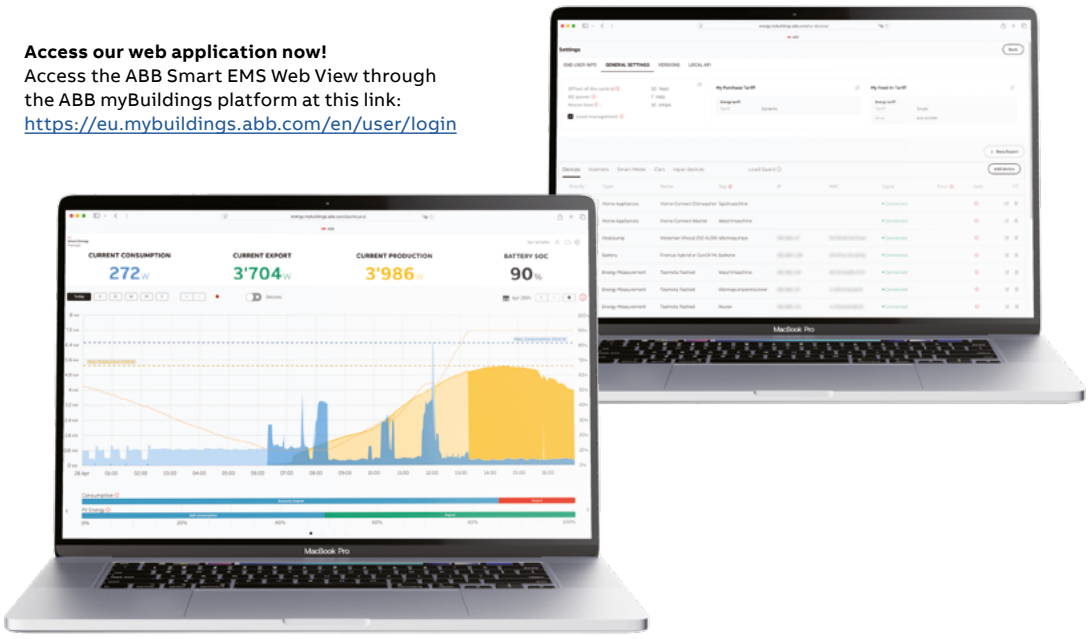


Download our ABB Smart EMS app!
Scan the QR code to download our app from the App Store or Google Play.

Download on the App Store

GET IT ON Google Play

Access our web application now!
Access the ABB Smart EMS Web View through the ABB myBuildings platform at this link:
https://eu.mybuildings.abb.com/en/user/login



One Ecosystem

Even better in combination with ABB's smart home systems

Enhance your comfort and peace of mind by integrating energy management with your existing smart home technology for the best experience possible. Whether you use ABB-free@home® or ABB i-bus® KNX, both can be easily combined with ABB Smart EMS. Want to check your energy consumption but don't have your phone handy? No problem—just take a quick look at your wall panel when combining ABB Smart EMS with ABB-free@home® or KNX APP-Control Server.

ABB Smart EMS, like all other ABB smart home solutions, is integrated into the ABB myBuildings platform. This platform offers a seamless experience with a single login for all connected systems and digital services, allowing you to fully optimize your smart home according to your needs.

With the ABB myBuildings portal, you can manage all your ABB solutions in one centralized location. Easily view your connected devices and active subscriptions without the hassle of switching between pages or apps. Enjoy the comprehensive benefits of ABB myBuildings, which also enables your installer to support and service your home from anywhere, at any time.

With the ABB myBuildings One Ecosystem, you can rest assured that you are always connected and in control.

ABB myBuildings portal

End customer portal + apps
Manage your ABB Smart EMS solution anytime, anywhere. Get full control and insight into what is happening in your home at the touch of a button.

Subscription plans

The ABB Smart EMS solution offers two subscription plans designed to provide you with the most suitable package for your needs.
The **Smart EMS Energy_Basic** plan enables you to optimize your energy usage effectively for any installation. For an enhanced experience, the **Smart EMS Energy_Premium** plan delivers a higher level of optimization, savings, and comfort through the use of AI and machine learning algorithms that actively inform and interact with your connected systems.

Features	Smart EMS ENERGY_BASIC	Smart EMS ENERGY_PREMIUM
Supported vendors Wide range of plug and play compatible energy devices	> 300	> 300
Supported devices classes Wide range of plug and play compatible energy devices	EV, PV, Heatpump, Smart Meter, Batteries, Smart Plugs, Hot Water, Home App., E-Cars	EV, PV, Heatpump, Smart Meter, Batteries, Smart Plugs, Hot Water, Home App., E-Cars
Energy Monitoring Always keep tack of your energy production and consumption	✓	✓
Self-consumption optimization Automatic optimization for maximum self-consumption of your self-generated energy	✓	✓
Smart Forecast Increased optimization through forecast data such as solar forecast, day ahead energy price and weather forecast	✓	✓
Load Management & Protection Automatic load balancing to suit your domestic installation and protecting the grid feed	✓	✓
AI Energy Assistant AI Assistant to further boost energy savings through automatic detection of anomalous consumptions and corrective actions recommendation	X	✓
E-car SOC connection Link your electric car with ABB Smart EMS and benefit from even higher optimization, thanks to the direct exchange of data related to the EV battery level	X	✓
Dynamic Tariffs Benefit from low energy costs. ABB Smart EMS shifts energy usage to favorable daytime windows	✓ (1)	✓ (1)
Energy Communities ABB Smart EMS optimizes self-produced energy in a local community for self-consumption and selling exceeds and automatic billing	✓ (1)	✓ (1)
Remote Access/ Connectivity Get access to your ABB Smart EMS solution from any place at any time	✓	✓

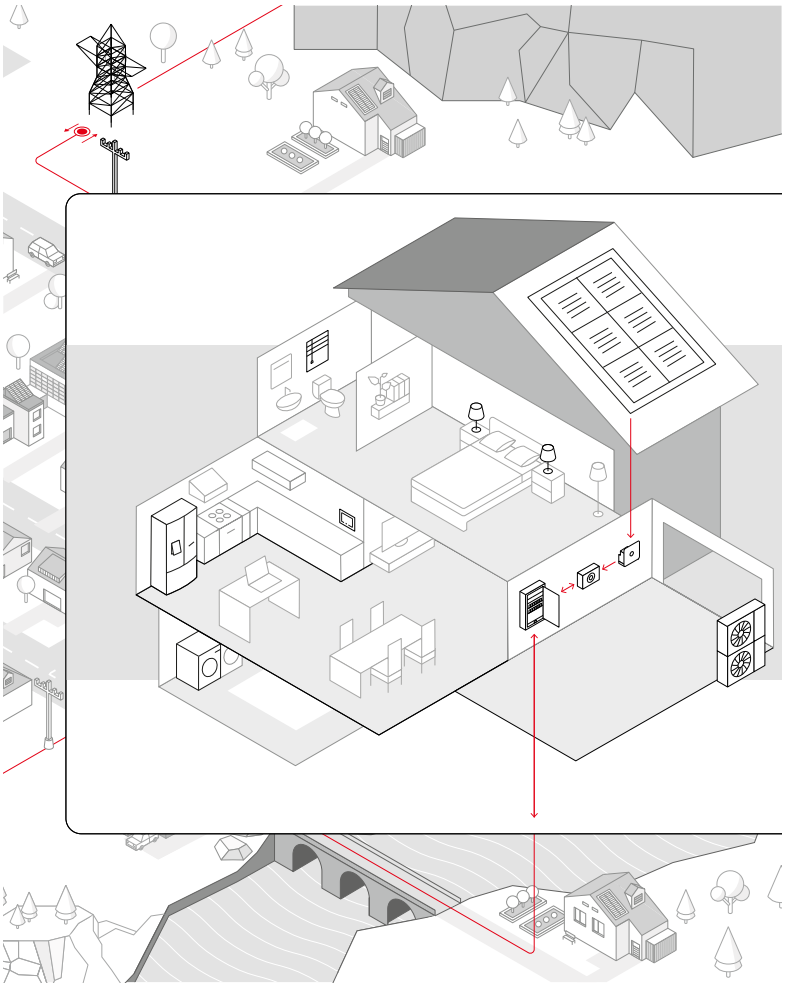
(1) Depending on country availability

Application areas
Single-family houses or multidwellings

Single family home

Optimize the energy consumption of any type of single-family home, whether modern or traditional, large or small.

The ABB Smart EMS is designed for simple installation in new buildings and can also be used as a retrofit solution, offering high flexibility with a large number of "plug & play" drivers. It continuously monitors energy consumption and automatically optimizes the main consumers based on various factors such as self-generated energy, expected solar energy, forecasted electricity prices (dynamic tariffs), and the use of electric vehicles as storage (V2X).



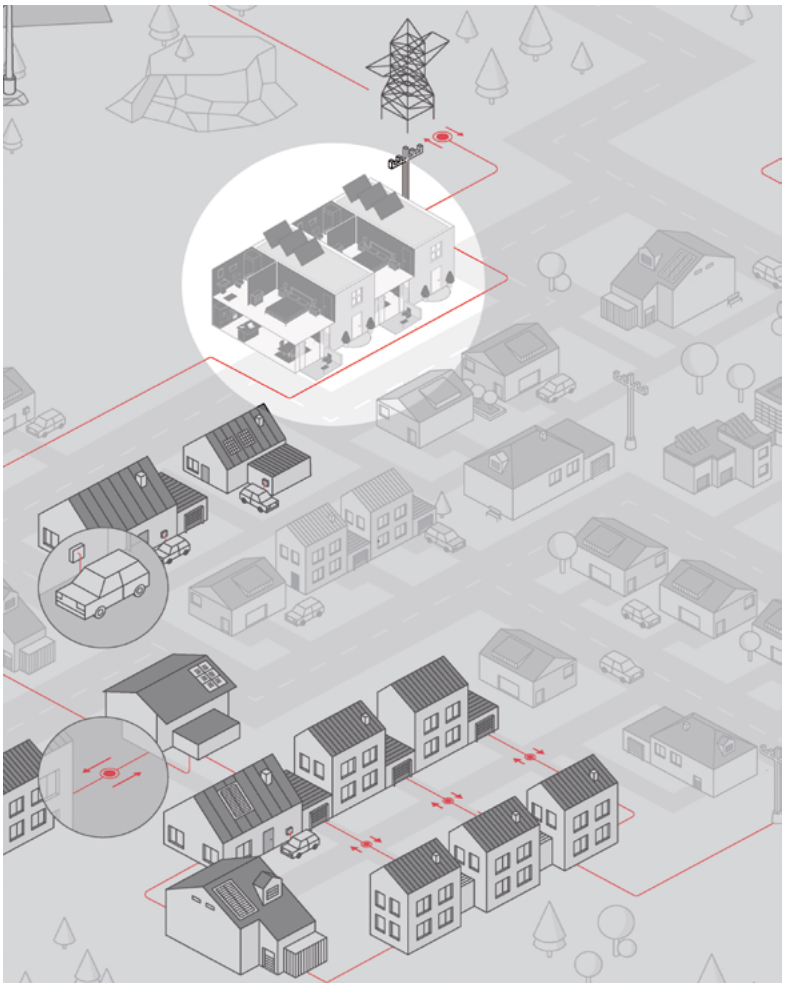
Multi-family houses

In apartment buildings the focus lies on optimizing the consumption of electrical energy to ensure efficiency and cost-effectiveness. This involves strategies such as shortening the payback period by optimizing the usage of large consumers like heat pumps, EV chargers, and hot water preparation.

Another aspect is the possibility for smart energy sharing in energy communities, where self-produced electricity or inexpensive electricity from the grid can be sold to residents and tenants. This can be billed independently or through a billing partner connected to the platform, providing flexibility and cost-saving opportunities for all involved.

Financial benefits
Optimizing the energy consumption of an apartment building through ABB Smart EMS benefits all parties involved. In the case of a rental property, the owner can sell the solar power generated to the tenants, who in turn benefit from a lower tariff compared to conventional electricity prices.

Large consumers
To reduce the payback period, it is beneficial to prioritize the optimization of energy use for large consumers. This applies to both single-family and multi-family houses, where large consumers like electric vehicles can be operated in a cost-effective manner using solar power and ABB Smart EMS with load management, heat pumps, or hot water systems.



For Professionals

System overview
Hardware and software

ABB Smart EMS offers a comprehensive suite of products and features designed to meet diverse energy management needs

ABB Smart EMS Energy Edge EX.1 Gateway

The ABB Smart EMS Energy Edge EX.1 Gateway serves as the heart of the solution, seamlessly connecting to all integrated devices and efficiently managing energy distribution across various applications.

Easy installation: the installation process is user-friendly, featuring easy commissioning that begins with a QR Code and a Web Wizard, ensuring a hassle-free setup.

Broad compatibility: designed for versatility, the gateway is compatible with a wide range of energy devices and systems, making it adaptable to various environments.

Powerful hybrid solution: the gateway ensures that basic energy functionalities remain operational, while leveraging state-of-the-art web/cloud-based energy management. This future-proof system allows for advanced scenarios, such as energy optimization based on weather forecasts, dynamic tariffs, and energy community concepts, offering a robust platform for modern energy needs.

The gateway is equipped with 2 Digital inputs, 2 Binary outputs as well as 1 Analog output (0-10V) to connect to additional appliances or systems.

For technical details and the ordering code, see page 42)

ABB Smart EMS Installer App

The solution can be accessed through a user-friendly app tailored for professionals, designed to meet their specific needs.

Download on the App Store

GET IT ON Google Play

Intuitive interface: installers can easily commission, monitor and control their customers' installation through a clear and simple interface.

Real-time data: the ABB Smart EMS Installer App provides a comprehensive overview of all of your customers' installations, the current health status and the main energy data/KPIs.

Remote support: Manage your customers' installations from any place at any time. From comissioning, monitoring up to remote assistance and adjustments, this gives you the full freedom and reduces efforts.

ABB Smart EMS Installer Web View

ABB Smart EMS is designed to offer a seamless, secure, and efficient experience for both homeowners and installers. With its robust feature set, it ensures that energy usage is optimized, while also prioritizing convenience and data security.

Detailed analytics: The solution provides in-depth analytics, offering users comprehensive insights into energy data and performance metrics, enabling better decision-making and optimization of energy consumption.

Remote management: installers can monitor systems, provide support, and make necessary adjustments from anywhere, streamlining maintenance and troubleshooting without the need for on-site visits.

Enhanced Security and Reliability: ABB Smart EMS comes with the highest standard of data and cyber security to ensure long-term safe and stable operation.

The Web View can be accessed through the ABB ProService portal, the best companion for ABB professional installers who want to manage all ABB smart solutions from one single platform.

Access the Web View now!
Access the ABB Smart EMS Installer Web View through the ABB ProService platform at this link:
https://proservice.mybuildings.abb.com/abb/en

Benefits
For installers

Connect assets and devices, set up and commission easily through the ABB Smart EMS Installer App or Web View.

Wide range of supported 3rd party vendors.

Overview of all customer installations on the same platform.

Key figures and monitoring for all installations including notifications for maintenance and servicing of the installations

Simple management of employees and end customers.

The solution is designed for easy installation by professionals, typically taking only a few minutes to set up.

Installers can perform simple adjustments and troubleshooting remotely, saving time and reducing the need for on-site visits.

System architecture

One Ecosystem also for professionals

ABB Smart EMS can work as a standalone solution, but it can also be integrated with ABB smart home systems for the benefit of the end users.

At the same time installers who are used to managing their ABB smart installations through the ProService Portal will be able to do it also for ABB Smart EMS.

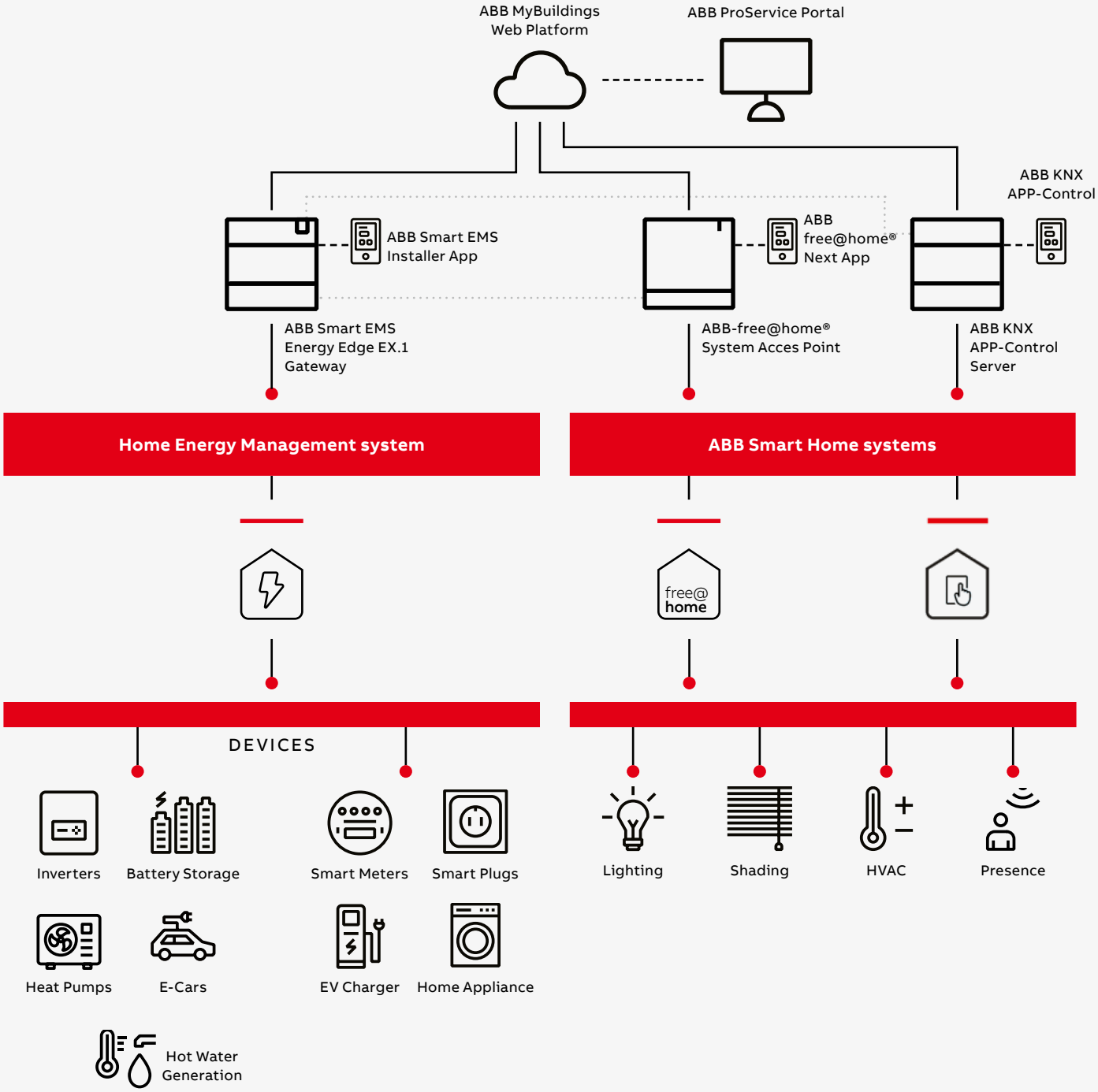
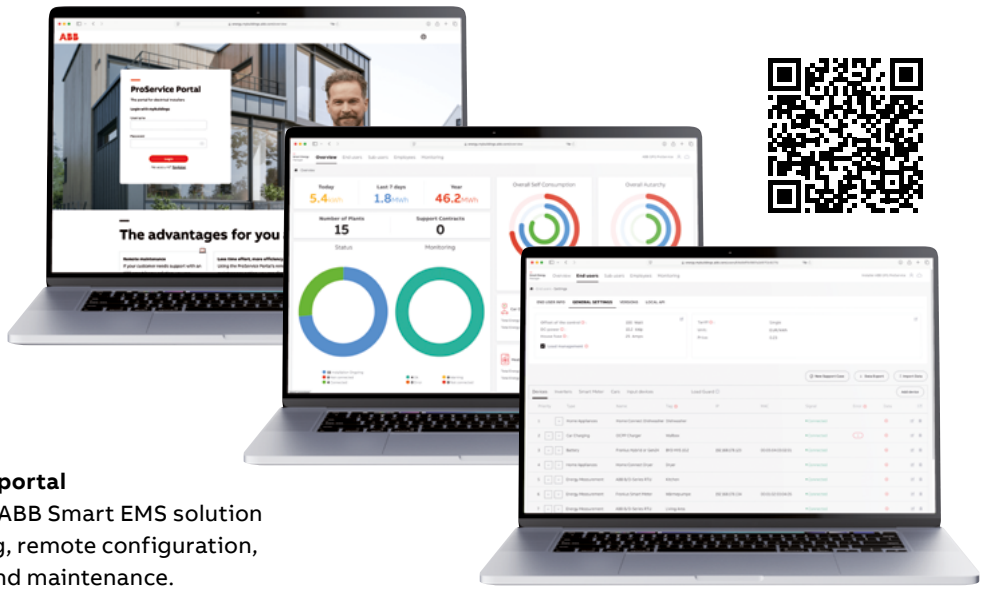


ABB ProService Portal

The ABB ProService Portal is the central place for professionals and electrical installers who work with ABB's Smart Home and Smart Energy solutions.

The whole process from project planning up to installation and operation can be easily managed and assisted by the ABB ProService offering, compatible with a range of ABB systems (ABB-free@home®, ABB-Welcome, ABB i-bus® KNX, ABB Smart EMS).



Professional portal
Manage your ABB Smart EMS solution from planning, remote configuration, monitoring and maintenance.

Integrations and compatible devices
From over 300 manufacturers

Explore the devices supported by ABB Smart EMS for optimized energy management. From smart meters for consumption monitoring to EV charging, inverters, batteries, and heat pumps. Scan the QR code for the full list and more detailed information.

Integration Capabilities

ABB Smart EMS integrates seamlessly with a wide range of energy solutions to enhance efficiency and optimize energy usage across different applications.

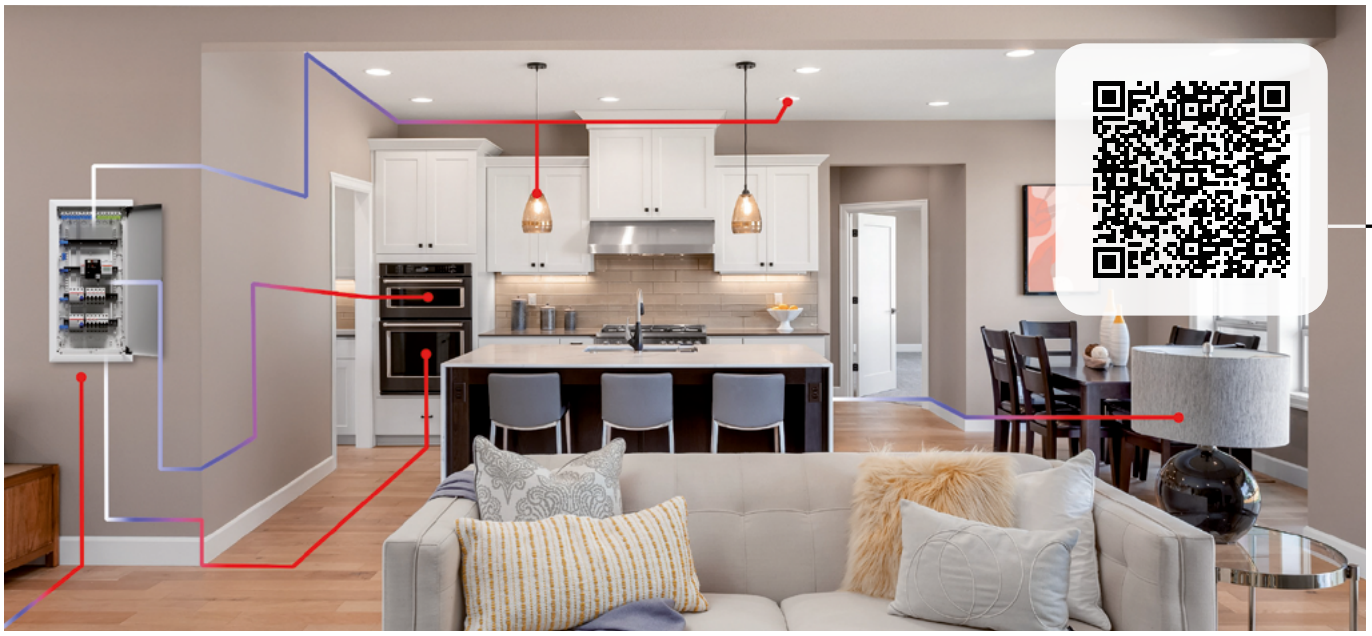
Inverters: it supports inverters from major PV system brands, allowing users to maximize the self-consumption of their self-generated solar energy.

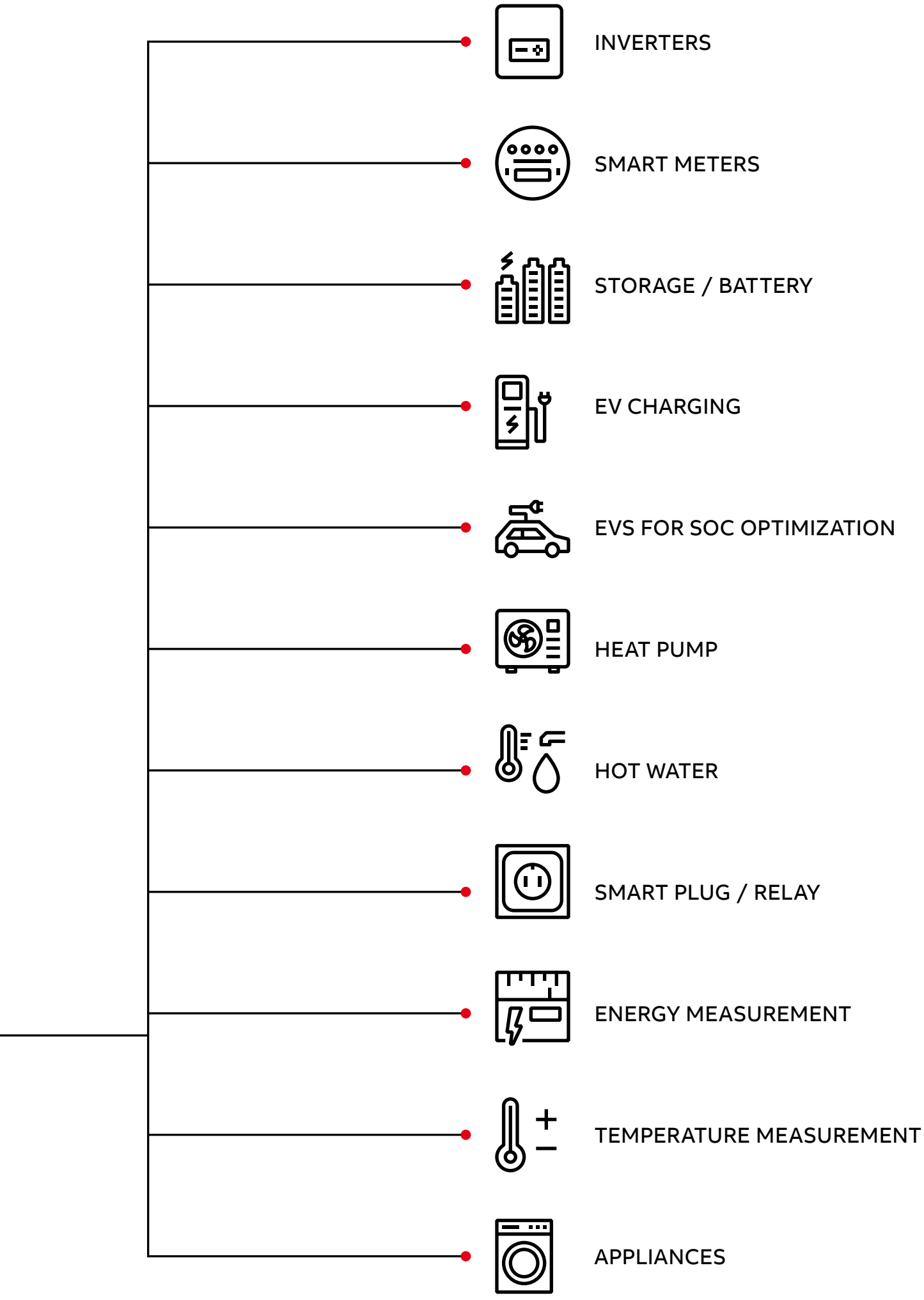
EV chargers: it integrates charging stations for electric vehicles and is designed to optimize charging times, utilizing excess solar energy when available and adjusting charging schedules based on grid tariffs. Additionally, advanced cascaded charging is available for public spaces and multi-dwelling units, ensuring efficient energy distribution.

Heat pumps: it provides intelligent control overheating pumps, optimizing heating and cooling for greater energy efficiency.

Energy storage systems: it allows users to store excess energy by optimizing it based on self-consumption needs and price fluctuations, ensuring cost-effective energy use.

Smart devices: it allows users to integrate and control a variety of smart plugs and household appliances, further enhancing energy management and automation in the home.




INVERTERS
SMART METERS
STORAGE / BATTERY
EV CHARGING
EVS FOR SOC OPTIMIZATION
HEAT PUMP
HOT WATER
SMART PLUG / RELAY
ENERGY MEASUREMENT
TEMPERATURE MEASUREMENT
APPLIANCES

System functionalities

Advanced Features

The energy management solution incorporates advanced features designed to optimize energy usage and enhance efficiency across various applications.

Dynamic tariff optimization: users can adjust their energy consumption based on time-of-use electricity rates, ensuring that they take advantage of lower prices during off-peak hours while minimizing costs during peak times.

Predictive control: leverages weather forecasts to proactively manage energy needs, allowing users to anticipate changes in energy production and adjust their consumption accordingly.

Load management: to prevent overloads, ABB Smart EMS employs effective strategies that intelligently distribute available power among devices, while also integrating fuse and main phase protection for added safety.

Energy Communities: ABB Smart EMS facilitates energy sharing and billing in multi-unit settings, making it easier for neighbors or residents in multi-dwelling units to collaborate on energy consumption and costs. This integrated approach not only promotes energy efficiency but also fosters a sense of community and cooperation in managing shared resources, ultimately contributing to a more sustainable energy landscape.

Energy Analytics

The energy management solution is designed to provide users with comprehensive insights and tools for effective energy monitoring and optimization.

Energy Flow Diagram: it provides users with a clear, real-time visualization of energy production and consumption, making it easy to understand how energy is being generated and utilized within their systems. This intuitive representation allows users to monitor their energy flow at a glance, enabling them to make quick adjustments as needed.

Historical data: ABB Smart EMS offers access to historical data, allowing users to track energy patterns over time. By analyzing this data, users can identify trends and make informed decisions about their energy consumption and production strategies, leading to improved efficiency and cost savings.

Performance metrics play a crucial role in evaluating the system's effectiveness; users can monitor key indicators such as the self-consumption rate and the degree of autarchy, which reflect how effectively they are utilizing their generated energy independently of the grid.

Together, these features empower users with comprehensive insights into their energy management practices, facilitating continuous improvement and optimization of their energy usage.

Customization Options

ABB Smart EMS is designed to provide users with enhanced control and flexibility in managing their energy consumption.

Prioritization settings: users are empowered to define which devices should receive power based on their specific preferences and needs. This feature ensures that critical appliances and systems remain operational during peak demand or when energy resources are limited, enhancing the user's control over their energy consumption.

Operating modes: users can also select from various operating modes, ranging from preset configurations designed for common scenarios, to custom setups tailored to unique requirements. This flexibility allows users to adapt their energy usage according to daily routines or specific events.

Alerts and notifications: users can set up customized alerts for important energy events, such as high consumption levels, system malfunctions, or changes in tariff rates. This proactive approach not only keeps users informed about their energy management but also facilitates timely interventions when necessary, ensuring optimal performance and efficiency in their energy systems.

Overall, these features enhance user engagement and control, leading to more efficient energy use and improved satisfaction.

ABB Smart EMS is continuously evolving, with regular updates and new feature additions to meet the changing needs of energy-conscious consumers and the rapidly advancing energy technology landscape .

System functionalities
Additional details

SELF-CONSUMPTION OPTIMIZATION

To maximize self-consumption and make the most of available power, ABB Smart EMS intelligently controls integrated consumers whenever there is a surplus of solar power. This results in reduced electricity purchases, cost savings, and a shorter payback period for the energy management solution.

ABB Smart EMS handles various optimizations, including:

Hot Water
ABB Smart EMS optimally utilizes the electricity produced for hot water preparation, minimizing the need for additional electricity purchases. This involves controlling devices like water heaters or a relay for heating boilers, storing any excess energy instead of feeding it back to the grid.

Electric Car
ABB Smart EMS allows easy configuration whether the electric car should be charged with any solar surplus that may be available - always, only at low tariffs, or only using power directly from the grid.

Battery
Excess electricity can be temporarily stored in a battery for later consumption, enabling nighttime electricity requirements to be met based on solar system size and weather conditions.

Smart Plugs
Devices connected to a power outlet can be controlled using a Smart Plug, with ABB Smart EMS able to switch devices on and off based on the available surplus.

Heat Pump
ABB Smart EMS can directly control modern heat pumps, optimizing the temperature of the home based on weather forecasts to conserve energy. The system takes into account dynamic tariff rates, shifting high energy consumption to times when electricity prices are lower.

Other Devices
Most devices connected to the home network can be managed by ABB Smart EMS.
ABB Smart EMS can identify the best time - e.g., during solar surplus or low costs depending on dynamic tariffs - to start household appliances such as washing machines.

AI Energy Assistant

The AI Energy Assistant leverages advanced machine learning to provide tailored messages for optimizing your energy management. For instance, it offers insights into your building's expected electricity production over the next few days based on current weather conditions. Additionally, the assistant sends push notifications to keep you informed about optimal electric vehicle charging tariffs and to alert you about any unexpected abnormalities.

The following are the four categories and examples of potential notifications:

Energy Reports
Regular reports on key performance indicators, such as self-consumption rate, network reference, and changes in major consumers, allowing you to track important developments in a timely manner.

Progress & Comparisons
Feedback on the development of key performance indicators, providing updates on your network coverage and celebrating milestones such as achieving 100% self-sufficiency for multiple days.

Anomaly Detection
Alerts about unusual issues like rising grid consumption despite steady production, hot water system problems, or unexpected device activity.

Optimization Proposals
Proactive suggestions on how to maximize the efficiency of your ABB Smart EMS system, including tips on utilizing expected production and using smart loading modes for electric vehicle charging.

System functionalities
Additional details

ELECTRIC VEHICLE CHARGING

Electric vehicles can be charged with solar energy, even with regular daily use. ABB Smart EMS efficiently charges the electric car exclusively with available solar power or allows the possibility to switch to sourcing power directly from the grid utilizing dynamic tariffs.

With just two clicks, the ABB Smart EMS app allows you to configure your car to be charged entirely with solar power, a combination of solar power and low tariffs, or immediately regardless of available self-produced electricity . The app also provides solar power forecasts and consumption statistics for your electric car, assisting you in planning accordingly. Additionally, ABB Smart EMS seamlessly integrates multiple electric vehicles, ensuring that your home connection is safeguarded, with power purchase monitored and charging power adjusted as needed.

Using simple components such as smart plugs, the app allows for the control of other vehicles, such as e-scooters and e-bikes, and the measurement of fuel consumption.

Bidirectional Charging
Bidirectional charging occurs when an electric car battery functions not only as a propulsion system but also as a stationary storage solution at home (Vehicle-to-Home - V2H) or to provide services to the grid (Vehicle-to-Grid - V2G). ABB Smart EMS supports both use cases, positioning you to invest in a future-proof solution.

For example, the average nighttime consumption of a single-family house with a heat pump typically ranges from 5 to 15 kilowatt-hours. Charging and discharging from the electric car can be adjusted to meet this consumption. You can define the level to which the car should charge the house, offering flexibility to adapt these settings according to your mobility needs.

Utilizing the car battery as an intermediate storage system requires a combination of a vehicle and a charging station that supports bidirectional charging. Currently, a DC charging station is needed, and the selection of vehicles with bidirectional capabilities is still limited.

HOUSEHOLD DEVICES AND SOLAR-OPTIMIZED HOME APPLIANCES

Many household devices are major electricity consumers and are well-suited for intelligent control via ABB Smart EMS, making their management seamless. Top home appliance brands like Bosch, Siemens, Gaggenau, Neff, and Miele offer select appliances that can be optimized to run efficiently using solar power.

Optimized Home Appliances
Initiate washing, drying, and rinsing operations automatically when sufficient solar power is available or during lower tariffs. By optimizing their usage with ABB Smart EMS, you can maximize your use of self-generated electricity.

Seamless Integration into your ABB Smart EMS App
The compatible devices can be easily added to the energy management solution with a few clicks, allowing you to prioritize them as desired alongside other devices. This ensures that you have full control over your energy consumption at all times.

Example: Washing Machine
Configuring the washing machine is straightforward. Simply select a time by when ABB Smart EMS should start the washing machine. The solution will then determine the optimal time to begin the laundry cycle using solar power. If there is insufficient solar power during the process, the washing cycle will still commence until the predefined time.

Embrace the Future of Energy Management
By optimizing washing and rinsing processes with solar power, you are making your household future-ready and setting an example for sustainable living. Solar-optimized use of household appliances not only saves energy but also reduces costs.

System functionalities
Additional details

LOAD MANAGEMENT

The increasing trend towards electrical charging poses challenges for today's home grid connections, which is often not designed to handle the load. To prevent devices from running simultaneously at full capacity and causing a blackout, an energy management solution like ABB Smart EMS is essential. It constantly monitors power consumption to avert potential blackouts.

Supplier-independent, dynamic load management
Load management is often associated with large underground car parks featuring numerous charging points. However, the need for load management is also prevalent in single-family homes and small apartment buildings. Many older home grid connections lack the capacity to accommodate electric vehicles and heat pumps. To avoid the costly upgrade of electrical protection, load management can offer effective solutions. ABB Smart EMS provides this capability, allowing for optimized electricity usage and protection of the home grid connection.

Dynamic load management monitors the home grid connection and regulates targeted consumers as needed, with a primary focus on charging infrastructure for electric cars. ABB Smart EMS facilitates the integration of charging stations from various manufacturers, representing an ideal utilization of available supply without overloading the system. When other large consumers, such as heat pumps or hot water preparation systems, are active, the charging of electric cars is adjusted accordingly. If additional power becomes available, the charging power is increased, and surplus solar energy can be used to alleviate the load on the home grid connection.

Network flexibility to fulfill all the needs
In geographies where load shedding is required, the surge in electric cars and the installation of new charging stations has prompted action from power companies. For instance, most electric utilities require remote shutdown capability for the charging infrastructure. ABB Smart EMS supports this requirement and offers a significant advantage over conventional remote shutdown systems by interrupting the charging station through the communication interface. This allows for seamless resumption of charging after the signal is cleared, whereas manual reactivation is often necessary with traditional remote shutdown systems. Furthermore, ABB Smart EMS ensures that electric car charging is still possible when sufficient solar power is available, even if the remote shutdown signal is active.

HEAT PUMPS

ABB Smart EMS provides support for integrating heat pumps in various ways. In order to achieve optimal self-consumption, ABB Smart EMS considers factors such as the heating system type, available buffer storage tanks, connected service water storage facilities, and the building itself as a heat storage medium. As part of this, ABB Smart EMS offers integration options for heat pumps to facilitate the optimal self-sufficiency of local produced energy of electricity by converting it into heat for heating and hot water purposes.

Integration via PV- and SG-Ready
There are several options to integrate a heat pump into self-consumption optimization. This integration is commonly achieved through a relay contact (PV-Ready) or using two relay contacts (SG-Ready). By utilizing these contacts, the heat pump can be informed about surplus energy or tariff optimization, allowing it to adjust its operation accordingly. ABB Smart EMS fully supports both of these integration options.

Integration by LAN (Bidirectional)
Certain heat pumps support integration via a local area network (LAN). This method offers more precise control as it allows for the transmission of exact values via the LAN interface, unlike the limited states available with PV-Ready or SG-Ready (which offer only 2 or 4 states). Moreover, LAN integration provides bidirectional communication, enabling not only messages to the heat pump but also the retrieval of information for visualization and optimization purposes. A list of supported devices for LAN integration is available, detailing the heat pumps that can be seamlessly integrated into the ABB Smart EMS and monitored by means of the Heatpump Monitoring Dashboard.

System functionalities
Additional details

DYNAMIC TARIFFS

Your home, your energy: Optimized for dynamic efficiency.

Make the most of efficient energy usage and reduced energy costs with dynamic electricity tariffs. Benefit from flexible pricing based on current market conditions.

Dynamic electricity tariffs adjust the price to real-time fluctuations in the electricity market, reflecting current supply and demand conditions at short intervals. This allows you to take advantage of low prices during periods of high renewable energy production while also contributing to grid stability.

With dynamic tariffs, you can benefit from lower electricity prices, particularly on days with limited sun or during winter months when solar energy production is reduced. ABB Smart EMS ensures a reliable and cost-effective supply of daily energy provider prices, intelligently optimizing your consumption. When electricity prices are high, ABB Smart EMS minimizes electricity purchases.

- Access low-priced electricity at the current market price
- Reduce energy costs through predictive optimization and intelligent control
- Optimize your electric car charging
- Cost-effective grid electricity during periods of low solar energy production
- Can be used without a PV system

Significant savings potential
Hourly price adjustments, smart meter integration, and optimized electricity purchasing can lead to significant energy cost savings.

Flexible and transparent
Unlike traditional tariffs, price fluctuations can be directly passed on to you. You only pay the actual hourly price plus taxes and network fees.

Benefit from negative prices
During periods of surplus electricity in the grid, prices can become negative, meaning you will be paid for your consumption in such cases.

Current providers of dynamic pricing models
Various providers for dynamic pricing models are available in Denmark, The Netherlands, Germany and Switzerland. The selection is expected to expand in the future. For Germany, many dynamic tariffs are based on the European Power Exchange (EPEX Spot). If your provider follows this model but is not listed, select EPEX Spot.

Tariff Optimization
Within the app and web view, you have the option to select dynamic tariffs instead of fixed rates. You can decide for each device whether it should be optimized solely using solar energy or combined with cost-effective grid electricity (tariff optimization).

A broad selection of supported devices
Our dynamic tariffs solution supports a wide range of compatible appliances, including charging stations, heat pumps, heating elements, relays, and smart plugs.

System functionalities
Energy communities

SMART ENERGY SHARING

Energy communities represent the future of sustainable living, and ABB Smart EMS makes them a reality today.

By prioritizing self-produced energy within apartments or neighborhoods, ABB Smart EMS ensures energy is used locally, as efficiently as possible - wherever, whenever.

Through the ABB Smart EMS app, residents can easily monitor their energy consumption and PV production, fostering more mindful usage. Additionally, ABB Smart EMS is compatible with various billing partners, providing a comprehensive solution.

- Integrated: a comprehensive solution for optimizing self-consumption and reading energy data.
- Transparent: the app provides visibility into individual electricity needs for all parties involved.
- Versatile and open: supported meters offer high compatibility across various manufacturers.
- Professional: the interface with the calculator ensures a professional solution.

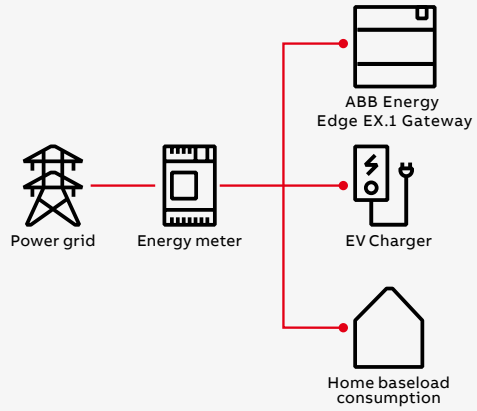
SINGLE FAMILY HOUSE SCENARIO

Application areas
Example use cases

Smart Electrical Charging

WHAT YOU NEED
- EV Charger (with Modbus or IP connectivity) with (MID) energy meter build-in
- OPTIONAL: Energy Meter for EV
- Energy Meter (Household)
- ABB Energy Edge EX.1

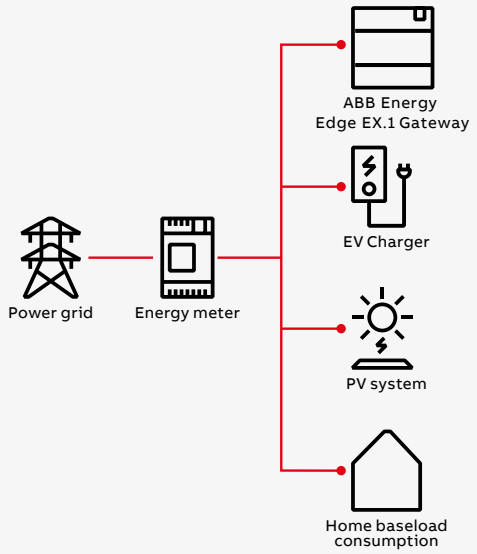
WHAT YOU GET
- Insights about energy flows and consumption
- Dynamic Loadbalancing
  - When baseload consumption+ EV are reaching household Max load threshold → EV charging power reduced
- Easy choice for prefered optimization
- Tariff based charging



PV Production + Electrical Charging

WHAT YOU NEED
- EV Charger (with Modbus or IP connectivity) with (MID) energy meter build-in
- OPTIONAL: Energy Meter for EV
- PV System (Inverter with connectivity options)
- Energy Meter (Household)
- ABB Energy Edge EX.1

WHAT YOU GET
- Insights about energy flows and consumption
- Dynamic Loadbalancing
  - When baseload consumption+ EV are reaching household Max load threshold → EV charging power reduced
- Tariff based charging
- Solar charging



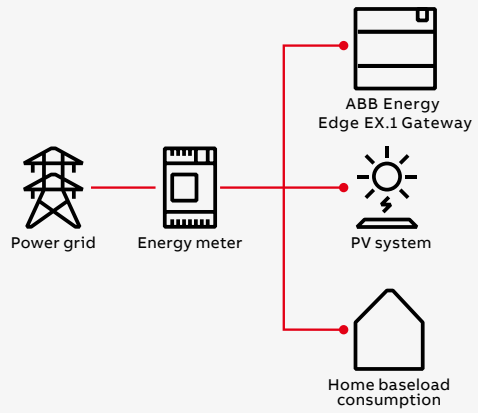
Smart Energy Management PV + Grid

WHAT YOU NEED

- PV System (Inverter with connectivity options)
- Energy Meter (Household)
- ABB Energy Edge EX.1

WHAT YOU GET

- Zero-feed in function
  - Control your solar system to minimalize or block the export of self-produced power into the grid
- Zero grid sourcing
  - Reduce the import from grid to a minimum
  - Country specific use case, e.g. NL, BE



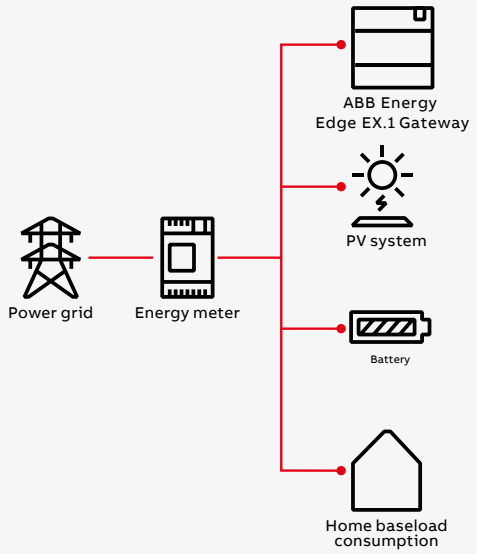
Smart Energy Management PV + Grid with Battery

WHAT YOU NEED

- PV System (Inverter with connectivity options)
- Battery System (Integrated in PV or stand alone)
- Energy Meter (Household)
- ABB Energy Edge EX.1

WHAT YOU GET

- Peak shaving
  - Reducing the peaks in the power consumption and/or production by smart control of battery and using stored energy and/or solar
- Battery charging
  - Net-zero
  - Tariff based
  - Solar (Including solar forecast)



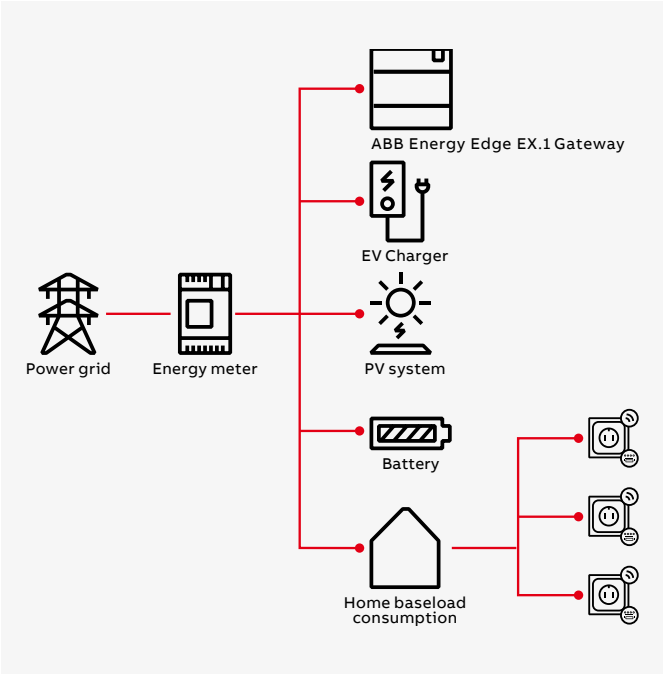
SINGLE FAMILY HOUSE SCENARIO

Application areas
Example use cases

Smart Energy Management PV + Grid + Battery + Smart Plugs

WHAT YOU NEED
- PV System (Inverter with connectivity options) AND/OR
- Battery System (Integrated in PV or stand alone) AND/OR
- Energy Meter (Household) AND/OR
- EV Charger
- ABB Energy Edge EX.1
- Smart Plugs / Sub-Meters

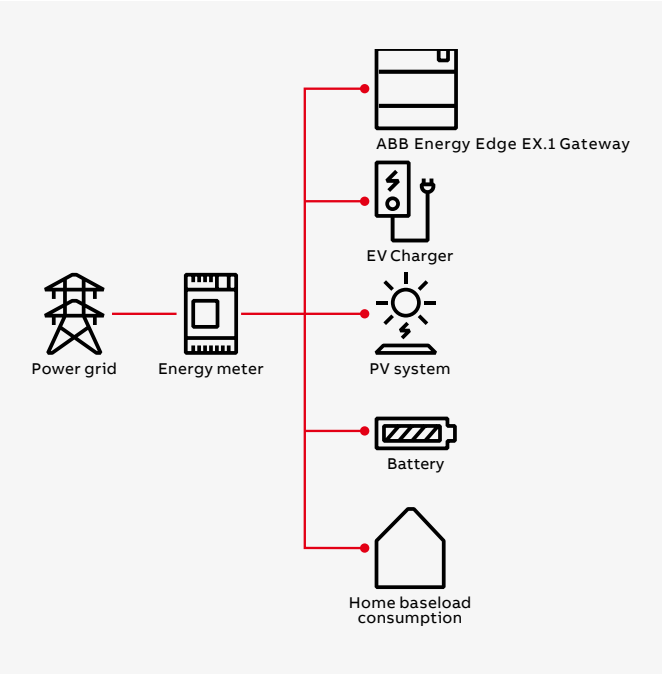
WHAT YOU GET
- Household baseload monitoring
  - Adding smartplugs (and such to add more granularity to the monitoring
  - Switch of no-crucial loads in case of peak shaving
  - Scheduled priority of loads (MTB in weekends)
- Dynamic tariffs
  - Switch On/Off smart plugs when dynamic tariff is Low/High
- Solar Charging
  - When Solar is feeding into the grid it will activate the Smart plugs to increase self-suffiency
  - Bi-directional charging with dedicated wallboxes and cars
  - V2G and V2H Charging
    - "Car as Battery storage"



Feedin Management

WHAT YOU NEED
- PV System (Inverter with connectivity options) AND/OR
- Battery System (Integrated in PV or stand alone) AND/OR
- Energy Meter (Household) AND/OR
- EV Charger
- ABB Energy Edge EX.1

WHAT YOU GET
- Dynamic Loadbalancing
  - When baseload consumption+ EV are reaching household Max load threshold → EV charging power reduced
- Peak shaving
  - Reducing the peaks in the supply using stored energy and/or solar
- Battery charging
  - Net-zero
  - Tariff based
- Solar Charging
  - When Solar is feeding into the grid it will activate the EV charger and load the car with the available solar overshoot power



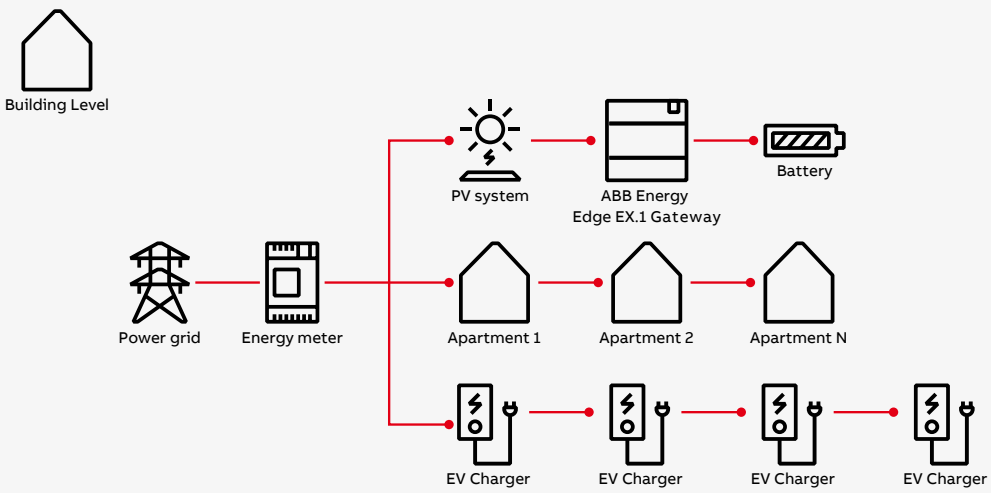
Cascaded charging and Smart Energy Share

WHAT YOU GET

- Smart Energy sharing
  - For billing purposes, the owner of the solar installation and the consumers of the solar electricity form a self-consumption association. This allows the homeowner to sell the solar power to the tenants. ABB Smart EMS supports billing by making the energy data available either for self-billing or to a billing partner

Load management:

- Balance and cascade multiple EV chargers per property
- Load reduction and load shedding to stay inside the properties electrical speicifcations



Technical information
Product codes

ABB SMART EMS ENERGY EDGE EX.1 GATEWAY

Energy management gateway for use in private residential buildings (single-family house, multi-family house, multi-apartment).
Easy to install and configure (plug-and-play).
Connected to a web portal (ABB myBuildings platform) with extensive energy management functions.
Wide compatibility with a variety of third-party devices. Easy integration of, for example, EV wall boxes, heat pumps, battery storage systems, PV systems, electric vehicles, smart meters, and smart household appliances.
Web interface, app for the electrician, app for the end customer.
Available for iOS and Android, including a tablet app.
Smart EMS Energy_Basic or Smart EMS Energy_Premium subscription required.
The app analyzes, visualizes, and optimizes energy consumption in the building.
Optimizes self-consumption with solar power forecasts, dynamic tariffs, and automated energy management.
Supports the requirements for grid-friendly control according to keep 14a EnWG.
Protects the infrastructure with dynamic load management.
Smart reduction of energy costs through predictive optimization and inclusion of dynamic tariffs.
Suitable for new build and renovation.
Easy customization to individual needs by the end customer (modes and prioritizations).
Helps with individual optimization through AI-based analyses.
Gateway is installed on-site as a sector-coupling interface.
Establishes the connection to all local energy systems and to the ABB backend (myBuildings platform).

Technical data

- Mounted on a DIN rail (4MW)
- LAN connection
- RS 485 interface for integrating Modbus meters
- 2 digital inputs (230V via coupling relay) for querying control signals (e.g., control box of utility)
- 2 digital outputs (max. 4A resistive load) for controlling, for example, heating elements via contactor, heat pumps (PV/SG Ready)
- Analog output 0-10V for stepless control (for example, for heating elements)
- Power supply 24 V DC (available separately, e.g. ABB CP-D 24/0.42).

Product Name	Type code	Order Code	EAN	Dimensions HxWxD [mm]
Energy Edge	EX.1	2CKA006230A0001	4011395354933	90x71x59