

Building Energy Management Systems – Smart Buildings

The logo for TREND, featuring the word in a bold, orange, blocky font.

Simon Bathard & Pradeep Singh: Trend Control Systems Ltd

A small version of the TREND logo in orange block letters.

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

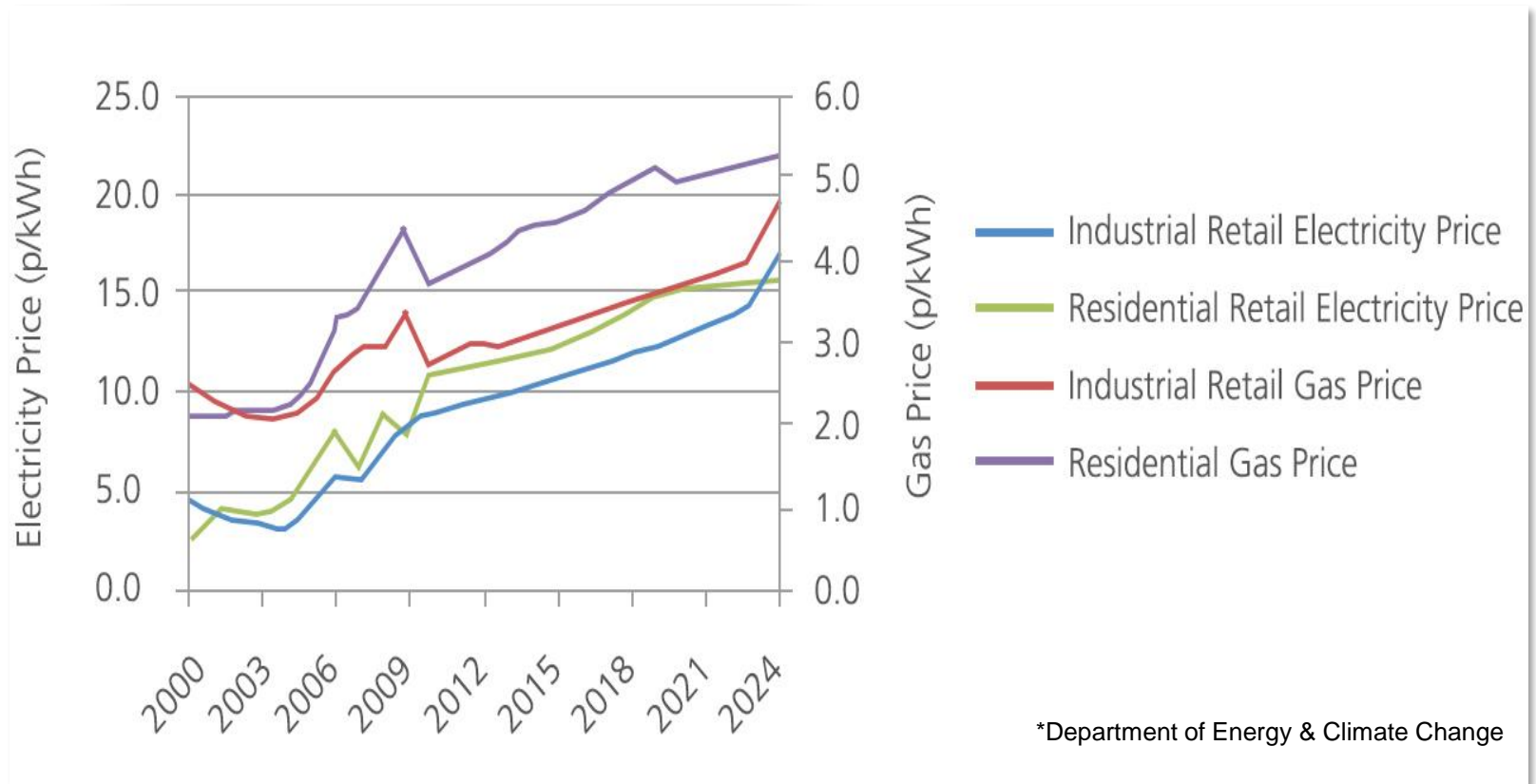
Sustainability – Energy Drivers



- 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



BEMS Are Already Pretty Smart – But.....

building energy management
take control

The Trend BEMS can
be easily extended and
integrated with a wide
range of third party
devices and systems:

- Heating
- Air-Conditioning
- Lighting
- Security equipment
- Fire detection



A modern office interior with large windows, a curved desk, and a person working. The image is used as a background for the slide.

1

Well being

2

Productivity

3

Sustainability

4

Flexibility

5

Future Concepts

The BEMS is of interest to: the estates team, sustainability, HR, Energy manager, finance team, CEO, real estate, facilities...It can maximise business performance and deliver bottom line financial savings

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.

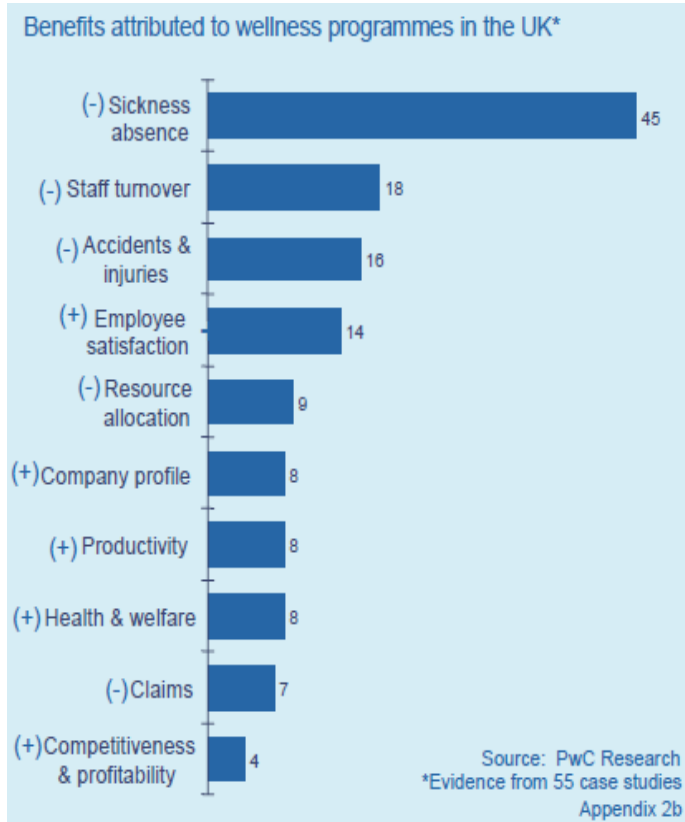
Well Being and Productivity

- 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.



“
HAPPY STAFF ARE MORE PRODUCTIVE,
LOYAL AND CREATIVE...
CAN YOU AFFORD TO IGNORE YOUR
STAFF'S WELLBEING?”

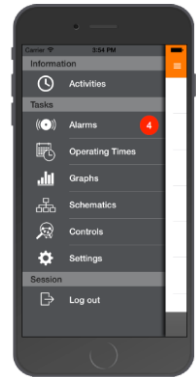
Well Being and Productivity BEMS Interaction Benefits



- 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

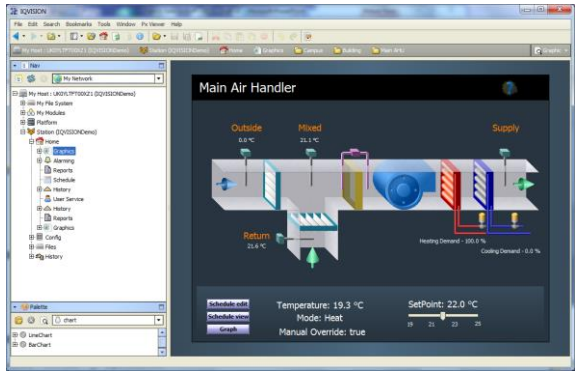
Security Alarm

Fire Alarm

Boiler 1 Fault

AHU1 Fault

[View Alarm History](#)



Graphics Are Only Limited By Imagination

[Main Menu](#)

Sutton Park Primary School - When it's nice outside

[Log out](#)

Time 10:35
Date 28/07/11

When it's dry outside we use the mains water supply to flush our toilets
Just like we do at home!

Please follow the numbers to see how it works


See how much mains water we've used for flushing our toilets

| | |
|-------------|--------|
| Today> | 0.0 m3 |
| Last month> | 33 m3 |
| This year> | 121 m3 |


See how warm it is outside today > 5.8 DegC

See how fast the wind is blowing > 0.6 MSec

See which way the wind is blowing > 58 Deg



I set in the West "Night night"




I rise in the East "Good morning"

When it's raining we have a special system at our School
It collects the rain water and uses it wisely

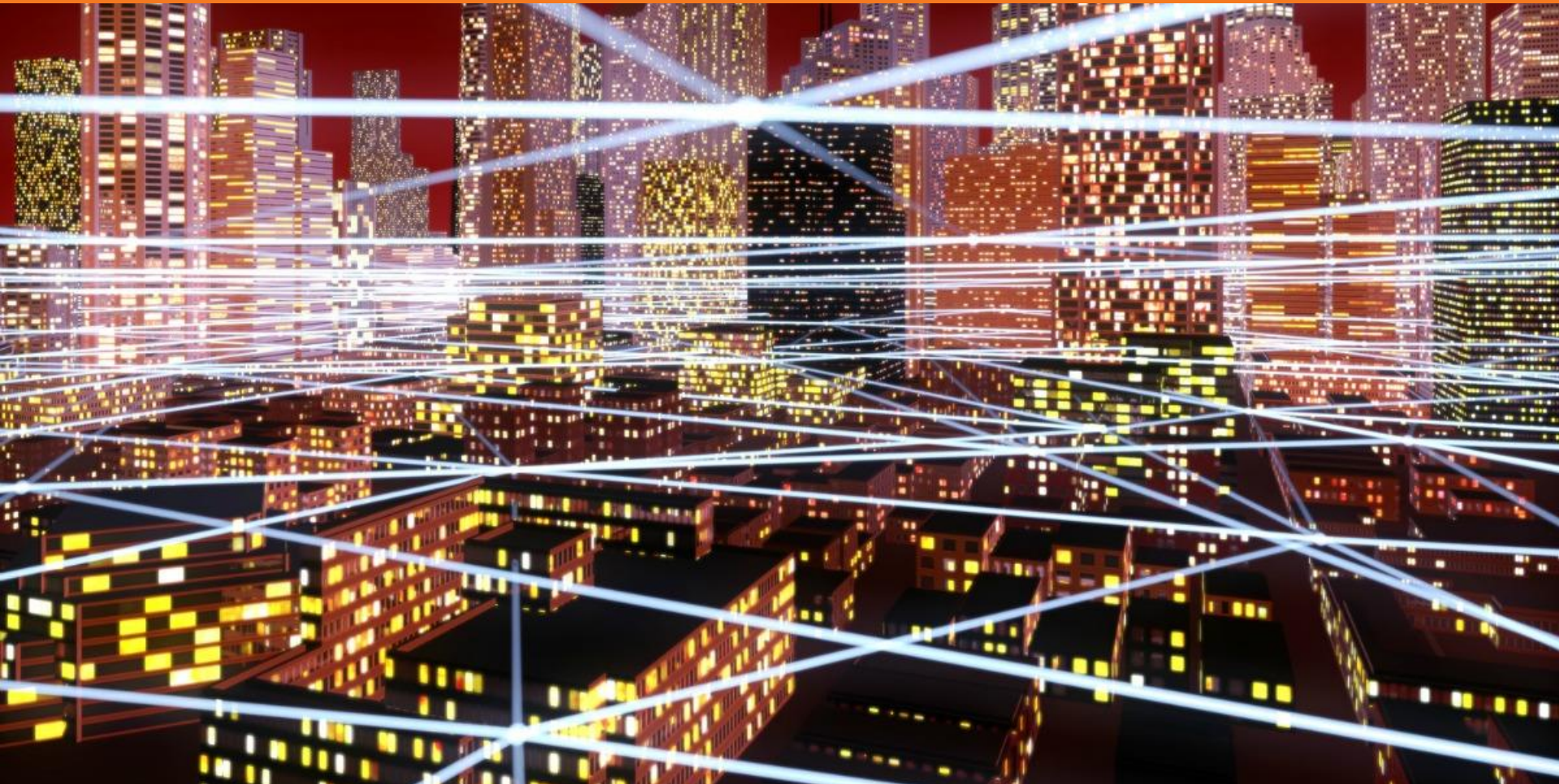
It is called a grey water system and it's really eco friendly!

Click on my hat to see how it works



Building Energy and Environment Management Systems

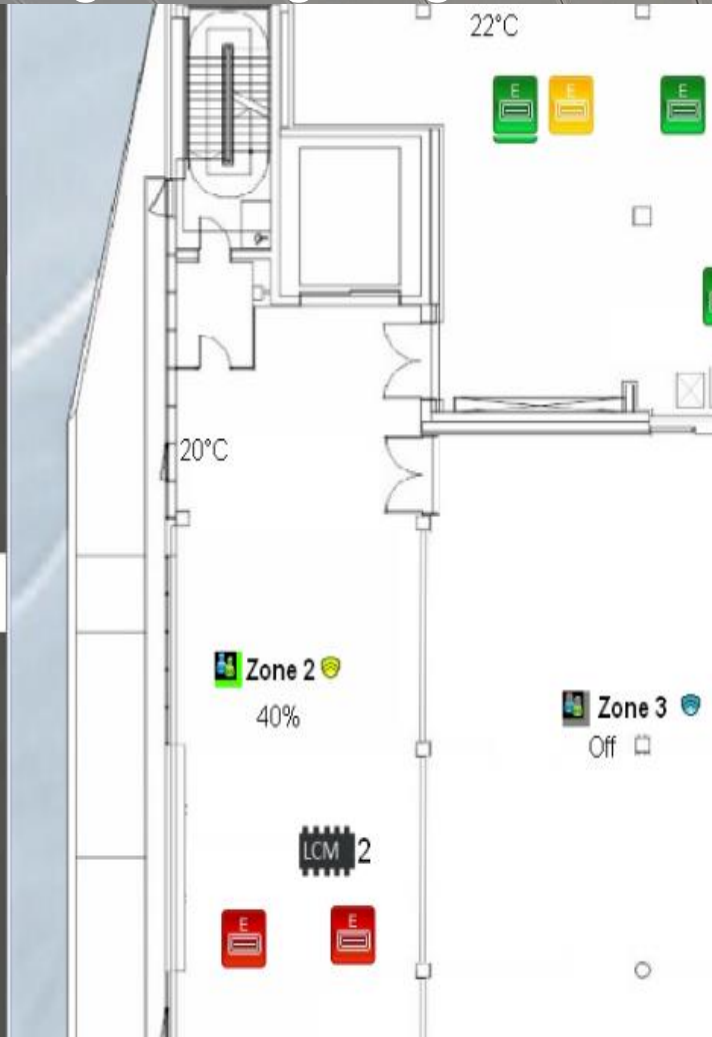
Unlocking the Potential Within Buildings



Sensors Today



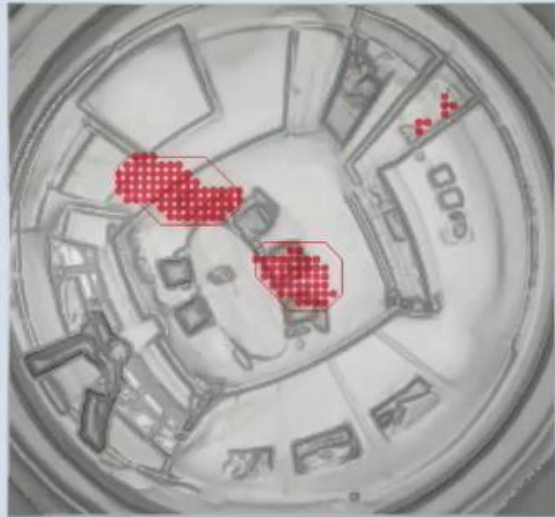
Integrate Lighting & BEMS Today



Sensing Technology – Today and Tomorrow



People Sensing Technology - Tomorrow



Light On

Start Test

Reset



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

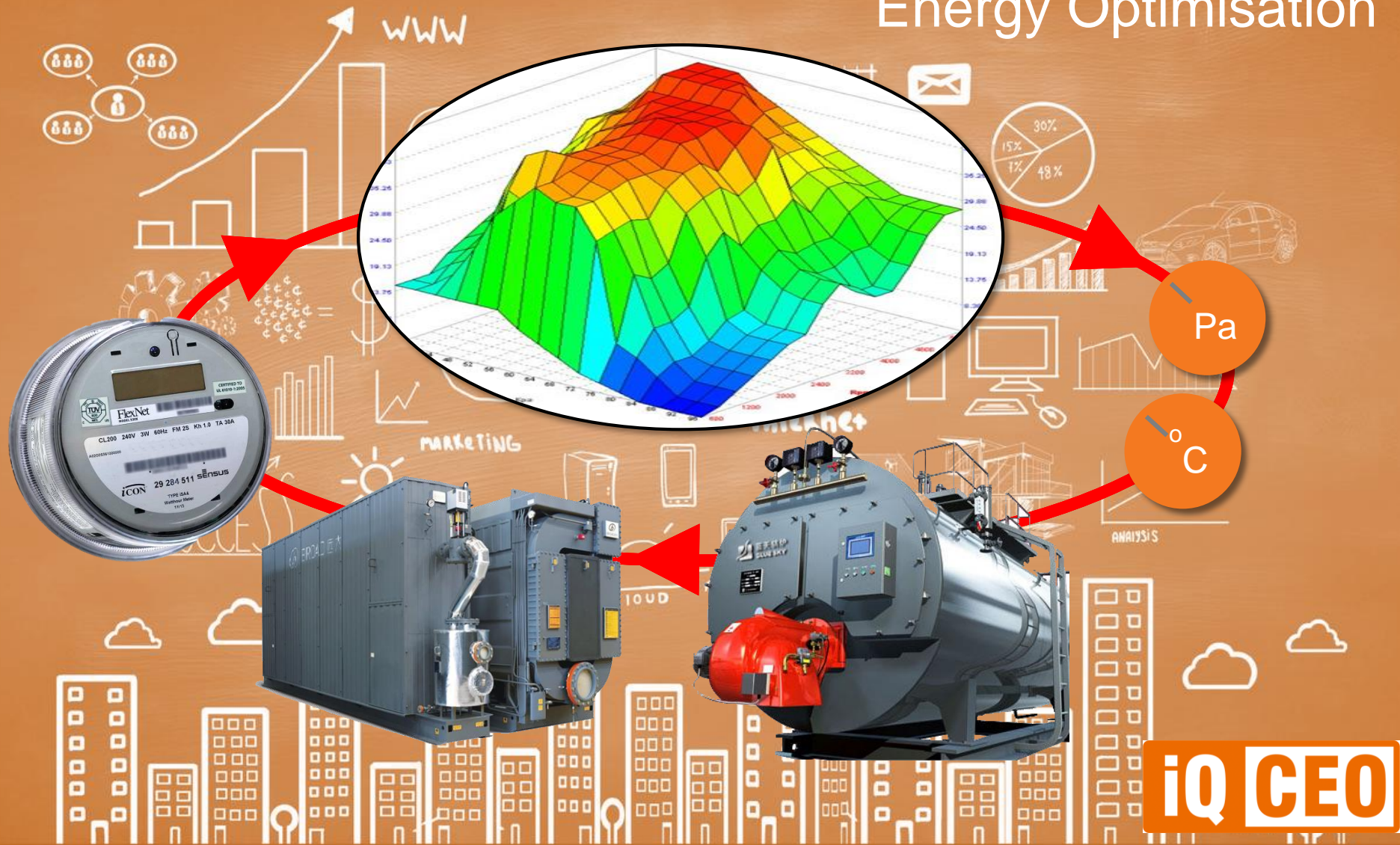
Communication Protocols

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



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
