Building Energy Management Systems – Smart Buildings

Simon Bathard & Pradeep Singh: Trend Control Systems Ltd

Buildings – Whole Life Cost

The Royal Academy of Engineering

whole life cost ratio **1:5:200**

For every **£1** spent in constructing a building

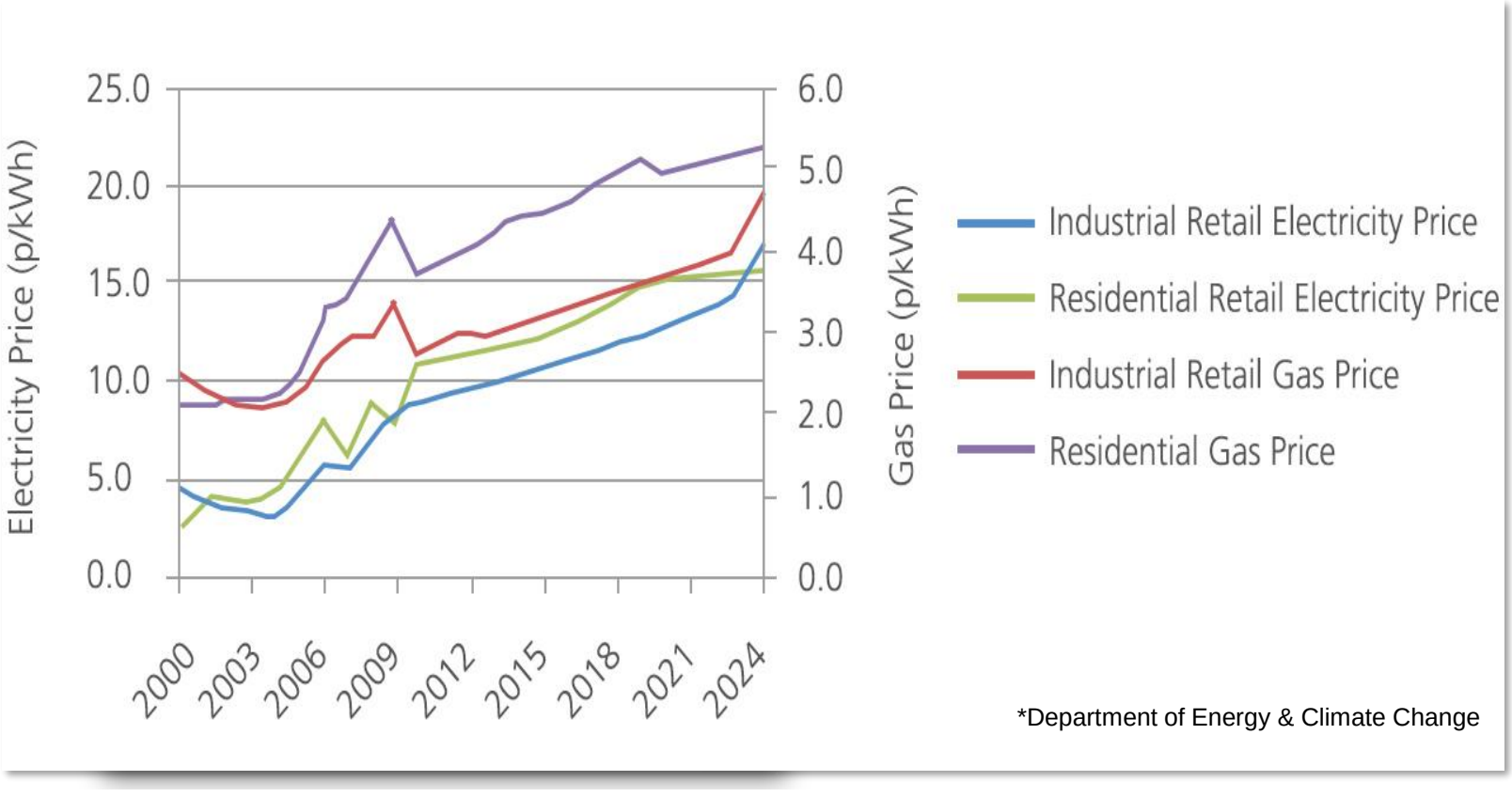
it will cost **£5** to maintain that building and

a further **£200** to operate during its life

Sustainability – Energy Drivers

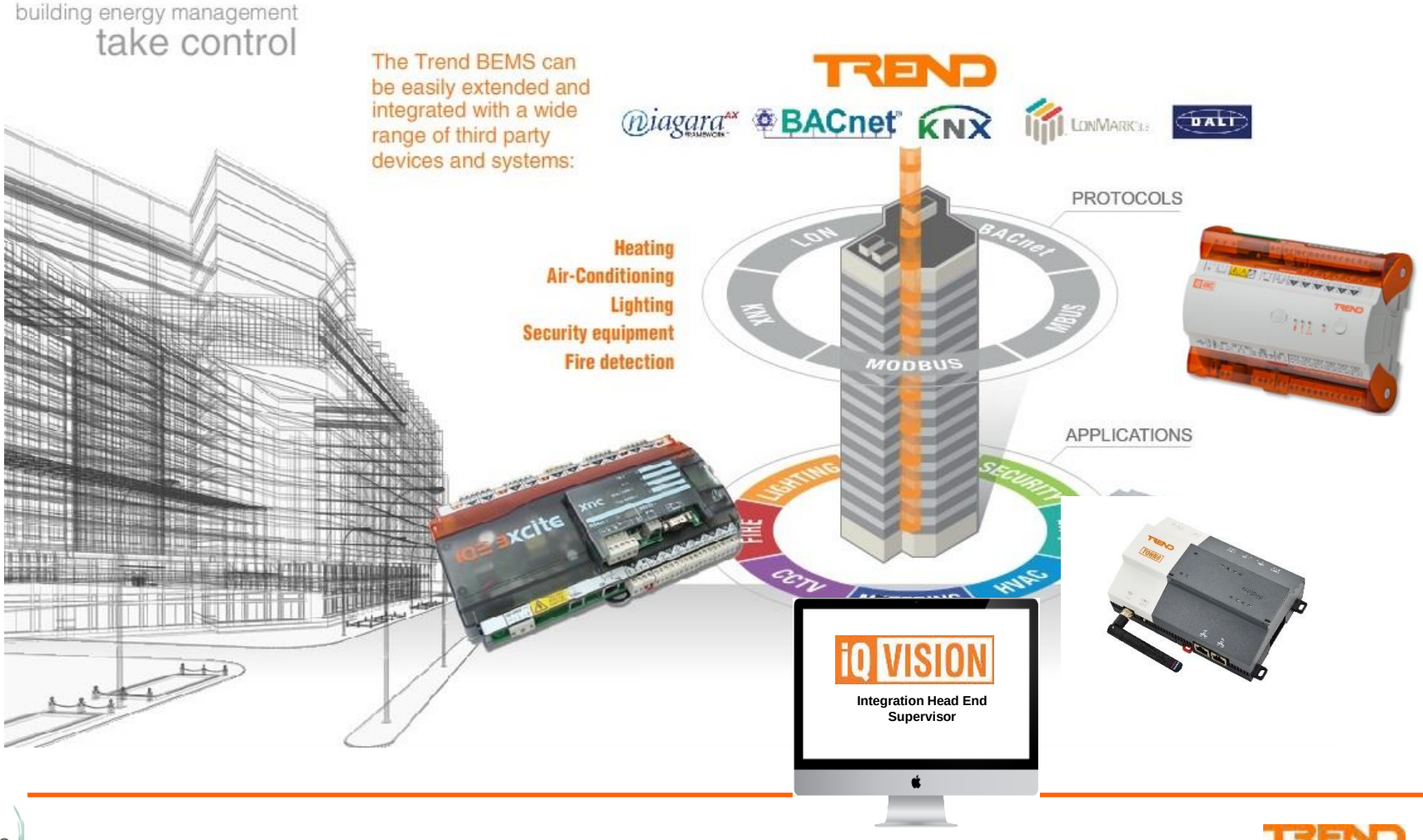
- Energy Cost, Rising Utility Bills
- Security of supply
- Government Legislation
  - Emissions Targets
- Climate Change
- BREEAM / LEED
  - Environmental assessments
- Human factors
- Corporate responsibility

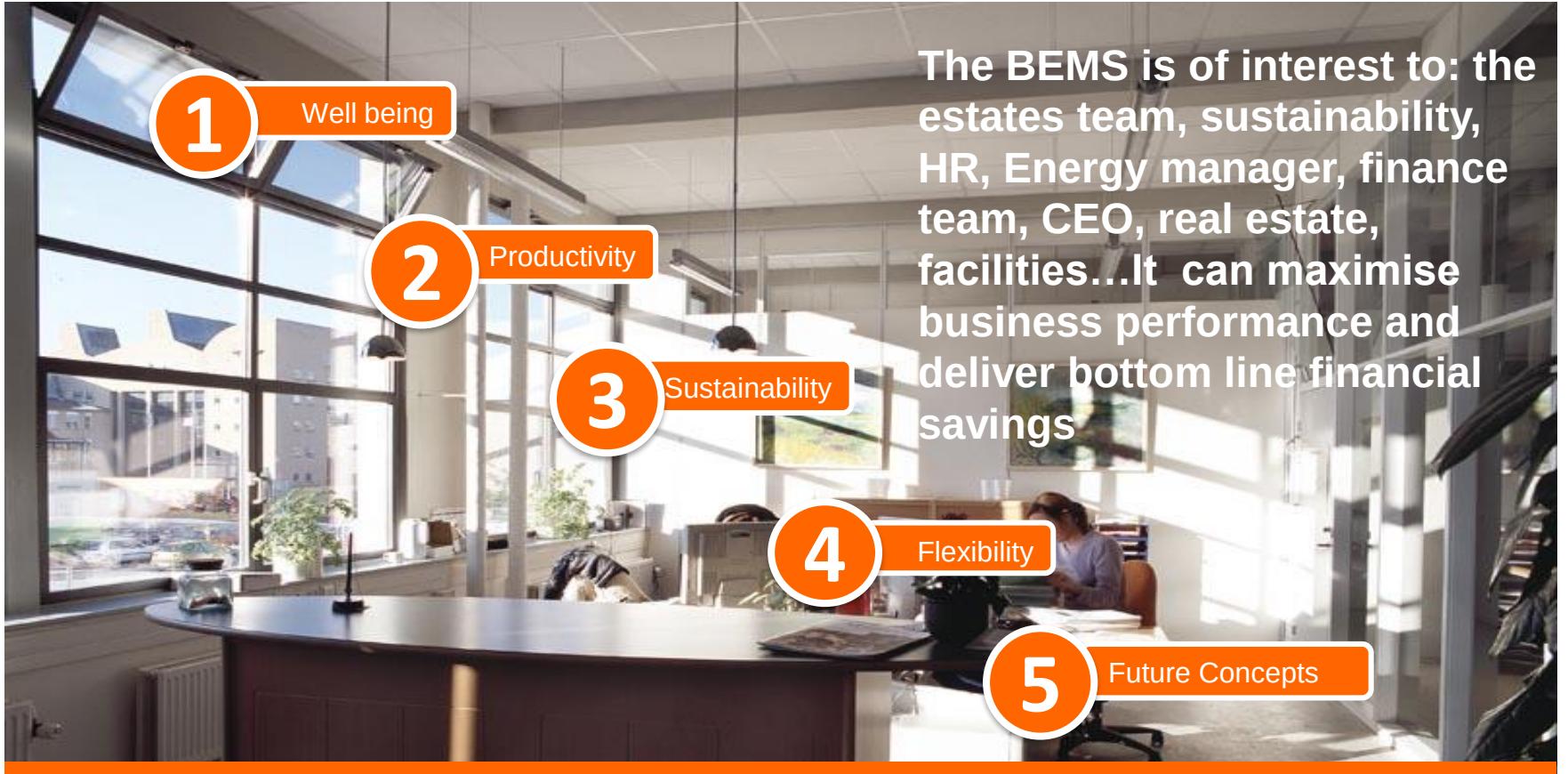
Sustainability Energy – BEMS Connected



*Department of Energy & Climate Change

BEMS Are Already Pretty Smart – But…..



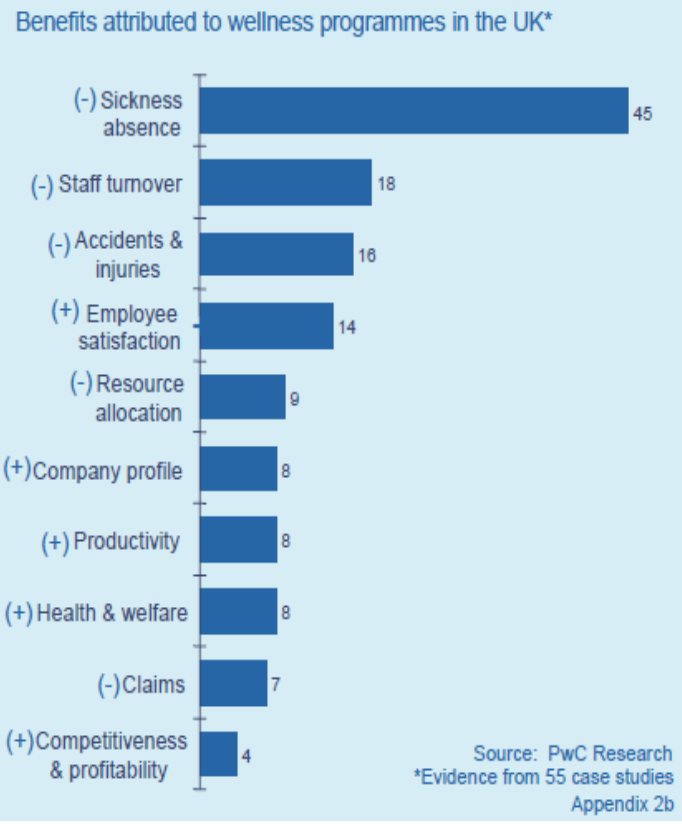


A smart building needs to look after the well being of users, be sustainable, low energy consuming and flexible to future changes and demands of its use.

Well Being and Productivity

- Staff costs account for 90% of all business operating costs.
- A modest improvement in employee health or productivity leads to huge employer gains.
- Research demonstrates building design has a material impact on wellbeing.
- Organisations can measure staff perceptions on buildings and work place.

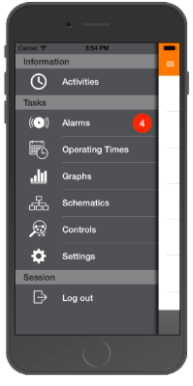
Well Being and Productivity BEMS Interation Benefits



- Indoor Air Quality: Health benefits
  - Low CO2 concentrations,
  - Remove odours and pollutants
  - Ventilation rates, moisture content
- Thermal Comfort: Health and workplace satisfaction
  - Personal controls of thermal comfort
  - Temperature, air movement, humidity
- Daylighting and lighting: Workplace satisfaction
  - View from a window, maximising daylight
  - Task Lighting, glare, quantity, quality
- Interior Layout,
  - Density, ergonomics, breakout and social spaces, zoning

BEMS Interaction

- Standard IT technology, Apps, Touch screen implementation, any web browsing platform: Wall displays, user interactions, desk control.
- Voice control via Amazon Echo: Heating demand, and set points, light levels.
- Interaction via QR readers: Quick Response Codes can be read by an imaging device such as a camera, and processed and appropriately interpreted.
- Design interaction to the BEMS to suit the users requirements.

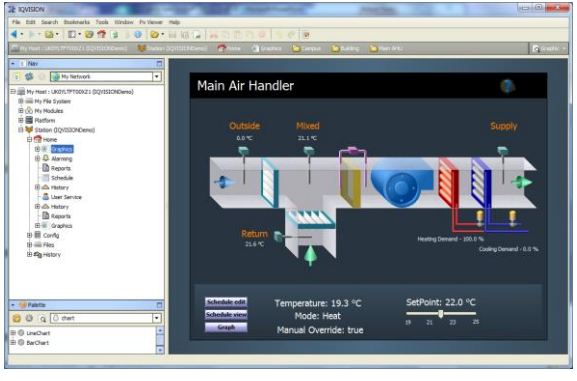


Flexible Presentation Of Data

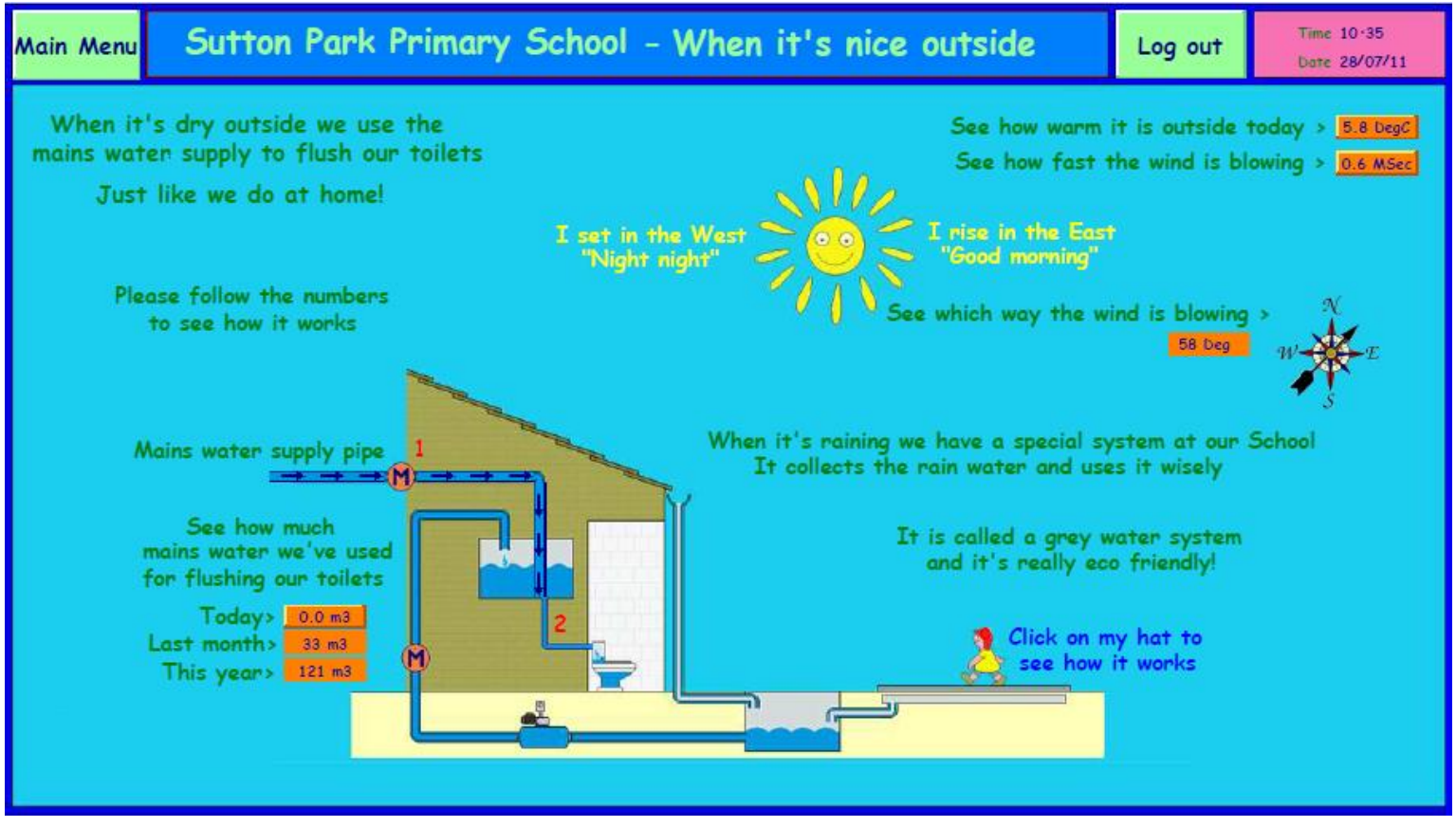
Alarms

Security Alarm	
Fire Alarm	
Boiler 1 Fault	
AHU1 Fault	

View Alarm History



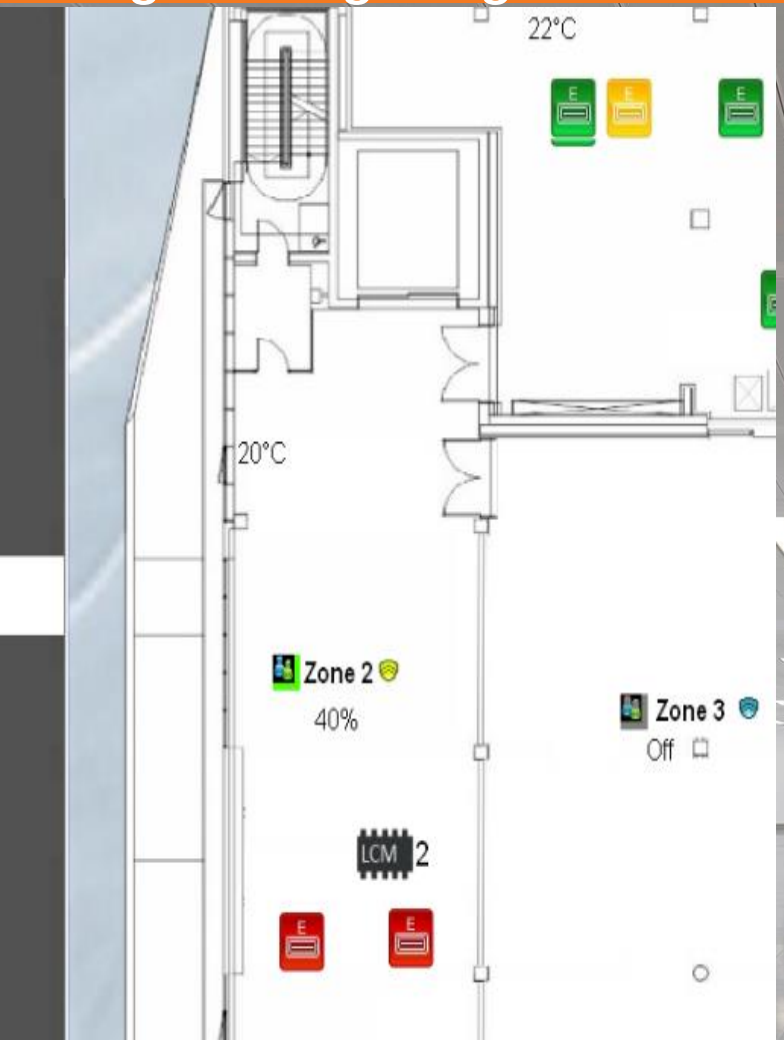
Graphics Are Only Limited By Imagination

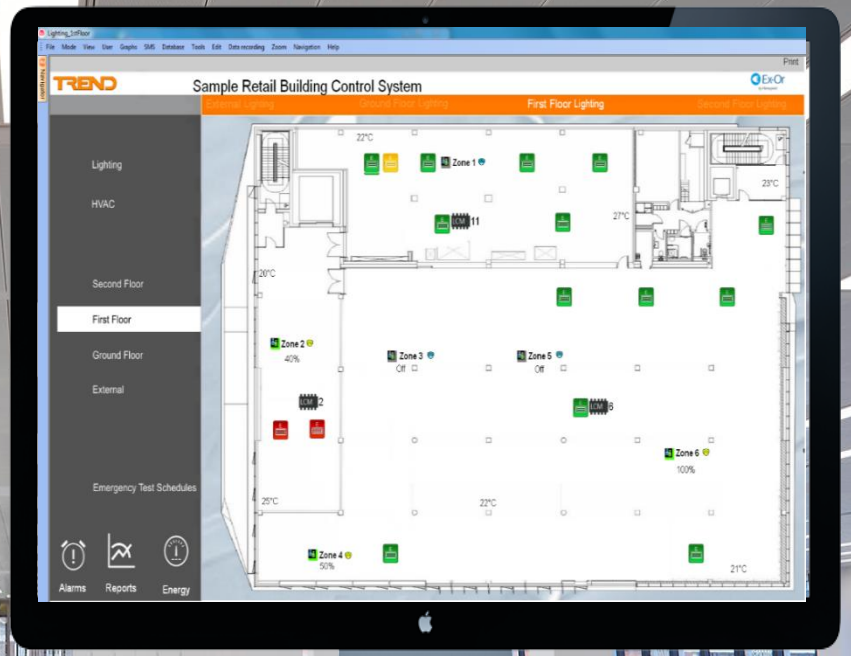


Building Energy and Environment Management Systems
Unlocking the Potential Within Buildings

Sensors Today

Integrate Lighting & BEMS Today





e Sensing Technology – Today and Tomorrow

People Sensing Technology - Tomorrow

Connected Technologies

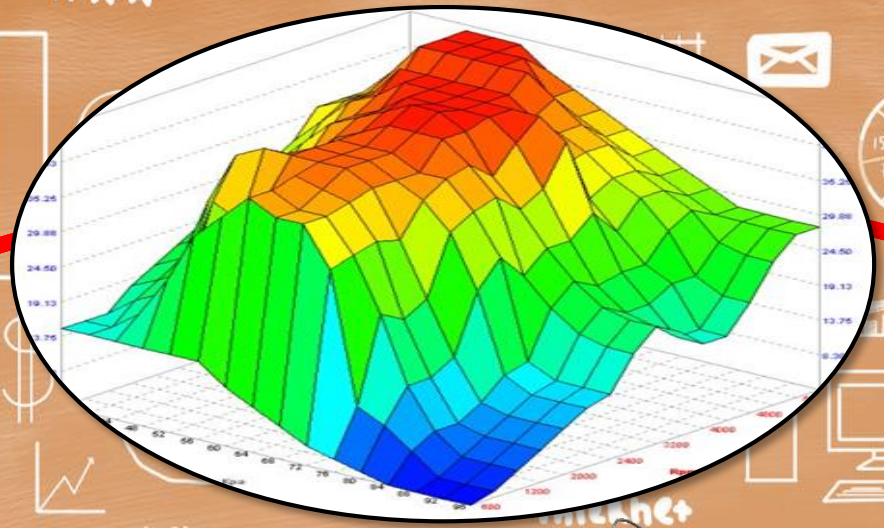
- Well Being Of Occupants
- Efficient Operation of Building
- Heating & Ventilation
- Lifts & Escalators
- Lighting
- Process Control
- Utility Metering / Load Shedding
- Access Control
- Security, CCTV & Fire Detection
- Efficient Resourcing
- Hotel Booking System
- IoT Technologies
- Vital Statistics Auditing
- Intelligent Control
- Predictive Maintenance
- Off Site Data Hosting & Reporting

Communication Protocols

- EtherNet/IP
- BacNet
- CC-Link Industrial Networks
- CanBus
- TIS-Bus
- C-Bus
- Honeywell SDS
- SNMP
- ModBus & Mbus
- EnOcean & Zigbee / Wireless
- DALI
- KNX
- oBix
- OPC UA
- LonTalk
- Wallbus / SilkBus
- ProfiBus

Software As A Service by Pradeep Singh

Energy Optimisation



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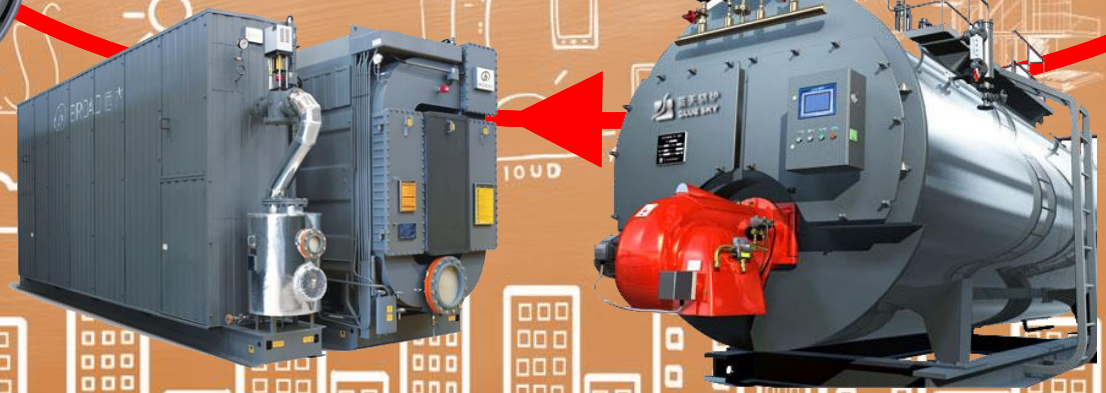
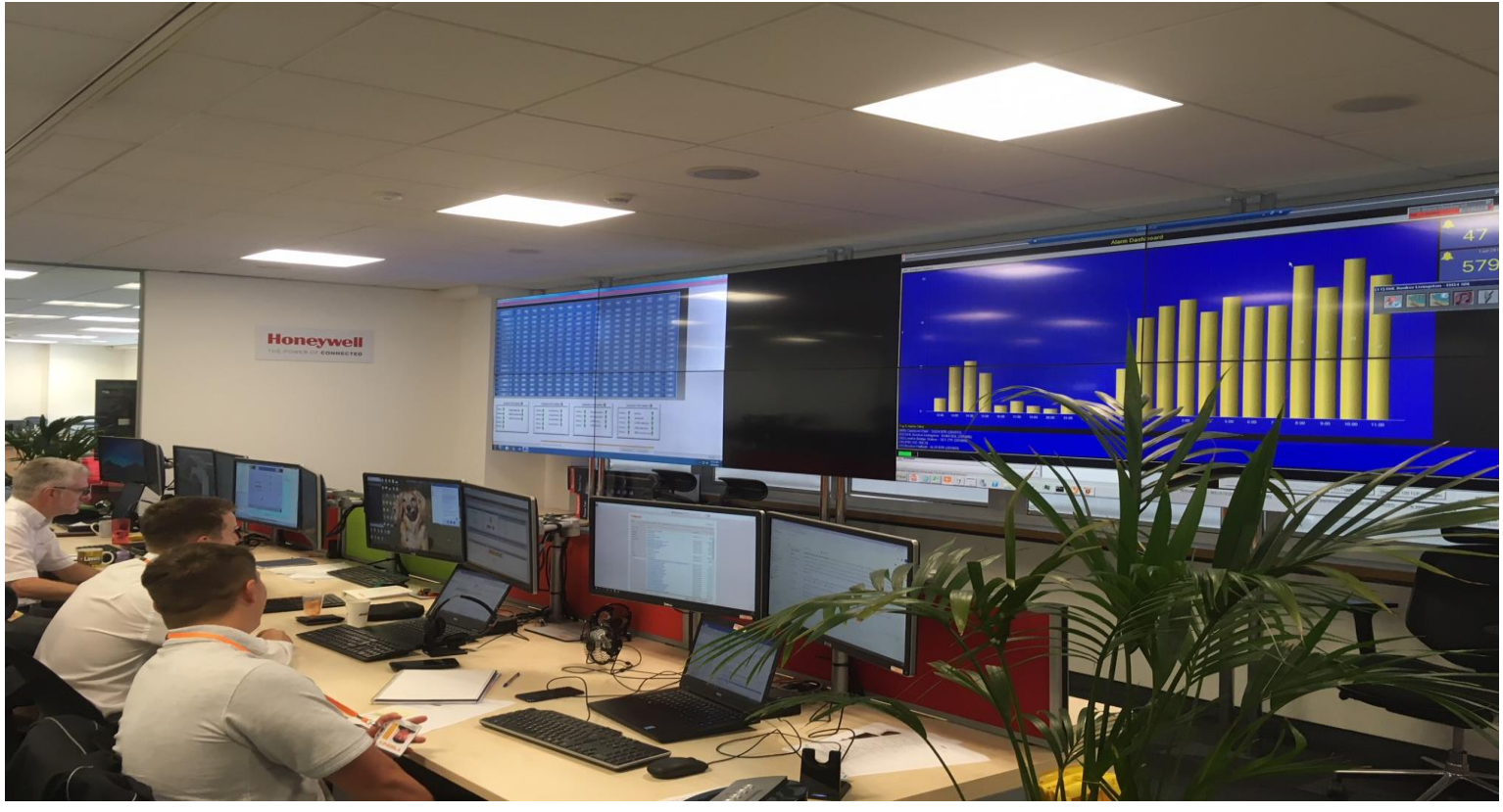


iQ CEO

Network Operations Centre (NOC)



Trend National Coverage

TREND
CONNECTED SERVICES

Alarm Management

Automatic alarm forwarding to email, voice escalation, alarms investigation, monthly reports

Hosting Services

Hosting services for Trend supervisors & energy management

Reporting Services

Reports based on live data (snapshots) or static data (data collection)

What **'Connected Services'** do we offer?

Remote Support

24/7/365

Benchmarking

Multisite Energy reports based on data

Are You Ready: Asset Check?

Wrap It Up, Smart Buildings Deliver

- Maximum business performance
- Save energy
- Increase efficiencies
- Increase productivity
- Increase wellbeing
- Operational improvements
- Sustainable environment
- Human factors of, happy staff, happy clients, attract talent
- Give you options

- Carbon reduction ☑
- Energy waste down ☑
- Activity based working ☑
- Staff morale / retention ☑
- Wellbeing ☑
- New talent ☑
- Real estate cost ☑
- Cost of meeting ☑

Intelligent Buildings

=

Increased Profit

Thank You

Simon Bathard and Pradeep Singh: Trend Controls

Wessex EEMG

TREND