

# Driving Building Performance Using Big Data Analytics

Smart Future Cities  
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# Are There Opportunities to Use IoT?



**30B**

By 2020, there will be 30 billion devices connected via the Internet of Things



**50%**

In developed economies, at least half of the buildings that will be in use in 2050 have already been built

# Buildings are a Huge Energy Drain



The infographic features a blue sky background with stylized white and light blue clouds. A blue and white striped hot air balloon is positioned on the left side. At the bottom, there is a silhouette of a city skyline in shades of green. The central text is displayed on a large white cloud shape.

**40%**

of the world's energy  
is used in buildings

# Lifecycle Costs



**20%**

Only 20% of facility managers use 80% of the available capabilities in their building management systems



**75%**

75 percent of a building's cost over its lifetime will go toward maintenance and operating expenses

# Critical Drivers are Impacting All Industries

Aging stock

Labour

Outsourcing

Risk

Emerging technology

Sustainability



# BMS and Dashboards

## BMS:

- > Review graphics
- > View Alarms
- > Set up Trends

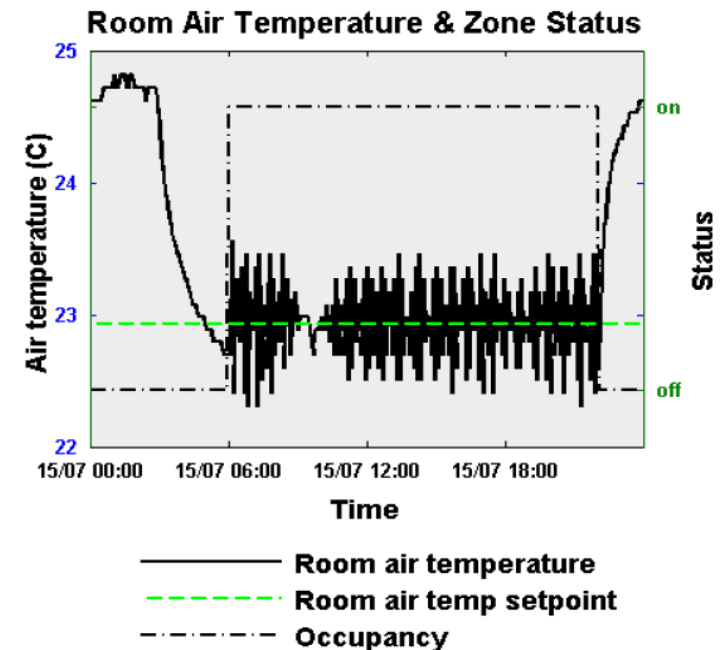
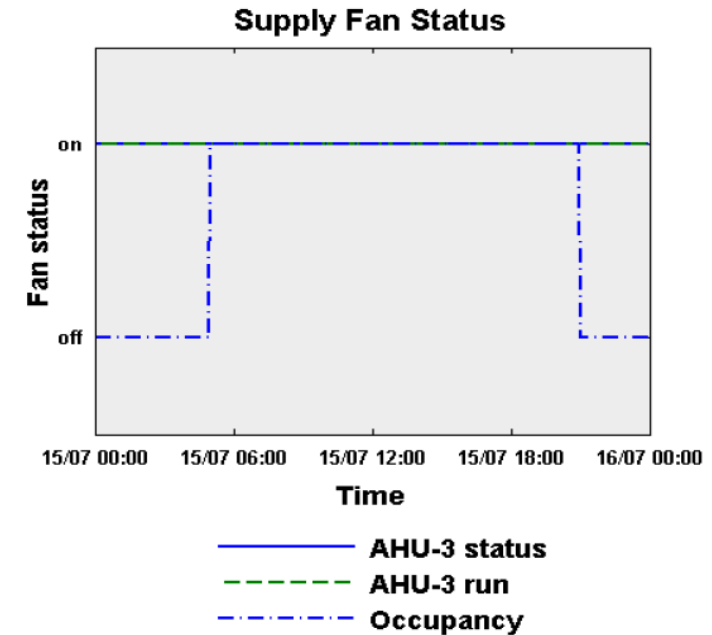
## Energy Dashboards:

- > Metrics
- > Manually spot trends
- > Indicate where inefficiencies may be



# Analytics

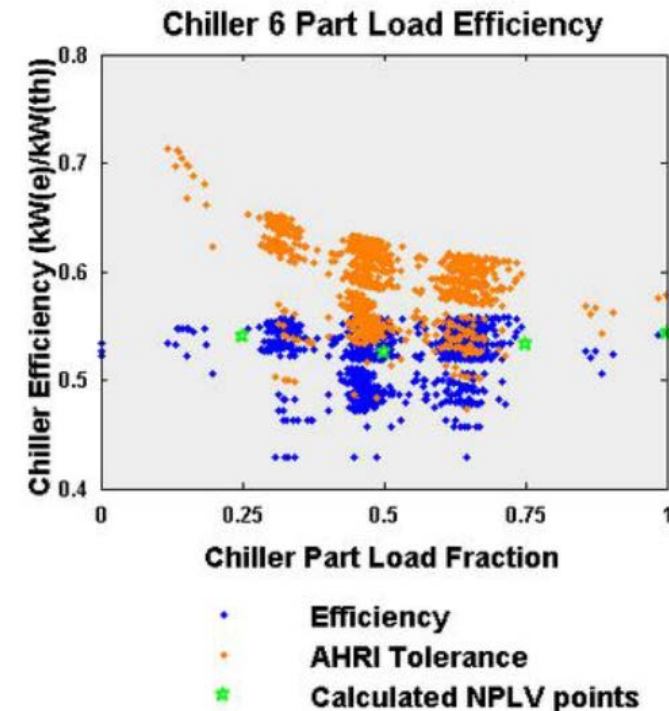
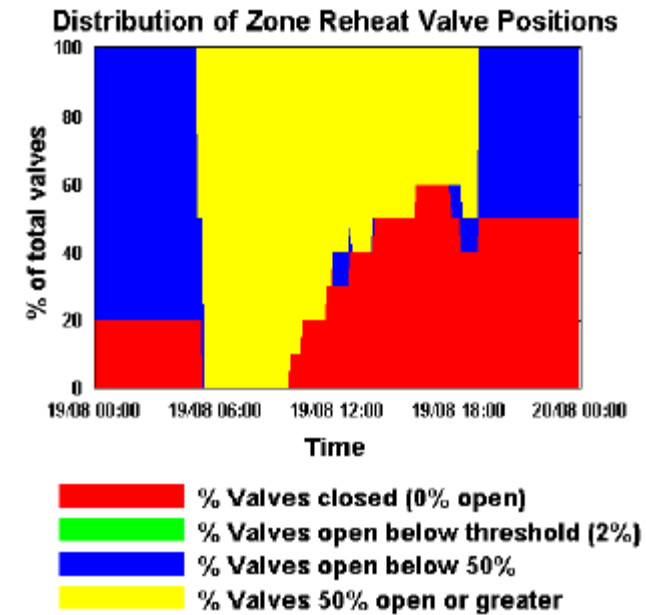
- > Collects, stores and trends building data
- > Automatically detects anomalies
- > Prioritises:
  - Energy waste
  - Comfort issues
  - Operational inefficiencies



# AFDD

## Automatic Fault Detection and Diagnostics:

- > Hierarchical
- > Rule-based
- > Rules are inter-related
- > Identify likely root causes
- > Prioritises faults based on their impact
- > Monetises wastage



# Deployment Options

Analytics Solution	Pros	Cons
Custom Built System	<ul style="list-style-type: none"><li>•Flexible</li><li>•Tailored</li></ul>	<ul style="list-style-type: none"><li>•High Cost</li><li>•Staff to deploy and operate</li><li>•IT and cyber security responsibility</li><li>•Difficult to deploy across multiple sites</li></ul>
SaaS	<ul style="list-style-type: none"><li>•Automated</li><li>•Web based</li><li>•Lowest deployment cost</li><li>•Easy to deploy across multiple sites</li></ul>	<ul style="list-style-type: none"><li>•Reliant on staff to operate and manage</li><li>•Potential Cyber security concerns</li></ul>
MSaaS	<ul style="list-style-type: none"><li>•Automated</li><li>•Expert analysis and monitoring</li><li>•Lower deployment cost</li><li>•Easy to deploy across multiple sites</li></ul>	<ul style="list-style-type: none"><li>•Potential Cyber security concerns</li></ul>

# Using the Actionable Information

Daily



Critical

Monthly



Identify



Prioritise



Execute

Quarterly



Validate & Maintain



# Examples

- > Commercial office building. Hidden faults were identified and rectified.
- > Lab, office and education facility, only 5 years old. 52 VAV valves were found to be passing – enormous hidden energy costs
- > Community centre, comprising rooftop package units where analytics was used to provide ongoing commissioning. ROI of 23%.
- > Remote healthcare site where analytics outputs are assessed before travelling to site, resulting in reduced travel time and prompt rectification.



# The world is getting smarter.

The advancement of analytics technology allows us to work smarter, not harder.

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Make the most of your energy<sup>SM</sup>

Thank you!

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