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PRESENTATIONS

Committee ENVIRONMENTAL SCRUTINY COMMITTEE

Date and Time of Meeting TUESDAY, 12 JULY 2016, 4.30 PM

Please see attached the Presentation(s) provided at the Committee Meeting

Item 4 - Energy Prospectus Update Presentation 12.07.16 (Pages 1 - 28)

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Energy Prospectus

Update

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Gareth Harcombe

Energy and Sustainability Manager

City of Cardiff Council

difference | **wahaniaeth**
make the | gwnewch





Strategic position

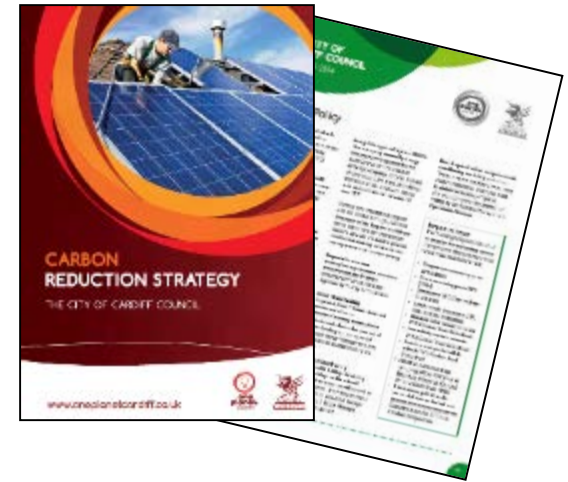
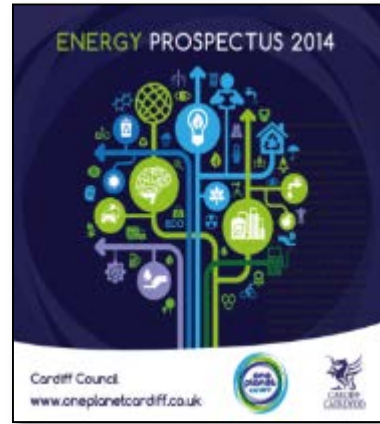
2015/16 work

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Innovation Projects

Next steps

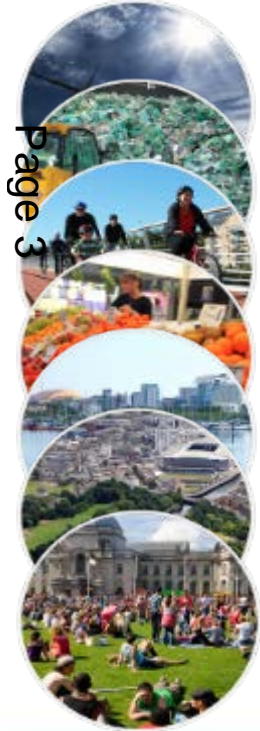


Strategy



Increasing, diversifying and localising supply

Reducing demand



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Energy

Waste

Transport

Food

Water

Place

People

Strategy Refresh

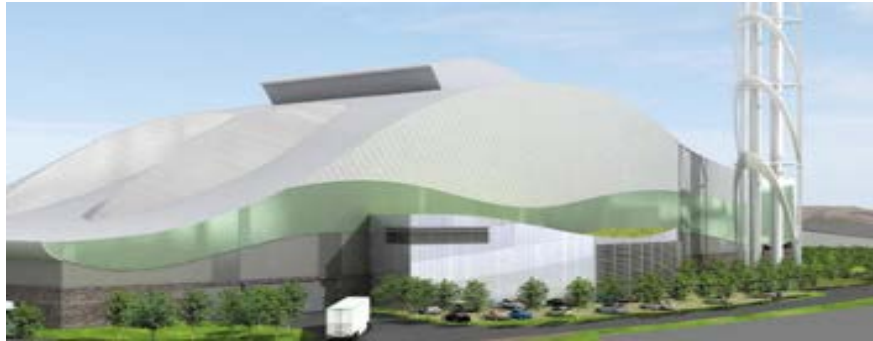


- “Energy for a Liveable City”
- Next round of activity
- New policy context
 - Reduced subsidies
 - Increased legislative context
 - Paris Agreement
 - Wellbeing of Future Generations Act
 - Wales Environment Act
 - Etc



2015/16 Activity

Partnership Schemes



Trident Park Energy from Waste Plant

- 30MW of electricity
- Potential for 20MW of heat?



Landfill Gas Burners

- 4MW of electricity



Kelda Anaerobic Digestion Plant

- 1.5 MW of electricity
- Heat?

Energy Efficiency in the Council's Estate



Salix Funding

WG Energy Efficiency Finance

- Interest free funding for energy efficiency measures
- Must pay back in 6 years or less
- Savings on energy bill used directly to pay back loan
- 2015/176 focus on LED Lighting for schools



SOLVING ENERGY EFFICIENCY FINANCE IN THE PUBLIC SECTOR

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Ton Yr Ywen Primary School

Birchgrove Primary

Cardiff High School

Coed Glas Primary

Coryton Primary School

Glantaf Secondary

Kitchener Primary School

Lansdowne Primary

Llanishen Fach

Peter Lea Primary

Radyr Comprehensive

Rhiwbeina Primary

St Fagans primary

Tongwynlais Primary

Capital Investment £780k

Savings £116k p/a

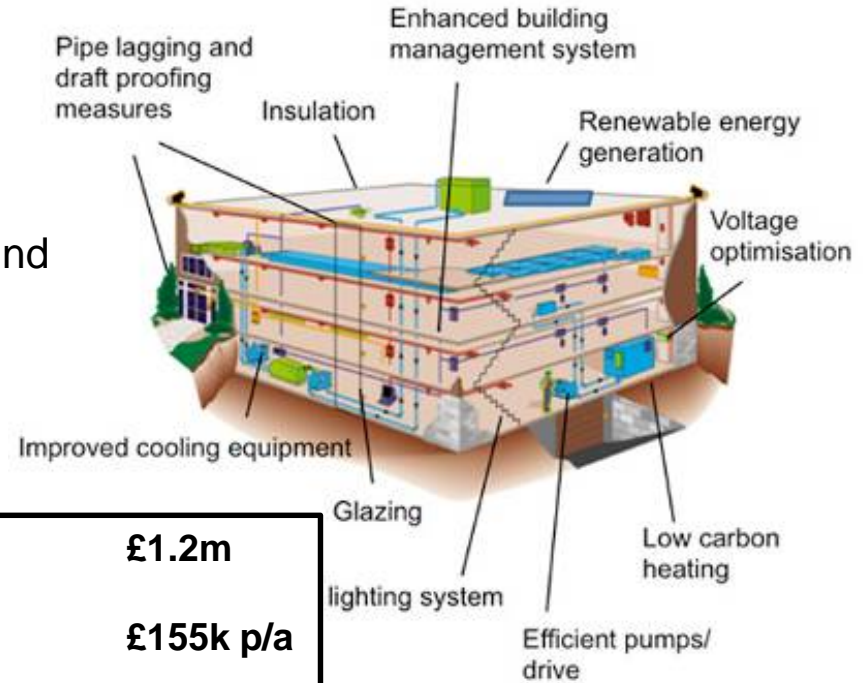
Payback in 6 years

Energy Efficiency in the Council's Estate



* Re:Fit

- * Provides guaranteed energy savings
- * Wide range of possible measures
- * Up to £4m of works
- * £2.2m WG Green Growth Wales Invest to Save Fund
- * In contract with Engie (Cofeley)
- * Works start Aug/Sept



Capital Investment	£1.2m
Savings	£155k p/a
Payback in 7.7 years	

- Cardiff Castle
- City Hall
- Fitzalan High School
- Lamby Way Depot
- Llanederyn Primary
- Ysgol Plasmawr
- Radyr Comprehensive
- Willows High School

Energy Efficiency in the Council's Estate

Roof Mounted Solar



Site Name	Total Power (kWp)
Oakfield Primary School	35
Ysgol Gyfun Gymraeg Plasmawr	50
Ysgol Gyfun Gymraeg Glantaf	50
Willowbrook Primary School	29
Cardiff International White Water Centre	30
Channel View Water Activity Centre	20
Glamorgan Records Office	44
Total	258

Capital Investment	£332k
FIT Income p/a	£23.5k
Export revenue p/a	£5.2k
On-site savings p/a	£14.6k
TOTAL p/a	£43.3k
Payback in 7.6 years	

Housing Retrofit



- ARBED/ECO/HRA
- Over 1,600 houses treated in 15/16
 - External wall insulation
 - Cavity wall insulation
 - Loft insulation
 - Boiler replacement



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- NEA Grant for works targeting individuals with identified fuel poverty health issues - Partnership with Flintshire

Radyr Weir Hydro



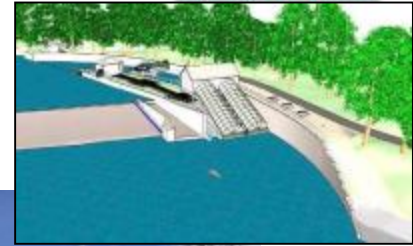
Enough renewable energy to power approximately 550 homes

1.6GWh annual energy generation

Circa £3m net income over 20 year for the council

Currently finalising landscaping and eel pass installation

Taff Trail scheduled for 20th of July opening



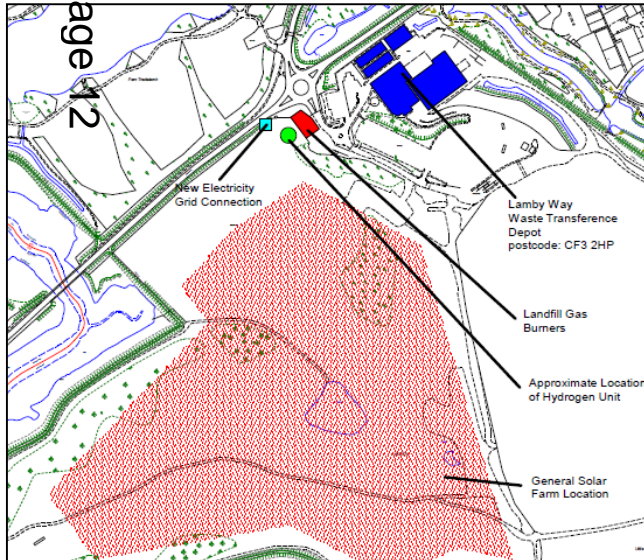
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Lamby Way Solar Farm



- Initial operator pulled out due to Government Policy Change
- Re-scoping and market testing during spring
- Re-advertisement planned to include:
 - Direct feed to Lamby Way Depot
 - Other “private wire” arrangements
 - Overcapacity and storage options
 - Still significant market interest

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INNOVATION PROJECTS

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7 live projects
£2.3m external funding
Over 20 partner organisations

Heritage Retrofit SBRI

The “problem”

- More than 30% of buildings in Wales are over 100 years old
- Mainstream retrofit sometimes conflicts with heritage protection

Response

- 30 applicants, 6 feasibility projects, 3 demonstrators



Llywodraeth Cymru
Welsh Government



CARDIFF
CAERDYDD

SBRI Government challenges.
Ideas from business.
Innovative solutions.

Innovate UK

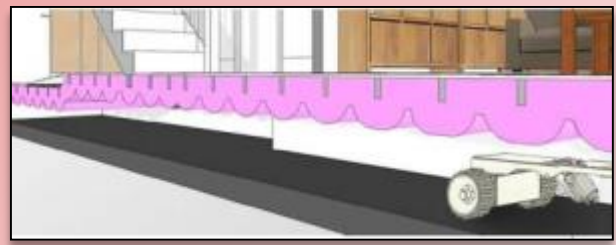
Vivus Lime

Quick drying lime render and insulation panels



Q-Bot Limited

Underfloor Insulation Robot



Okotech Ltd Heatboss®

wireless zoned heating control solution.



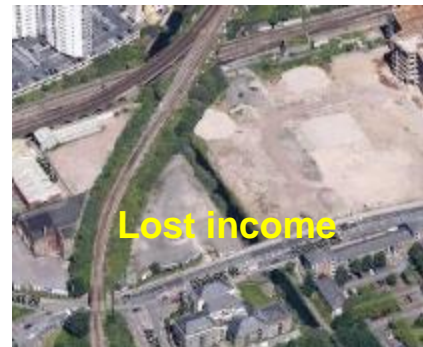
Portable Renewables SBRI

The “problem”

- Vacant and underused land
- Not enough renewable generation in cities
- Can energy be a temporary “meanwhile” use

Response

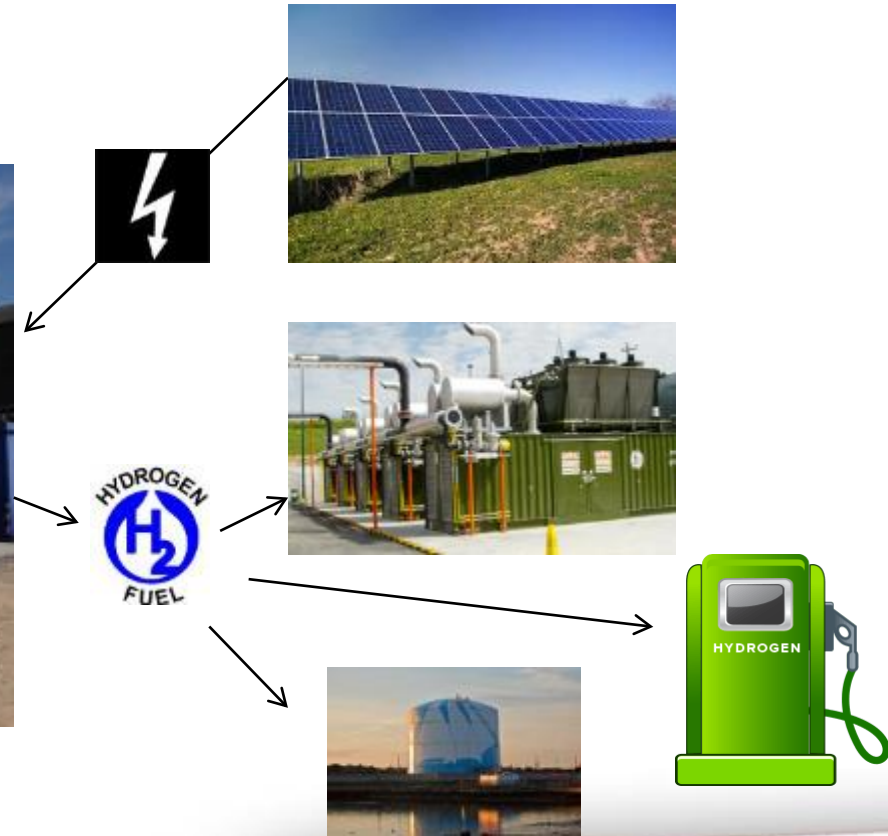
- 35 applicants, 4 feasibility projects, 2 demonstrators



Hydrogen Enabled Local Energy

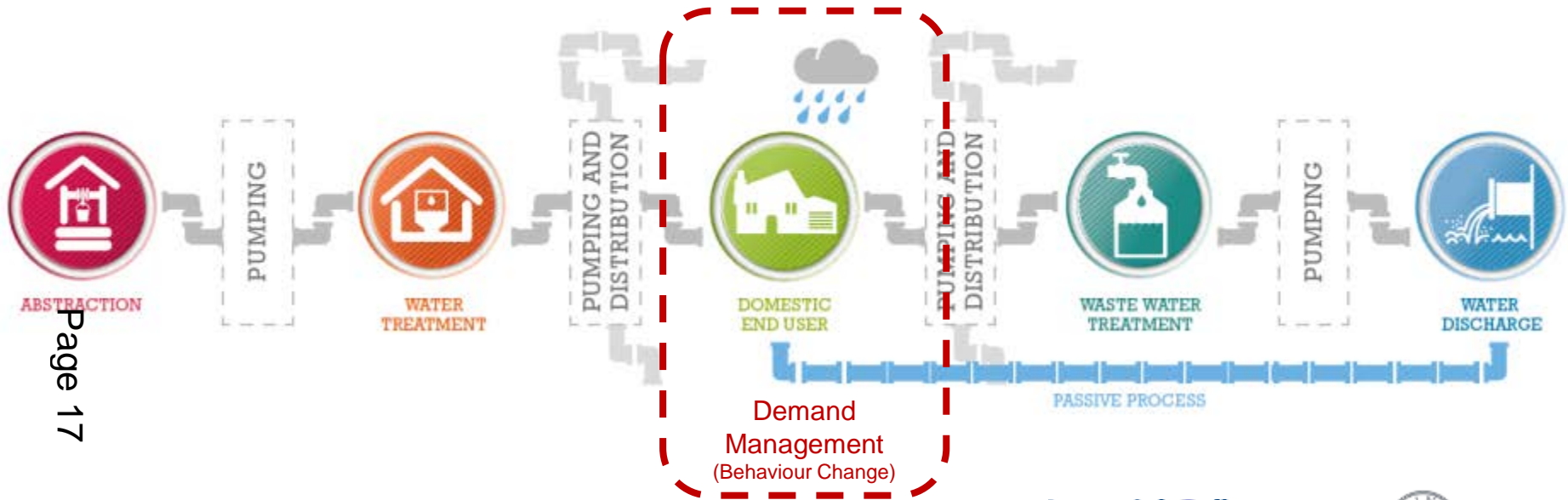


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EU FP7 WISDOM

Water analytics and Intelligent Sensing for Demand Optimised Management



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Dŵr Cymru
Welsh Water

Imperial College
London



CSTB
le futur en construction

advanticsys

make the difference | gwnewch wahaniaeth

EU FP7 PERFORMER



Portable, Exhaustive, reliable, Flexible and Optimized appRoach to Monitoring and Evaluation of building eneRgy performance

- Understand why building actual energy performance is different to building predicted energy performance
- Look to reduce this gap by better management of the buildings HVAC systems through ICT controls



GROUNDWATER HEAT PROJECT

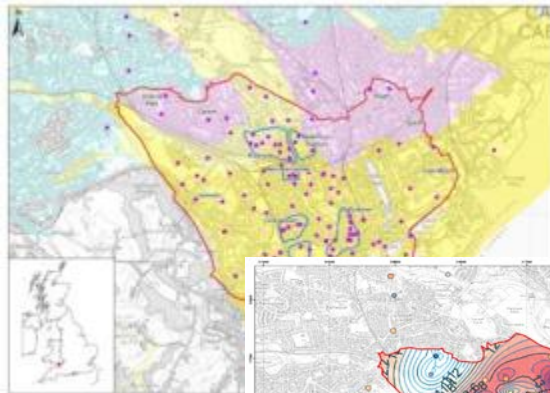


British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

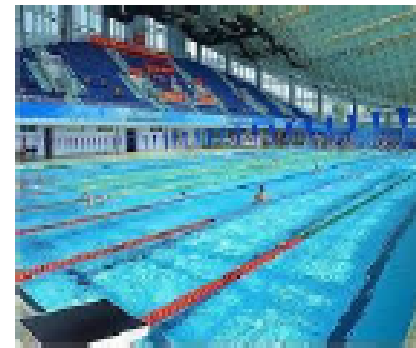
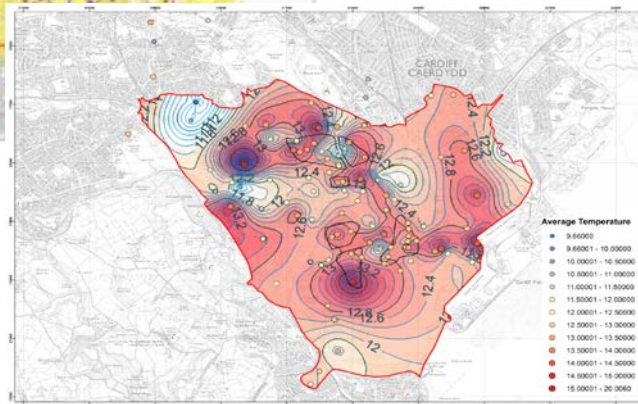


Innovate UK

Energy Catalyst



• Groundwater volume = 28 Billion Litres at 12°C



Enough water to fill 11,000 Olympic swimming pools!

• First estimates/approximate, but in right 'ball park'

Progress to Date



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- Sensors and impact monitoring in 60 boreholes
- Grangetown Nursery School Heat pump
- 3D city scale geological mapping
- Second stage funding bid

BEDROCK

Strategic Outcomes?



- Delivered or facilitated over **35MW** of local renewable energy generation capacity which is contributing to a **16% renewable energy provision per head** of population for the city, the fourth highest in the UK.
- Total of about **£6m** external grant funding over 3 years
- **2,000 tonne** reduction in the CO2 emissions from the Council's operational estate in the last year.
- Latest DECC data - **27% reduction in citywide per capita CO2 emissions** (based on 2005 baseline) and a 20% reduction in citywide absolute CO2 emissions.

Current Work and Future Aspirations

Cardiff Heat Network

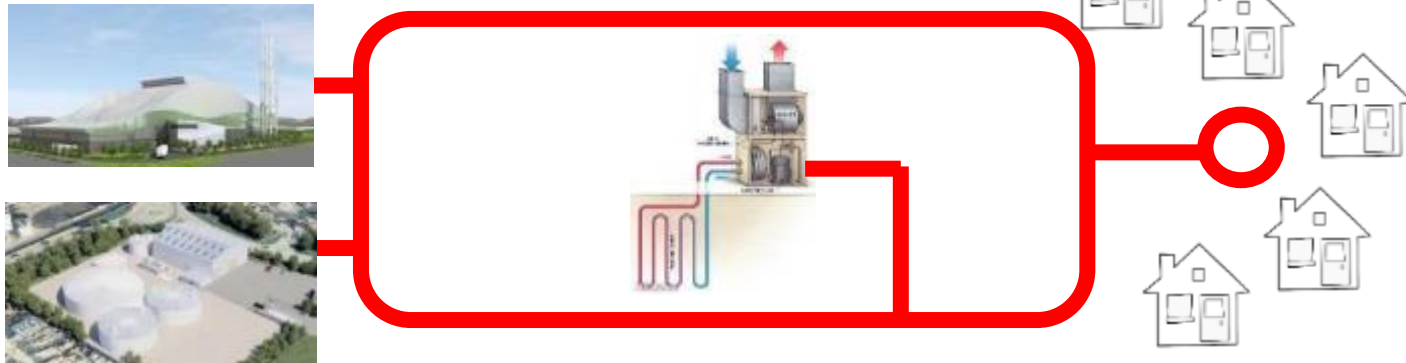
H.N.D.U funded feasibility work

- Heat map and masterplan
- Technical delivery study
- Planning Guidance
- Business Planning
- Legal and Governance Issues

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Department
of Energy &
Climate Change

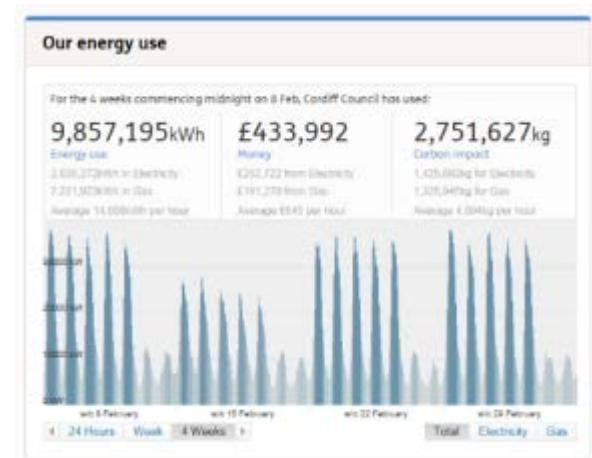


Smart Energy



- “Carbon Culture”
- Automated building management?
- Maximising local renewable use – balancing demand - smart grids?

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Tidal Lagoon?



- Swansea Bay Proposal
 - 320 MW – enough power for 150,000 homes

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- Cardiff Proposal? - 11 times larger
 - 1,800MW-2,800MW?

And...



- Community energy?
- More hydro?
- Speeding up retrofit?
- New models for small scale renewables?
- Localising supply?
- Supporting more innovation

Questions?

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