Coca Cola Swaziland Conco Ltd

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>
> *Paul Kotze*
> *Senior Software Engineer*
> *Systems Anywhere Coastal*

Coca-Cola Swaziland uses Wonderware Solutions to Optimize Energy Usage and Reduce Costs

Goals

- Reduce energy consumption by 20% and increase visibility into the production processes

Challenges

- The old model was to take a holistic view of energy cost rather than usage
- The energy users were not empowered enough to take control of situations in the plant

Solutions and Products

- Corporate Energy Management application
- ArchestrA® System Platform
- Wonderware® Information Server
- Wonderware InTouch® HMI
- Wonderware Historian
- Wonderware Historian Client
- Wonderware SmartGlance

Results

- The improved visibility into energy usage and cost per plant and subsection and the implementation of smarter energy usage/cost control protocols resulted in a reduction in energy consumption.
- Gaining the ability to control high energy operations to take place during low-cost periods and having the staff be immediately aware of their immediate impact on energy cost resulted in a tighter grip on corporate departmental budgets and targets

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Swaziland, South Africa – Recognizing the need for an effective energy management strategy, Coca-Cola Swaziland (Conco Ltd.) decided to investigate further and what they found surprised everyone.

While there are many definitions for energy management, they mostly focus on two aspects; maximizing profits or minimizing costs through lower energy consumption. However, it's rare to see actual practical examples of how one actually goes about achieving these desirable goals and that's because the solution is a great deal more complex than switching off something when it's not in use.

There are no best practice guides for specific industries and, insofar as electricity is concerned, only the incoming supply is usually measured and these data disappear into storage rarely to be seen again. Monitoring systems tend to only provide historical analysis tools and don't offer any control functions. But electricity isn't the only cost – what about, air, steam, water, gas, etc. And, most important, where does one start?

It Starts Right Here

Before diving in and installing technology, it's important to understand that energy management involves a culture change in the company and a different way of looking at the broader picture. Conco was fortunate in accepting and understanding the following long before the project started:

Mastering the fundamentals – It's vital to instill an energy efficiency culture through executive leadership, goal reviews etc. and then to:

- Track energy performance for all operations
- Extend energy accountability to the line/shift/product level rather than in the catch-all "overheads" basket
- Monitor the performance of assets and technology choices

- Measure the effectiveness of the facility's location
- Balance more assured returns of energy project investments against lower initial returns in the long term

Taking a longer and broader view about strategic decisions – Energy can be seen as a lever for positive growth and change within the business, not simply a cost. It's possible to make the most of the strategic value of energy by thinking in terms of "Embedded Energy" and "Energy Productivity."

Creating awareness about the way energy is managed, procured and used – It's important to be innovative and aggressive in pursuing and publicizing new product and service offerings based on new energy technologies and suppliers.

Creating contingent strategies for emergent future scenarios – This involves rehearsing specific aspects of the future, including substantial and sustained swings in energy price and supply, severe weather events and penalties or incentives around energy use and greenhouse gas emissions. It also means actively managing exposure to risks, and readying plans to take full advantage of what the future brings and which "road ahead" is emerging.

Taking personal action – Corporate leaders can take a number of "to-do" actions today for tomorrow. All can be taken individually, in companies, on corporate boards and across industry.

Evolving from ISO14001 to ISO50001 – Whereas ISO 14001:2004 specifies requirements for an environmental management system, ISO 50001:2011 specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption.

Corporate Objectives

- Reduce energy consumption by 20% in one year.

- Formulate a series of strategic initiatives that would enlist the commitment of corporate management and create employee awareness while helping meet departmental targets and investing in tools that assist with energy management. One of the most important initiatives was to form a focus group to drive down energy costs. "We shifted out priority to reducing energy cost rather than usage," says Wiseman Magagula, automation engineer at Coca-Cola Swaziland. "After all, if a process requires 500kWh there is not a lot that can be done about it apart from shaving off say 5% energy usage, but if the process is shifted to non-peak hours, costs can be reduced significantly. **This just goes to show that energy cost need not be dependent on energy usage."**

- Formulate a series of tactical initiatives that would optimize energy usage on the shop floor. These would include charging forklifts and running cold rooms only during off-peak periods, running the dust extractors only during working hours and basing lights and air-conditioning on someone's presence.

- Increase visibility into the factory and other processes.

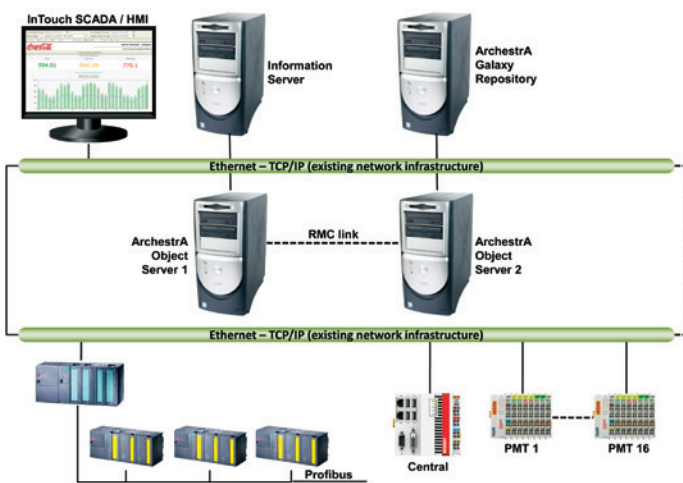- Enable limited, non-intrusive control functions for certain processes.

Figure 1: System Topology

Implementation

Coca-Cola Swaziland selected system integrator Systems Anywhere Coastal for the implementation of the energy management project who, in turn, selected a range of software solutions from the Invensys Wonderware stable. These solutions included the System Platform based on ArchestrA technology, Historian and Client, InTouch SCADA / HMI, Information Server, SmartGlance for mobile reporting and Wonderware's Corporate Energy Management (CEM) package.
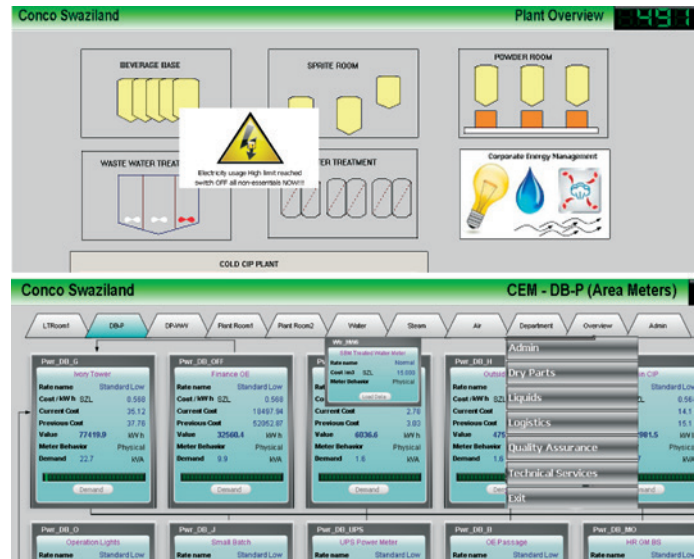

Figure 2:
Two sections of the InTouch screen showing the plant overview (top) with demand displayed at the top right corner and plant areas (bottom) with access tabs to other areas as well as water steam and air status.

"We were pioneering the CEM implementation with version 1.2 of the software using the water, steam, air and power modules," says Paul Kotze, senior software engineer at Systems Anywhere Coastal. "The Wonderware CEM fits into the System Platform environment and is an "off the shelf" product that has multiple metering options. It enables real-time visibility of usage and cost and makes data available to any delivery vehicle."

When the first results were made available they came as a shock – notably, this was the first time that measurements included data from sources other than the mains supply. "The company had its own ideas about usage and cost and did not accept these initial figures," says Kotze. "But after

the Swaziland Electricity Company validated the results and achieved a discrepancy of less than 1%, the business completely bought into the system."

The InTouch system keeps operators informed on the exact real-time status of the plant and its various departments while management is kept informed on their smart phones via the SmartGlance mobile reporting facility. This real-time information availability allows for the study of cause-and-effect scenarios which were previously invisible to everyone.

Figure 3: SmartGlance in Action

Benefits

- Visibility into energy usage and cost per plant and subsection
- Implementation of smarter energy usage/cost control protocols
- Tighter grip on corporate departmental budgets and targets
- Ability to control high energy operations to take place during low-cost periods
- Business/people awareness of their immediate impact on energy cost

Conclusion

Passive monitoring of energy usage is never going to achieve the desired results – energy needs to be controlled and the only way to do that is to incorporate it into the manufacturing process. After all, energy can be regarded as a raw material, just like any other, which is transformed by the process into added-value goods. To that degree, it can be accurately allocated to the manufacturing costs of individual items if necessary and that level of knowledge empowers people to make the right decisions and take control rather than being the victims of soaring costs.

Rev. 04/15   PN WW-4144