DTE Energy
Utility Saves Millions with Fleet Optimization

Detroit Edison
A DTE Energy Company

DTE Energy is an $8.6 billion energy company based in Detroit, Michigan, providing electricity and/or gas services to more than 3 million customers throughout Michigan through its utility subsidiaries Detroit Edison and MichCon. After a PI System pilot project in 1999 helped one of Detroit Edison's power plants save $180,000 in just six months, DTE Energy rolled out the PI System to each of its 7 major power plants. With the PI System in place company-wide, DTE Energy launched a fleet optimization program in 2006 that has saved the company millions of dollars annually.

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Situation

For power plant operators, efficiency is king. Producing the most power at the lowest cost is what keeps lights on, energy prices down and plant doors open. The metric that describes this efficiency is simple: dollars-per-megawatt. But calculating that metric isn't simple. Thousands of factors go into determining it: fuel costs, emissions, power output, heat generation and other operational values must all be collected and translated into dollar amounts. Infrastructure upgrades, fees, fines and other overhead factors get included, as well.

Before DTE Energy began using the PI System, they gathered this data through dozens of systems and operators reported data; business staff took this archived data and used it to determine each plant's dollars-per-megawatt for the prior month.

But for plant operators and executives looking to improve performance and boost efficiency, how to move the needle on that metric was still something of a mystery. The aggregated number didn't tell them which of the day-to-day operational factors most influenced the dollar-per-megawatt metric and historical data didn't allow them to tie specific operational practices or events to changes in plant costs or revenues. To further improve their units' performance, operators needed real-time access to data.

DTE Energy joined the Midwest Independent System Operator (MISO) energy market in 2005, making this need for data more urgent. MISO provided DTE Energy with new opportunities to earn revenue, but to seize them the utility needed a much more detailed view of its operations. Plus, if MISO participants fail to meet their commitments for power delivered, they incur hefty fines. In its first year as part of MISO, DTE Energy fines totaled more than $17 million. To avoid those penalties and make better use of its resources, the utility needed to improve its power capability predictions.

Solution

The success of the 1999 pilot project at a DTE Energy coal-fired plant was enough to justify an expansion of the project to other DTE Energy plants. By the end of 2002, the PI System had been deployed fleetwide and operators were using it at each of the seven plants. DTE Energy employees began leveraging the real-time, integrated data reporting and visualization tools within the PI System to identify new dependencies and optimization opportunities. That alone yielded more than $13 million in annual savings from improvements to both control and business processes.

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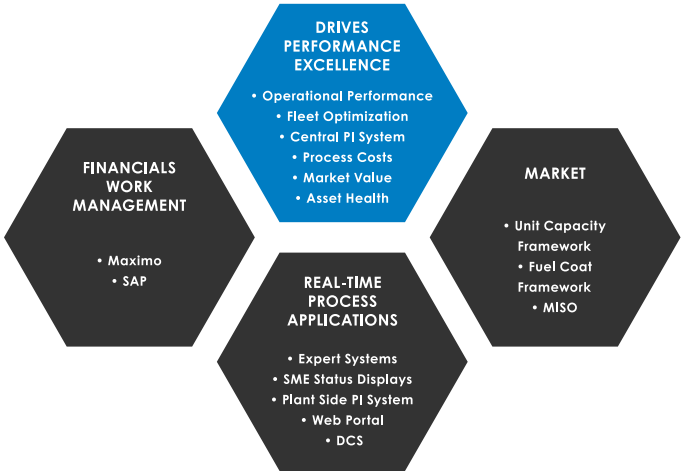
"Once you give people this information and show them what can be done with it, they start coming up with so many ideas," says Sumanth Makunur, Lead Engineer, DTE Energy. "They start asking, what else can we do?"



Total Fleet Management

Operators took it upon themselves to find new ways of measuring and monitoring their plants' performance; they slashed heat rates, boosted efficiency and increased uptime. Soon, DTE Energy realized the PI System could allow it to do even more and joining MISO spurred broader efforts. "We need to forget the isolated view of each plant," Makunur says. "You need to have a fleetwide view into the whole system."

With that new insight, DTE Energy in 2007 established a Performance Center from which it remotely monitors the health and performance of all facilities. Visibility into the organization's operations expanded dramatically. Everyone saw new ways to gather and analyze data and DTE Energy doubled the number of system variables it tracked from 300,000 to 600,000. The performance center gathers fleetwide data then reports it out to individual unit operators, providing them with actionable, real-time information needed to drive improvements.

Benefits

Using the PI System to drive an enterprise-wide fleet optimization project has yielded significant benefits for the company. Individual plant and unit operators have gained greater visibility into the daily operation of their facilities and the company has seen improvements in its dollars-per-megawatt metric, through both significant operational improvements and avoided MISO penalties.

"Throughout the fleet, operators had had no visibility to what was happening in the market," Makunur says. "We were able to bridge that gap with the fleet optimization performance center. Operators became aware of the revenue and loss."

Today, operators call the performance center and alert them to potential issues before they happen, working to find solutions in collaboration. This new behavior has helped prevent unexpected outages, allowing the company to shift plants' offline periods to low-value market times. That's boosted market-driven revenues and slashed MISO penalties; DTE Energy expects to pay under $7 million in fines in 2012. Cumulatively, the fleet optimization process has yielded more than $30 million in additional annual savings, over and above individual plant performance optimization.

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Customer Business Challenge

- Decision-grade data wasn't available when it was needed.
- Plant operations were monitored individually, but their collective performance mattered, too.
- Lack of predictability resulted in $17 million of MISO fines annually.

Solution

- PI System was installed at all individual plants.
- A Performance Center uses PI System tools for fleetwide improvements.
- Operators get integrated real-time data access.

Customer Results

- Increased plant uptime, power output and reduced waste.
- Improved each plant's dollar-per-megawatt metric, saving millions of dollars.
- Eliminated more than $10 million in annual MISO fines.