

## DATASHEET

# ABB Ability™ Energy Management System

Deliver on your sustainability commitments and maximize energy cost savings

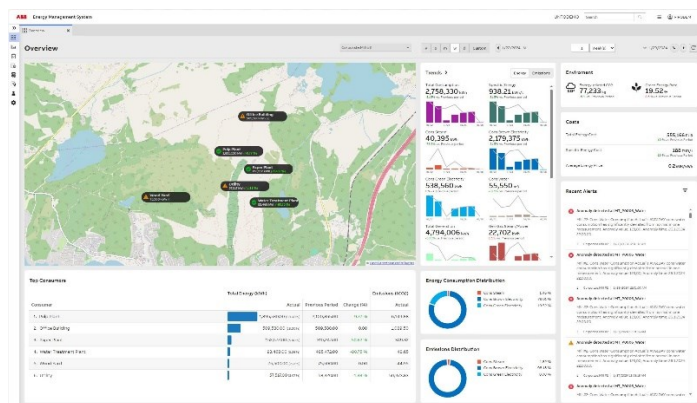


ABB Ability™ Energy Management System main dashboard

We establish a comprehensive energy and emissions management platform, starting from monitoring to forecasting and then optimization. The platform enables regulatory compliance, energy procurement, and overall energy supply/demand balancing.

The climate crisis demands that businesses decarbonize as fast as possible, but today, energy-intensive industrial companies are not functioning at their full potential due to insufficient transparency into their energy use and emissions generation. According to the International Energy Agency, tracking progress and improved data is a necessary enabling condition for accelerating the transition to net zero emissions for heavy industries<sup>1</sup>.

ABB Ability™ Energy Management System (EMS) maximizes sustainability performance and energy cost savings through a cycle of monitoring, forecasting, and optimizing production schedules and energy supply for an entire facility or enterprise. EMS helps process industries and manufacturing organizations make data-driven decisions about environmental, financial, and operational cost/benefit trade-offs while working toward carbon neutrality.

## Features

- Real-time monitoring, automated reporting, and decision support
- Sets benchmarks following your industrial process areas and asset hierarchies
- Alarms for abnormal consumption levels
- Visualizes savings potential in real-time
- Predicts energy consumption of entire plant and process areas based on production plans
- Calculates corresponding energy supply schedules to get the best price
- Supports 15-30-60 min imbalance settlement periods
- Suggests production schedule scenarios towards times of lower energy prices or to avoid contractual power/energy limits
- Suggests optimal use of energy resources to meet loads at minimum total cost when plant has access to multiple energy sources (e.g., grid, on-site generation, energy storage, etc.)

## Benefits

- Reduce energy spend by up to 15%
- Comply with the ISO 50'001 standard
- Improved, data-driven decision-making
- Save time/effort required to consolidate energy data
- Reduce errors in energy & sustainability reporting
- Avoid energy supply & demand risks, price peaks, and penalties
- Reduce carbon emissions

## How it works

The ABB Ability™ EMS includes an energy management server for storing historical data. The energy management server receives the measured energy data (e.g., water, air, gas, electricity, steam) from various local customer data sources and through standard protocols (e.g., OPC), customized interfaces, or manual entries for low frequency data. The EMS has a built-in calculation tool which allows the users to create and maintain calculation rules easily.

Additional interfaces to external systems can be provided as extensions to describe the energy context. For example, production data from a Manufacturing Execution System can give an understanding of energy consumption patterns as they relate to production and process steps, or a drop in energy efficiency could be explained by data from an Asset Management Software when a piece of equipment needs maintenance.

## Module 1: Monitoring & Reporting

The Monitoring & Reporting module is based on a model of the plant that includes energy consumption units on hierarchical levels, such as process areas, sub-areas and equipment. The main dashboard display shows totals for the energy performance indicators such as energy consumption, costs, CO<sub>2</sub> equivalent emissions, and average specific energy consumption.

The main display has the following panels:

- Map: Map visualization of the energy consumers
- Timeline: Historical timeline of total energy consumption
- Environment: Renewable energy share, total emissions
- Cost: Total energy costs
- Consumption distribution: Top consumers contribution
- Energy distribution: Energy type (e.g., electricity, heat, etc.)
- Alarms: Recent energy alerts

The Monitoring & Reporting module also contains several other displays such as the:

- Energy Timeline, which presents energy performance by selected energy type and can visualize current against past performance
- Contracted Consumption chart, which helps to optimize consumption to the permitted level to avoid penalty fees. This is done by creating a linear forecast for the selected energy contract by the end of the current billing period (e.g., 15, 30, 60 min).
- Energy Flow diagrams, which visualize the energy consumed from top department to the lowest sub departments (i.e., different process areas or stages of the production process)
- Alarms display, which shows all rules-based alerts to identify deviations and abnormal consumption behavior
- Notes display, which enables users to write and share notes that give context to the energy consumption data such as observations, alarms, improvement suggestions, or actions taken
- Reporting, which contains a pre-configured Energy & Emissions performance report but also allows for creation of custom reports using any time-series variable

## Module 2: Forecasting & Planning

The Forecasting & Planning module calculates the predicted energy consumption schedules based on the production plans and other correlating parameters.

The consumption schedules can be sent to the energy suppliers or used as the basis for energy procurement planning. The module can predict several energy types per consumer unit, such as electric power and steam. For a corporate customer, multiple facilities can be integrated to create a company-wide procurement strategy, allowing comparison and benchmarking.

## Module 3: Energy Optimization

The Energy Optimization module takes a holistic look at energy supply and demand to minimize the total energy cost. The optimization targets may include:

- **Energy demand:** Module suggests production schedule scenarios towards times of lower energy prices or to avoid contractual power/energy limits
- **Energy supply:** Module suggests optimal use of energy resources to meet loads at minimum total cost when a plant has access to multiple energy sources (e.g., grid, on-site generation, energy storage, etc.)

For example, in a mechanical pulp line at a pulp & paper mill, the Energy Optimization module would balance both the energy flows (e.g., electricity, steam, and different fuels) and the material flows (e.g., pulp, water, and chemicals) for optimal use of resources that achieves the overall lowest total energy cost.

The output of the Energy Optimization module, such as a proposed production schedule and/or equipment set points, is visualized in the dashboard displays and/or reports, and operators can use the EMS as an advisor or choose to allow the EMS to control the process automatically. The energy consumption forecast will be updated according to the optimization results, allowing energy purchasing departments to utilize the information to purchase an optimal amount of electricity in the upcoming period.

