ITC INFOTECH

Business-friendly Solutions

ITC Infotech's ENERGY ANALYTICS SOLUTION

Leveraging IOT and data analytics for efficient and greener manufacturing

POWERED BY PREDIX

Introduction

The Energy Analytics and Resource Optimization practice at ITC Infotech helps businesses *"leverage data analytics for achieving efficient and greener manufacturing".* Our unique solution provides *online Energy Audit and analysis* which helps to instantly identify areas of energy losses for taking quick corrective actions, thereby saving precious energy and hence money.

Businesses today face increasing challenges in the areas of Energy Efficiency, Environmental Sustainability and Resource Optimization. While cost concerns drive majority of organizational initiatives, other objectives include branding, greening of supply chain, regulatory compliance and stock exchange listing requirements.

A major hurdle for achieving these objectives is the vast amount of disaggregated data handled. The various existing Control Systems/ Enterprise Resource Planning (ERP) applications and IT systems focus only on smoother operations but are not designed to compute resource usage efficiency at a plant, process or equipment level. Moreover, variations in process conditions such as raw material/ product grades, capacity utilization, fuel characteristics, etc. add to the complexity of computation. Consequently, most plants continue to use simplified metrics like specific energy consumption (e.g. kWh/ton of product) which neither give an accurate picture, nor capture the dynamic nature of production.

A need therefore arises for developing Resource Use Optimization Models with appropriate real-time dashboard software that is customized for each plant's configuration and dynamic conditions.

Business Challenges

Manufacturing units find real-time resource use efficiency evaluation to be a challenge. While the purchase of energy resources (electricity, coal, fuel oil and natural gas) is a major cost head (refer table below), most companies tend to focus primarily on increasing production/output, and reducing costs in supply chain/ labour as means for enhancing profitability. Energy and resource costs are largely perceived to be 'unmanageable' due to technical complexities linked with production variations. However, as per UNIDO (2010), there is a straight opportunity of reducing energy costs by 5-30% through efficiency improvements.

INDUSTRY	ENERGY COST SHARE	IMPROVEMENT POTENTIAL	
	Energy Cost as a percentage of Total Product Cost	OECD Countries	Non- OECD Countries
Chemical and petrochemical	50-85%	9-25%	14-30%
Petroleum refining	50-60%	10-25%	40-45%
Non-ferrous metals	30-50%	5-35%	5-50%
Iron and steel	10-30%	10%	30%
Cement	25-50%	20%	25%
Glass	7-20%	30-35%	40%
Pulp and paper	15-35%	25%	20%
Textile	5-25%	10%	20%
Food and beverage	1-10%	25%	40%
Automotive	1-10%	10-15%	25-30%

Table 1: Typical Energy Costs as share of Total Production Cost. Improvement Potential in Developed (OECD) and Emerging (Non-OECD) countries [Source: ***Top Strategies for Energy Intelligence,*** *LNS Research (2013);* ***Global Industrial Energy Efficiency Benchmarking,*** *UNIDO (2010)]*

Energy intensive plants are also increasingly coming under energy efficiency targets and CO_2 emission caps and need to prepare for stricter environmental regulations. Large customers of such industries are also demanding for increased resource use efficiency through their "Supplier Codes of Conduct".

Specific challenges for resource intensive industries include:

- Plant efficiency optimization
- Maximizing asset performance
- Real-time financial implication of energy losses
- Energy flow tracking
- Identifying underperforming areas for quick action
- Better maintenance and spares planning

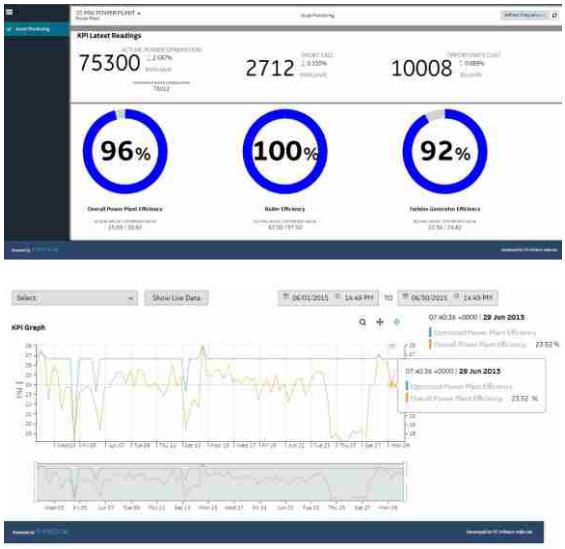
System challenges include:

- Existing IT applications of Distributed Control Systems (DCS) and SCADA are operations specific, have legacy challenges and are not modified to suit latest MIS needs on energy efficiency analysis.
- Conventional spreadsheet based analysis has limitations such as being non-interactive and considerable time and effort being required each time to generate prompt reports for different functional heads

Solution Overview

The Energy Analytics solution powered by GE Predix IOT Platform provides data-driven intelligent analysis and visualization of energy use productivity through a Dashboard on a real-time basis.

Dynamic Benchmark models are created by computing Energy/ Resource Use Efficiency for each plant. Advanced statistical analysis is performed for historic data (3-5 years) for identifying key cause-effect patterns affecting efficiency. Internal best efficiency benchmarks for the entire range of process conditions are created, and projected as 'Optimised Efficiency Bands'.



Illustrative dashboards on GE Predix IOT Platform showing KPIs and performance trending (optimised vs actual)

The actual performance at any point of time is then compared with Optimised Efficiency Bands to estimate potential losses. The gap in performance (deviation) helps in easy root cause analysis, and undertaking quick corrective actions to address under performance. A distinct feature is that Dashboards provide common financial metrics (opportunity costs or monetary revenue foregone) that enable users to easily visualize losses across units and lines, seek control and target high performance consistently. **Six Sigma** and other **Quality Management System (QMS) tools** such as Pareto Analysis can then be applied for narrowing the energy efficiency performance gap.

Benefits

- Around **5-20% savings** in energy costs by adopting real-time Energy Analytics IT Solutions.
- Most efficiency improvement measures can be undertaken with minimum/ no capital investment. Hence, **high ROI with typical payback < 1 year.**
- Losses are translated to simple **financial metrics (i.e. opportunity costs)** – enables prompt awareness of top management and line functions (costing, maintenance, purchase, etc.). Better accountability of energy use across the organization.
- Precise clarity on performance, irrespective of varying process conditions. Enables easy **root-cause analysis** of deviations.
- A big reason for under performance is poor maintenance practices. The Dashboards help in **improving plant maintenance** and have better spares inventory management, as the opportunity cost of poor maintenance is immediately reflected in the financial metrics.
- Staff can be held more accountable for operational performance resulting in better equipment maintenance, instrumentation and spares inventory management.
- Single IOT and Dashboard platform across all production lines and geographies. GHG accounting can also be incorporated.
- Plug and Play: User-friendly software architecture for use across functions.

Our Competitive Advantage in Energy Analytics

- **Customized Optimization model:** Algorithm and Dashboard developed from scratch for each plant
- **Practical and meaningful KPIs** such as computation of potential energy savings in Financial metrics (Opportunity Costs)
- Strong domain expertise with background in **Manufacturing, Energy Management and Audits,** augmented by in-house **Advanced Analytics team with Data Scientists** possessing rich experience in statistical modelling
- User-friendly software solutions executed with no additional infrastructure

ABOUT ITC INFOTECH

ITC Infotech is a specialized global full service technology solutions provider, led by Business and Technology Consulting. ITC Infotech's Digitaligence@work infuses technology with domain, data, design, and differentiated delivery to significantly enhance experience and efficiency, enabling our clients to differentiate and disrupt their business.

ITC Infotech is a fully owned subsidiary of ITC Ltd, one of India's most admired companies.

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