

Energy Dashboard

Identify Opportunities for Energy and Emissions Reduction



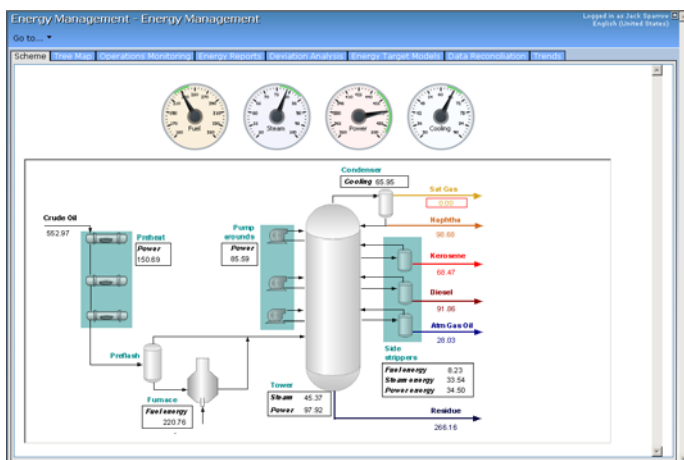
Energy and emissions management is critical in the current economic and regulatory environment. Honeywell offers a monitoring solution that provides complete integration with the overall information and work processes of a manufacturing facility, ensuring that energy management is at the heart of decision-making and reporting activities. With higher energy prices and increasingly tight environmental regulations expected over the long term, this solution can identify opportunities leading to improvements in energy efficiency and associated greenhouse gas emissions.

Integrated Monitoring and Decision-making Suite

Honeywell's Energy Dashboard gathers information from various instruments and systems so energy consumption can be tracked against dynamic energy targets. Capturing and analyzing this data allows users to understand key energy indicators (KEI) and how they affect overall energy consumption enabling users to establish specific goals for improving energy use and emissions reduction objectives. The Dashboard ensures that energy management flows from planning and business functions through to operations and provides the associated feedback. It captures raw energy data from the process and organizes it in a way that enables the user to quickly identify the big energy consumers and how they are doing against a set of appropriate targets.

process operating conditions (throughput, yield, operating parameters) and process energy and emissions. These are derived from a combination of historical data and the use of first principles simulation tools to represent process across a range of operating points.

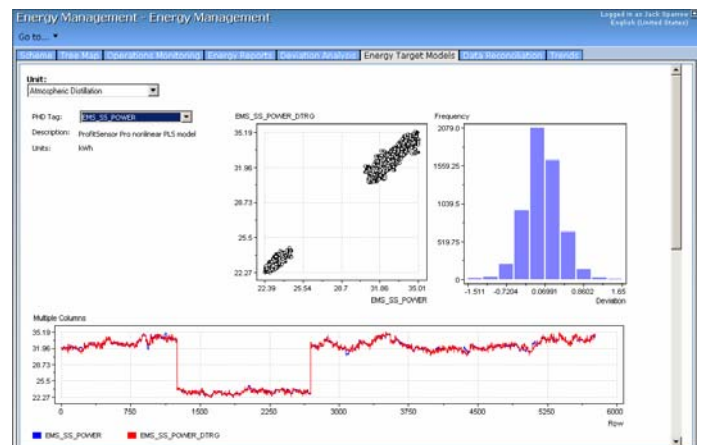
These models provide targets for process operations and planning groups to measure against actual performance, and to identify deviations. Actual performance is monitored in real time and compared against targets from planning systems, and against target models based upon current operating conditions. Deviations are measured and economic impacts calculated using a wide range of methods. Operators and other staff can select reason codes for deviations as well as input comments to provide later analysis of results. Data reconciliation is used to drive out errors and maximize the use of available instrumentation and data.



The plant overview energy schematic shows overall plant/mill energy usage. The gauges indicate the usage of each type of energy.

Analytical tools to develop energy target models

Honeywell provides a set of analytical tools to develop mathematical models to describe the relationships between

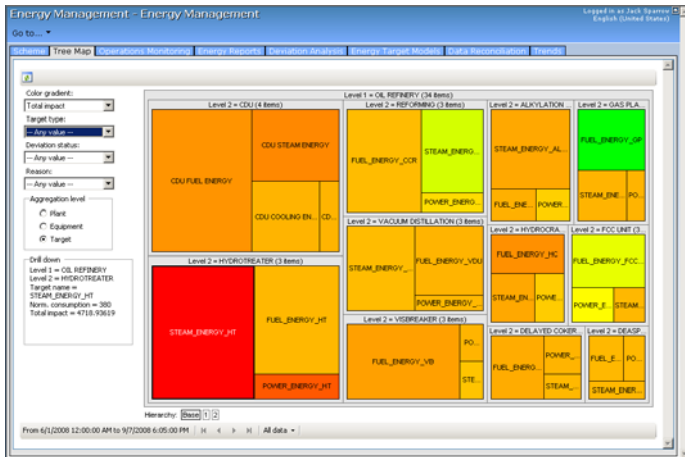


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Easy visualization and reporting

A hierarchy of views is provided by the Energy Dashboard that allows the user to drill down to multiple levels and identify possible actions.

- The Unit Overview shows the relative size and impact of energy and emissions in each unit of the plant
- The Unit Detailed View shows the value of KElS against target values
- The Trend Display allows for trending of KElS against targets over time.
- The Energy Reports function allows for preconfigured reports to be generated for different time periods.
- The Deviation Analysis allows for easy analysis of time periods when KElS significantly deviated from target.

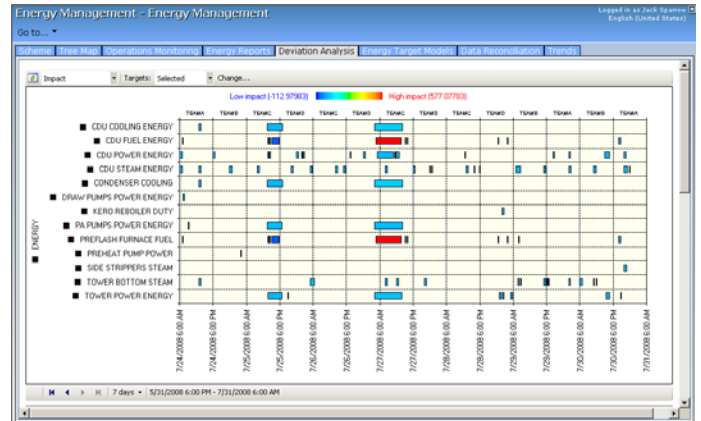


The unit overview tree map shows the relative size and impact of energy and emissions in each unit of the plant.

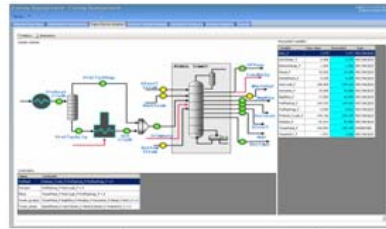
The solution makes use of reason codes that the operator can select when deviations occur and these can then be queried over time. In this way it is possible to build up a history of the most common causes for a particular KEl not meeting its target.

Broadly applicable system architecture

The dashboard uses many standard Honeywell MES products which allow the Energy Dashboard to be configured over a wide variety of DCS systems and interfaces with Honeywell's PHD or other historians such as OSI's PI. The main displays are configured in Honeywell's WorkCenter and can be accessed through client-server architecture or via web access.

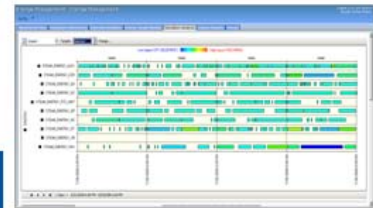
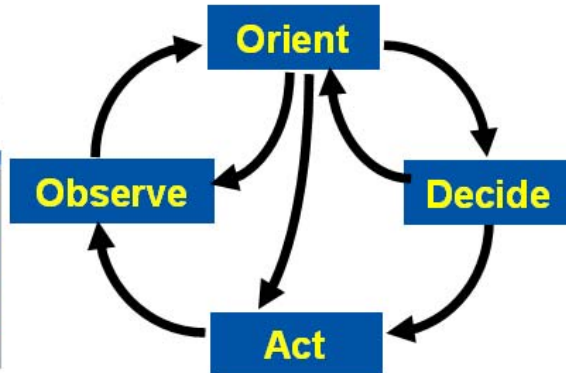


In the deviation analysis tool, reasons are assigned to all deviations and the impact, time and duration is clearly visible for easy analysis.



*Create energy models
Turn data into meaningful information*

*Capture Energy Data
Observe Current Situation*



*Determine possible actions
based upon analysis.*

*Take action based upon
informed decisions.*



Solid Methodology

A good energy monitoring solution should perform like John Boyd's OODA loop¹ which allows the user to quickly **Observe** the situation and assess the relative performance of multiple units; **Orient** oneself by being able to drill down to get more details on key energy indicators of the most critical areas; **Decide** on a set

of possible actions based upon the determination of possible causes for deviation from target; **Act** quickly and decisively based upon a set of well informed decisions. The loop allows for rapid internal feedback so the user can quickly observe the impact of actions taken and hence re-orient and decide on any further actions. The Honeywell Energy Dashboard was developed around these principles in order to increase the visibility of energy use and develop a comprehensive, operations-wide strategy for improving energy performance and reduce the associated GHG emissions.

More Information

For more information on any of Honeywell's Products, visit our website www.honeywell.com/ps, or contact your Honeywell account manager.

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