Non-domestic smart energy management innovation competition information day

30th November 2017

Department for Business, Energy & Industrial Strategy

WELCOME

Agenda

Time	Item	Presenter
13:40	Opening remarks	Daron Walker (BEIS)
13:50	Rationale for action	Michael Harrison (BEIS)
14:10	Research overview	David Kenington (BEIS)
14:25	Sector overview: schools	Henry Greenwood (Ashden)
	Sector overview: retail	Steve Denham (betterRetailing.com)
	Sector overview: hospitality	Malcolm Hanna (The National Energy Foundation)
15:20	SM data overview	Peter Morgan (BEIS)
15:30	*Refreshment break*	
16:00	Panel discussion	TC, PM, MH, AG, SD, MH
16:30	Competition overview and Q&A	David Kenington (BEIS)
16:55	Closing remarks	Teresa Camey (BEIS)
17:00	*Close*	

Sli.do

Please add your questions and thoughts, and vote throughout the day

- Wifi:
  - Username: **CHW-Guest**
  - Password: **Westminster1**

- Sli.do:
  - Go to: **slido.com**
  - Event code: **#NDSEMIC**

OPENING REMARKS

Daron Walker
Director, BEIS
Senior Responsible Owner, Smart Metering Implementation Programme
BEIS

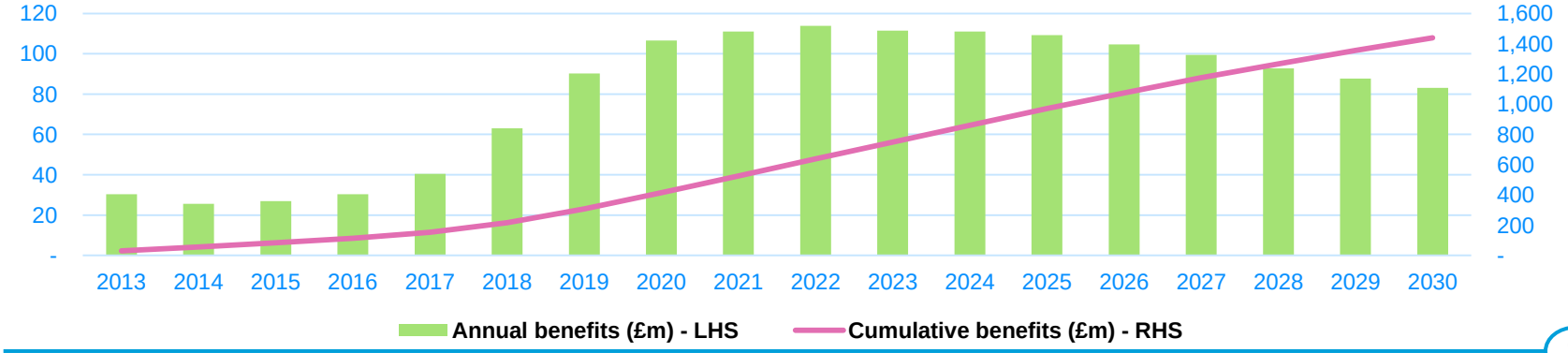
RATIONALE FOR ACTION

Michael Harrison
Head of Benefits and Evaluation
Smart Metering Implementation Programme
BEIS

Overview

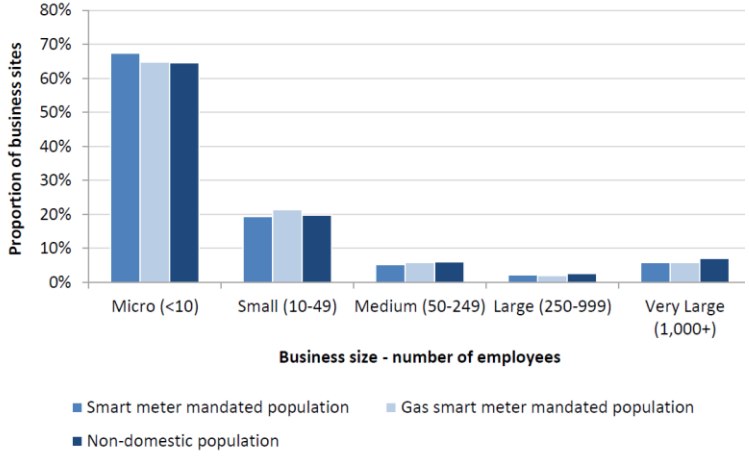
Through extensive research BEIS have identified the opportunity for a step-change in energy management tools and approaches for smaller non-domestic sites

1. The make-up of the target population, and what we learnt about their potential for energy management
2. What we learnt about the market and energy saving potential from innovation
3. The opportunity – driving change through:
   - intervention in innovative, sector-focussed products and services
   - Supporting target sector end users to take these up and use them



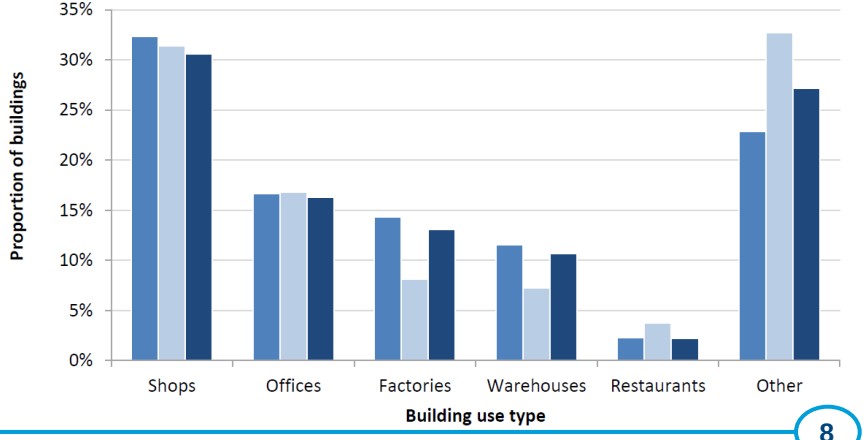
Target population: activities and business size

The Programme will impact the majority of non-domestic premises in Great Britain



The majority of meters are at sites occupied by micro-businesses or SMEs but there is a proportion occupied by very large businesses (chains of sites)

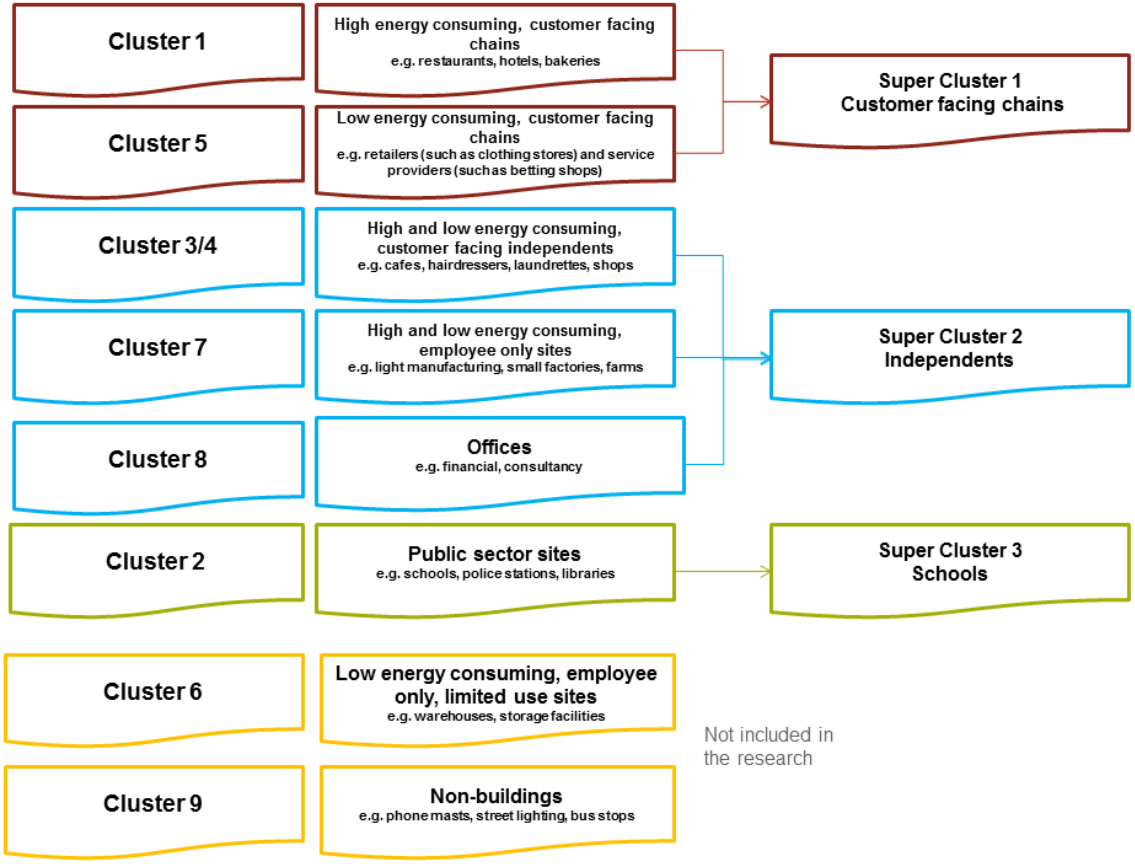
The largest number of sites are occupied by shops, followed by offices; there is also a significant number of sites occupied by public sector organisations (e.g. schools)



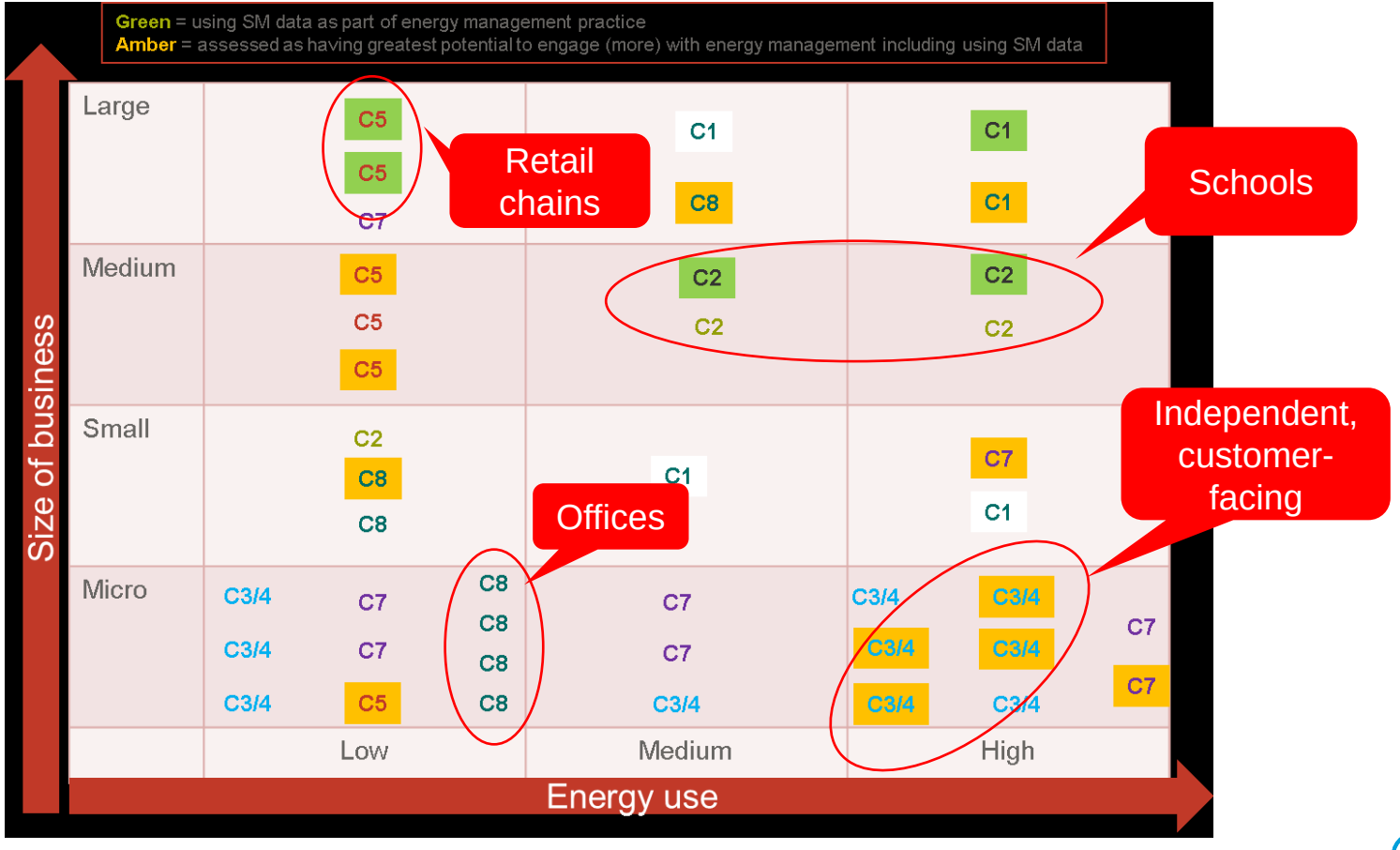
Case study research 2015-6

Objectives

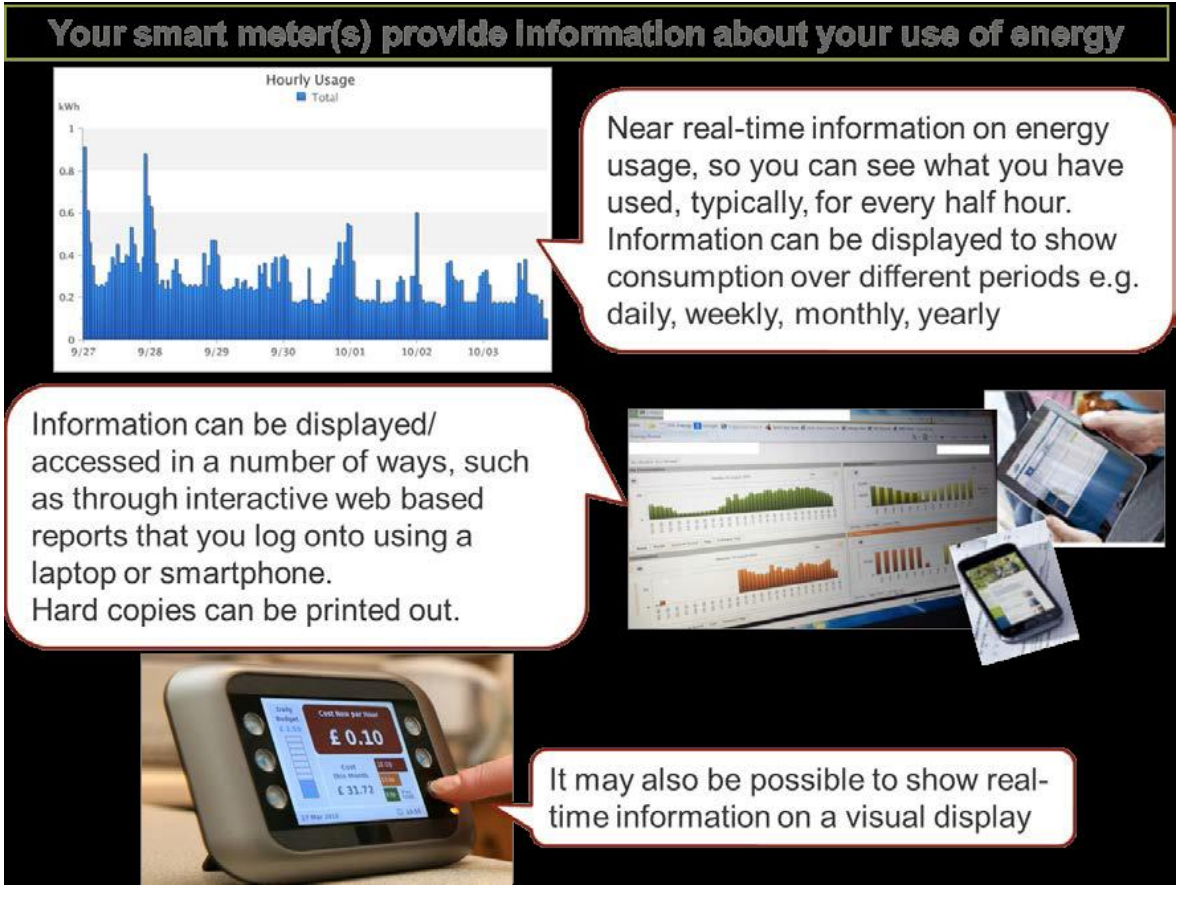
- Establish how these types of sites make energy related decisions;
- Understand the ways in which meter data is being used for energy management;
- Develop an understanding of the pathways, enablers and barriers to energy saving in smaller non-domestic sites using smart meter data; and
- Consider what further action may be required to maximise benefits



Potential to engage with SM data



Existing means of access to smart data

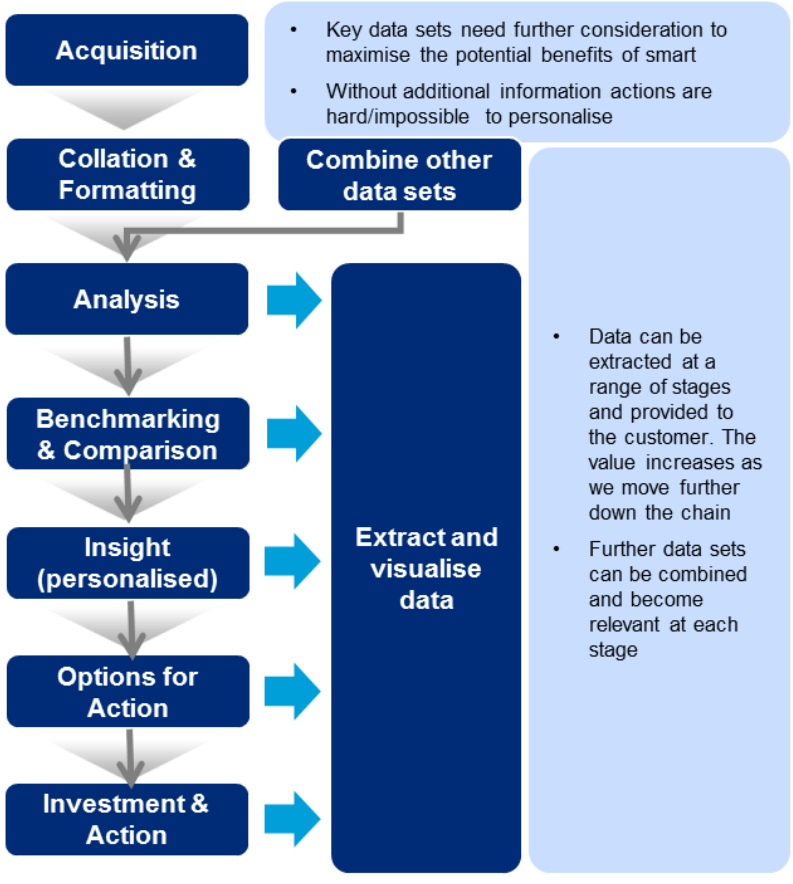


Existing means of access to smart meter data may not be enough

"Having access to smart meter data was, in itself, unlikely to trigger changes in behaviour in many organisations, where they lacked the ability to translate the information into energy efficiency actions."

Research overview report, 'engaging with smart meter data' p41)

Adding value to smart meter data

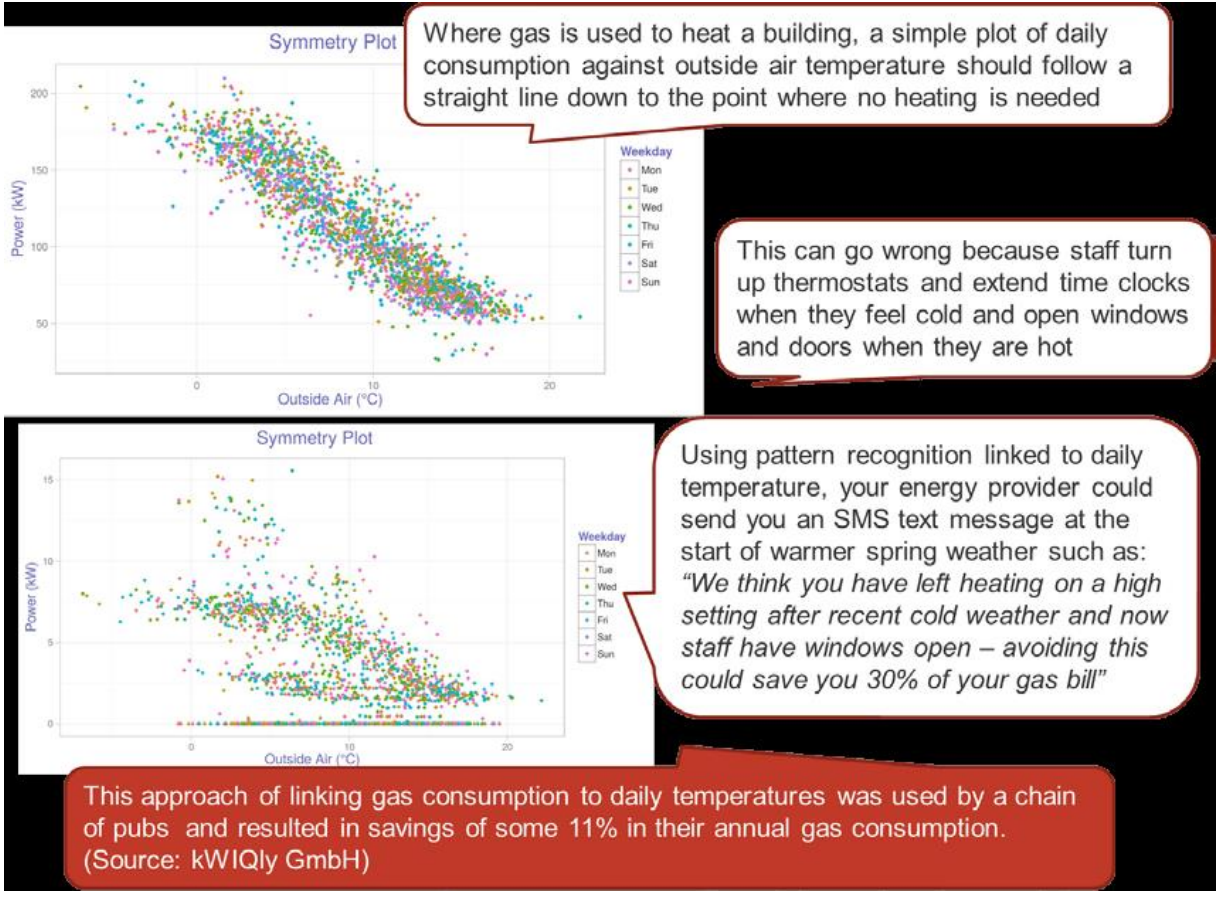


There's a need to do more than just provide this information back to the consumer in an easily comprehensible format

Key research finding: smart meter data has the potential to prompt organisations into taking action provided:

- they have easy (and preferably free) access to their energy use data
- they know how to interpret it within the context of their own operations
- and a cost effective solution is available

An example of combining data sets



The opportunity

Intervention in innovative, sector-focused products and services
Supporting target sector end users to take these up and use them

Energy management experts and researchers

Building on the evidence:

how best to raise consumer awareness and deliver behaviour change at scale?

The need for innovation in:

- Services providing targeted, real time and actionable advice
- Support mechanisms tailored to organisational characteristics

Technology developers

Building on smart meter and other data:

what products and services will provide most value to consumers?

The competition aim

To develop and prove smart data tools and deliver a series of pilots, learning from which can then be disseminated and scaled through the target population

RESEARCH OVERVIEW

David Kenington
Research and Evaluation Advisor
Smart Metering Implementation Programme
BEIS

Overview

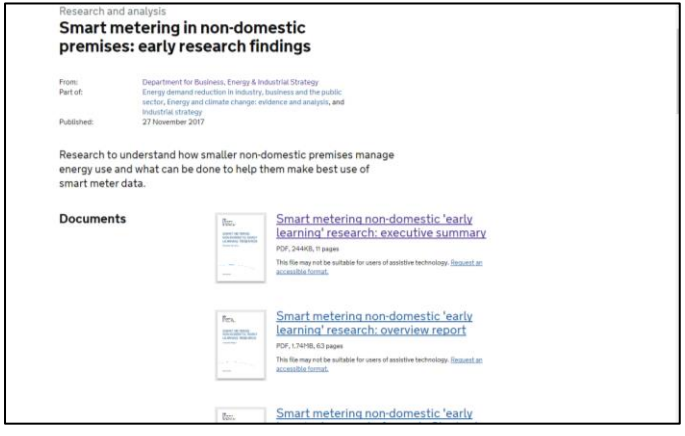
BEIS and others have undertaken extensive research aimed at providing a better understanding of the context for energy management for smaller non domestic consumers

1. Small organisation energy management challenges

2. Engagement with data and the potential opportunities offered by smart meters

3. How this has informed the Competition
   - Focus and objectives
   - Structure and phasing

Research is available here:
https://www.gov.uk/government/publications/smart-metering-in-non-domestic-premises-early-research-findings


Research and analysis

Smart metering in non-domestic premises: early research findings

From: Department for Business, Energy & Industrial Strategy
Part of: Energy demand reduction in industry, business and the public sector, Energy and climate change: evidence and analysis, and Industrial strategy
Published: 27 November 2017

Research to understand how smaller non-domestic premises manage energy use and what can be done to help them make best use of smart meter data.

Documents

Smart metering non-domestic 'early learning' research: executive summary
PDF, 244KB, 11 pages
This file may not be suitable for users of assistive technology. Request an accessible format.

Smart metering non-domestic 'early learning' research: overview report
PDF, 1.74MB, 63 pages
This file may not be suitable for users of assistive technology. Request an accessible format.

Smart metering non-domestic 'early

Energy management in small organisations

Challenges and opportunities

Challenges

- All pay bills, but few actively 'manage' energy
- Most do not have dedicated energy managers and lack time, interest and skills
- Huge variation in organisational activities and associated energy use – one size does not fit all

Opportunities

- Those who manage energy often are owners / have significant control
- Several see energy use as a significant cost
- Lots of 'low hanging fruit', both in behaviours and installation

Engaging small organisations with energy

Smart meters present new opportunities to engage small organisations with energy information and data

Engaging with energy information and data

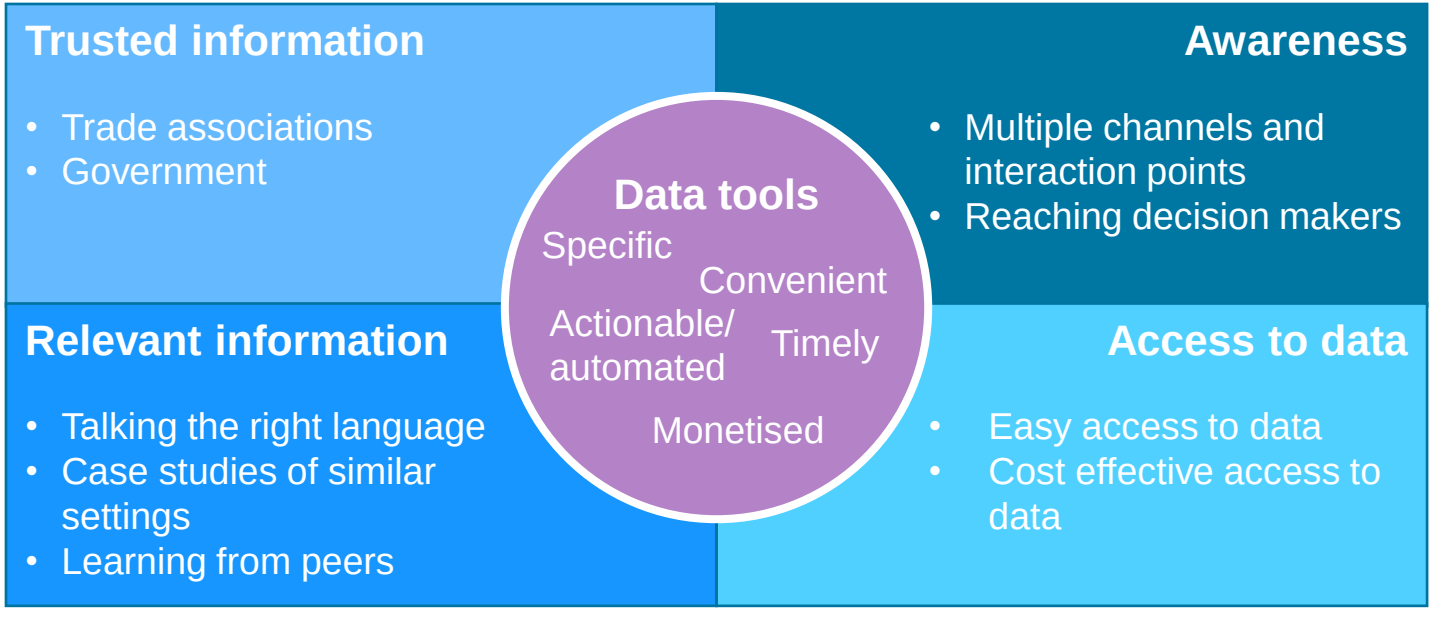
- Many do not understand their current bills and/or do not engage with them on a regular basis
- Interventions need to be simple, easy to engage with and take up little time
- Reluctance to engage with external expertise

Smart meters opportunities

- Enabling technology
- Data in-of itself is unlikely to be that useful to target audience
- Lots of solutions potentially available including
  - Data disaggregation
  - Tailored messages
  - Timing

What does a good solution look like

Our research has identified the characteristics of a holistic solution which will be developed through the competition; central to it are effective data tools to effect energy saving



Competition focus

The competition will be focussed on sub-sectors with significant energy use and addressable energy management challenges.

Businesses

Shops and **offices** are highest % of sites

Retail, **hospitality** and offices dominate by energy consumption

Public sector

Schools are the largest category by number of premises, and also largest by energy consumption

Size of organisation

Of c. 2 mn smart meter mandated non-domestic sites, approximately **90%** are occupied by small or micro businesses and public sector bodies

Competition target sectors

The competition will be focused on the retail and hospitality sectors, and schools. Smaller, independent, businesses will be explicitly targeted as well as chains with sites within scope.

Independent hospitality and retail	Chain hospitality and retail	Schools

Competition objectives

The competition is designed to deliver outputs which support the broader objectives of the Smart Metering Implementation Programme and the BEIS Energy Innovation Programme.

Competition outputs

Develop innovative and easy-to-use **data tools**, tailored for the target segments, and adding value to smart data

Develop tailored packages of **support mechanisms** which drive the uptake and effective use of data products and services

Broader objectives

Secure earlier and greater levels of energy management activity in the target segments

Develop and strengthen the market for energy management products and services for smaller non-domestic consumers

Support the implementation of energy management through enabling increased and more effective activity by partner organisations (Smart Energy GB, energy suppliers, devolved administrations and others)

Competition structure

The competition will be phased in its implementation, and is designed to be accessible to a wide range of participants.

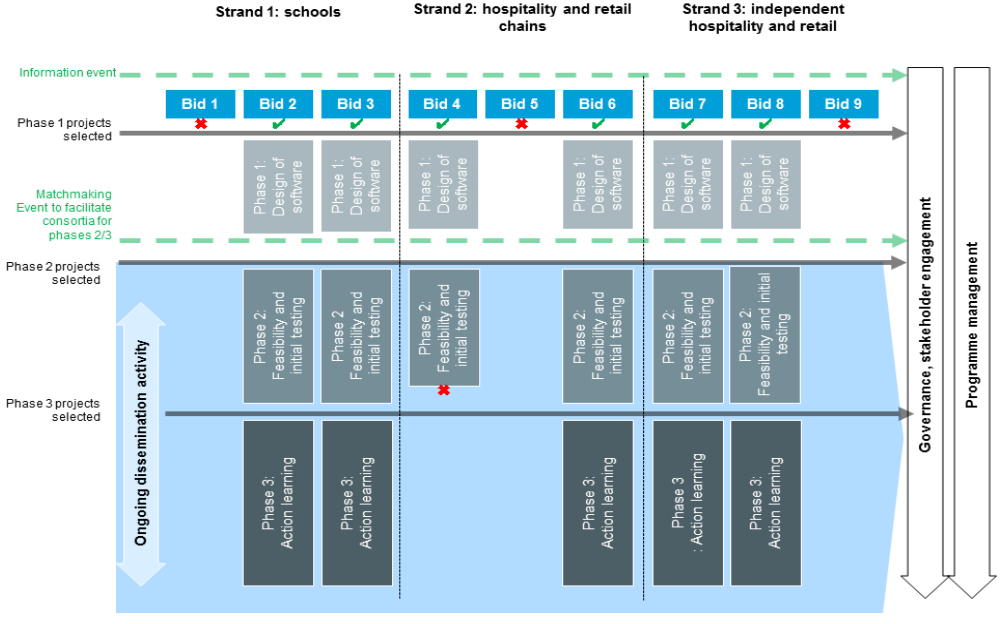
Competition phases

Structured around three phases of innovation, promoting a broad base of innovation and funneling funds to the most promising solutions:

Phase 1: Design of software (Mar – Summer 2018)

Phase 2: Feasibility and initial testing (Autumn 2018 - early 2019)

Phase 3: Action learning (early 2019 – early 2020)



Opportunities for involvement

Successful implementation of the competition will require cooperation and engagement of a wide range of stakeholders:

Tech developers	Leading development of tools, integrating innovative data sources and technologies
Energy management experts	Providing practical expertise and guidance
Research organisations	Guiding research and demonstration, maximizing project learning
Energy suppliers	Providing trial sites, customer engagement expertise
Sectoral bodies	Disseminating learning and opportunities to members, advising on sector needs

SECTOR OVERVIEW: SCHOOLS

Henry Greenwood
Mentor, Ashden LESS CO_2 Programme
Founder, Green Schools Project
Ashden

Bank of America
Merrill Lynch

LESS CO_2 / SCHOOLS WORKING TOGETHER TO SAVE ENERGY NOW

Bank of America
Merrill Lynch

LESS CO_2
Low Energy Sustainable Schools

Ashden champions and supports sustainable energy leaders to accelerate the transition to a low-carbon world.

Bank of America Merrill Lynch

LESSCO2

Low Energy Sustainable Schools

Bank of America
Merrill Lynch

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LESSCO2
Low Energy Sustainable Schools

Bank of America
Merrill Lynch

LESSONS
Low Energy Sustainable Schools

Bank of America Merrill Lynch

LESS CO2
Low Energy Sustainable Schools

The LESS CO2 programme launched in **2011**

269 schools have taken part across the UK

135,800 pupils have learnt about energy saving

Ashden
Sustainable solutions, better lives

Bank of America Merrill Lynch

EACH YEAR LESS CO2 SCHOOLS SAVES

CONSUMPTION
7,620,471 kWh

COST
£281,555

CARBON
1,646 tCO2e

Each school saves an average of 17 tonnes of emissions annually. That's equivalent to

99,600

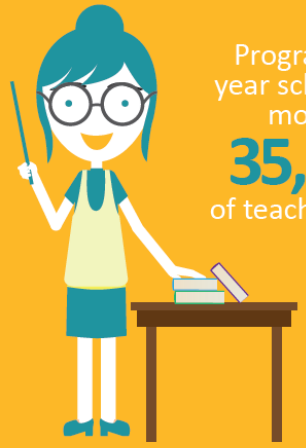
school runs in a car.

EACH YEAR THE AVERAGE SCHOOL SAVES

13% in energy consumption

14% in energy costs

12% in greenhouse gas emissions



Programme wide, each year schools save enough money to pay for

35,194 hours

of teaching assistant time.

Carbon Credentials

LESS CO2
Low Energy Sustainable Schools

Electricity Use in Independent Convenience Stores

Steve Denham
Associate Editor, betterRetailing.com

betterRetailing.com

1989 my first year:
0.25%

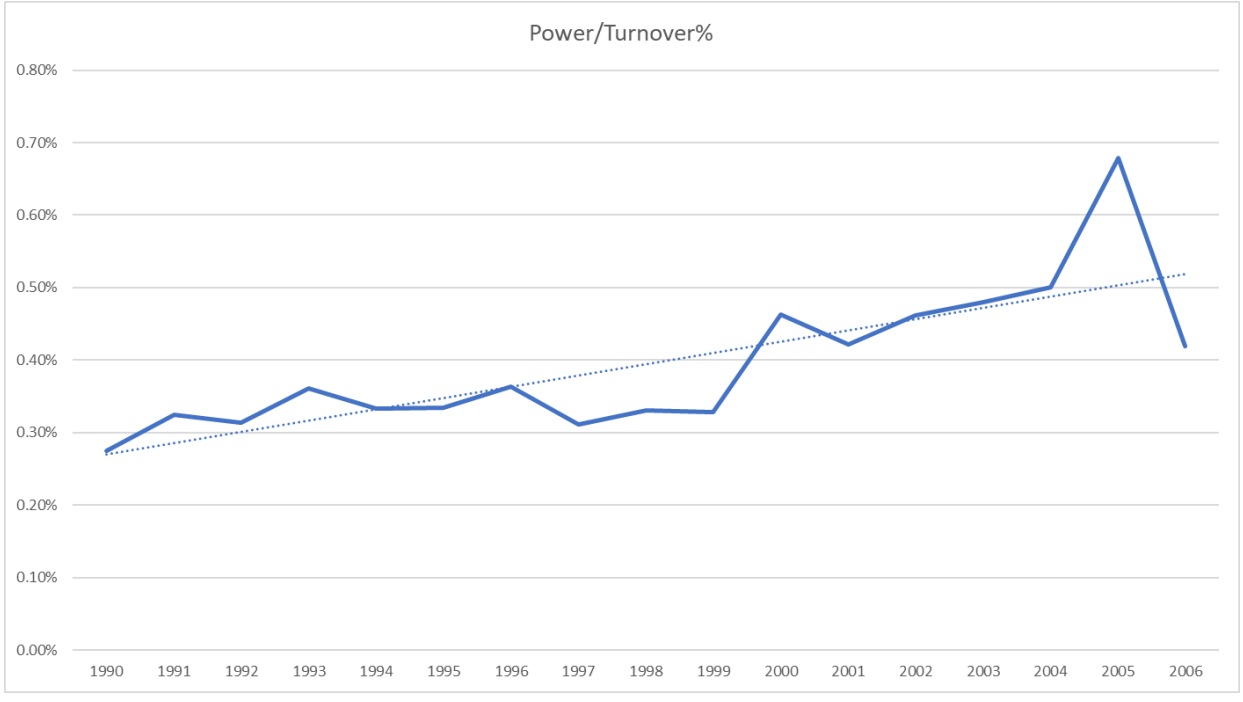
1991 store improvement:
0.32%

1997 A major investment:
0.33%

2000 Convenience:
0.46%

2005 serious investment: 0.7%

betterRetailing.com



Cost of power for my store
shown as percentage of turnover 1989 to 2006

So many things to do

Mo Razzaq's low energy store: 0.97%

Amin and Joga Uppal's Symbol Group store: ?

betterRetailing.com

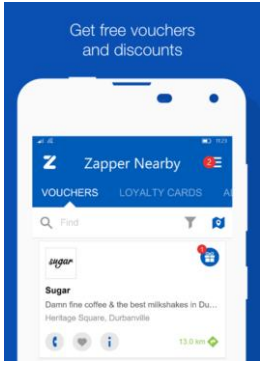
Energy Costs in

Independent Convenience Stores

under 1% to over 2%

of Turnover

SNapp



Retail technology must make the job easier and more profitable.

betterRetailing.com

What could an app do?

- Manage energy use
- Validate bills
- Pay bills
- Analyse use
- Allow retailers to group together to get better deals on energy?

@Retail_Steve

steve.denham@newtrade.co.uk

betterRetailing.com

NATIONAL ENERGY FOUNDATION

Smart Metering for the Small Hospitality Sector

Malcolm Hanna, NEF
30th November 2017

improving the use of energy in buildings

Contents

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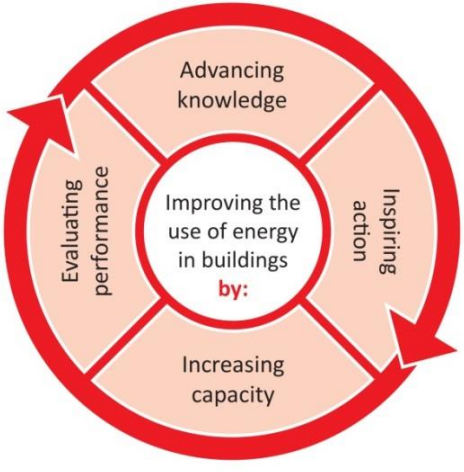
National Energy Foundation (NEF)



The National Energy Foundation is an ***independent charity*** that has been at the forefront of ***improving the use of energy in buildings*** since 1988. We aim to give people, organisations and government the knowledge, support and inspiration they need to understand and improve the use of energy in buildings.

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The Hospitality Sector

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The Hospitality Sector

- 4th largest industry
- Directly employs 3.2m people
- 4% of UK GDP
- 50,000 – 60,000 hotels
- 59,000 pubs
- 56,000 restaurants
- 97% employ less than 50 people

THE CATERER

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Sector Energy Use

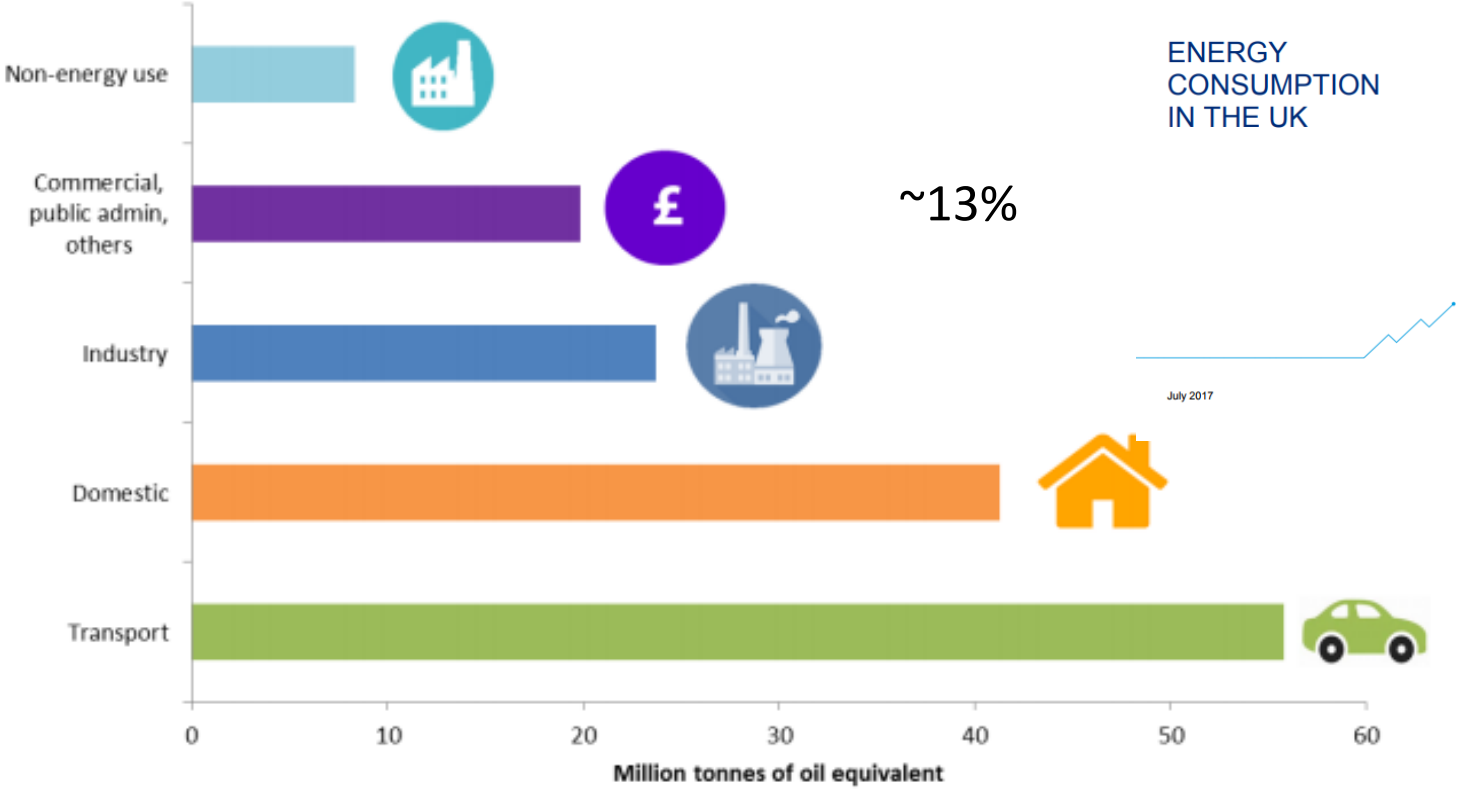
- 2016 – UK - 149 million tonnes of oil equivalent

Department for Business, Energy & Industrial Strategy

ENERGY CONSUMPTION IN THE UK

~13%

July 2017



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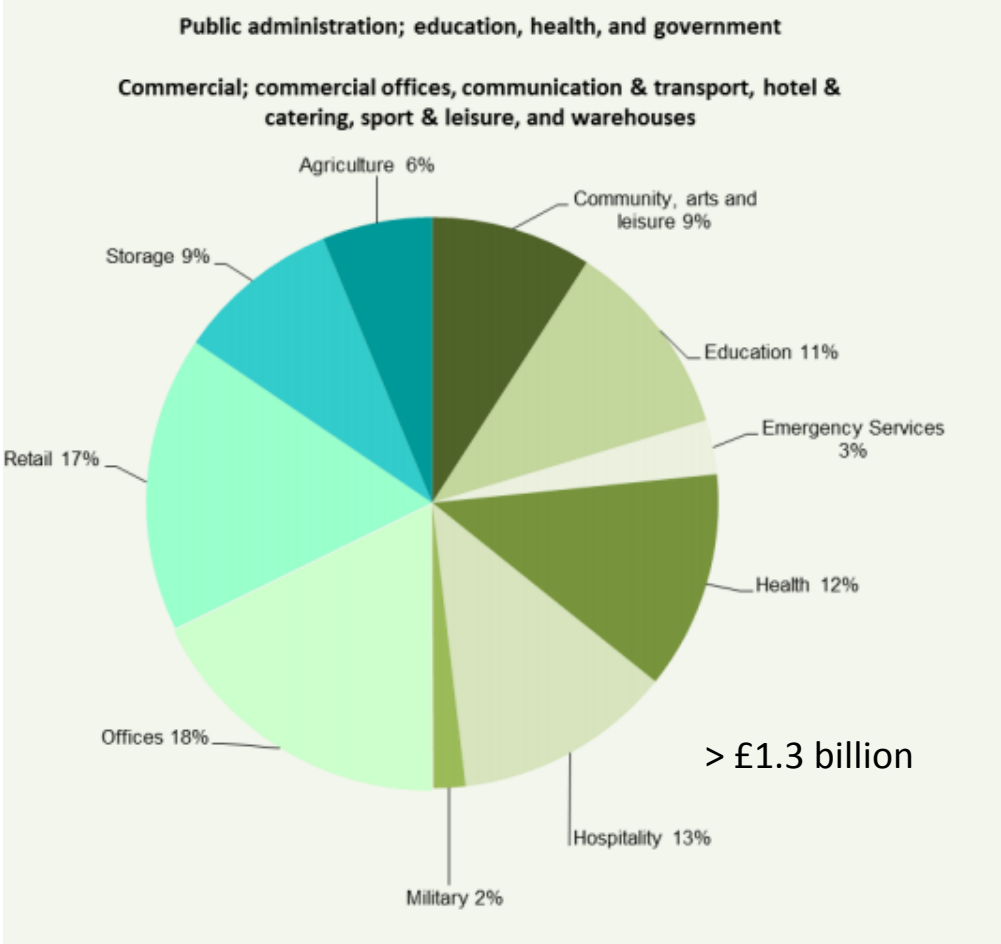
Sector Energy Use



> £1.3 billion

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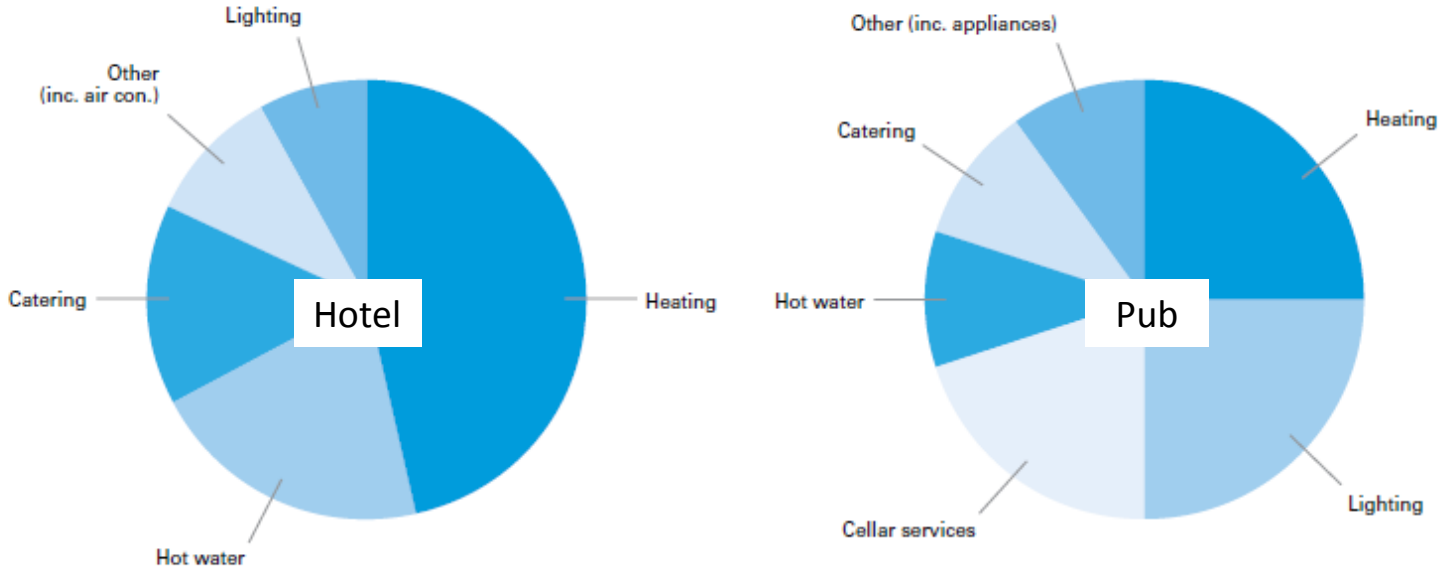
Energy use hotels and pubs



Source : The Carbon Trust

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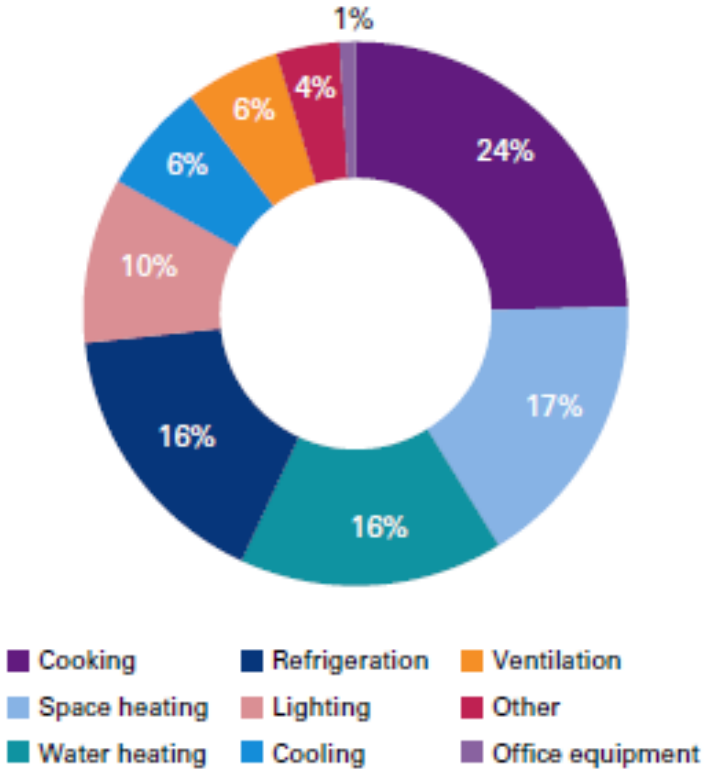
Energy use in kitchens and restaurants



Source: US EIA data for energy consumed in food service buildings. US data used is representative of UK business.

Source – Carbon Trust

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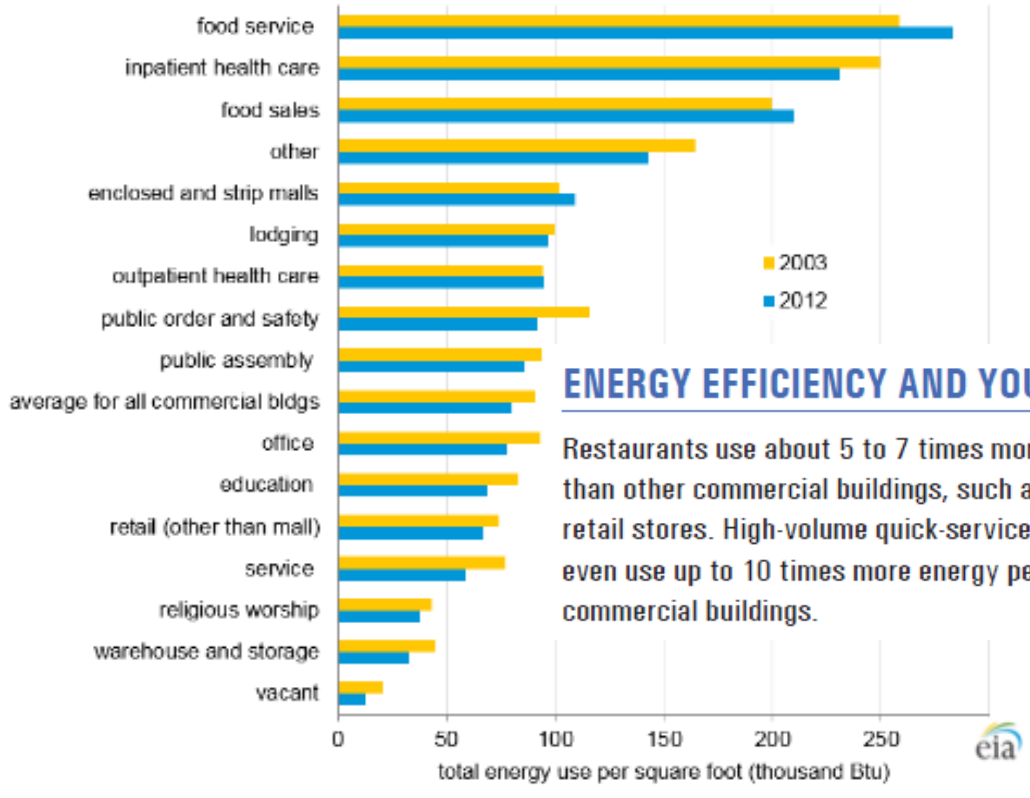
Energy Intensity



Source: U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey.

ENERGY EFFICIENCY AND YOUR RESTAURANT

Restaurants use about 5 to 7 times more energy per square foot than other commercial buildings, such as office buildings and retail stores. High-volume quick-service restaurants (QSRs) may even use up to 10 times more energy per square foot than other commercial buildings.

ENERGY STAR

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The Opportunity

- Energy can be highest cost after labour, savings straight onto bottom line
- Estimated that good housekeeping can provide savings of up to 20%
- 20% energy saving for many businesses is equivalent to 5% increase in sales
- Key intervention opportunities
  - Operation
  - Maintenance
  - Procurement
  - Design – new build and refurbishment
- In some kitchens as little as 40% of energy used goes into the preparation and storage of food, most waste heat

For a company with a **5%** profit margin over 3 years, a **£500**-a-year saving from energy efficiency makes the same profit as **£30,000** of extra sales.[2]

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The Opportunity

- Energy management - Good housekeeping
  - Catering – relatively labour intensive
  - Equipment operating for extended hours
    - Start up / shut down procedures
  - High staff turnover
    - Ongoing engagement / training
  - Sub metering and monitoring has been effective
    - Engage staff in achieving targets
    - Highlight operational improvements or issues
    - Identify inefficient equipment

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The Challenge

- Disconnect between energy efficiency and the aims and strategic targets of the business
- Lower priority - Focus is on service delivery and new business
- Most businesses do not know how to collect and interpret energy data and develop solutions
- Staff skills and resources – lack of time (beyond day job) and knowledge (to know how to collect and interpret data and how it relates to business)
- Smart meters can risk data overload requiring a lot of analysis

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The Challenge

- Landlord / tenant – split incentives in terms of investment
- Capital finance for investment in energy projects – survey (npower) – 60% of SMES who think energy improvements is important – said that they didn't have the cash to invest
- Regarded as a one-off activity, usually around procurement - not continuous improvement
- Very few independent case studies available on success stories
- Data - Utility company barriers (ownership / charges / complexity) to release data

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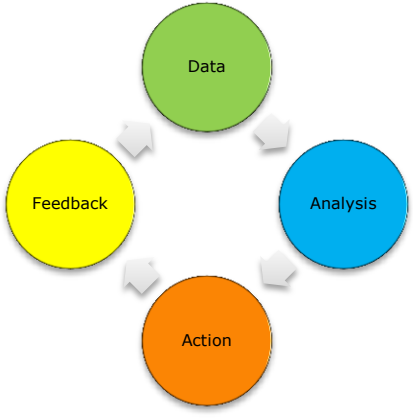
Solutions and Services

- Energy data – the start point for operational management (behaviours) to generate savings, engagement, prove the benefit and gain momentum, before any investment
- Smart meters can produce an action point every half hour (at least), not just every time you get a bill, it is an opportunity multiplier
- Active Data (not passive), can send specific information to specific people (especially finance) e.g., "you cost 15% more last night than you did before"
- Focus on efficiency, affordability, competitiveness and productivity benefits



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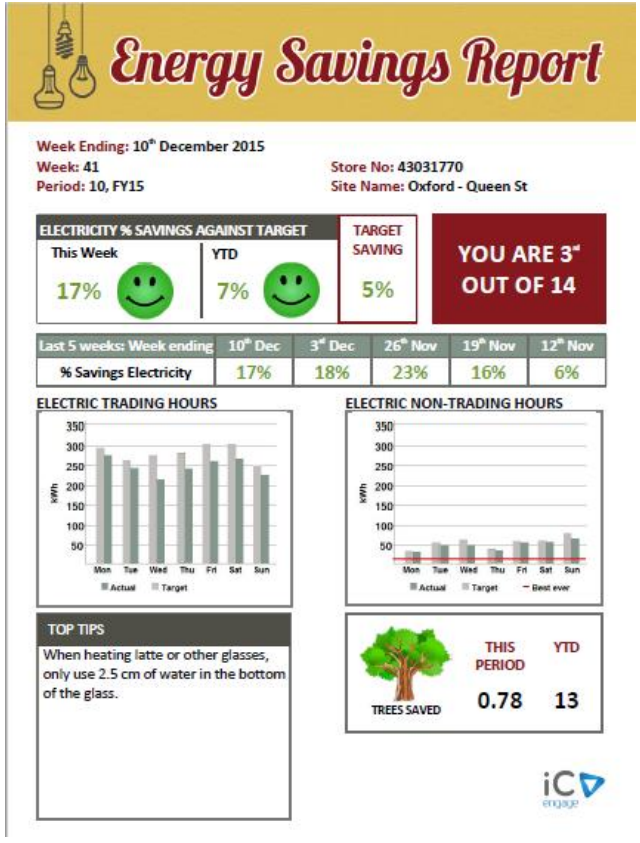
Solutions and Services



Energy Savings Report

Week Ending: 10th December 2015
Week: 41
Period: 10, FY15

Store No: 43031770
Site Name: Oxford - Queen St

ELECTRICITY % SAVINGS AGAINST TARGET		TARGET SAVING
This Week	YTD	
17%	7%	5%

YOU ARE 3rd OUT OF 14

Last 5 weeks: Week ending	10th Dec	3rd Dec	26th Nov	19th Nov	12th Nov
% Savings Electricity	17%	18%	23%	16%	6%

ELECTRIC TRADING HOURS

ELECTRIC NON-TRADING HOURS

TOP TIPS

When heating latte or other glasses, only use 2.5 cm of water in the bottom of the glass.

TREES SAVED	THIS PERIOD	YTD
	0.78	13

iC engage

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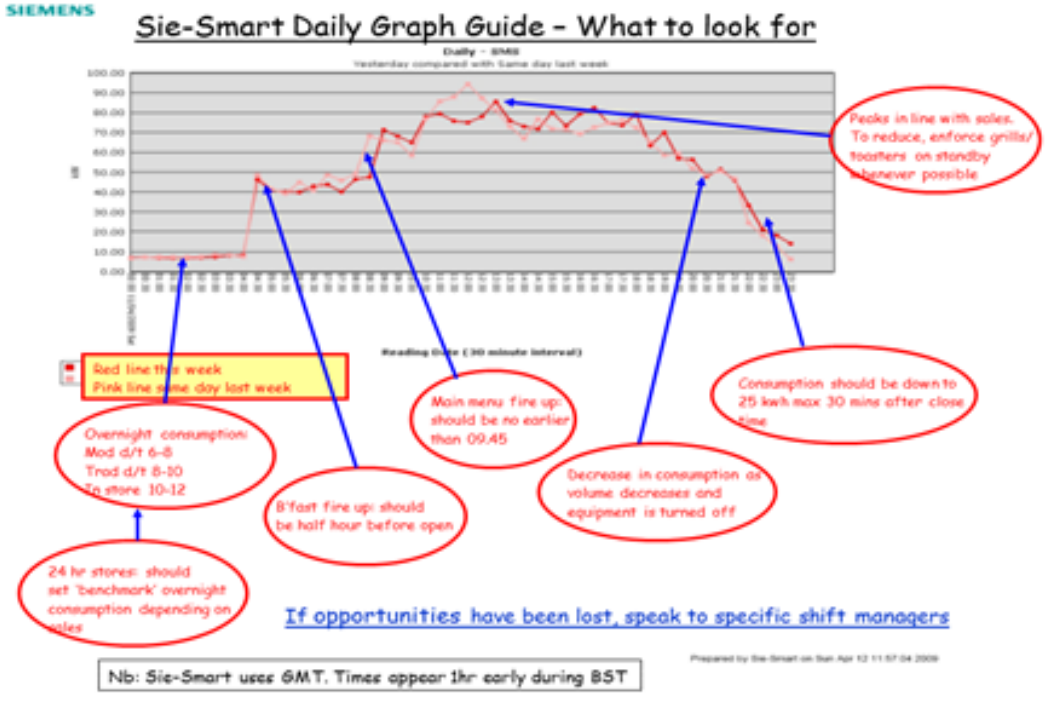
Solutions and Services

Restaurant chain using daily energy profiles



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Solutions and Services

Need new tools and analysis packages – to bring out the value in the data

- Define and develop key contextual data - combined with site information - relevant, useful and powerful e.g. energy and temperature, covers, occupancy levels
- Action based exception reporting - (diagnostic - analysis done).
  - Profile comparison with historic performance
  - Occupancy profiling
  - Start up / shut down profiles

- New tools to integrate data into daily business practices – 'bring the data to life' e.g. mobile Apps linked to the data and behavioural messages
- Equipment monitoring – potential use of Non intrusive load management (NILM)
- New value from data around Demand Management and storage

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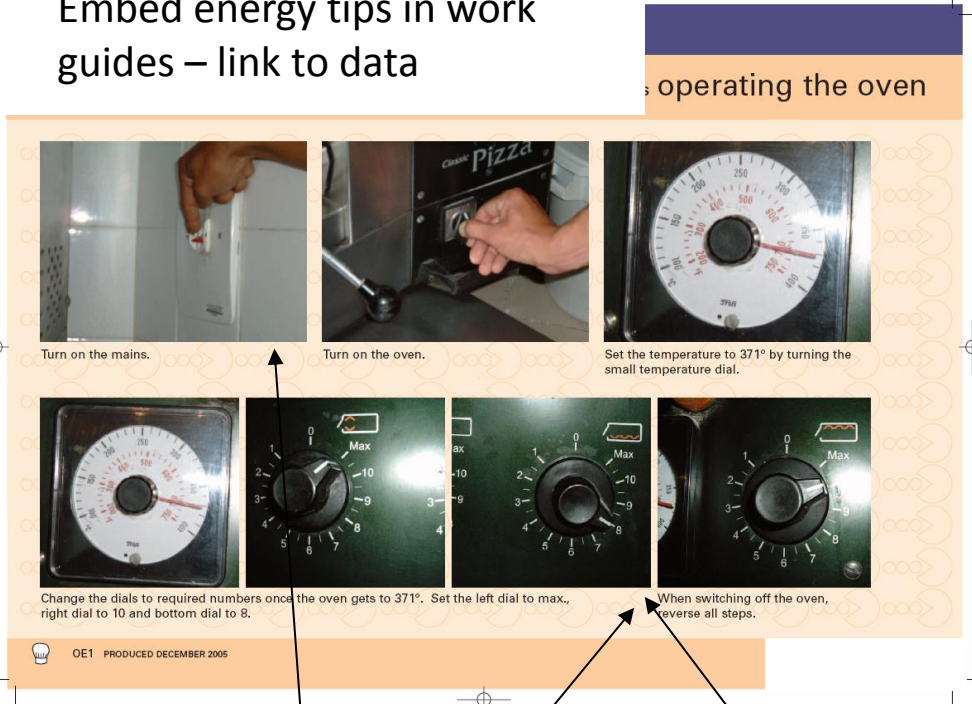
Solutions and Services

Embed energy tips in work guides – link to data



Only switch on as many decks as you will need

Switch on oven no earlier than 45 minutes before trading starts

Switch off or turn down one or more decks when you can

Additional note: Switch oven off once last order is complete

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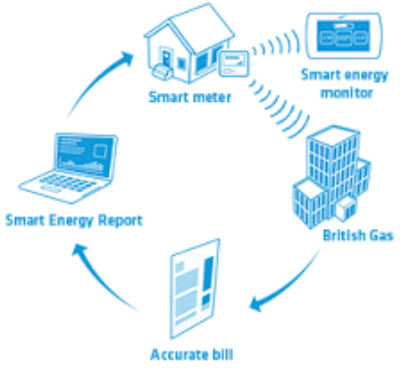
Solutions and Services

Potential business models for new services

- Linked to the energy supplier or supply contract - directly with supplier
- Linked to supply contract - third party broker / bureau
- Stand alone new technical solution – kit plus user interface (or software), sold to the users
- New platforms / forum e.g. third party provider or in collaboration with sector organisations or landlords



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Wider requirements and opportunities

- Case Studies - Need to develop a robust and independent evidence base (Local demonstrators, possible link to sector bodies)
- Training and advice programmes
  - Basic advice and guidance e.g. on installation.
  - Basics on smart meter and staff behaviours, monitored via the data.
  - Guided workshops for sectors e.g. energy management in hotels.
- New benchmarks – sector specific - possible link to sector bodies
- National data platform to enable access
  - basic functionality for all, pay providers for added support & services
- Good communication on the benefits of smart metering (national campaign)

NATIONAL ENERGY FOUNDATION

NATIONAL ENERGY FOUNDATION

Smart Metering for the Small Hospitality Sector

Malcolm Hanna, NEF
30th November 2017

improving the use of energy in buildings

SMART METER DATA

Peter Morgan
Technical Expert
Smart Metering Implementation Programme
BEIS

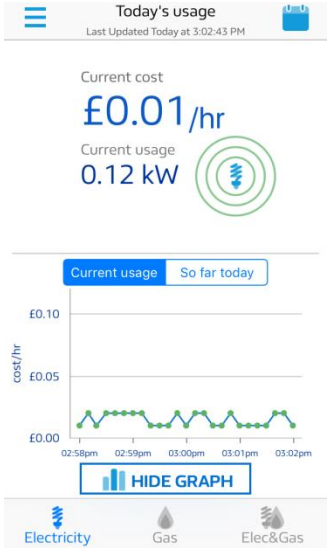
Smart meter data – a platform for innovation

Smart Meter Delivery

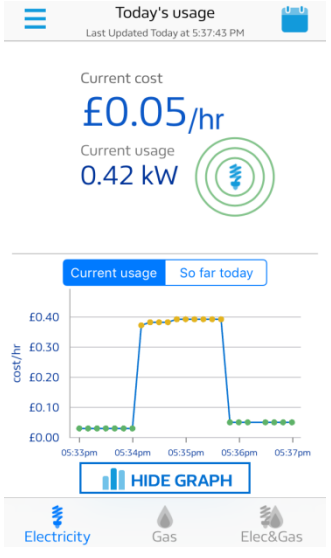
This is what the data can look like…

- Single source for real time and historical consumption as well as tariff data for 26 million homes

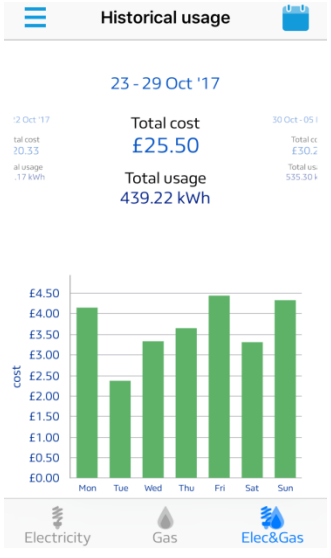
Baseload



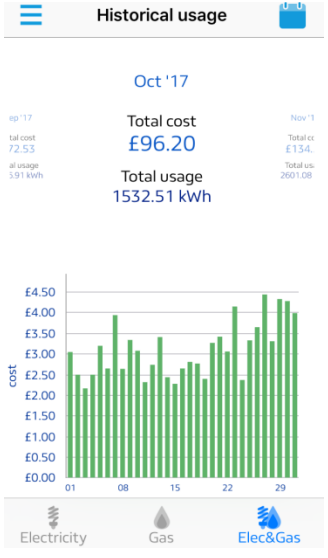
Kettle



Weekly total



Monthly total



Content

1) Smart meter system design
   - Accessing smart meter data
   - Connecting and controlling appliances
2) Innovation opportunities
3) Conclusion

Smart meter system design

The smart meter system has been designed to support innovation

- **Open Standards for the HAN:** ZigBee is used for communications between the smart metering equipment
- **Proportionate security and privacy:** protects consumer and network while maintaining easy access to data
- **Scalable platform:** other devices and data can be added

Accessing smart meter data

There are two routes for companies to gain access to data (given consumer consent)

Data access route 1 - DCC

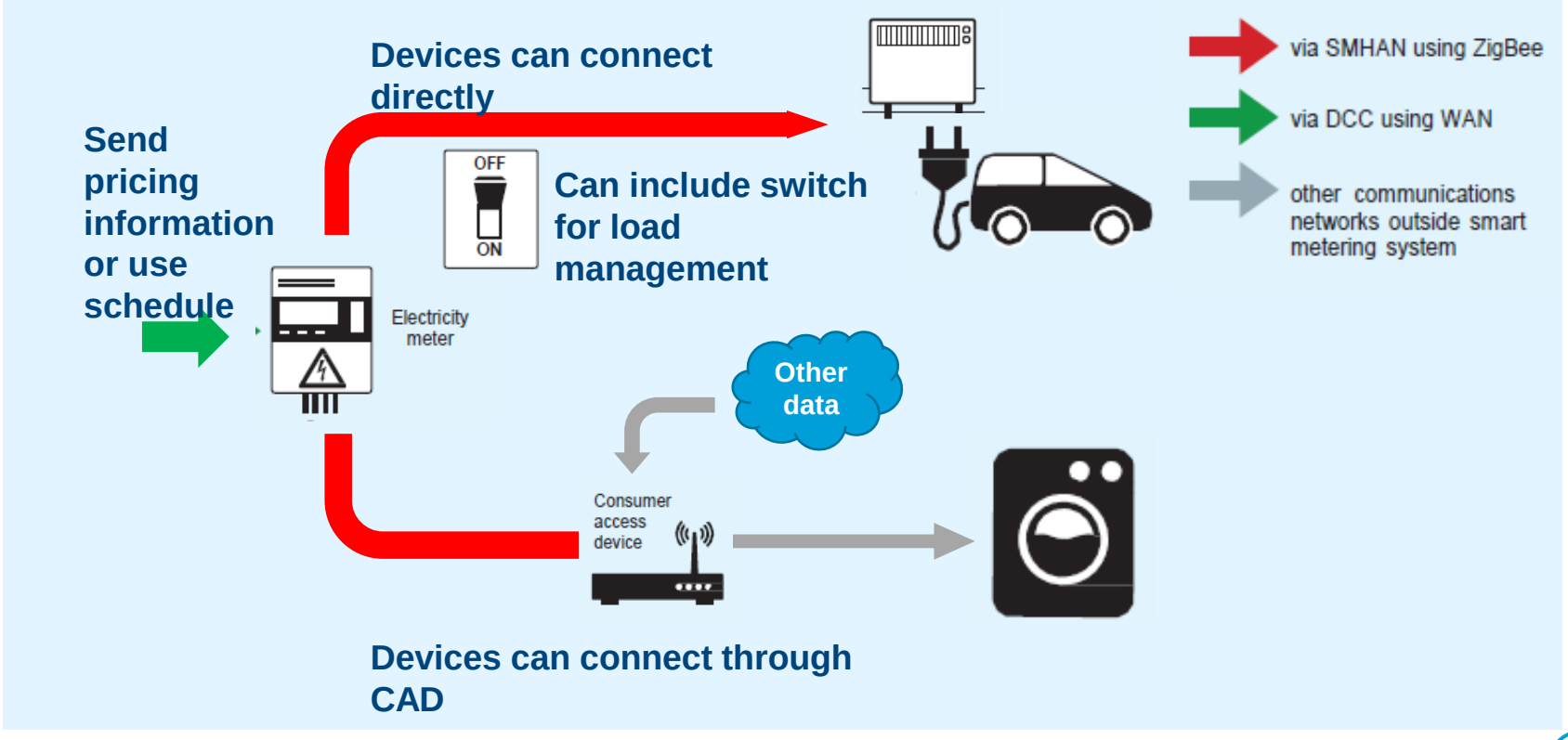
- No additional equipment required
- Companies can access data by
  - becoming DCC Other User themselves
  - partnering with a DCC User to access data via the DCC
- Half hour gas and electricity consumption data available

Data access route 2 - CAD

- CAD is any device that supports ZigBee Smart Energy
- CAD can for example be gateway device or smart appliance
- CAD can arrive “pre-paired” or can be paired by the energy supplier / DCC User over the internet or via phone
- Near real time electricity data available

Connecting and controlling appliances

There are a number of ways to connect and manage appliances and equipment

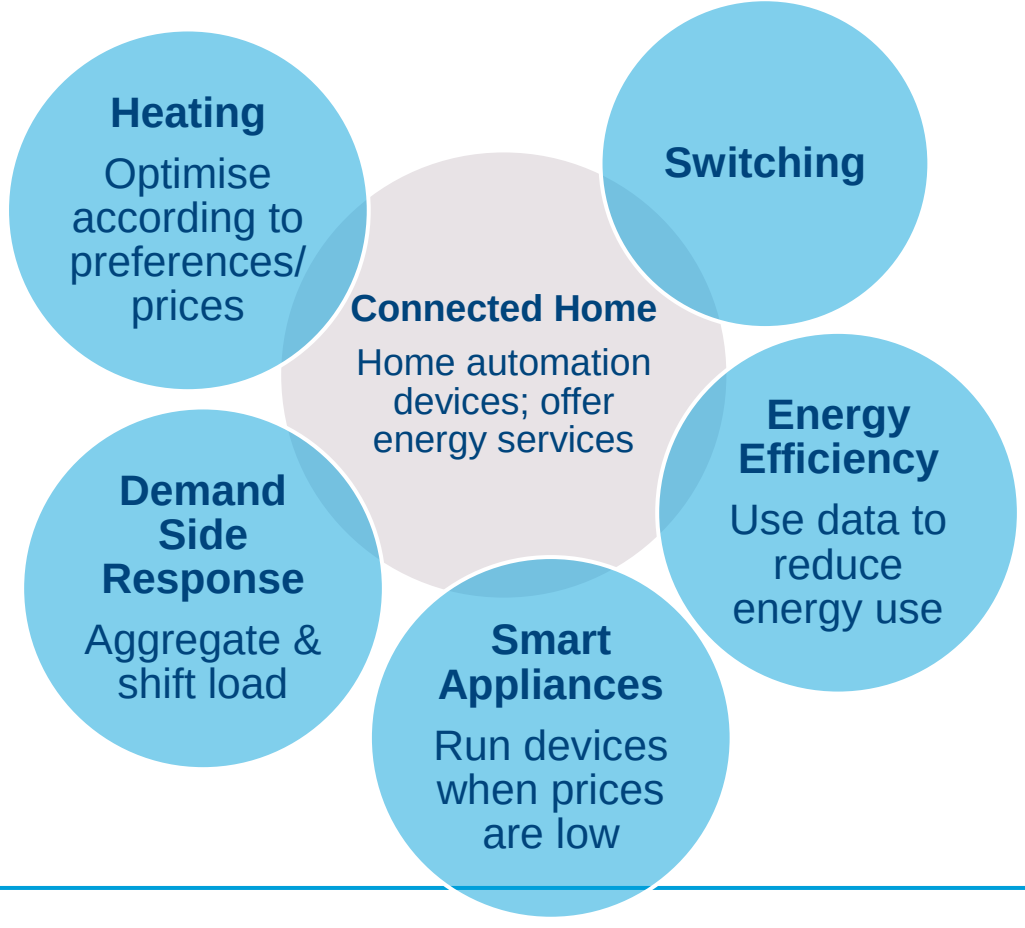


Update on General Data Protection Regulation (GDPR)

- Replaces UK Data Protection Act 1998 (DPA) in the UK from 25 May 2018
- Shifts the way that organisations must protect and handle personal data
  - Explicit consent from consumer required
  - New data portability rules that enable other 3rd party to access data given consumer consent

Innovation opportunities

Innovation opportunities are already emerging



Conclusion

- Overview of some innovative solutions on the back of smart meter data and infrastructure
- Early days for some of these products and services, but enablers like half hourly settlement are picking up
- Aim of this event is to share use cases and experiences as well as to give you the opportunity to provide feedback to us

Enjoy the event!

TEA AND COFFEE

Please return for 16:00

PANEL DISCUSSION

Michael Harrison (BEIS), Peter Morgan (BEIS), Henry Greenwood (Ashden), Steve Denham (betterRetailing.com), Malcolm Hanna (NEF)

Chair: Teresa Camey (BEIS)

COMPETITION OVERVIEW

David Kenington
Research and Evaluation Advisor
Smart Metering Implementation Programme
BEIS

Competition segments

Our research has demonstrated the importance of a segmented approach to the non-domestic sector

Competition target sectors

The competition will be focused on the retail and hospitality sectors, and schools. Smaller, independent, businesses will be explicitly targeted as well as chains with sites within scope.

Private sector

Independents

- Retail
- Hospitality

Chains

- Retail
- Hospitality

Public sector

- Schools

- We will fund up to nine projects, and are looking to fund a range across the segments
- Competition strands and sectors, project numbers, can be across multiple strands

Research and Evaluation Coordinator

The competition provides a significant opportunity to improve evidence on improving energy management in non-domestic settings

- A Research and Evaluation Coordinator (REC) will be procured, through a separate, parallel process, to deliver two objectives

Help successful Competition applicants	Inform smart metering policy development and implementation

- As such the REC will work closely with successful project applicants
- We anticipate proposals for the REC role from organisations with strong action research and evaluation skills and credentials

Competition scope and objectives

Scope: electricity and gas
Geography: GB

Competition summary objectives
1. **Develop innovative, easy to use and tailored tools**
2. **Develop packages of tailored supporting complementary interventions (e.g. energy advice, case studies)**
3. Secure earlier and greater levels of energy management within the target segments
4. Develop and strengthen the market for energy management products and services
5. Support and enable increased and more effective partner activities (e.g. SEGB, suppliers, devolved administrations, others)

Research and Evaluation objectives
1. **Action research:** help successful Competition applicants to improve the tools and supporting information and advice by working with them, conducting research with them and customers, and providing feedback at key points
2. **Evaluation:** inform smart metering policy development and implementation, and broader Government innovation and small non-domestic energy policy

Competition structure - overview

	Competition projects (<£7.3 mn across <9 projects)		Research and Evaluation Contractor (<£1.5 mn)
Phase 1 Mar – Summer '18	£1.8 mn	• Design of software / technical tools • Developing partnerships and approaches with energy management experts / suppliers • Reporting / application for Phase 2	£1.5 mn in total • Research and evaluation plans • Embedding research contractor with competition participants
Phase 2 Autumn '18 – early '19	£0.675 mn	• Initial 'real-world' testing with customers • Development of energy advice • Action research • Reporting / application for Phase 3 (if needed)	• Evaluation activities • Action research (main stage) • Interim reporting
Phase 3 Early '19 – early '20	£4.825 mn	• Roll-out / further testing of tools, including broader engagement activities and energy management advice • Reporting and dissemination	• Evaluation activities • Action research • Final evaluation reporting

Eligibility and competition selection criteria

Criteria will be made clear within the application forms, when they are published

Eligibility
1. Be at a pre-commercial stage of development (see section 4, call scope);
2. Address the call scope (see section 4);
3. Be led by a single organisation with evidence of strong collaboration across consortia (if a consortium bid is proposed)

Project selection criteria
1. Technical approach / innovation
2. Project plan
3. Skills and expertise
4. Market potential and business case
5. Cost

CLOSING REMARKS

Teresa Camey
Head of Stewardship
Smart Metering Implementation Programme
BEIS

THANK YOU

SmartEnergyManagement@beis.gov.uk