



Applications

- EnergiStream® provides a consolidated tool for complete energy efficiency management and power capacity planning of data center assets from one interface
- Gather and aggregate power information from a variety of different electrical loads
- Capture power usage per minute and energy usage (kWh) over selectable periods of time
- Environmental monitoring
- Load Aggregation/Grouping and reporting at all levels within single or multiple data centers
- Calculate costs to power a rack, device, racks or entire data center per hour, per day or over time

Benefits

- Reduce energy costs by identifying energy waste and applying best practices or equipment and process improvements
- Reduce downtimes. EnergiStream® Alerts provide pre-emptive notifications of out of band events such as phase imbalances, capacity shortages, low current, high current, loss of load, reducing loads where consistency should be, and environmental alarms
- Make informed power capacity decisions by being able to forward plan based on actual and projected circuit load. This may extend the data center life by 3-4 years, saving millions in capex costs
- Monitor and measure energy consumption and costs per device
- Real-time visibility into power consumption, allowing more efficient power usage
- Identify costs and trends to simplify power and cooling capacity planning
- Determine actual energy usage by department/server to create charge-back process
- Ability to set a maximum on power usage and threshold alerts to stay within budget

EnergiStream® overview.

Advancing Data Center Efficiency.



EnergiStream® is a solution for monitoring, reporting and managing your data center energy consumption, cost and carbon footprint, along with its environmental operating conditions.

Monitors the energy consumed by overall data center power, UPS's, cooling systems, cabinet rows through to individual I.T device's, servers, switches or storage devices as required. Capacity plan for improved location and utility supply longevity.

EnergiStream® provides Data Center Managers with the ability to reduce energy consumption, improve data center uptime, plan and manage power capacity, and provide billing per device, cabinet or rows of cabinets.

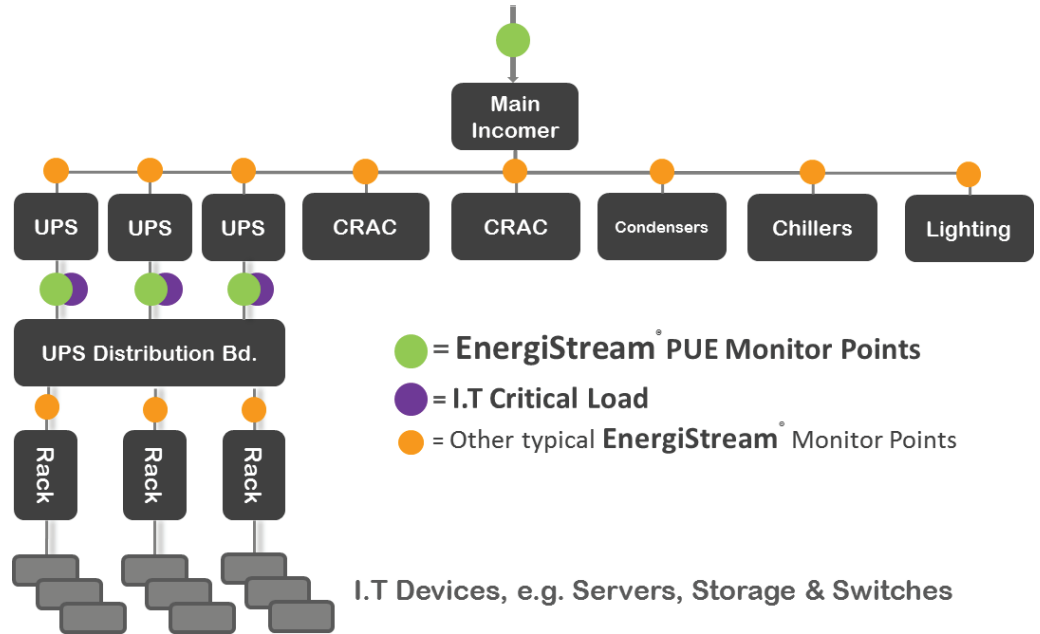
No one can be truly satisfied with the current state of their Data Center energy consumption.

Everyone knows it is important to reduce costs and lower energy consumption. But there are many reasons other than cost for managing energy consumption in the data center, like capacity planning, PUE management, risk and uptime mitigation, reporting critical energy events and getting the most performance out of existing equipment. But how do you get a continual baseline? How do you integrate an energy management solution into your existing Data Center without having to spend huge amounts of cash and hours of downtime?

EnergiStream® has been developed with 3 key principles in mind, easy to visualize energy efficiency, easy to deploy and affordable to purchase. EnergiStream® has a built-in ability to retrofit, non-invasively into existing data centers. EnergiStream® uses the data center existing IP network to move energy data to our Cloud-hosted or on-site appliances.

EnergiStream®.

A Building Energy Efficiency System.



Benchmarking

The well-used saying, "if you can't measure it, you can't manage it" is especially true for energy consumption and efficiency in the data center.

EnergiStream® allows operators to measure and benchmark many forms of energy, for example kWh's, voltage, kw's, current, power factor and also temperature.

Benchmark electrical efficiency of power and cooling in the data center by comparing actual efficiency to the expected efficiency of a load, device or group of loads. The analyses are based on your data center design and assists in identification of constraints that prevent systems from achieving expected efficiency.

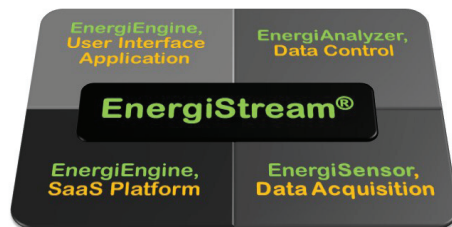
EnergiStream® reports the overall efficiency of the data center(s) via the PUE protocol established by the Green Grid.

EnergiStream® provides benchmarking of CRAC/ CRAH kWh efficiency. EnergiStream® also provides a breakdown of the power system losses into UPS and power distribution.

To achieve true energy efficiency and real cost reductions in the data center, your data center infrastructure and IT equipment need to be able to be energy monitored and integrated as a holistic system. EnergiStream® monitors all assets in the data center, from the main incomer, through UPS, CRAC's and down to the individual servers or network equipment.

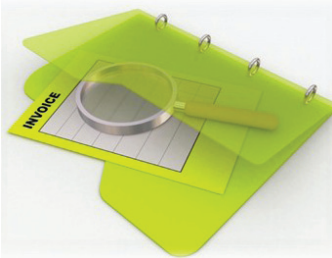
EnergiStream® provides a comprehensive view of the entire data centers energy profile. EnergiStream® allows you to pool all energy information in one application for comprehensive consumption, cost and carbon footprint views. Find out where virtualization projects would be best suited, what equipment is unused or has residual computing capacity, and identify where energy and computing capacity are used.

The EnergiStream® System.



EnergiStream® is a non-invasive, retro-installable Data Center Energy Management solution. Its component parts:

- **Software.** EEnergiEngine comprises of energy monitoring, metrics reporting, load management & environmental abilities. EnergiEngine operates either in a cloud or on-site appliance architecture.
- **SaaS Platform.** EnergiEngine is a cloud computing based architecture that supports large volumes of Itemized Energy data sent every minute from every channel monitored. Based on a combination of a SQL database and Cloud Platform, EnergiEngine delivers the data you need, when you need it, where you need it.
- **Hardware.** Depending on the data center operators energy efficiency goals & available space a mix of 6, 12, 24 or 48 channel EnergiAnalyzers. The EnergiAnalyzer allows connection of any combination of single or 3-phase loads. EnergiSensors are deployed to measure energy consumption at either MDB, SMDB or load connection and range from 1A to 10,000A per phase.



Energy Cost Reports and Chargebacks

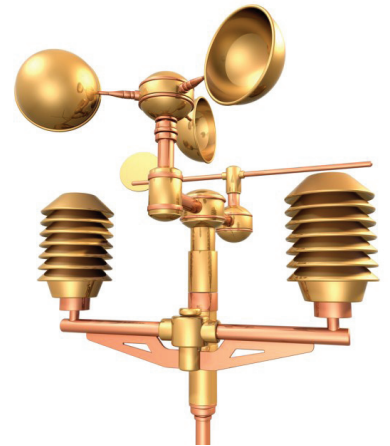
With EnergiStream® the capability to manage your energy as an asset is standard, with this comes the ability to manage costs. By knowing how, when and where energy is used, you can not only reduce energy costs, but you can allocate energy costs back to the departments, servers or customers that use them.

Traditionally, in data center facilities, energy costs are shared across customers depending on their infrastructure and space requirements. EnergiStream® provides operators with the ability to meter (kWh) and charge on an rack pod, row of racks, individual racks, or if required individual servers. Billing is able to be provided based on Time of Use tariffs to better than 0.5% accuracy.

Data Center Environment

Poor control and monitoring of the conditions in your data center may shorten the life of the equipment, overheating can cause intermittent faults, and in extreme cases cause equipment to fail catastrophically. Running areas of the data center at un-needed temperatures wastes money and reduces CRAC efficiency. EnergiStream® has the industry-leading ability to identify areas to drastically reducing cooling energy use.

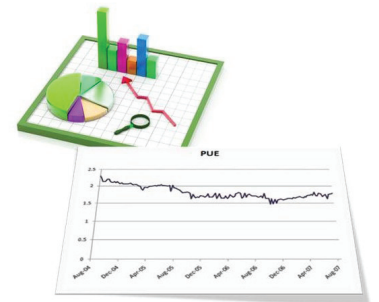
EnergiStream® improves data center efficiency and uptime by environmental monitoring. In partnership with 3rd party remote sensing hardware vendors, EnergiStream® optimizes data center efficiency through environmental visualization and real-time feedback after data center changes. The hardware and software is quick to deploy and vendor independent in any data center. EnergiStream® monitors temperature in data centers, comms rooms and racks. Email and SMS alerts 24/7 give early-warning of impending environmental problems.



Energy Efficiency Metrics

With energy usage by data centers increasing every year, the need for energy efficiency has become more crucial. Currently data centers use 3% of the energy generated globally, this is expected to double within the next 10 years. It is essential to implement energy efficiency measures without compromising reliability.

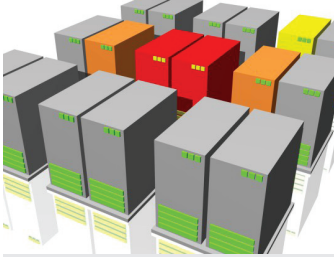
Get to know your Power Usage Effectiveness (PUE) or any other relevant data center electrical metric with EnergiStream®. If the subject of power efficiency metrics isn't a topic of conversation in your data center operations today, it soon will be. Understanding the role of PUE ($PUE = \text{Total Facility Power} / \text{IT Equipment Power}$) is vital to improving your overall data center energy efficiency. One of the key building blocks in any effort is actionable information, EnergiStream® provides this in real time and in an easy to understand views.



Improved Uptime

EnergiStream® provides alerts in visual notification, SNMP, email or SMS text, 24x7x365. Out of band energy and environmental events are reported by defined users allowing for process controlled escalation. If data center assets start to draw excessive current, or start to decrease unexpectedly this could be the 1st sign of asset failure leading to device, row, and rack or cooling downtime. EnergiStream® provides pre-emptive alerts through an easy to use and configure Management screen.





Energy Groups

EnergiStream® allows data center operators to create virtual groups of energy data using the highly useful EnergiGroups feature. For example, putting all CRAC energy consumption into one Energy Group allows real time analysis of the energy consumption and efficiency of all CRAC's in one view, allowing instant recognition of your least efficient and most wasteful CRAC's and chillers.

EnergiGroups views provide instant data on inefficient loads leading to improved maintenance or controls adjustment to reduce consumption and not efficiency.

EnergiGroups can create combined views to allow energy consumption of server farms, cabinet rows, UPS, Dept.'s, IDF's, co-location customers or any meaningful group of energy load or human consumers to be monitored together wherever the location.

EnergiStream®.

Which software Pack s needed for your project?

EnergiStream® features

	Base	Action	Analyse	PowerQ
Energy Monitoring, unlimited channels, locally or globally	✓	–	–	–
Voltage, current, Kw, kWh, PF, VA monitoring of all channels	✓	–	–	–
EnergiGroups & sub groups for load monitoring	✓	–	–	–
Flexi-Phase monitoring per h/w channel	✓	–	–	–
Aggregate loads for overview visualisation	✓	–	–	–
Multi-site, multi-campus, multi-building, multi-country	✓	–	–	–
Multi-country monitoring via users I.P network	✓	–	–	–
Cost, Consumption & Carbon visualisation	✓	–	–	–
Capacity Planning (Real time & Projected) & near capacity alerts	✓	–	–	–
5-year cost, consumption & carbon visualisation	✓	–	–	–
Flexi-Phase monitoring, 1 x 3-phase & single phase per channel	✓	–	–	–
Load Aggregation to provide Shadow Load, e.g. Main Incomer	✓	–	–	–
Voltage monitoring upto 500VAC	✓	–	–	–
Flash Zoom function for detailed data analysis	✓	–	–	–
Customisable calendar/historic views	✓	–	–	–
Copying data to other channels (assumes balanced phases)	✓	–	–	–
Utility-grade logging, every 1, 5, 15, 30 or 60 minutes	✓	–	–	–
Microsoft Office SQL Data Connection (.odc) for reports	✓	–	–	–
Easy to use User Interface	✓	–	–	–
Administrator controlled user login & Password	✓	–	–	–
Cloud & Hosted options	✓	–	–	–
Expandable to many thousand channels	✓	–	–	–
Target setting vs. actual consumption, (via SQL/Excel)	✓	–	–	–
Temperature Monitoring	✓	–	–	–
Monitor pulsed inputs from gas & water meters	✓	–	–	–
Energy period over period analysis, (via SQL/Excel reports)	✓	–	–	–
Energy Alarms & Threshold reports, SNMP, SMS, email & screen	–	✓	–	–
Power capacity user-definable alerts	–	✓	–	–
Peak Demand Management	–	✓	–	–
Load shedding, rules based	–	✓	–	–
Energy Efficiency Metrics, customisable	–	–	✓	–
Data Center PUE Efficiency Metric	–	–	✓	–
Customisable Billing & Time of Use reports	–	–	✓	–
Power Quality monitoring (harmonics and spikes)	–	–	–	✓

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