Achieving Excellence in Energy and Utilities Management

Implementing software for management and optimization of utilizing and sourcing energy

Managing energy and utilities are one of the challenging tasks in any process plant. The right management of these facets will not only allow companies to reduce cost but will also enable to optimize operation. Read to know more...

Source: AspenTech

Energy is the single largest operating expense after raw materials for the process industry. Cutting-edge utilities software allows manufacturers to manage and optimize the way they use and source energy.

Companies face constant pressures to make effective capital planning decisions. Running a refinery, chemical plant or power station is a complex business. Therefore, being able to see the bigger economic picture is vital in effectively managing operational maintenance, regulatory requirements, energy efficiency and sustainability goals.

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Minimizing costs and optimizing the operation is a priority in the battle to remain profitable and competitive. However, when global energy markets fluctuate, businesses need to improve the way they source, trade and use energy while considering ever-changing environmental, organizational and technical constraints. So, how can companies achieve overall excellence with their energy and utility management on a daily and weekly basis?

Energy is the single largest operating expense after raw materials for the process industry. Cutting-edge utilities software allows manufacturers to manage and optimize the way they use and source energy across an entire production site. It enables companies to ensure that all their processes receive reliable supplies, while minimizing running costs by reducing overall consumption and identify the most economical sources of supply. Crucially, utility planning software defines and improves the energy business processes that are important to the overall economic performance of the site.

Reducing production costs

Minimizing energy costs and maximizing operational reliability of the utilities system can be achieved simultaneously through the implementation of an integrated energy management and optimization system, which links business and operational objectives. In turn, this enables companies to make more profitable decisions about how to use and source energy across an entire production site.

Utilities are integral to the functionality of a plant and provide heating and cooling, electricity and fuel used by vital machinery to ensure that product quality standards are consistently met and produced to optimum operational effectiveness. It is common for fuel, power, steam production and consumption networks to be modeled in high level detail to build a customized model, which helps users understand how to reduce site energy costs within a short time frame.

Many plant decision-makers have adopted utility planning software in an effort to improve their weekly and daily planning. This includes forecasting plans and demands based on current results and the provision of future assets, recommending how to operate the plant, eliminating or reducing fuel and steam venting and performing 'what-if' analysis of future investments while operating and optimizing current assets. From a defined model they can expect fully optimized assets based on economic evaluations to obtain specific recommendations for fuel exchange, proposals to operate steam turbines or information on boiler loads.

Companies have options to purchase or import utilities from outside sources, while some plants may choose to produce their own solutions. The key to choosing an optimum schedule is establishing the blend between purchasing and producing utilities in order to minimize cost. Cutting-edge utilities software can model the required utilities system for a process and help specify the quantity and time frame of when utilities are needed. From a designated utility purchasing contract, the software will optimize around the utility's needs to establish the cheapest method of acquirement (i.e., through in-plant production or outside purchase).

A complete operational overview

From a business perspective utilities software considers all aspects of the operation of a utilities system (e.g., reliable supply of energy or energy sourced at the lowest overall cost that meets reliability and environmental goals). Companies can achieve both technical and commercial excellence in energy and utilities management by embracing the adoption of software applications for different types of users - ranging from plant operators to utilities contract managers up to senior company management.

Source: depositphotos.com / SergeyNivens

By establishing a two-way link between production and energy scheduling, companies can ensure continuous energy supply for production plants and avoid unnecessary costs.

Many leading companies have implemented Aspen Utilities—an integrated software solution that enables process manufactures to optimize and manage energy usage and sourcing across an entire production site. It enables companies to ensure all their processes receive reliable supplies, while at the same time minimize running costs by reducing overall consumption and identifying the most economical sources of supply. Another crucial benefit is that the software can integrate with existing plant and business systems, whereby information can be automatically extracted (i.e., planning and scheduling systems, historical data and ERP systems for resource planning).

The AspenTech approach is based on defining and improving the energy business processes that are important to the economic performance of the site. By considering all site utilities systems within a single environment, Aspen Utilities can capture all relevant data and provide clear and consistent recommendations on how to achieve the lowest cost operation. The system can be used both offline, such as for 'what-if' analysis, and also online to provide real-time recommendations to operations personnel.

The Aspen Utilities Planner improves weekly and daily planning, forecasting plans and demands based on current and future asset results. In addition, it eliminates or reduces fuel and steam venting and investigates likely imbalances. The software calculates a utilities forecast based on actual and future production demand while considering penalties, peak demand charges and load factor contract clauses. The optimum utilities production plan accounts for operational, economic and environmental constraints. The benefits of using these tools are significant. AspenTech's energy optimization solution improves energy management to enable users to reduce site energy costs by up to 5 per cent with a project payback in less than one year.

Energy optimization tools have three main areas of application:

- Online operational advice system for operators to optimise the utilities plant operation
- Tactical and strategic advice system to improve utilities plant planning, including utilities nomination, CO_2 trading, power trading, maintenance scheduling, as well as contract negotiations and investment analysis
- 'Plan versus Actual' management system for utilities consumers to allow the tracking and evaluation of actual performance compared to target performance

Achieving operational excellence

The process industry is experiencing dramatic market changes as it endeavors to meet energy requirements while maintaining competitive rates. Those executive decision-makers who embrace more robust project planning methodologies and implement thorough plans to gain greater visibility of the overall operation will deliver a better financial return to the business, while meeting the needs of their customers.

By establishing a two-way link between production and energy scheduling, companies can ensure continuous energy supply for production plants and avoid unnecessary costs. With Aspen Utilities, decision-makers will achieve more informed evaluation of assets, the lowest cost operation, better choice of fuels, accurate demand forecasts and profitable trading—the ultimate achievement in energy management and utility optimization.