ITC INFOTECH
Business-friendly Solutions

SMART ENERGY & MAINTENANCE
Management for Retail

INTRODUCTION

Energy is amongst the top 4 operating expenditures in retail, and it is constantly growing.

Here are a few common reasons why retailers continuously lose money:

- Air-conditioning and refrigeration running at constant load despite variations in weather & occupancy
- Constant lighting usage on a bright summer day
- Higher energy consumption by obsolete equipment or their frequent breakdowns
- Non-compliance to store SOPs on energy control & maintenance

Conversely, lack of right temperature affects food freshness & quality; consequently consumer perception. Inadequate lighting impacts merchandise sales. Hence, lack of precise energy regulation technique, in conjunction with business imperatives, can have far-reaching business impact.

Typically, a retailer with **700 stores,** each of about **25000 sqft.**, spread over multiple geographies, would run an energy bill (electricity + fuel) in the order of **US $25 M to $40 M per year.** Depending on their maturity & the level of automation deployed, energy cost leakages alone could range anywhere between **US $2.5** M to a staggering **US $ 12 M per annum.** Most retailers do not record, let alone recognize, these huge energy cost leakages, which directly affect their bottom line.

Today, the e-Commerce players are challenging brick & mortar stores' cost competitiveness and squeezing their margins. Most brick & mortar retailers are struggling to rein in costs. In order to plug these cost leakages and improve margins, it is imperative that retailers deploy efficient energy management and predictive maintenance solutions.

BUSINESS CHALLENGES

Outdated Legacy Systems

The biggest bottleneck to efficient store energy and maintenance management is outdated executive controllers and building management systems (BMS), which regulate key consumption areas of heating ventilation & air conditioning (HVAC), refrigeration and lighting among others (ref. figure 2).

These devices operate in isolation (i.e. non-IP addressable) and have severe limitations in extracting data for real-time analysis and external smart control based on occupancy & weather conditions.

Maintenance Logjam

The break-to-fix cycle for maintenance is anywhere between few hours to days. The current process of skilled maintenance personnel understanding alarms / telemetry data, before raising a work order / service order ticket in the ERP systems, is labour intensive and delayed, leading to shrinkage, sales loss and customer dissatisfaction.

Other Retail specific challenges:

- Store energy optimization, closed loop automation.
- Estimating financial implication of energy losses
- Identifying areas, equipment, stores for quick corrective action

Energy and related equipment maintenance activities easily account for anywhere between 10% to 20% of store operating costs.

Figure 1: Typical Retail Operating Cost Break up, products exlcuded
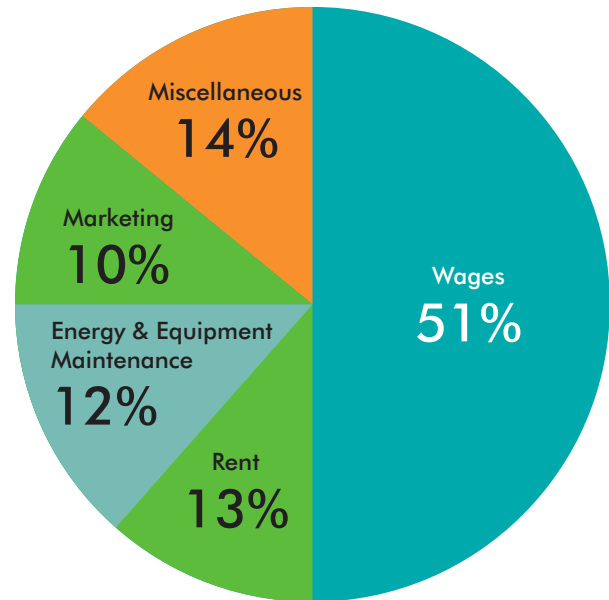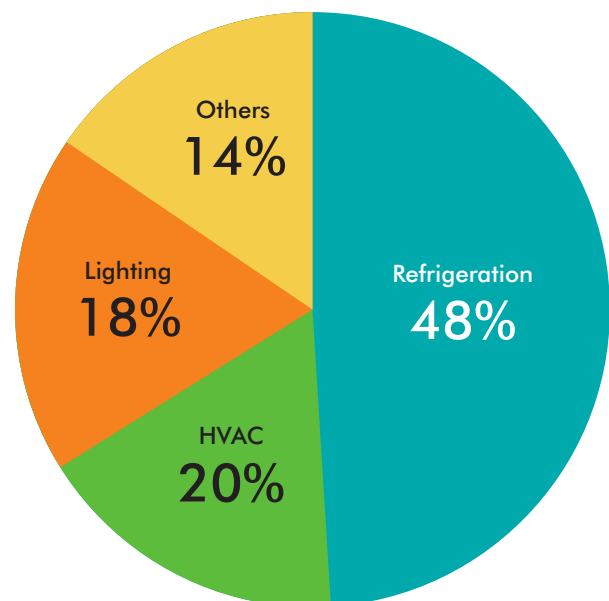

Figure 2 : Major Energy Consumption Areas for a Typical Food Retailer


- Automated ticketing for maintenance activities
- Better maintenance and spares planning
- Maximizing asset performance

SOLUTION OVERVIEW

Retailers can now leverage new-age technologies such as Internet of Things (IoT), cloud & mobility to improve energy efficiency and reduce costs through ITC Infotech's "Smart Energy Management & Maintenance" solution based on PTC's ThingWorx Data & Analytics platform.

Figure 3: ITC Infotech's Smart Energy & Maintenance Management Framework for Retail
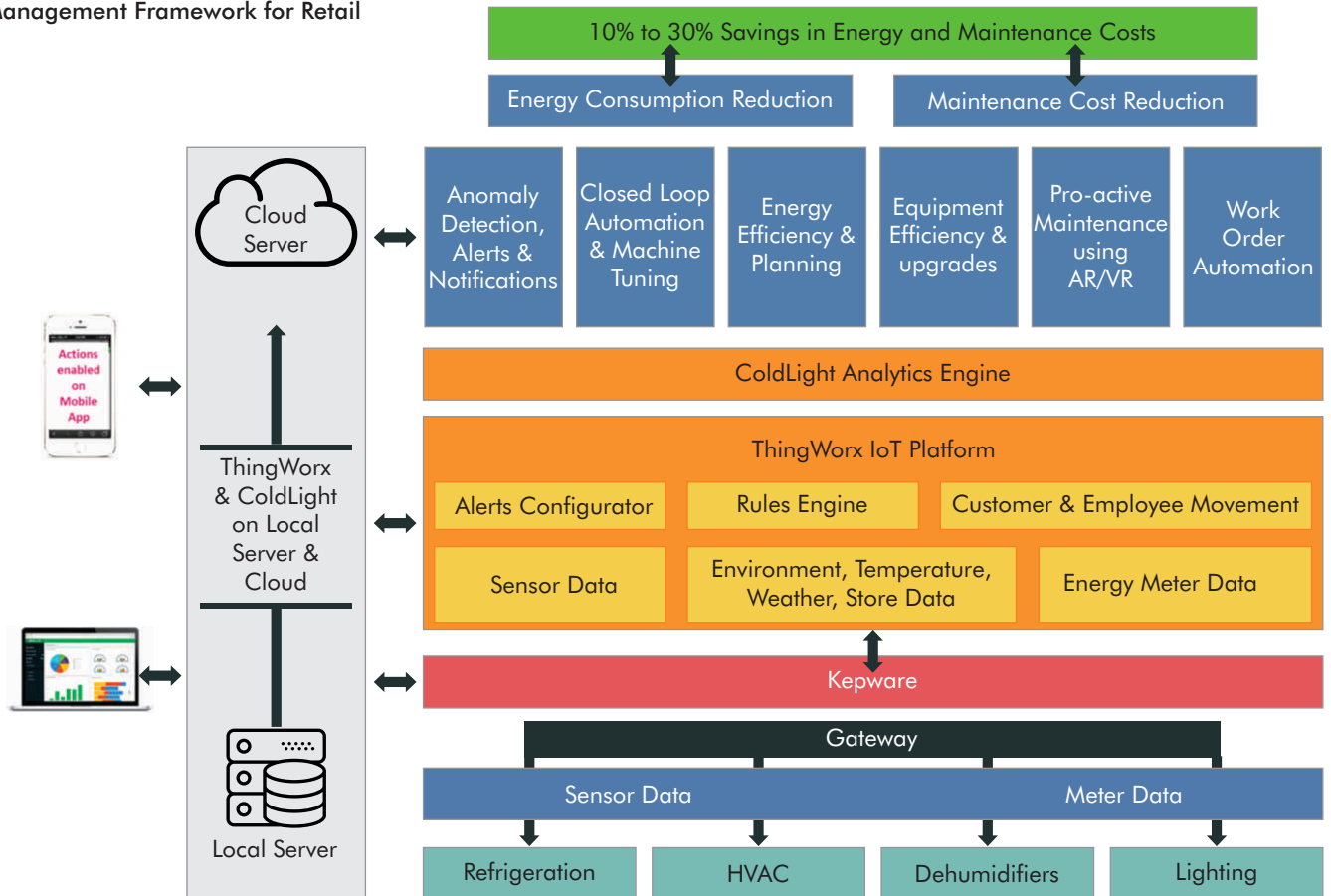
Monitor, manage and control energy consumption & maintenance costs.

Energy Management

- Remote monitoring, role-based KPI dashboards with store-wise energy performance.
- Anomaly detection, timely alerts & notifications.
- Live stream and analysis of telemetry data at the edge (store-end), based on established business logic
- Closed-loop automation through controllers, fine-tuned to store configuration and dynamic conditions
- Planned retrofits/upgrades for improved performance

Maintenance Management

- Proactive Maintenance with smart KPI monitoring – periodic & predictive.
- Work order / service order automation.
- Equipment health monitoring, repairs / trouble shooting using AR/VR and plan for replacements with star-rated equipment.

ThingWorx Platform helps to:

- Have a single platform across multiple locations and geographies.
- Connect or bypass controllers and pull telemetry data directly from non-IP connected devices/sensors.
- Provide actionable Intelligence and unified User Interface for store managers, field technicians, store office associates, Regional & Corporate offices
- Customized algorithms basis occupancy, weather, etc.
- Integrate with existing ERP Systems (SAP, Oracle, etc.) for work order/service order management.

Figure 4: Clockwise (from top left) Role based KPIs, real-time infographics
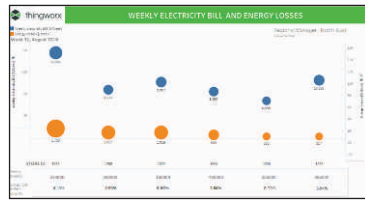
Regional Manager: showing weekly energy performance across his/her stores, overlaid by Weekly Sales
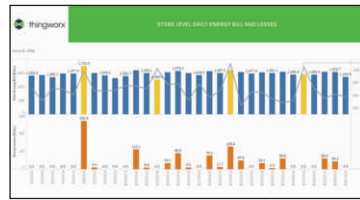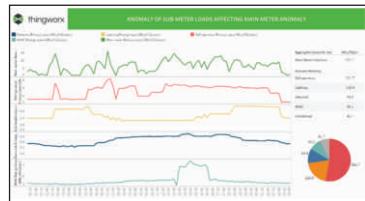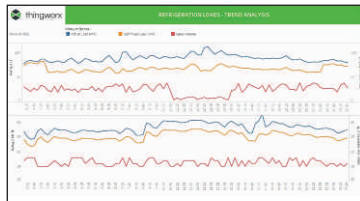

Store Manager: Daily Energy performance across a month overlaid with Store Footfalls

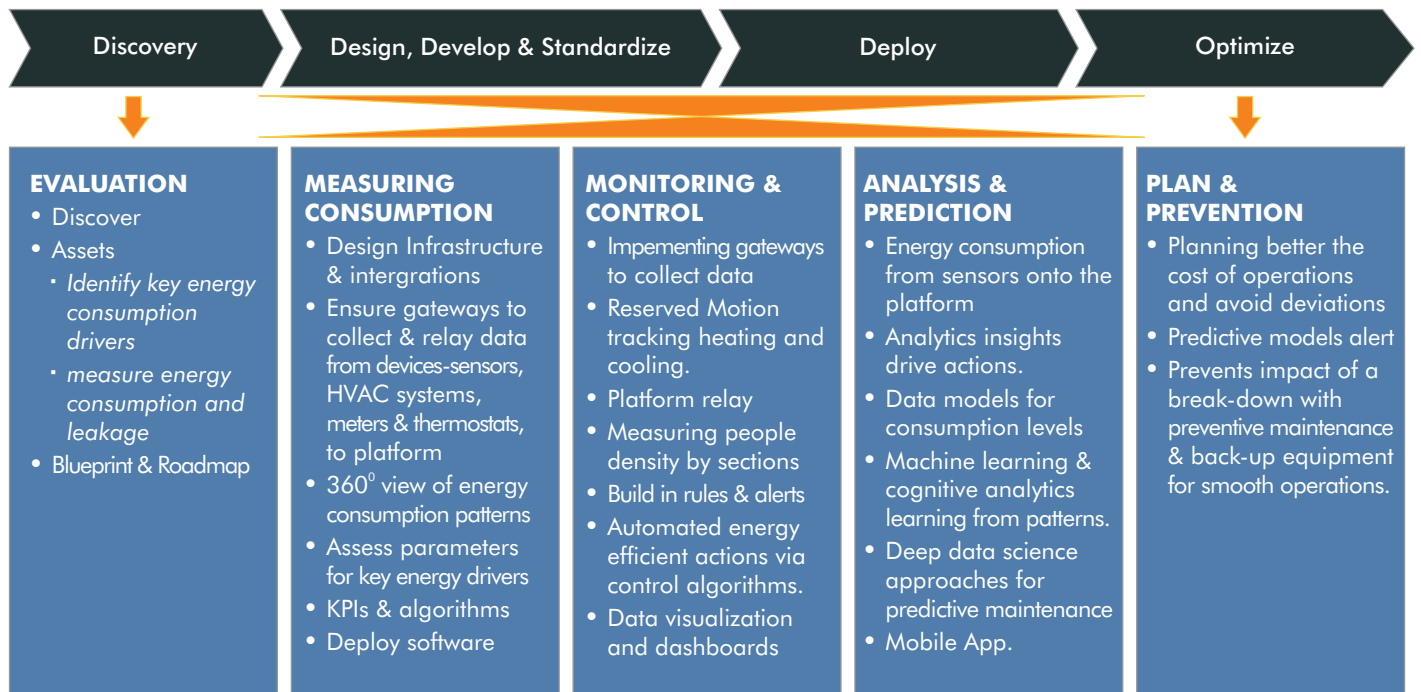**Store Manager/ Facility Technician:** Energy Sub-Meter loads (Refrigeration, HVAC, etc.) anomaly

Facility Technician: Refrigeration 1 & 2, Energy Efficiency Performance anomaly

BENEFITS

- **10-30% savings** in energy costs.

- **Better accountability** of energy use across the organization with simple **financial metrics.**

- **Reduced average response** time for break-to-fix cycle by automating work orders/service orders

- **Overall, high ROI** with typical payback for the initiative < 2 years

IMPLEMENTATION APPROACH

Figure 5: ITC Infotech's Retail Energy & Maintenance Management Solution Implementation

Discovery → Design, Develop & Standardize → Deploy → Optimize

EVALUATION
- Discover
- Assets
  - *Identify key energy consumption drivers*
  - *measure energy consumption and leakage*
- Blueprint & Roadmap

MEASURING CONSUMPTION
- Design Infrastructure & intergrations
- Ensure gateways to collect & relay data from devices-sensors, HVAC systems, meters & thermostats, to platform
- 360^0 view of energy consumption patterns
- Assess parameters for key energy drivers
- KPIs & algorithms
- Deploy software

MONITORING & CONTROL
- Impementing gateways to collect data
- Reserved Motion tracking heating and cooling.
- Platform relay
- Measuring people density by sections
- Build in rules & alerts
- Automated energy efficient actions via control algorithms.
- Data visualization and dashboards

ANALYSIS & PREDICTION
- Energy consumption from sensors onto the platform
- Analytics insights drive actions.
- Data models for consumption levels
- Machine learning & cognitive analytics learning from patterns.
- Deep data science approaches for predictive maintenance
- Mobile App.

PLAN & PREVENTION
- Planning better the cost of operations and avoid deviations
- Predictive models alert
- Prevents impact of a break-down with preventive maintenance & back-up equipment for smooth operations.

ITC INFOTECH'S EDGE IN RETAIL & ENERGY ANALYTICS

- Customized Optimization model
- Practical KPIs with financial metrics.
- Strong domain expertise with background in
  - Retail operations
  - Energy management and audits,
  - Advanced analytics & statistical modelling

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.

For more information, please visit: www.itcinfotech.com | or write to: contact.us@itcinfotech.com