

# Kirklees Energy Management Toolbox



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# Introduction

- Our Aims
- Kirklees Energy Management Toolbox Overview
  - Centralised Billing
  - Intelligent Metering
  - Building Energy Management System Upgrades
  - 3-in-1 Energy Surveys
  - Future Plans

# The Kirklees Situation

- Kirklees Energy Bill in excess of **£10m**
  - Building Energy in excess of **£6 million**
  - Motor Fuel/ street lighting in excess of **£3m**
  - Water in excess of **£1m**
- District emissions: 3,286,000t CO<sub>2</sub> annually;
  - Domestic 983,000t
  - Industrial and Commercial Sector 1,374,000t
  - Transportation 920,000t
  - Land Use & Change & Forestry 5,000t
  - Council emissions alone are still 35,000+ tonnes
- Kirklees target is 30% reduction in CO<sub>2</sub> by 2020 from 2005 base line or 600,000 tonnes

# Key Drivers

- European Directives and UK Building Regulations:
  - Energy Performance In Buildings Directive
  - Energy Efficiency and Energy Services Directive
  - Building Regulations Part L and Part F
- Climate Change and Sustainable Energy Act
- Council's Energy Policy
  - Energy Reduction
  - Carbon Reduction
  - Cost Reduction
  - Improved Utilisation
- ESTA Accreditation and Carbon Trading



# Our Aims

- Improve the environment across Kirklees through the efficient use of energy and carbon reduction
- Be an exemplar council for energy management
- Comply with and exceed current and all future environmental legislation requirements

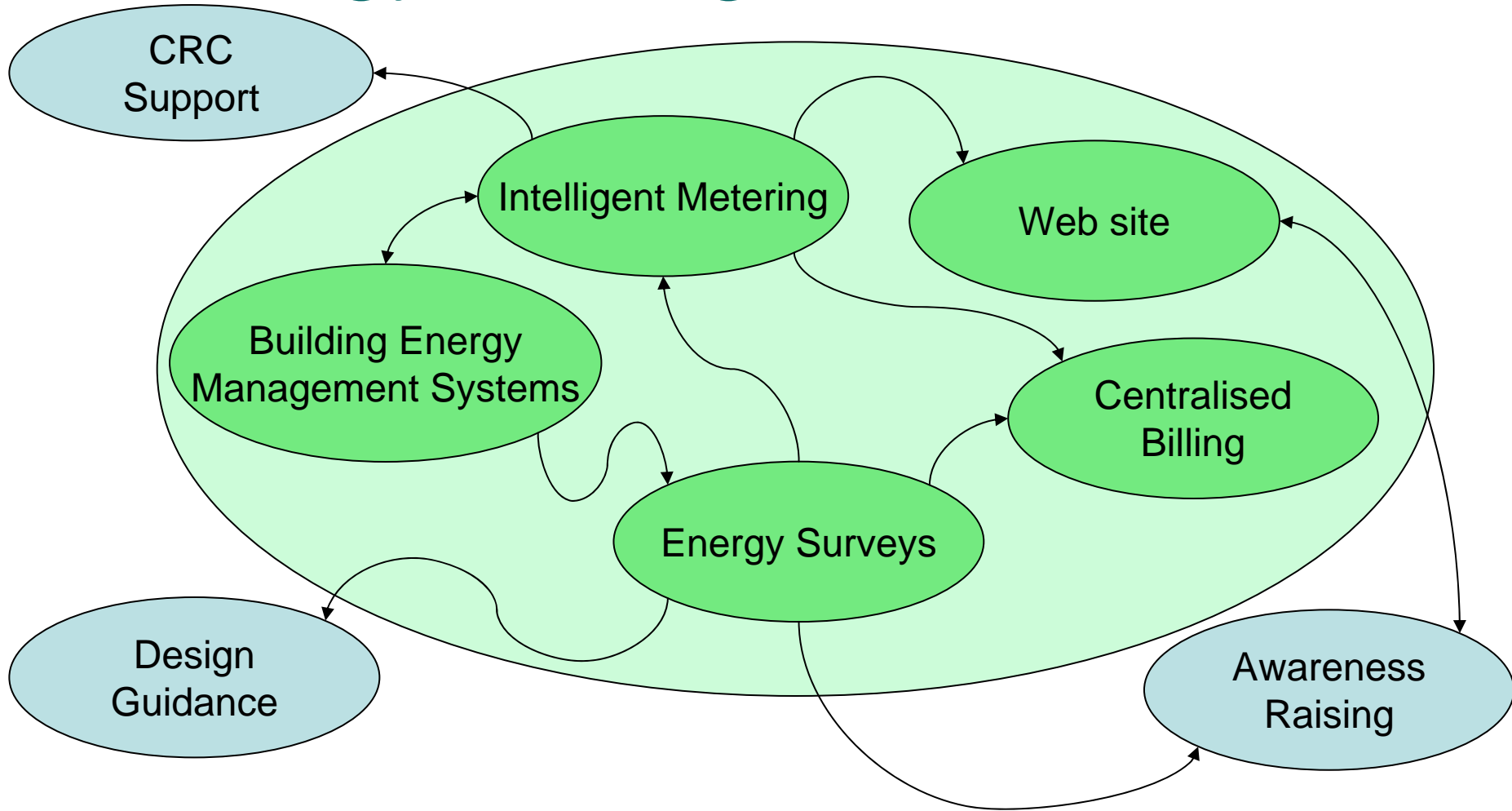
Real help for **communities**

Responding to **recession**

Reducing **inequalities**

Reducing **carbon**

# Energy Management Toolbox



# Implementing Building Energy Labelling

- European Energy Performance of Buildings Directive 2003
- UK Energy Performance of Buildings Regulations 2007
- Display Energy Certificate (DEC)
  - Displayed in all public buildings over 1000m<sup>2</sup>
  - Valid for one year
- Kirklees Council position
  - 650 eligible buildings

# Kirklees 3-in-1 Energy Surveys

- What is a 3-in-1 Energy Survey?  
A Complete, fully inclusive Energy Survey for a Public Building comprising
  - 1) Energy Investments
  - 2) Display Energy Certificate (legislation)
  - 3) Building Energy Profiling



# 1. Energy Investments

Identify new energy investment opportunities

- Building Fabric
- Building Services
- Ancillary Equipment

Make the most of past investments

- Good Practices by Building Occupants
- Maintenance and Fine Tuning

# 2. Display Energy Certificate

Display Energy Certificate
HM Government

How efficiently is this building being used?

**Kirklees Council**  
KIRKGATE BUILDINGS  
Byram Street  
Huddersfield  
HD1 1BY

**Certificate Reference Number:**  
0050-1009-7080-2396-8895

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This certificate indicates how much energy is being used to operate this building. The operational rating is based on meter readings of all the energy actually used in the building. It is compared to a benchmark that represents performance in a large number of all buildings of this type. There is more advice on how to interpret this information on the Government's website [www.climatesave.gov.uk/geb](http://www.climatesave.gov.uk/geb)

Energy Performance Operational Rating

This tells you how efficiently energy has been used in the building. The numbers do not represent actual costs of energy consumed; they represent comparative energy efficiency. 100 would be typical for this kind of building.

More energy efficient:

**A** 0-25

**B** 26-50

**C** 51-75

**D** 76-100

**E** 101-125

**F** 126-150

**G** Over 150

Less energy efficient

Total CO<sub>2</sub> Emissions

This tells you how much carbon dioxide the building emits. It shows tonnes per year of CO<sub>2</sub>.

11,000

Technical information

This tells you how much energy has been used by this building. Cooling system data has not been included.

Main heating fuel: Natural Gas  
Building Envelope: Heating with Natural Gas  
Total useful floor area (m<sup>2</sup>): 3001  
Asset Rating: 0

	Heating	Electrical
Annual Energy Use (kWh/m <sup>2</sup> /year)	27	85
Typical Energy Use (kWh/m <sup>2</sup> /year)	125	101
Energy from renewables	0%	0%

Administrative information

This is a Display Energy Certificate as defined in SI 2007/991 as amended.

Assessment Software: TEAMDISCO V4  
Property Reference: 00000000020  
Assessor Name: Glenn Thorpe  
Assessor Number:  
Accreditation Scheme: CIBSE Certification Centre  
Employer/Trading Name: Kirklees Council  
Employer/Trading Address: O&P, Kirkgate Buildings, Huddersfield, HD1 1BY  
Issue Date: 17-11-2008  
Expiry Date: 18-11-2009  
Valid Until: 17-11-2009  
Related Party Disclosure: Kirklees Council Energy Changes  
Recommendations for improving the energy efficiency of the building are contained in the accompanying Advisory Report.

Previous Operational Ratings

This tells you how efficiently energy has been used in this building over the last three accounting periods.

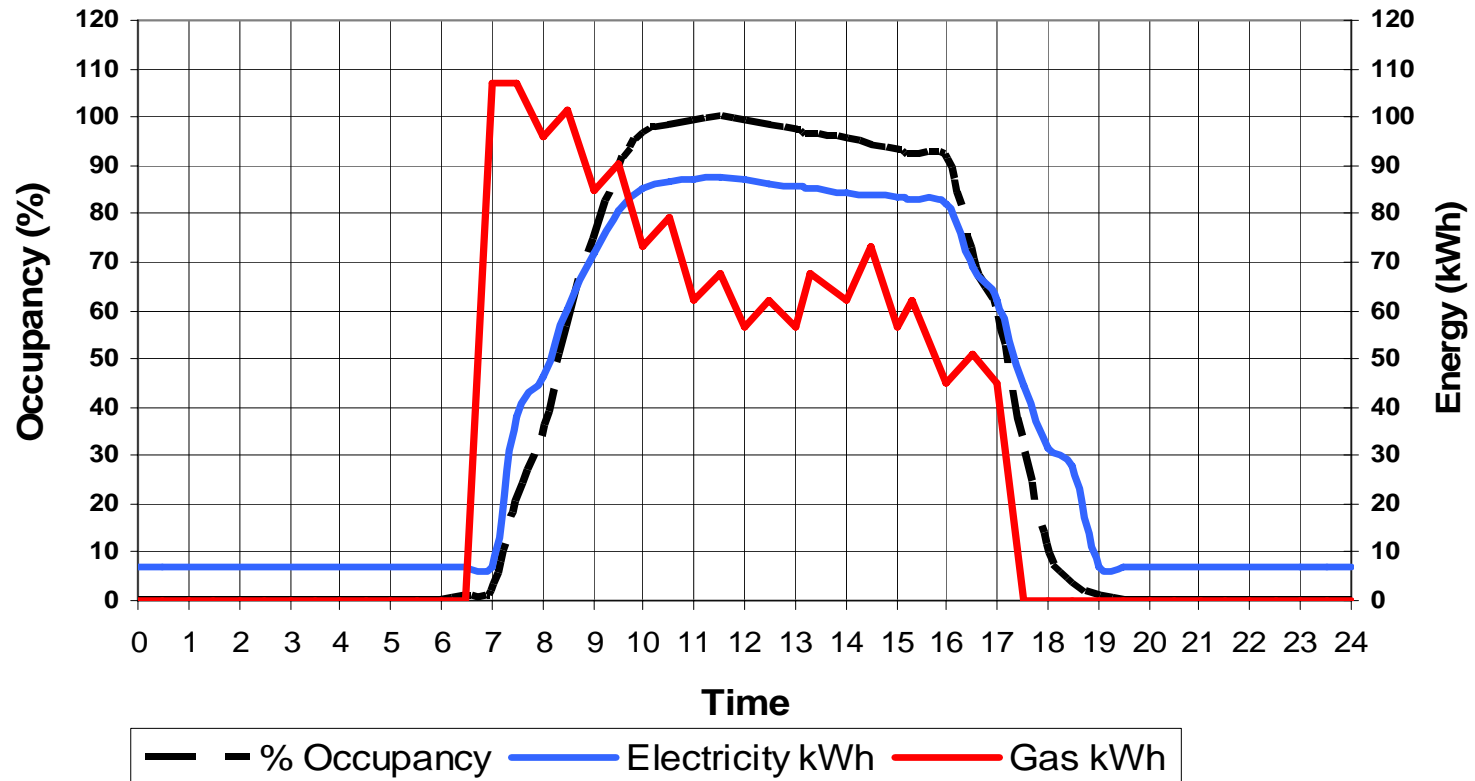
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# What use is a Display Energy Certificate to building users?

- Provides the building with
  - Legislative compliance – Display Energy Certificate and Advisory Report
  - Clear Performance Feedback
  - Year on Year Improvement
  - Accountability to the Public
  - Benchmark with Other Buildings

# 3. Building Profiling

Typical Office Building  
Energy Profile vs Occupancy (Typical Week Day)



# What is Intelligent Metering?

Intelligent Metering has three key components:

- Automatic collection of data from energy and water metering devices
- Automatic transfer of collected meter data to a central database for monitoring and analysing building consumption
- Feeding back information to building managers and users for energy use optimisation and billing purposes

# Benefits of Intelligent Metering

Implementation of Intelligent Metering solutions will enable the Council to:

- Provide proactive energy management, based on 'real time' data
- Reduce and monitor carbon emissions via analysis of accurate and timely data
- Secure accurate billing and reduce the costs of energy and water reconciliation
- Accurately forecast requirements for procurement of energy and therefore stronger negotiation power with utility suppliers.
- Accurately forecast energy usage for purchase of Carbon Reduction Commitment credits
- Encourage reduced carbon dioxide emissions through effective building energy and water usage
- Reduce electricity, gas and water usage and costs
- Comply with current and future legislation

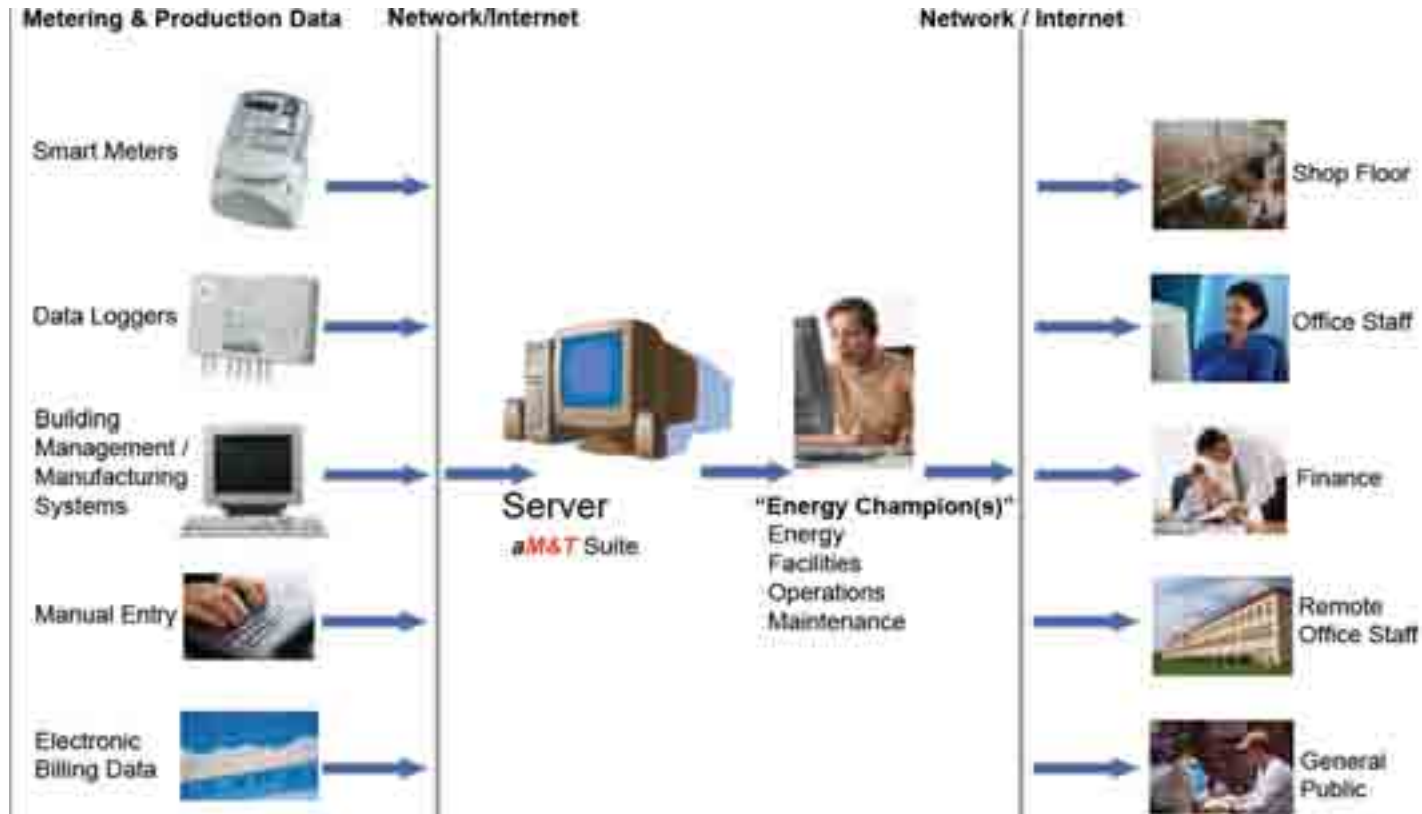
# Kirklees Intelligent Metering Trials

- Between April 2006 and January 2008
- Conducted at 15 various Council sites including schools, depots, offices, town and civic halls, culture and leisure
- Used key players in this field who have the potential to provide the Council with a means to better control the use of electricity, gas and water
- Investigated the use of AMR and AM&T

# What is AMR & AM&T?

- AMR – Automatic Meter Reading
  - The means to remotely communicate to a utility meter and retrieve recorded meter data.
- AM&T – Automatic Monitoring and Targeting
  - The ability to evaluate and set the energy profile requirement of a building and monitor actual consumed energy against a determined profile.

# Intelligent Metering: The whole picture



# Understanding aMR

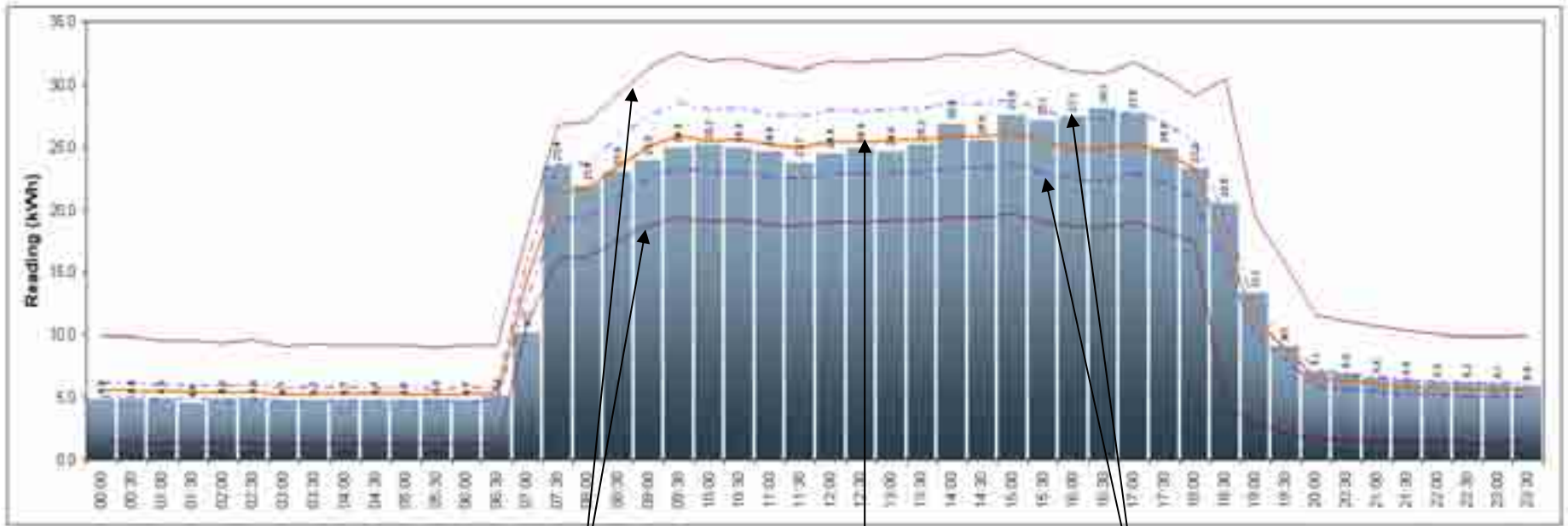
Consumption

Cost



Day usage    Night usage    Half-hourly values

# Understanding aM&T



**Alert  
limits**

**Target  
usage**

**Control  
limits**

# Example Daily Analysis Report



# Demand Management

- The process of linking the aM&T system with data from a Building Energy Management System (BEMS) to achieve intelligent reporting on a building's energy and water consumption

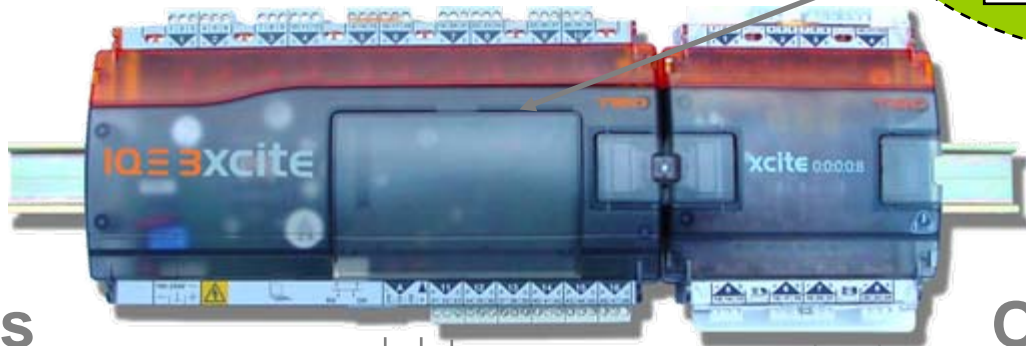
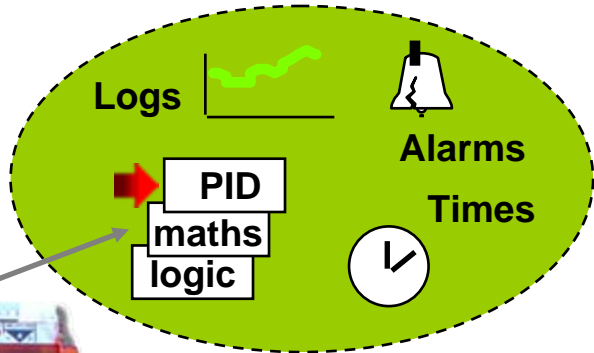


# Building Energy Management Systems (BEMS)

What is a Building Energy Management System (BEMS)?

- Heating
- Hot Water
- Ventilation
- Timing, temperature, zones, alarms

# The Controller



## Inputs

➔ Analogue  
Temperature  
Pressure  
Humidity



Digital  
Run / fault



➔ Pulsed  
Meters



## Outputs



➔ Modulating or on/off valves

Time control  
for boilers,  
chillers etc.

# What's involved in the BEMS project?

- Investment in excess of £1½ million
- Over 100 sites upgrading network communications
- Replacing obsolete controllers
- Improving software strategy
- Building in scope for expansion

# What are the benefits of using BEMS?

- Improved energy management
- Accurate and reliable IT network communications
- Supports/works in conjunction with Intelligent Metering
- Wider access for clients (Web browser facility)
- Provides real time data and diagnostics information for plant and building maintenance

# What is Centralised Billing?

The Council handles £10+ million of Bills.

The aim is for Utility Bills come to a Central Point and be checked for:

- Accuracy
- Continuous readings and dates
- Correct tariffs
- Reduced estimates (currently almost 60% of invoices are based on estimates)
- Identify increased usage / seasonal usage



The image shows a screenshot of a software application interface. At the top, there are two tabs: 'Client's Log' and 'BA Verification'. The main area is a large grid of data, likely representing utility bills, with columns for various fields. The grid is divided into several sections by horizontal lines. The data appears to be organized in a way that allows for easy comparison and verification of bills. The interface is designed for data entry and review, with a clear layout for handling large volumes of information.

# What are the benefits of Centralised Billing?

- Improved accuracy in billing
- Energy cost savings
- Reduced admin costs
- Reduced Council debt
- Improve tendering / procurement process
- Support centralised payment (future)



# Future Plans

- Energy Awareness Raising
- Supporting design teams
- Continually improve BEMS
- Expanding the roll out of Intelligent Metering in phases
- Asset Management

# Key contacts

## General Energy Enquiries

Gary Williams, Principal Mechanical and Energy Engineer

Internal: 04069

Email: [gary.williams@kirklees.gov.uk](mailto:gary.williams@kirklees.gov.uk)

## Energy Surveys and DEC's

David Thorpe

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## Intelligent Metering

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## Building Energy Management Systems

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## Centralised Billing and Bill enquiries

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## Communications and Awareness Raising

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# Thank you for listening



## Questions and Discussion