



## Harness Real-time Data to Support ISO50001 Energy Management Systems

ISO50001: Plan, Check, Act, Do  
For metals and mining operations

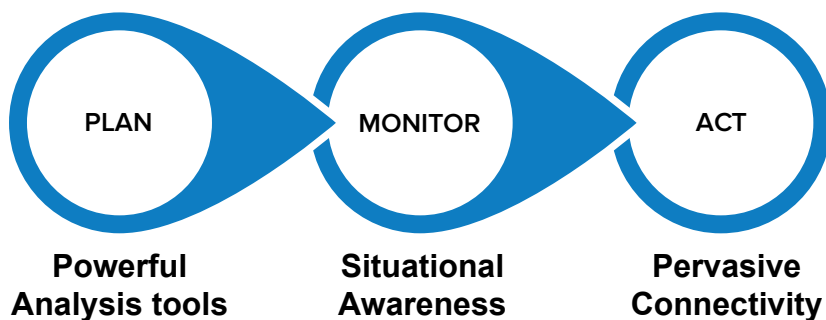




## Executive Summary

One of the main challenges to mineral processing plants is the efficient management of energy. Energy represents a major cost in metals and mineral processing. The rising cost of energy has a direct impact on the profitability of the operation, especially as the grade of the ore is reduced over time. For example, in copper processing, comminution uses over 50 percent of the total energy used to produce end product. As grade decreases, the energy requirement and cost increases sharply, which significantly reduces profit.

Rising energy costs, economic volatility and climate shifts are leading global corporations to adopt Energy Management Systems (EnMS) to manage cost and comply with regulations. While initial energy management systems may address localized conservation efforts, corporate leaders are turning to recognized standards such as ISO50001 to accelerate significant, enterprise-wide reductions in energy use. This guide will illustrate how the OSIsoft PI System™ supports each and every phase of a continuous improvement EnMS based on the ISO50001 framework.



### Aurubis Customer Reference:

In its first year, Aurubis was able to reduce energy consumption by 5 percent – the equivalent of 2 million euros.

## Benefits

- Standardize resource data regardless of source
- Calculate accurate baselines
- Identify targeted areas of improvement
- Gain situational awareness
- Establish and share best practices
- Set performance-based goals
- Share data within and outside of your enterprise

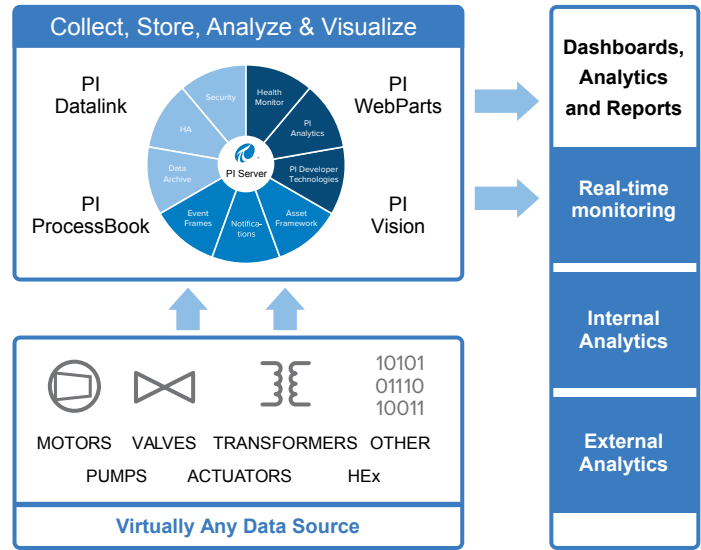
## Recommendation

We recognize that ISO50001 is a performance based standard used to drive continuous cycles of improvement in respect to energy management. A strategic investment in a data infrastructure, if architected properly, can support every phase of ISO50001. The PI System embeds a real-time data infrastructure throughout operations, data centers and facilities. The infrastructure brings high resolution data from diverse sources into a single system of record and makes it available to multiple users and purposes. Users from anywhere in the enterprise can monitor assets, standardize best practices and maximize efficiency.

# THE POWER OF REAL-TIME DATA

It's all about decision making. Every day, people responsible for energy management are making decisions based on the information they have. Are they working from complete data sets? Can teams determine how concurrent processes influence energy usage? Can performance fuel plans for future cycles of improvement?

“Real-time” means having the right data at the right time to make better decisions. Employees making minute-by-minute decisions need current data. Executives responsible for strategic planning need access to data with enough resolution to make accurate predictions.



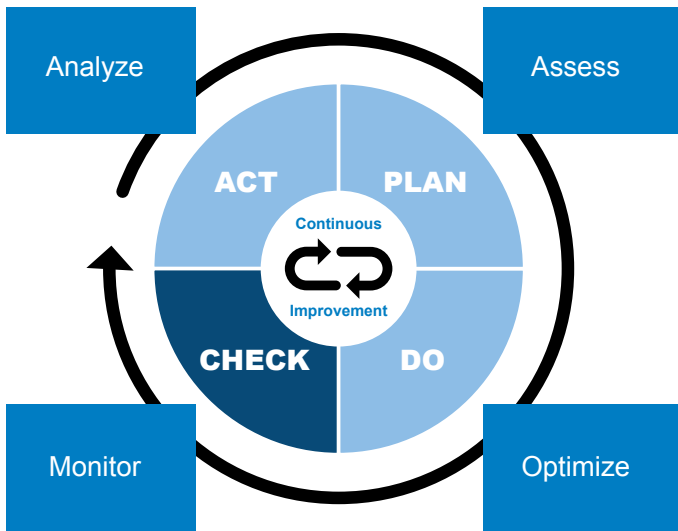
The necessary data exists, but it's often isolated, in the wrong format or unavailable to the users who need it. An infrastructure approach collects ALL relevant data and puts information in front of decision makers – at the right time, in the right format.

**CUSTOMER REFERENCE:**  
 Andrew Cooper, Energy Specialist at New Gold's New Afton Mine, believes that continual energy performance improvement should be every employee's day-to-day responsibility; Cooper sees huge value in ISO 50001 being the vehicle to make this a reality. "It's also the right thing to do," he says, "We're reducing the impact on the environment and getting a financial payback for doing so."

## Diverse data sources, real-time infrastructure, powerful applications





<p>Analyzing enterprise energy use can be complex. The PI System brings data from diverse sources including instrumentation, metering, and manually collected data into a single infrastructure.</p> <p>Data sources that are normally isolated from each other are now integrated, giving context and greater process visibility.</p>	<p>The PI System is the world's leading environment to manage operational performance of critical and mobile assets.</p> <p>Mining, mill, fleet or facilities managers have up-to-the-moment data immediately available to make better decisions, review goals and identify areas of improvement.</p>	<p>Performance-based Enterprise data can be easily located, analyzed and rolled up into customized dashboards and reports.</p> <p>Up-to-the-moment and historical data can be shared across sites to achieve collaboration.</p>
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# SUPPORTING YOUR ENERGY MANAGEMENT SYSTEM



Effective ISO50001 EnMS complement core business operations – not compete against them. PI System data bring enough temporal and “operational” resolution to generate information that goes beyond general insight. Standardized for your organization and visualized through customized displays, real-time data gives employees tools to quickly identify problems and execute targeted solutions. Analyzed over time, high fidelity data enables decision makers to establish benchmarks, identify specific areas of improvement and generate effective plans of action.

“Cascades’ senior leadership has made energy efficiency improvement and sustainability very visible in the company in both short- and long-term goals. The ROI was less than a year at the corporate level, based on the deployment speed.” — Francois S. Ruel, President, Hulix Genie Conseil

	<ul style="list-style-type: none"> <li>• Consolidate real-time energy, water and gas usage from assets and buildings into a single, accurate system of record.</li> <li>• Use standardized, historic and real-time data to calculate accurate baselines, identify KPIs and target specific areas of improvement.</li> </ul>
 <p>DO</p>	<ul style="list-style-type: none"> <li>• Develop customized displays to link situational data to informed action.</li> <li>• Use performance-based information to optimize asset procurement.</li> </ul>
	<ul style="list-style-type: none"> <li>• Monitor asset performance onsite or remotely.</li> <li>• Verify the accuracy of energy costs and charges.</li> <li>• Avoid unexpected down-, slow-, and wait-times, process defects and potential safety issues through automatic alerts triggered by preset thresholds.</li> </ul>
 <p>ACT</p>	<ul style="list-style-type: none"> <li>• Use high resolution data to analyze asset and process efficiency.</li> <li>• Establish and share best practices based on actual performance.</li> <li>• Create transparency and visibility into enterprise energy consumption patterns.</li> </ul>

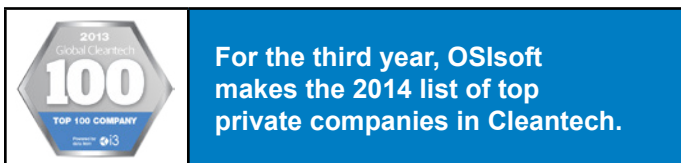
## Who are we?

In 1980, Patrick Kennedy formed a company to help customers optimize operations by designing advanced control systems. For insight into the variability of their work over time, they developed software to monitor and store real-time control system data. Soon, the team realized that the real-time data software had more universal value than customized control systems, and the PI System was born. For over 30 years, OSIsoft has delivered the PI System, the industry standard in enterprise software for real-time data infrastructures. Our customer base includes Fortune 100 and 500 companies in oil and gas, utilities, pharma, mining, manufacturing and process industries. With installations in 110 countries, the PI System is used for core business initiatives such as asset reliability, productivity improvements, process optimization, quality control, risk mitigation and compliance.

OSIsoft was founded as a private company in San Leandro, CA, and has always been profitable. The company's mission is to ensure that our customers have high fidelity operational data available to support profitability, growth and innovation – wherever and how ever it is needed. OSIsoft remains privately held, adheres to its founding principles and is committed to making PI System data infrastructures reliable, scalable yet agile enough to bring value now and over time.

## OSIsoft and Sustainability

Global Cleantech has recognized OSIsoft in their list of Top 100 companies in the category of energy efficiency for three years in a row. This list answers the question: According to the world's cleantech community, which 100 of today's private cleantech companies are the most likely to make the most significant market impact over the next 5-10 years?



Microsoft selected OSIsoft as its inaugural Sustainability Partner of the Year because of the consistent success the PI System has had in supporting sustainable operations.

## The OSIsoft Advantage

OSIsoft solutions can help you maximize operational efficiency, set baselines and optimize processes by turning raw data into actionable information.

Consolidate data from numerous systems into one integrated solution for all parts of your business, from the field to the front office.

Get up and running quickly with our easy-to-deploy solution. You can install the PI System in just a few days without having to modify your other systems.



# CUSTOMER REFERENCES

## NEW GOLD

New Gold is an intermediate gold mining company. The company has a portfolio of four producing assets and three significant development projects. The New Afton Mine in Canada, the Mesquite Mine in the United States, the Peak Mines in Australia and the Cerro San Pedro Mine in Mexico, provide the company with its current production base. In addition, New Gold owns 100 percent of the Rainy River and Blackwater projects, both in Canada, as well as 30 percent of the El Morro project located in Chile. New Gold's objective is to be the leading intermediate gold producer, with a focus on the environment and social responsibility.

Sustainable energy management is the key to efficient use of energy, which is a scarce, and expensive, resource. In 2014, New Gold's New Afton copper-gold mine became the first in North America to become ISO 50001 certified. Companies like New Gold that have implemented ISO 50001 expect energy savings of five to seven per cent annually at the start of their energy management programs.

For an effective implementation, New Gold realized that there was a need for a system-based approach to energy management that includes continual improvement. While energy-efficiency improvement projects are an essential component of an energy management program, they are not, in themselves, sustainable. There is a step change in efficiency as soon as a project is completed, but efficiency starts to drop off again over time if the systems to support energy efficiency are not in place.

Energy management should be self-sustaining, something that is done by all employees on a day-to-day basis and not just project based. New Gold's New Afton Mine launched their new ISO 50001 Energy Management System in June 2011. It is a system-based approach to energy management and New Afton mine saw this as the vehicle for integrating continual energy performance improvement across all functional areas of the organization. Starting in late 2012, New Afton was the first mine in Canada to start implementation of the ISO 50001 system.

As data and measurement form the foundation of any Energy Management System, in late 2012, New Afton implemented a PI-based Real-time Energy Management Information System (RtEMIS). This is a product of RtTech Software. ADM Systems Engineering (Dartmouth, NB) was the integrator and Indel Control Services (Ingersoll, ON) managed the infrastructure. A comprehensive network of 120 electrical sub-meters, 6 gas meters and a data concentrator was established to hand off data to the OSIsoft PI System in place at the mine.

RtEMIS processes this data to provide energy-cost reporting, energy intensity analysis by cost center, track energy performance against baselines for operational performance targets and track the impact of energy efficiency improvements. RtTech's customers have reduced energy costs by an average of 6.6 percent using RtTech's industrial EMIS software, RtEMIS. The project, from planning to completion took only 6 months.

# CUSTOMER REFERENCES

## AURUBIS

Headquartered in Hamburg, Germany, the Aurubis Group is the largest copper producer in Europe and the world leader in copper recycling. Aurubis has sites in seven European countries, employs about 4,800 staff and bases its growth on the growing demand for copper and its activity across integrated production capabilities in smelting, refining and recycling. Their core business is producing copper cathodes from copper concentrates and scrap, then processing those cathodes into continuous cast wire rod, shapes and rolled products.

Aurubis' Hamburg copper smelting plant in Hamburg is the largest of its kind in Europe. The plant covers four square kilometers, produces 2 million tonnes of copper and consumes 600,000 MWh of energy on an annual basis. With energy costs doubling over the last five years and increased energy-related taxes, Aurubis wanted to implement an ISO50001 certified energy management system for cost reduction and compliance. Because ISO50001 is a performance-based standard, its implementation would be a complex process. The Hamburg site alone had 30 different data streams related to energy consumption. With only three full-time employees dedicated to calculating and monitoring energy use across its enterprise, Aurubis needed a solution that could reliably bring all energy data into a single management system.

In 1999, Aurubis had adopted the PI System to optimize operations at the Hamburg site. Because the PI System successfully consolidated data from all facets of the copper smelting process, they decided install multiple submeters and expand the PI System footprint to bring high resolution energy data into their pre-existing data infrastructure.

Aurubis has earned its ISO50001 certification using the PI System as its data platform. The resolution of PI System data has allowed operators to identify specific areas of improvement and monitor processes such as cooling water before returning it to nearby sources. Aurubis is able to avoid tax penalties when PI Notifications alert them that their natural gas usage exceeds daily limits. The reliability of the data also makes energy accounting transparent to all levels of the company and available on demand. In its first year, Aurubis was able to reduce energy consumption by 5 percent - the equivalent of 2 million euros. Overall, using the PI System as a platform for performance-based cycles of improvement has yielded a solution that is customized to Aurubis' current business needs yet can be adapted to future ones.

## CASCADES

Cascades Inc. manufactures green packaging and tissue products and has \$3.9 billion (Canadian) in annual revenues. The company is the leading recycler of paper in Canada, and its annual \$350 million energy spend is a reflection of the power-intensive nature of creating new product from recycled paper.

Challenge: Reduce \$350 million annual energy bill by 2 percent annually.

Solution: Adopt the OSIsoft PI System to gather and deliver real-time energy usage data to employees across the organization. Monitor real-time events, analyze and report energy usage information.

Cascades is using the PI System to monitor energy use in real time across all its mills. Employees use PI System dashboards and reports to track performance against energy-related KPIs with targets based on models from historical data. Cascades is achieving continuous reduction in energy consumption and GHG emissions, including beneficial use of 63 percent of generated waste, decreased natural gas consumption and optimization of energy sourcing using real-time pricing. The enterprise-wide adoption of the OSIsoft PI System is central to continual improvements in sustainability and energy management initiatives.

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# CUSTOMER REFERENCES

## LARGE SEMICONDUCTOR MANUFACTURER (LSM)

Established decades ago, this East Coast-based semiconductor plant has a diverse technology profile that has changed rapidly over the last 10 years. While management goals included quality, reliability and environmental stewardship, extreme cost control was necessary to stay competitive globally. They decided to take an in-depth look at resource management data to meet these goals.

By installing the PI System, LSM pulled water, HVAC and chemical distribution data into a single platform. They implemented dashboards to convey key process indicators. Employees had the situational awareness to reduce water consumption, associated power and chemical use, heat recovery and cooling load.

LSM achieved over \$3.6 million in annual savings the first year. Since then, they have reduced water usage by 27 percent while increasing manufacturing by 30 percent. Compared to their baseline prior to this initiative, these improvements create a savings of \$10 million per year.

The PI System has allowed LSM to understand the value of water at each treatment stage, and to understand that the connection between water and energy use was critical to calculating overall cost.

By applying the strategies learned from their water initiative, they were able to drive additional improvements in power consumption. With continuous improvement strategies, they met their goal of four percent annual power reduction while increasing productivity. LSM has reduced power consumption by 4,800,000 kWh per month – a monthly savings of \$390,000.



## CONCLUSION AND NEXT STEPS

For over 30 years, OSIsoft has worked with customers to improve operational efficiency, monitor asset performance and reduce resource consumption.

### LEARN MORE AND ENGAGE

OSIsoft invites you to engage in an onsite demonstration to show how our organization will benefit from embedding a real-time data infrastructure in operations, facilities and at corporate to support structured ISO50001 energy management strategies.

We offer opportunities such as Executive Briefing Sessions and Regional Seminars to learn and discuss first-hand why the OSIsoft PI System has become an irreplaceable part of core business tools for many enterprises.

To setup a meeting to discuss your energy management use case, please visit our website for contact information:

<http://www.osisoft.com/corporate/mmm/index.html>

The OSIsoft PI System, deployed on a trusted platform from Microsoft, is empowering our customers to realize their Sustainability goals. Companies in industries such as utilities, oil & gas, pharmaceuticals, chemicals, datacenters, and critical facilities can optimize their use of energy, lower their carbon footprint, and reduce their costs.

**Dr. J. Patrick Kennedy**  
CEO and Founder, OSIsoft

