

### The Opportunity

For thermal power plants, fuel is the single largest cost. Getting the most from every Btu is not just a good idea — it's absolutely essential in today's competitive environment. But without an online system to continuously monitor your plant's overall and equipment efficiencies, you could be wasting millions in fuel costs each year. GE Energy can help.

### The Solution

EfficiencyMap\* software from GE Energy continuously delivers the thermodynamic performance information you need at both the overall plant and individual equipment component levels. With this information, the root causes of efficiency losses can be identified and corrected, resulting in substantial annual fuel savings — as much as 1%. It also provides rapid payback — typically less than one year.

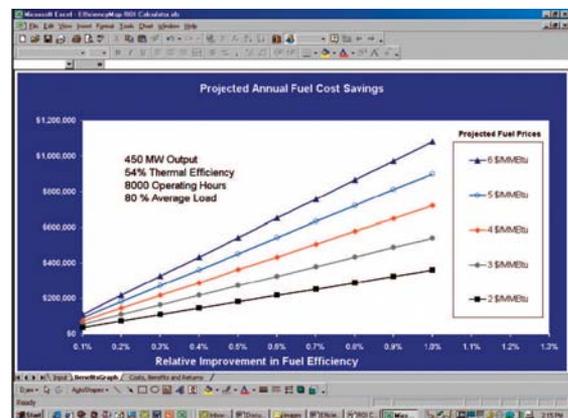
### Features

- Online heat balance and performance analysis
- Powerful display and reporting capabilities
- Adaptable for open-loop or closed-loop optimization
- Offline “what if” analysis
- Real-time database
- Integration with process control systems
- Works with System 1\* software for integration of mechanical and thermodynamic condition monitoring
- Supports connectivity to various historians

### Online Heat Balance and Online Performance Analysis

The heat balance capabilities of EfficiencyMap software reconcile plant measurements and produce consistent data for the current operating point that satisfy plant mass and energy balances. Using detailed thermodynamic models of the plant, EfficiencyMap also generates information that is not accessible through direct measurement, adding stream conditions and equipment efficiencies. Based on the resulting set of consistent heat balance data, EfficiencyMap software calculates equipment and plant performance in two ways:

- **Expected.** This provides performance parameters under current plant operating conditions compared to baseline (i.e., ideal “new and clean”) equipment conditions, resulting in trendlines of performance ‘gaps’ under current operating conditions.
- **Corrected.** This provides performance under reference plant operating conditions and actual equipment degradation. Because corrected performance uses fixed, baseline operating condition data, changes in corrected performance are related only to changes in equipment performance, allowing the user to more easily identify and trend equipment-related, rather than process-related, performance changes.



With our ROI calculator, you can use your own plant-specific data to estimate the annual fuel cost savings achievable with EfficiencyMap software—before you buy!



## Benefits

### Better Maintenance Decisions

With EfficiencyMap software, you can make better cost-benefit decisions regarding when to perform maintenance on specific components. EfficiencyMap's Compressor Wash Advisor module is just one example of this capability, providing advisory information on the optimal time to perform a compressor wash based on financial criteria you configure. And while you would rarely interrupt your operations to perform maintenance on a single piece of equipment, EfficiencyMap helps you plan your outages more effectively and shorten their duration by helping you understand which equipment needs attention and which equipment doesn't.

### Accurate Instruments – Accurate Performance

Because efficiency measurements are so sensitive to even small changes in each measured variable, the accuracy of your instrumentation is crucial. EfficiencyMap provides powerful tools to ensure your field devices are working properly, highlighting instrument-related problems such as sensors with poor or degraded accuracy, and enabling condition-based instrument maintenance.

### Open-Loop or Closed-Loop Optimization

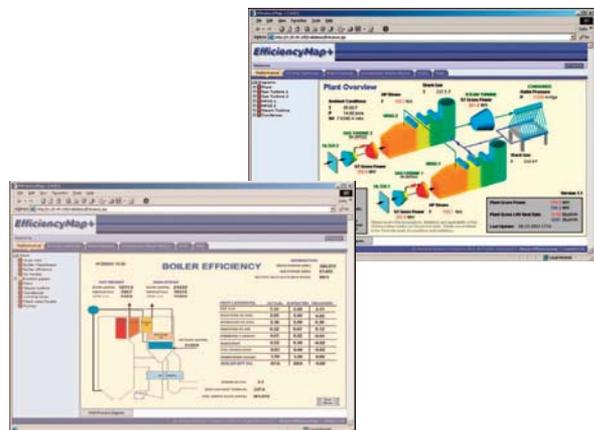
EfficiencyMap is able to provide real-time advisory information regarding the most profitable mode of operation for your plant. This allows operators to run the generating equipment at optimal setpoints, effectively utilizing EfficiencyMap as an open-loop supervisory control system. However, you can also apply the power of EfficiencyMap in closed-loop mode with your equipment controls via our Closed Loop Optimal Control System (CLOC\*) which provides automatic supervisory control in real time.

## Applications

- Simple- or combined-cycle power plants
- Cogeneration plants
- Coal-, oil-, and gas-fired steam plants
- District heating plants
- Desalination plants
- And many others

## Supporting Services

A Supporting Services Agreement (SSA) is an integral part of any EfficiencyMap installation, ensuring that your system is installed and commissioned properly, and then continues to work at peak performance. Our service engineers will regularly access your system, remotely or via on-site visits, providing you with reports on system health, usability, and operation relative to your objectives. The SSA also provides ongoing updates to the models in your EfficiencyMap system, ensuring they reflect changes you may make to plant controls, equipment, and sensors. Finally, we provide training for your people, ensuring they understand how to properly use the EfficiencyMap system and derive maximum benefit from it.



Contact your GE Energy representative today for complete product specifications and ordering information at [energy.efficiencymap@ge.com](mailto:energy.efficiencymap@ge.com)

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