SmartWater

SmartEnergy

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Energy – Water Nexus: Industrial Efficiency

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Energy – Water Nexus in Industries

Summary

Energy and Water sectors are interconnected since copious amount of energy is required to treat, move and distribute water while significant amount of water is required in the energy generation process and for cooling the steam generated. This is more pronounced in the industrial sector with industrial processes generating heat and requiring enormous energy, water to run them optimally. This session will discuss the energy – water nexus in industrial processes and highlight possible solutions to improve efficiency.

Agenda

- Energy – Water Nexus
- SmartWater and SmartEnergy
- Industrial Resource Efficiency: 3 takeaways

Energy – Water Nexus

- Significant amount of water is required in:
  - Creating Energy
  - Cooling Steam generated from power plants
  - Oil & Gas extraction, refining and production

- Significant amount of energy is required in:
  - Extracting, Moving and Treating Water across it's lifecycle
  - Heating and Cooling in Municipalities and Industries
  - Moving water in Agriculture

Energy – Water Nexus: some numbers

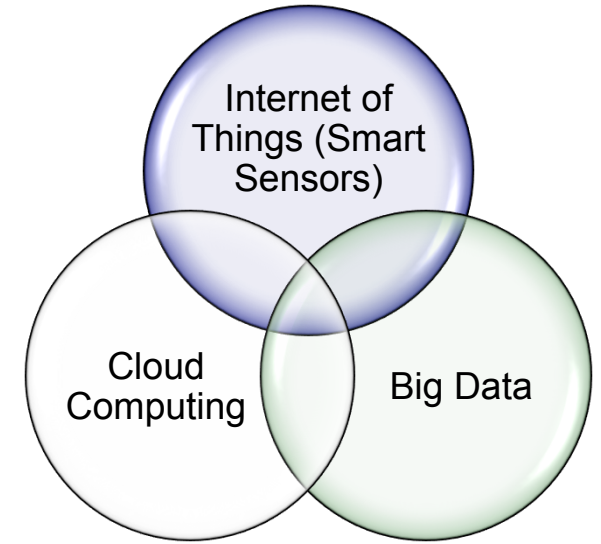
- Water for Energy* requires:
  - Each KWh of energy require 95L of water
  - Solar Thermal, Thermoelectric and Nuclear are most water intensive (L / 1000 KWh)
  - Each KWh of Hydroelectric results in loss of 69L of water
- Energy for Water* (Water & Wastewater Utilities) consume:
  - 100 million MWH of electricity annually (4% of US Power Generation)
  - 85 to 99% of utility energy consumption is to pump water
  - 12 to 28% of Total Operations & Maintenance cost

* US Data, Source: EPA, Wikipedia

Energy – Water Nexus in Industries: our focus

- Lower energy and water intensity across Industrial Processes:
  - Optimise systems and asset performance based on operating condition changes
  - Deliver smart analytics to improve plant operations decision making
  - Implement, Track and Manage conservation programs and integrate price signals to reduce demand

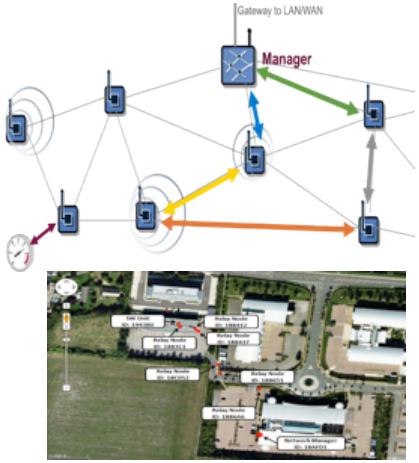
Technology Enablers



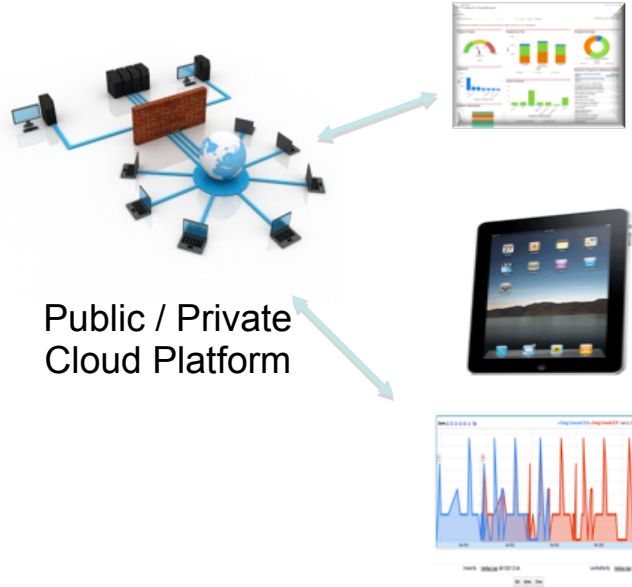
SmartWater SmartEnergy

Delivering Actionable Intelligence

Sensors:
Pressure, Flow,
Temp, Energy,
Vibration



Wireless Mesh
Sensor Network



Public / Private
Cloud Platform

Efficiency &
Improvement
analytics

SENSE. PREDICT. ACT.

aqua mw smart infrastructure

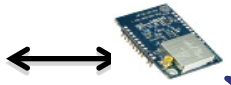
SmartWater + SmartEnergy – Optimising industrial processes (applications)

Process Cooling Systems

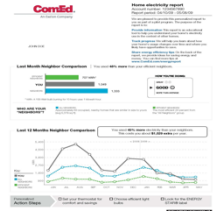
Industrial Pumping System

Compressors

System Operations: pressure, flow, temp, energy, voltage, power



Mechanical Parameters: Bearing Temp, Heat , Vibration



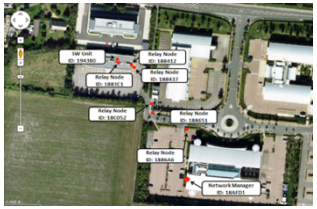
Digital Sensors & Data Logger

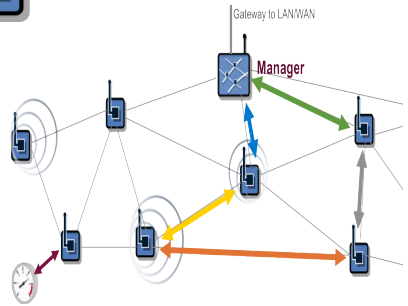
Wireless Sensor Network

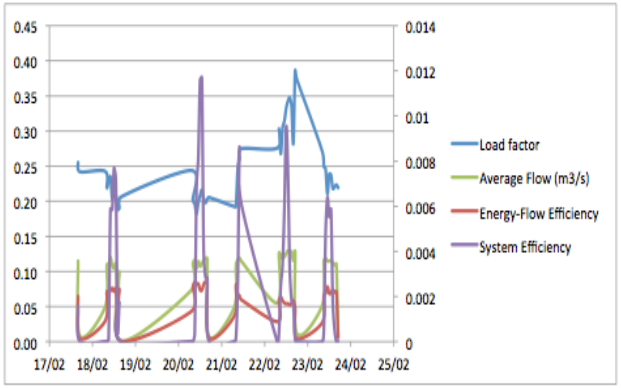
Application for Efficiency and Improvement analytics

Optimising systems based on real time consumption patterns reduces annual 15 - 25% energy, water and 10 - 15% annual maintenance cost.

SmartWater + SmartEnergy: How we work with facility owners?







Retrofit

- SmartWater and SmartEnergy hardware is retrofit to power source & sensors.

Wireless Sensor Network

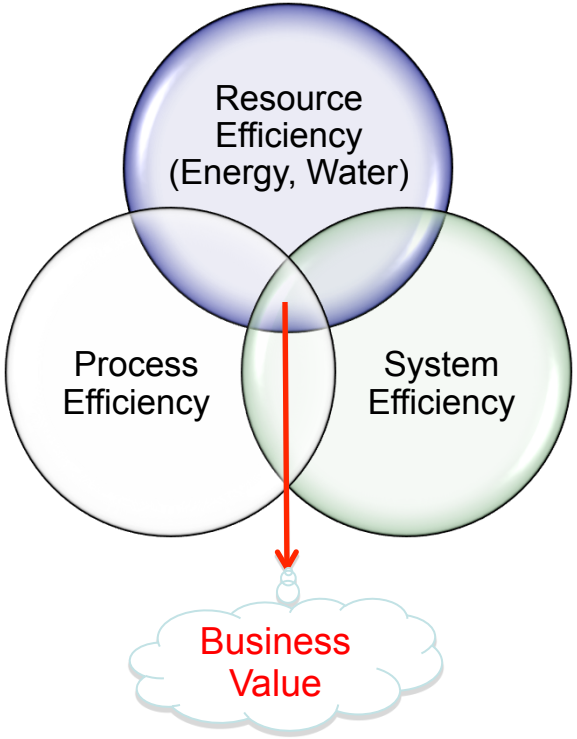
- Battery powered relay nodes transmitting data over long distance.

Cloud Analytics

- Efficiency Analytics: analyse real time system efficiency for proactive and prediction action.
- Improvement Analytics: identify and manage conservation projects.

Industrial Resource Efficiency: 3 takeaways

- Reducing resource (Energy, Water) demand through conservation programs
- Data Analytics to unlock insight for process efficiency and improve plant performance
- Resource, System and Process efficiency are all connected which can be delivered through Conservations Programs



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