Energy management in production

Optimized energy system management with B.Data
For increased transparency in your company

siemens.com/bdata
Energy efficiency. Your key to success.

Globally increasing energy costs are becoming more and more of a challenge for companies – and thus also an important factor for overall success and for job safety.

Increasing energy prices and a heightened sensitivity of the public towards environmental aspects mean that effective energy management plays an increasingly important role in the success of a company and thereby also contributes to the sustainability of the company. Here improved energy controlling and the reduction of energy costs are the main challenges. Industrial companies are still struggling with a lack of transparency in their infrastructure processes, changing cost centers and heterogeneous system landscapes, as well as with laborious energy reporting systems.

With B.Data, Siemens offers you a unique, holistic and proven state-of-the-art solution for optimized and economical energy system management.

- **Transparency in the company** based on cost centers – in which any changes made during the year are correctly displayed – helps to identify saving potentials, which in turn forms the basis for the optimization of planning and acquisition activities and thus effectively reduces costs.

- **Flexible interfaces** guarantee a smooth integration into existing system environments.

- **Maximum independence** in adjustment and utilization at user level makes it possible to react quickly to modified requirements and to respond with flexible reporting.

- **Optimal consulting** in top Siemens quality supports your company and ensures comprehensive know-how for all requirements and functions.

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### Energy management – company portal

**Energy planning and procurement**
- Energy purchase
  - Purchase support
  - Scenario calculator
- Forecast
  - Energy forecast
  - Budget planning
- Energy schedule
  - Energy purchase schedule
  - Specifications for load management

**Energy controlling**
- Emission
  - CO₂ emission monitoring
  - Wastewater disposal
- Energy accounting
  - Cost center allocation
  - Evaluation/invoicing
- Energy and material balance
  - KPI calculation
  - Production allocation

**Monitoring and reporting**
- Connection of external systems
  - Facility management
  - ERP (e.g. SAP R/3)
  - Maintenance management
- Energy reporting system
  - Analysis and reporting
  - Workflow system
  - Intranet/Internet viewer

**Operation and control system**
- Fault/alarm management
  - Alarms/messages
  - Remote alarms (text message)
- Operation and control system
  - Central detection
  - Plant visualization
  - Data processing and archiving
- Load management
  - Load shedding
  - Load control

**Automation and field level**
- Interfaces to lower-level systems
- Meters/measuring devices
- Process control/building management systems
- PLCs
- Circuit breakers
- Mobile data acquisition

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Energy management.

The challenge of the future.

The secret of success lies in accurate, automatic data acquisition and processing, as well as in seamless energy balancing for power generation and consumption plants.

With B.Data you can rely on a mature, holistic management tool for more effective energy management which covers all relevant areas from purchasing to controlling and thereby ensures efficient energy and cost controlling. Simple. Comprehensive. Easy. And reliable.

### Sustainability
- B.Data generates indicators for substantiated statements on increases in the efficiency of power generation and distribution systems

### Efficiency
- B.Data enables cost-by-cause-based energy cost distribution and allocation

### Productivity
- B.Data provides planning reliability through production-related load and consumption forecasts

### Professionality
- B.Data supports the purchasing department in energy procurement

### Responsibility
- B.Data fulfills legal obligations, such as for the monitoring and reporting on greenhouse gas emissions

### Integration
- As an option package for SIMATIC® WinCC and PCS 7, B.Data is integrated into the overall portfolio, but can also run as a stand-alone and be connected to other systems

### Energy management

<table>
<thead>
<tr>
<th>Current state</th>
<th>Energy controlling</th>
<th>Energy purchasing</th>
<th>Energy operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total costs of energy supply and disposal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Heat
- Electricity
- Gas
- Water
- Compressed air
- Oil
- Others
- Transparent energy and material balance according to originator
- Automatic invoicing and transfer to ERP systems (e.g., SAP R/3)
- Detection of plant optimizing potentials
- Creation of current contractual basics
- Forecast of energy consumption
- Automatic load scheduling
- Compliance with purchase contracts
- Quick, active decision-making
- Resource conservation and reduced workload for staff
- Error prevention
Effective energy controlling based on information related to when energy is needed and where. In this way, detailed statements can be made on optimizations and on savings potentials. In addition, cost allocation based on the costs-by-cause principle helps stimulate energy-saving measures in-house.

In addition to automated data acquisition and analysis, B.Data also offers unique system advantages that make it highly efficient to use in day-to-day work.

- B.Data plant explorer with an adaptable structure as a central navigation instrument for all configurations and for calling up results
- Calculation and allocation of energy costs to plants, customers or cost objects according to the costs-by-cause principle and support of bottom-up (measurement) and top-down (allocation) approach
- Determination of production-related KPIs for the energy evaluation of production plants
- Flexible modeling of hierarchically accounting structures
- Rates for quantities, flexible price rating with rate and price time series
- Transfer of costs and earnings into the ERP system (e.g. SAP R/3)

Energy controlling.
The transparent energy balance.

B.Data facilitates seamless monitoring, originator-related checking of energy and material flows as well as the allocation of costs to individual cost centers or products.

Energy monitoring with B.Data trender

Example of KPI*) report

*) KPI = Key Performance Indicator
B. Data visual display

10% 90% 20% 80%

Consumption area
(e.g. building 1)

Consumption area
(e.g. building 2)

75% 25%

Counter 1

Counter 2

Counter 3

Losses

Accounting area
(e.g. cost center)

Factors are based on
• Employees
• Used area
• Absolute values
• etc.

100% allocation
is ensured.

Allocation to cost centers
Energy planning.

An accurate forecast permits efficient purchasing.

B.Data is the prerequisite for optimal budget planning, with the most accurate forecasts possible for the energy requirements and load distribution of one or more locations, individual consumers, production areas or buildings.

The level of demand in industrial operations is mainly affected by production and its cycles, such as shifts or product cycles.

The synthetic approach of B.Data therefore also includes the following production-related factors in the calculation:

- Production plan (with quantities and lots)
- Basic load profiles for consumers and consumer groups
- Chronological sequence of production (shift calendar) taking idle times and bridging days into consideration

This approach ensures the most accurate forecasts for:

- Next day and next week (short-term forecast)
- Month, year (long-term forecast)
Accurate planning of energy requirements for a defined period of time makes it possible to achieve considerable purchasing advantages as energy suppliers now offer new rate systems. The greatest financial advantage can be gained if the difference between expected and actual consumption remains as low as possible within a defined period, or if demand can be shifted to the rate periods during which energy production is cheaper. With B.Data, you have all the relevant information on hand.

- Calculation of annual energy amounts and analysis of purchasing limits to be able to correctly determine prices and penalties for supply as well as network utilization
- Daily and weekly forecasts on energy demands with due consideration of production planning information
- Daily and weekly submission of the energy schedule determined on the basis of the load forecast and planned in-plant power generation, in the required energy schedule format
- Monitoring and supervision of balancing energy amounts and the exceeding of purchasing capacities and resulting procurement costs

Energy purchasing. Important information for improved negotiation results.

At all times, B.Data is able to provide the latest relevant information on the required energy amounts in the course of a year and for different times of day, thus providing the basis for an optimal purchasing result.
Reporting.

More productivity through automation with maximum flexibility.

B.Data provides numerous individual presentation possibilities and comprehensive functions without major configuration efforts.

Detailed records and a professional visualization of the business process serve as an important basis for decision-making. What is more, efficient information processing and representation are also decisive competitive factors today.

B.Data automated reporting function provides you with prompt and reliable aids in decision-making.

- Efficient preparation of customized reports for each unit and for individual information needs (energy controlling, maintenance, forecasting, optimization, simulation, planning, efficiency indicators and benchmarks, etc.)
- IT-based global view across systems and units to arrive at comprehensive company overview
- B.Data Intranet/Internet viewer (WEB client) for accessing reports and results throughout the company
- Fully automated reporting system with e-mail distribution and document administration
- Easy evaluation and representation of historical and online data using B.Data trender (zoom function, autoscaling, linear or logarithmic scaling, drag&drop function for curves in office programs, value queries using shot functions, etc.)
- Unique functions ensuring a high level of practical value and reliability (reproducibility of allocation results based on the versioning of recorded values and calculation models)
Sustainable energy data management in several steps

Creation of transparency + Cost-by-cause-based accounting + Process optimization = Operation optimization

**Phase 1**
- Installing measuring points
- Representing energy flow
- Identifying potential uses
- Visualizing
- Documenting

**Phase 2**
- Allocating energy costs to cost centers
- Energy cost per production unit
- Energy flow per production unit

**Phase 3**
- Automatic load management
- Identifying power distribution reserves
- Data exchange with process control systems

**Phase 4**
- Optimizing energy procurement
- Optimizing energy costs

Continuous improvement process
Additional system features

- Object-oriented and freely customized calculations (KPIs) and report design
- Continuous, automatic monitoring of energy and material flows
- Integrated meter management from meter overruns up to a planned meter exchange
- Numerous import and export functions based on maximum interface flexibility (e.g. SIMATIC WinCC, SIMATIC PCS 7, SICAM230, OPC, ODBC, ASCII or XML)
- Preprocessing of energy data in a freely configurable real-time accounting kernel including a formula editor for the definition and planning of new calculation functions (temperature computation for boiler systems, ratings of combined heat and power systems, etc.)
- B.Data mobile for mobile energy data recording including route planning for the meter-reading process
- Flexible energy and operating data recording using the B.Data Intranet viewer for manual data acquisition (Microsoft EXCEL®, web, etc.)
- Automatic plausibility testing and generation of substitute values
- Long-term archiving with versioning, aggregation and compression functions
- Measured values editor for inserting and updating energy and operating values as well as for meter management
With the B.Data energy management system from Siemens, you are investing in an innovative, reliable and easy-to-use system. Based on industrial technologies, it responds to the more stringent requirements of inhouse energy management. You will also be well prepared for future challenges and able to tap the full optimization potential with this totally integrated solution.

With Totally Integrated Automation und Totally Integrated Power, you profit from the consistency of products and systems, the use of standard components, a standardized operating philosophy and lower engineering costs, which ultimately leads to an increase in plant flexibility and productivity as well as cost reductions and quality assurance.

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**Energy management in industry**

- **Energy cost transparency**
  - Ethernet
  - B.Data

- **Energy flow transparency**
  - SIMATIC powerrate
  - WinCC/PCS 7

- **Energy data collection**
  - SIMATIC or SIMOTION

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**E.g. discrete automation**

- PROFIBUS
- Industrial Ethernet
- Motion Control
- Frequency converter with energy recovery
- SIRIUS switchgear
- Energy-efficient motors

**E.g. process automation**

- PROFINET
- PROFIBUS
- Power supply: SITOP (DC 24 V)
- Motor management devices
- Circuit breakers
- Low- and medium-voltage frequency converter
Sustainable energy management. With B.Data from Siemens.

With B.Data you can rely on a comprehensive solution for an optimized energy management system. B.Data is already in use and well established at renowned European companies so you can be sure you will get a maximum of best-practice expertise.
Competent
With the specialists from Siemens.

Drawing on its comprehensive know-how across all fields of industry and across all countries, the Siemens expert team helps you to implement B.Data to perfectly suit the requirements of your company.

Successful
With globally successful Siemens solutions.

B.Data has already been successfully implemented by leading companies. Secure a lasting competitive advantage for your company through improved energy management.

Transparent
With B.Data.

- Company-wide transparency through end-to-end energy and material balancing for power generation and consumption plants
- Performance indicators for substantiated statements on increases in the efficiency of power generation and distribution systems
- Cost-by-cause-based energy cost allocation with automatic transfer to the accounting system
- Planning reliability through production-related load and consumption forecasts
- Monitoring of and reporting on greenhouse gas emissions

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