

Energy Management Solutions for Refining



ADVANCED SOLUTIONS FROM HONEYWELL
PROCESS SOLUTIONS AND UOP

**Dynamic, technology-integrated
optimization solutions**

Honeywell

Today's refineries and petrochemical plants face ever increasing challenges to reduce energy costs and CO₂ emissions. Honeywell offers technology-driven solutions that can help you realize reductions of 12 to 25% in energy usage.

A unique combination of two leading experts for dyn

Honeywell

UOP

A Honeywell Company

While the goal may be to reduce energy usage and improve environmental performance, refiners may find that they can also maximize product yield, product quality and margins. Honeywell's unique approach relies on almost 100 years of refining process technology experience from its UOP subsidiary along with world-class automation and control technology from Honeywell Process Solutions (HPS).

Together, HPS and UOP are a powerful combination that can help refiners:

- Collect and analyze current operating data
- Optimize and control process conditions

- Identify and execute a range of opportunities for improvement
- Provide tools for sustaining benefits
- Reduce energy usage and CO₂ emissions
- Improve throughput, yield, and margin

Through technology-integrated optimization and advanced control solutions, Honeywell can help you to realize as much as a 25% reduction in energy usage per year - amounting to potentially more than \$20M in energy savings. These results are achievable while maintaining or even increasing your yields for improved margins and profitability.



Area of Savings	Actions	Energy Improvement
Improved operation and control	<ul style="list-style-type: none"> • Improve online monitoring, control and optimization through multivariable, predictive control and optimization applications 	2 to 4%
Improved heat recovery	<ul style="list-style-type: none"> • Increase heat recovery within and across process units 	4 to 9%
Advanced process technology	<ul style="list-style-type: none"> • Employ new process technology, design, equipment and catalyst technology 	3 to 7%
Utilities optimization	<ul style="list-style-type: none"> • Optimization and controls for onsite steam and power production/supply and demand optimization 	2 to 3%
H₂ and fuel gas management	<ul style="list-style-type: none"> • Optimize H₂ recovery • Maximize LPG recovery 	1 to 2%
Total		12 to 25%

Basis: for a 100,000 BPSD refinery; natural gas cost @ \$6/MMbtu

Opportunities for Savings

There are multiple opportunities for energy savings and emissions reductions across your operations. Honeywell offers a single-source solution with the right combination of skills, experience and tools in operation, process design, technology, modeling, energy & process optimization and control to help you achieve your goals.

Advanced and effective energy solutions

Improved Monitoring, Operation and Control

Capture hidden operational opportunities in your plant by improving energy monitoring and control. Honeywell can help you measure energy performance and identify areas that can be optimized with multivariable predictive control strategies without sacrificing throughput or yield.

Better Heat Recovery

Reaching higher levels of energy efficiency requires increased heat recovery within and across process units. Honeywell consultants use a practical methodology which not only considers value and cost of improved heat recovery but also seeks synergy in enhancing throughput and product quality.

Advanced Process Technology

Advanced process technology can offer significant opportunities for improved energy and process performance. UOP advanced process technology like enhanced heat exchangers, high capacity fractionator internals, new reaction internals, power recovery turbines, improved catalysts and other design features are an effective approach.

Utilities Optimization

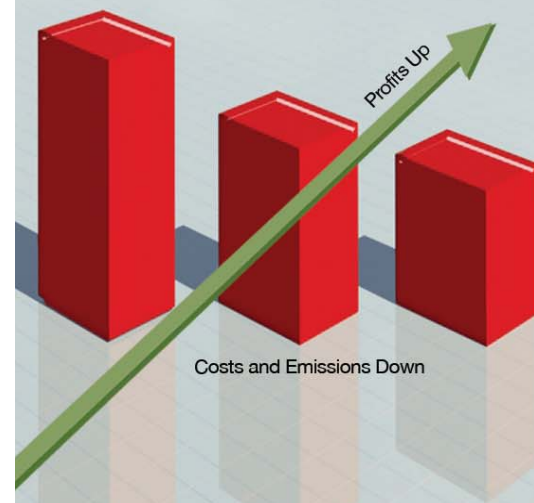
One of the keys to reducing energy costs is balancing changing energy demands from the process with adequate supply from the utilities plant. Honeywell offers a suite of software solutions to manage the supply/demand equation and optimize turbine and boiler performance.

H₂ and Fuel Gas Management

Saving and recovering H₂ and valuable components in fuel gas system not only reduces CO₂ emissions significantly but also enhances catalyst utilization and product yields.

Profit Increase	CO ₂ Reduction
\$3M to 5M/year	24,000 to 48,000 metric tons/year
\$4M to 8M/year	48,000 to 108,000 metric tons/year
\$5M to 10M/year	36,000 to 84,000 metric tons/year
\$3M to 6M/year	24,000 to 36,000 metric tons/year
\$8M-10M/year	32,000 to 44,000 metric tons/year
\$23M to 39M/year	164,000 to 320,000 metric tons/yr

Reduce energy costs and CO₂ emissions while improving your profitability



Execution of Honeywell Energy Optimization Services

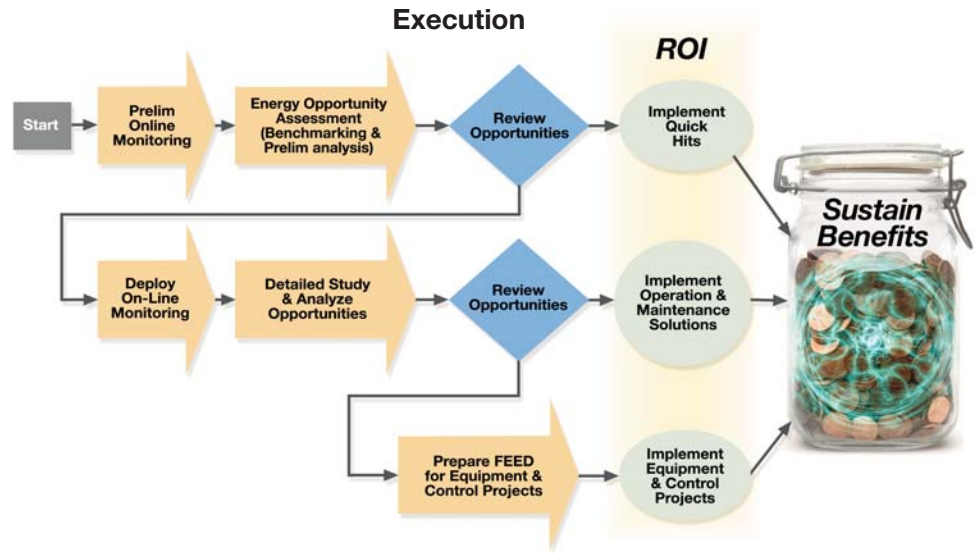
There are multiple approaches for refiners to find and implement energy optimization projects. The combined expertise of UOP and HPS can provide you with the data, analysis, tools and technology to identify and execute projects for the greatest return on investment.

Benchmarking

Initial online monitoring will allow you to benchmark units and identify performance and technology gaps. Honeywell can help your refinery focus on the best opportunities and advise on quick operational improvements with little to no capital expense.

Operation & Technology Solutions

Further monitoring and analysis by Honeywell will help to identify performance gaps so that production bottlenecks can be addressed. Our experts will help you to identify synergistic solutions for improving both process yields and energy efficiency to achieve maximum return



Equipment & Control Projects


The Honeywell solution can also include the development of a FEED package for implementation. We enable further enhancements by specifying the equipment required, identifying control improvements and upgrades and partnering with an engineering contractor for execution.

Our single source approach provides rapid implementation and eliminates the need for you to manage multiple contracts, reducing project man-hours and guaranteeing that you see long-term sustainable benefits.

Sustaining Benefits

To truly improve business performance, energy management solution benefits must be sustained throughout their entire lifecycle. Honeywell offers remote and online products and services to sustain and even increase performance over time.

The Energy Dashboard



The Honeywell Energy Dashboard ensures that optimum energy efficiency is continuously monitored and sustained.

The dashboard utilizes UOP established key energy indicators to help users monitor usage of different types of energy from a refinery-wide perspective. This unique tool, backed by decades of experience, helps to continually optimize energy and reduce emissions.

Find out more

If you are interested in learning more about Honeywell Energy Management Solutions for refineries please contact your UOP or HPS representative.

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