Tackling fuel poverty in social housing in Scotland – The role of renewable energy and energy efficiency

Mark Bramah, Director of APSE Energy

1. THE PROBLEMS OF FUEL POVERTY IN SCOTLAND

The causes of fuel poverty

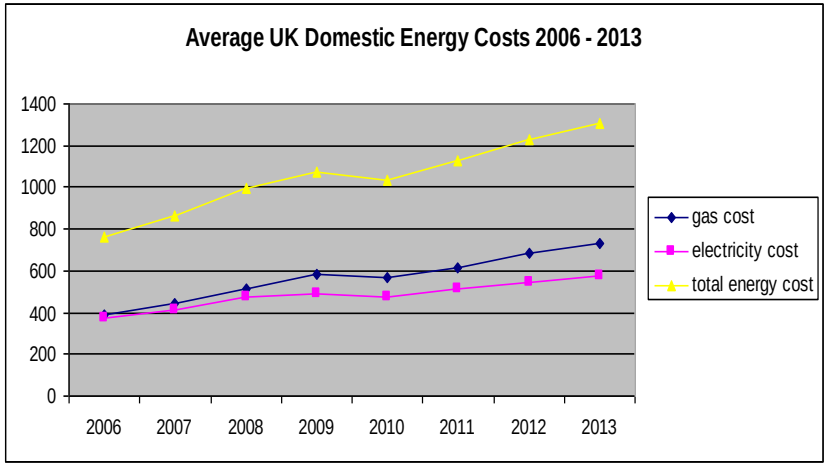
- High Energy Costs
  +
- Poor energy efficiency of homes
  +
- Low income =
- Fuel poverty

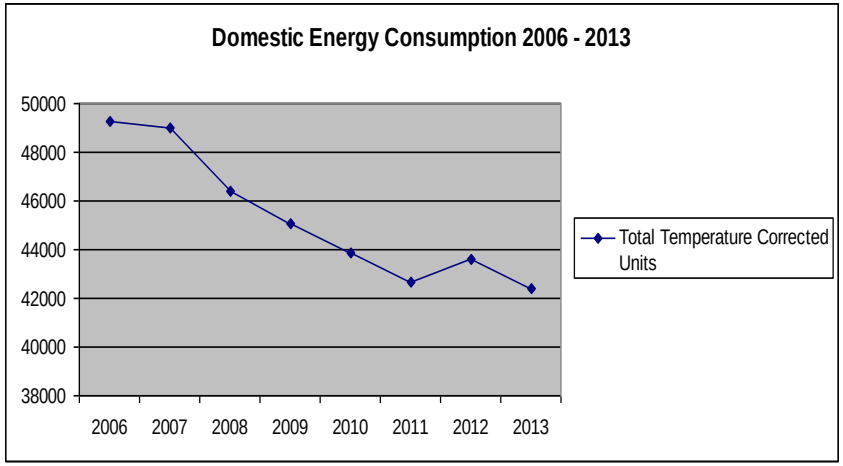
Scottish Government definition of fuel poverty

"A household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use."

Economic Impacts & Trends

- The UK has experienced significant year on year price rises for domestic energy over the past decade. Since 2006 average year on year rises have reached 15% with a compound rise of 71% in average dual fuel bills, rising form £760 in 2006 to £1320 in 2013
- At the same time domestic energy consumption has dropped by 9.1% for electricity and 6.8% for gas
- Retail customers are literally paying much more for much less!





Source: Dr Richard Williams, Southampton University, APSE et al 2015

Scottish House Conditions Survey

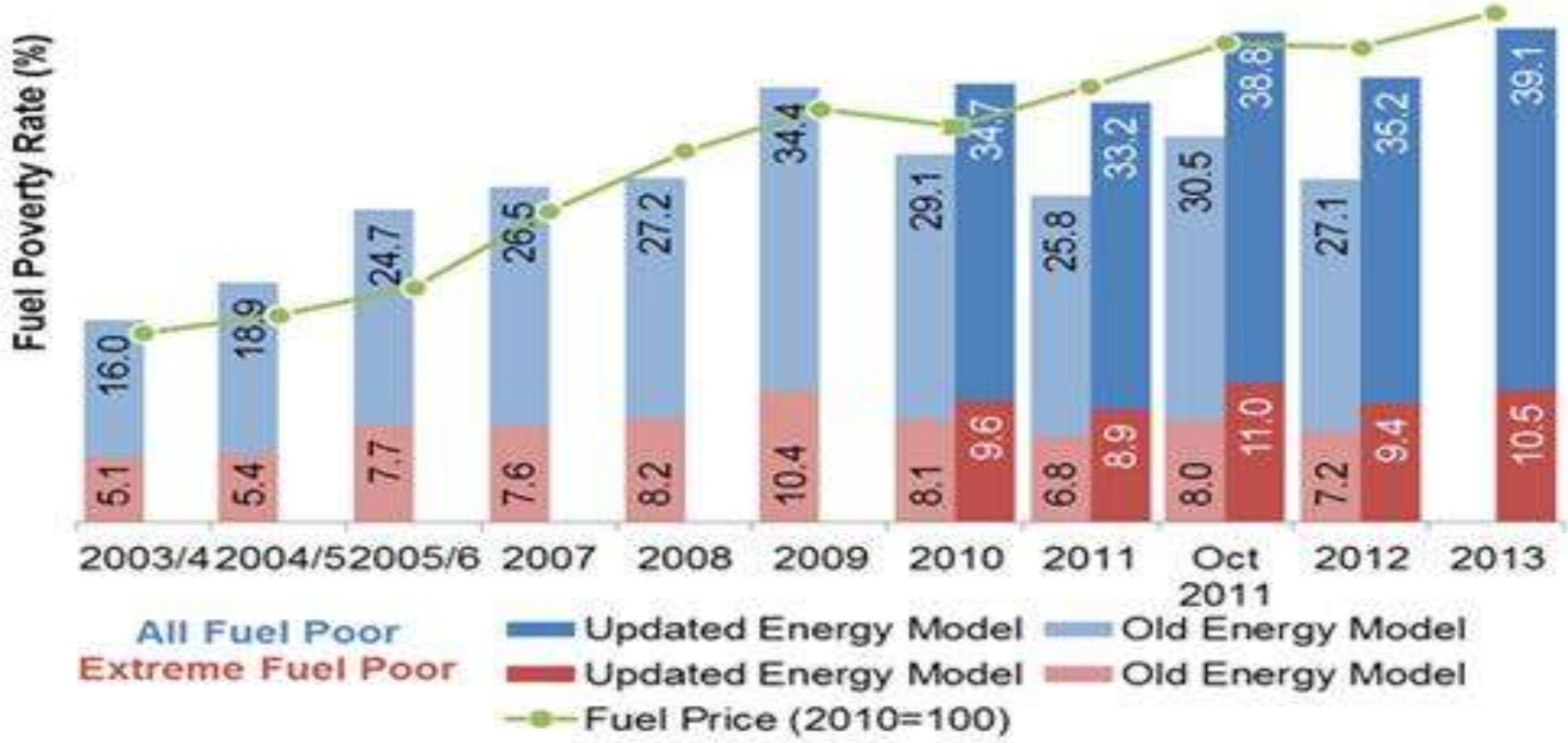
- **Fuel poverty in Scotland in 2013 was 940,000 households or 39.1%**
- Between 2012 and 2013, fuel poverty increased by 4 percentage points from 35.2% to 39.1%. This represents an increase of around 100,000 households from the previous year, reaching 940,000 in 2013.
- Since 2010 energy efficiency improvements have led to an 8% drop in the energy needs of the average household, while the cost of that energy has risen by 20%.
- The level of extreme fuel poverty recorded in 2013 was 252,000 households or 10.5%. Extreme fuel poverty is defined as requiring more than 20% of income for domestic fuel.

Fuel Poverty and Extreme Fuel Poverty since 2010

Year	Fuel Poverty		Extreme Fuel Poverty	
	000s	%	000s	%
2013	940	39.1%	252	10.5%
2012	840	35.2%	225	9.4%
Oct 2011	918	38.8%	260	11.0%
2011	787	33.2%	210	8.9%
2010	818	34.7%	225	9.6%

Table Source: SHCS 2013

Fuel poverty in Scotland



Costs of fuel poverty

Table 1 Comparison of energy bills between homes with different levels of energy efficiency[6]

Energy efficiency rating	Average annual energy bill
A/B/C	£917
D (average)	£1,188
E	£1,544
F/G (worst)	£2,153
Difference between D and F/G	**£965**

Table 3 Comparison of fuel poverty gap by EPC rating bands, 2012 [11]

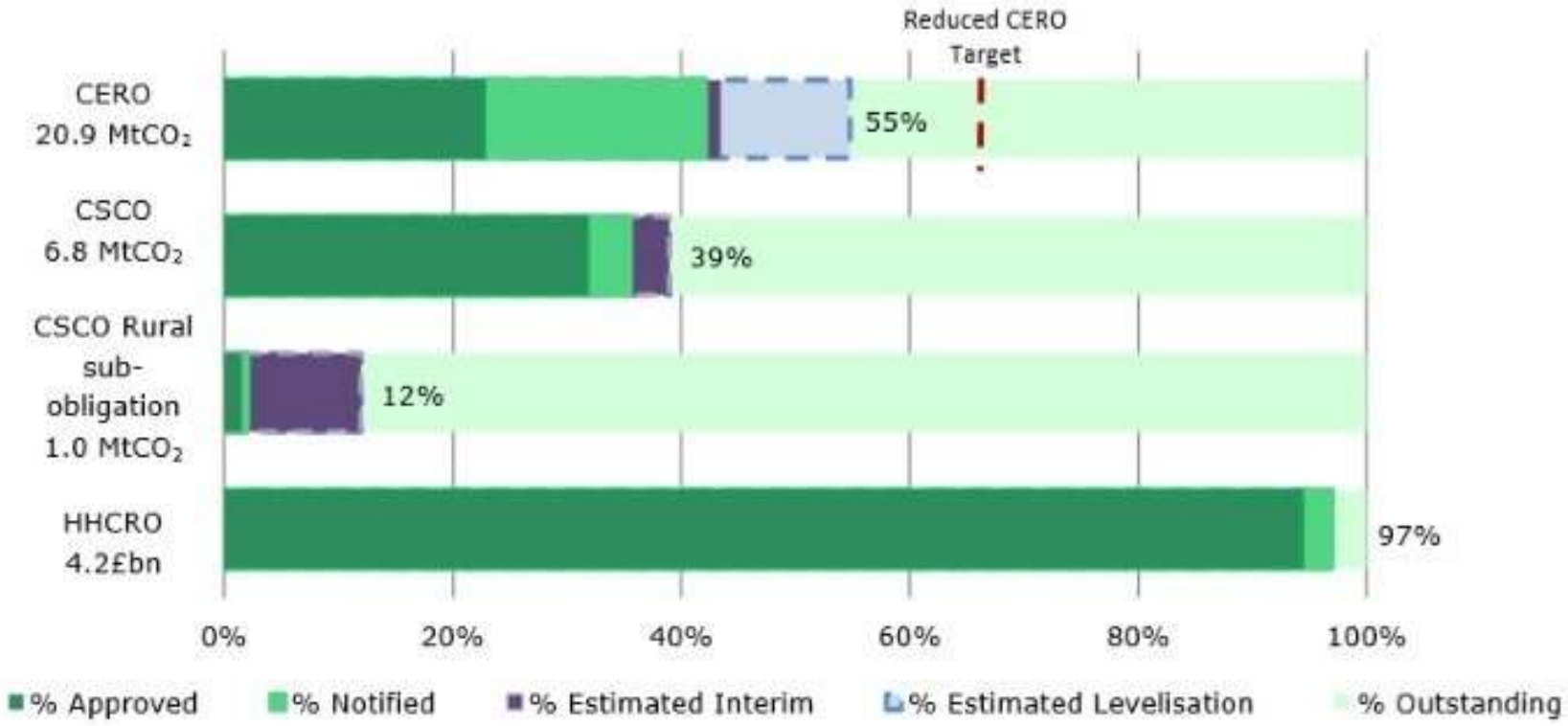
Energy efficiency rating	Fuel poverty gap
D (average)	£228
G (worst)	£1,702
Difference between D and G	**£1,474**

Source: Dept. for Energy and Climate Change *Annual fuel poverty statistics 2014*

Changes to ECO

- Affects work carried out after April 2014
- ECO extended for a further 2 years
- CERO target reduced by 33%
- Easy to treat insulation to become primary measures
- CERO uplift mechanism
- District Heating be become a primary measure
- Over delivery carry over mechanism
- CSCO remit extension *(up to of the most deprived 25% LSOA)*
- New CSCO Rural Rules

So where are the Energy Companies at?

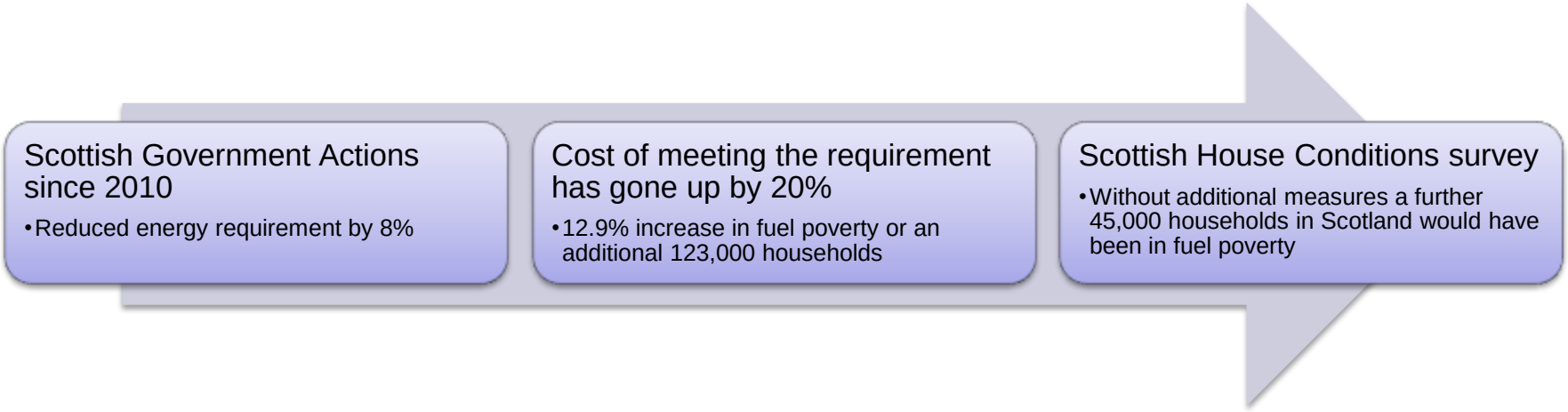


Energy Companies to deliver 100% of all obligations by end of March 2015

Progress report on Scottish Fuel Poverty, Dec 2014

- £300M invested in energy efficiency since 2009. Over a third of all Scottish homes now have an EPC rating of B and C or better.
- Introduced the home energy efficiency programme for Scotland (HEEPS) on the recommendation of the Scottish Fuel Poverty Forum.
- Introduced the new Energy Efficiency Standard for Social Housing (EESSH). Achievement of EESSH by social landlords will mean that approximately 600,000 social houses will be either an EPC band C or D by 2020. Estimated savings for tenants of around £210 per year on their energy bills.
- Consultation with stakeholders on any future standards from Spring 2015.
- highlights the work Scottish local authorities have undertaken working with government as key delivery partners for a number of fuel poverty programmes.
- local authorities play a much wider role in helping to tackle fuel poverty.

Scottish Fuel poverty outcomes



- Scottish Government does not have control over all levers in terms of prices, ECO and Warm Homes Discount.
- Smith Commission recommends that new powers be devolved to the Scottish parliament in areas affecting fuel poverty

An end to cold homes – Labour's Green paper on energy efficiency

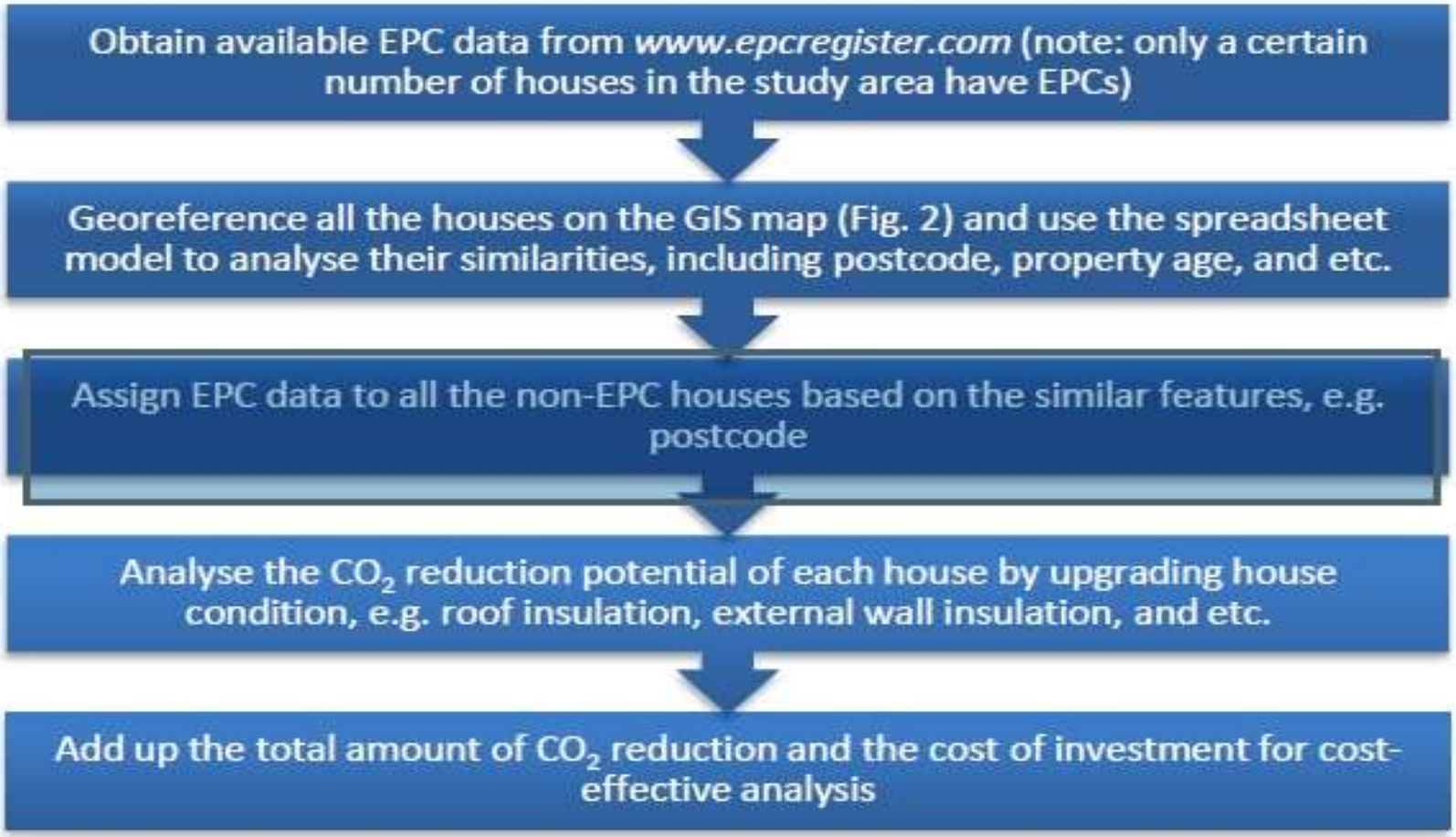
- Targeted support for households in or at risk of fuel poverty.
- Delivered street-by-street and led by local authorities and other trusted bodies.
- A whole house approach.
- Leadership through the public sector
- Energy efficiency – a national infrastructure priority
- Pay-As-You-Save – Interest free loans for energy efficiency for up to 1 million homes over the course of the next Parliament.
- Free personalised home energy reports

2. LOCAL AUTHORITY RETROFIT – USING DATA TO SUPPORT AN EVIDENCED BASED APPROACH

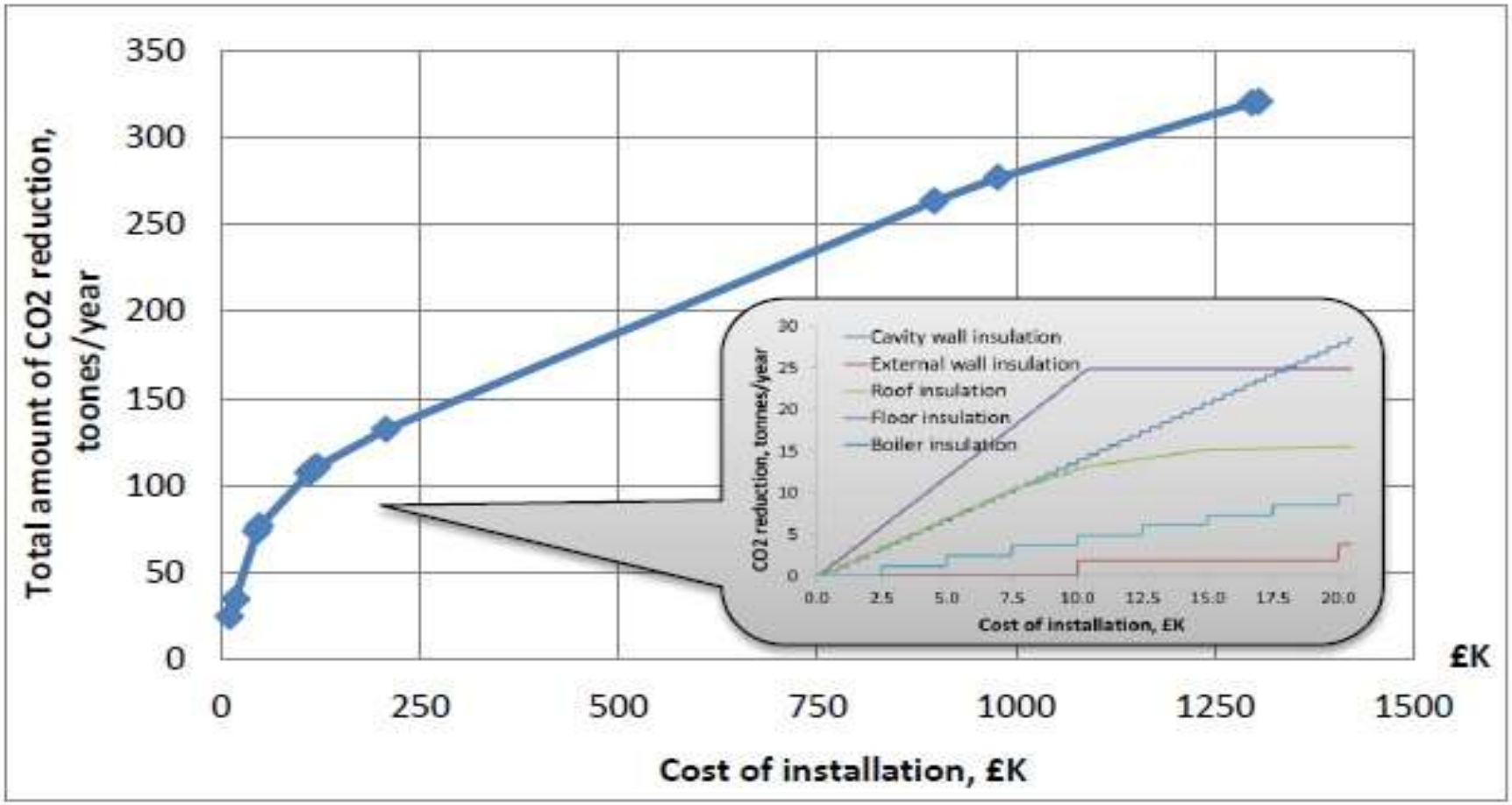
- Poorly Heated Homes In Local Authority Ownership
- “Single Skinned” Properties Targeted In Policy Terms
- Evaluation Of Costs And Benefits By The Energy & Climate Change Division
- Aim To Provide Scientific Base To Assist Decision Making

The Cost Of Retrofit

The Cost Of Retrofit - approach



The Cost of Retrofit

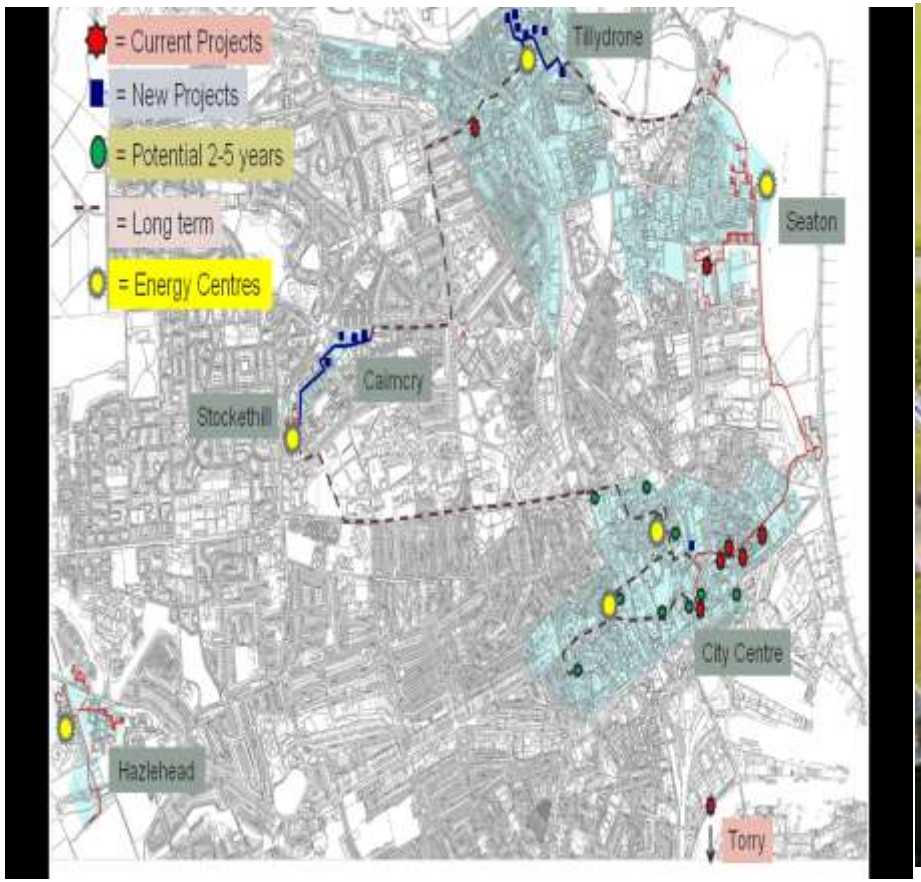


The benefits of Retrofit

Measures	Number of houses available for refurb.	Cost per house, £ / house	CO_2 reduction per house, kg / year	Energy cost saving per house, £/year	Pay-back period
Floor insulation	104	100	240	50	2.0
Roof insulation (from no roof insulation)	29	250	350	70	3.6
Roof insulation (from roof insulation less than 100mm)	12	250	250	50	5.0
Roof insulation (from roof insulation less than 200mm)	18	250	110	22	11.4
Cavity wall insulation	69	400	560	110	3.6
Upgrade boiler (from band G boiler)	25	2500	1220	300	8.3
Upgrade boiler (from band F boiler)	2	2500	810	200	12.5
Upgrade boiler (from band E boiler)	35	2500	610	150	16.7
Upgrade boiler (from band D boiler)	32	2500	420	105	23.8
External wall insulation (from no wall insulation)	69	10000	1900	385	26.0
External wall insulation (from cavity insulated walls)	32	10000	1340	275	36.4

3. DISTRICT HEAT

Aberdeen Heat and Power



Aberdeen Heat & Power

Aberdeen Heat and Power cont.

Mission – To deliver clean affordable energy

Values – AH&P value providing affordable energy with low environmental impacts that delivers socio-economic benefits to the citizens of Aberdeen

Vision – AH&P will be a committed proactive organisation, and will be a leading example to communities in Scotland and the UK, delivering decentralised sustainable and affordable energy.

Aberdeen Heat and Power cont.

- Set up by the City Council in 2002 as an arms-length not-for profit company limited by guarantee.
- ACC undertook an energy appraisal of its housing stock which concluded that multistorey blocks (59 in the city) were the least energy efficient and most expensive to heat.
- The company are able to provide affordable, reliable heating and reduced carbon emissions as the district heating replaced inefficient, expensive electric heating with natural gas fired CHP district heating.
- In most cases, the heating bills have reduced by an average of 30% while the carbon emissions have reduced by 40%.
- Over 2,100 flats have now been connected to district heating and more are being connected every week. Alongside these households, several Council buildings such as offices, schools, swimming pools and leisure centres have been connected.

3. STOCKTON-ON-TEES – EXTERNAL ISULATION PROGRAMME

Background

- Set up by the Council in 2011 to improve the energy efficiency of older solid wall private housing.
- 1000 homes in Parkfield and Town Centre Wards benefitting from £3.85m investment.
- Funded by CESP up to 2012 which is normally targeted at social housing providers.
- Now 2500 houses now retrofitted under CESP and ECO.
- Through a local delivery partner GoWarm, part of the Community Energy Solutions CIC group.
- package of measures is offered to qualifying households, including external wall insulation, cavity wall insulation, new heating systems, boiler replacements, heating controls, energy efficiency and benefits advice.

Community Energy Savings Programme (CESP)

- 1670 private homes in Stockton benefited from external wall insulation with boiler upgrades and loft insulation if needed
- Largest private sector CESP scheme in the country
- £9m private sector investment
- 300 jobs created

Stockton's Experience

- The operational benefits of an area-based approach to delivering energy efficiency schemes;
- The wider benefits which can be derived from area-based energy efficiency schemes;
- The benefits of close local authority involvement in energy efficiency schemes;
- The importance of strong political leadership;
- The importance of good data on the local housing stock and population in developing schemes;
- The challenges of delivering intensive energy efficiency improvements in private housing, and how they can be overcome.

The Challenges

- Liaising with almost 1,700 different households
- Dealing with the variety in the building stock
- Weather related problems
- Building control
- Working in the private sector
- Maintaining quality

The Interim Findings

Key Conclusions:-

- Many (two-thirds) homes are undoubtedly thought to be warmer;
- Other largest impact seems to be a ‘pick-up factor’ from getting something done;
- Improvement perceived by visitors;
- Some real savings on energy usage and costs;
- Some evidence of improvement in child performance, attendance and behavior.

Before

After

Outcomes

- £20m of Energy Company Investment.
- Reduction in fuel poverty.
- Made 300,000+ tonnes of lifetime domestic carbon savings.
- Improved local environment and pride of residents in their areas.
- Changes to ECO have impacted on programmes.

Short film:

https://www.youtube.com/watch?v=86Shtg-lUV4

4. RENEWABLE ENERGY POTENTIAL

Domestic properties main potential

- Solar PV and solar thermal
  - Roof based Solar PV
  - Ground mount solar PV
- Heat pumps – Air, ground and water source.
- CHP and district heating.
- Biomass.

Wrexham County Borough Council Roof based solar PV project

- Largest Social Housing Solar PV scheme in Europe
- 2700+ properties retrofitted with PV
- Scheme delivered within 9 months – FIT uncertainty
- Generating a long term sustainable income stream
- Tackling Fuel Poverty
- Creating Jobs
- Reducing CO2 emissions

Wrexham – Financial returns

Activity	Cost/Rate	Comment
Project delivery	£12.5m	All legal, technical, supply, design, connection and install costs
Capital reserve	£3m	To pump prime
Borrowing	£9.5m	
Annual finance/maintenance costs	£750,000	Includes all ongoing project overheads
Interest Rate	5%	Council consolidated interest rate
Repayment period	25 years	In line with FIT
Annual Gross Income	£1.3m	Estimated
Annual net Income	£550k	Average amount to be re-invested
Total Gross Income	£32.5m	Over 25 years
Total Net Income	£13.75m	

Financial benefits of Roof PV: business case – residential roof illustration

NB: year 1 below is first full year of operation

PV Assessment		
ITEM	UNIT	VALUE
No. of Houses	No.	1
Solar Irradiation	Hours	1020
Total Plant Size (4kW each)	kW	4
Total Yr. 1 Energy Yield	kWh	3,468
Total CapEx	£	5,400
O&M Cost p.a.	£	65

PV Assessment		
ITEM	UNIT	VALUE
Yr. 1 Resident Free Energy @ £10.00 / MWh: 70% consumed	£	242
Yr. 1 FIT @ £12.94 / MWh	£	448
Yr. 1 Export @ £4.77/ MWh: 30% export	£	49
Yr. 1 Total Income (FIT + Export)	£	497
Yr. 1 Income Nett (minus O&M)	£	432

Financial benefits of Roof PV: Business case example – residential roof - housing

PV Assessment		
ITEM	UNIT	VALUE
No. of Houses	No.	100
Solar Irradiation	Hours	1020
Total Plant Size (4kW each)	kW	400
Total Yr 1 Energy Yield	kWh	346,800
Total CapEx	£	540,000
O&M Cost p.a.	£	5,787
Lifetime CO2 avoided	ton / yr	3,752

PV Assessment		
ITEM	UNIT	VALUE
Lifetime Total Income (FIT + Export)	£	1,035,986
Finance Costs (20yr term, 4.4%)	£	788,394
Lifetime Operating Costs	£	115,743
NET POSITION (+/-) Assumes all income due to HA	£	131,849

NB: the Net position shown here, does NOT include the energy generated and given / sold to the tenant

(assumed to be free, hence not include)

5. BUILDING COMMUNITY ENGAGEMENT IN RENEWABLE ENERGY

Direction of travel

- Smart cities and smart communities.
- Empowered communities and individuals making informed choices.
- Democratising energy.
- Leadership role of local authorities.
- Municipal/distributed energy networks.
- Local generation, distribution and supply.

OVO Community energy partnerships

apse energy

OVO Energy announced its second ‘OVO Communities’ partnership, with Community Energy South, as part of its ground-breaking plan to democratise the energy market. The news follows just one month after OVO revealed plans for its first partnership with Plymouth Energy Community.

“We are planning to form OVO Energy’s first ‘Ovo Communities’ partnership. OVO Communities is an ‘out of the box’ solution for communities which want to cut out the middle man and become an energy company themselves – from supply and generation, to smart technology and energy efficiency. Once the partnership is confirmed, we will be able to offer the people of Plymouth the opportunity to buy energy from us, ensuring that we have tariffs that best suit our city.”

Plymouth Energy Community

‘Our Power’ – Community Energy in Scotland

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INSIDE HOUSING

Raised voices
Why has housing fallen out of the top 10 most important issues for voters?
See pages 12 and 16

Eco heroes
We showcase the Sustainable Housing Awards 2014 winners
See page 33

Landlords set to give power to the people

Sustainability Scottish social landlords on brink of founding energy company for tenants

Whose manifesto is the greenest? See page 25


THE INDEPENDENT MONDAY 17 NOVEMBER 2014

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Power to the people: a revolution in Britain’s energy market

Councils and social housing landlords unite to challenge dominance of Big Six

www.apse.org.uk

Conclusions

- Poverty is a scar on a modern economy and society.
- Millions in fuel poverty making choices between heating and eating.
- Impacts on health and education outcomes – costs to the public purse.
- Local authorities and housing associations demonstrably the best delivery agents for energy efficiency measures and renewable energy projects.
- Area based schemes work.
- Whole house measures have greatest impact.
- **General Election 2015 – Watch this space?**

6. JOIN THE ENERGY REVOLUTION

Aims

- People
- Poverty
- Pounds

Services offered

- **Advocacy and brokerage**
  - Government
  - Energy industry
  - Partnerships
- **Capacity**
  - Strategic advice
  - Feasibility
  - Time banking arrangements
- **Knowledge**
  - Resource portal
  - Technical and policy updates
  - Free legal helpline
- **Learning**
  - Practical workshops
  - Round tables
  - Secure networking
  - Conferences and seminars

Members of APSE Energy

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2. Barnsley Metropolitan Borough Council
3. Bradford City Council
4. Bridgend County Borough Council
5. Buckinghamshire County Council
6. Cardiff City Council
7. City of Edinburgh Council
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30. Preston City Council
31. Reading Borough Council
32. Sefton Metropolitan Borough Council
33 Stevenage Borough Council
34. Southampton City Council
35. South Lanarkshire Council
36. Stockton-On-Tees Borough Council
37. Swansea City and County Council
38. Wakefield Metropolitan District Council
39. Warwickshire County Council
40. Wolverhampton City Council
41. York City Council

APSE Energy – The Big Energy Summit

Programme: day one

12.00pm Delegate registration and buffet lunch

12.30pm Welcome by the principal Summit partner Angus McDonald, Managing Director, British Solar Renewables and networking lunch

1.00pm **Municipal Energy – The emerging policy environment**

Chair: Paul O'Brien, Chief Executive, APSE

Speakers:
- Direction of travel for Government policy – Dr. John Sartin, Head of Strategic Projects, Energy Efficiency Deployment Office, DECC
- Devolution and the local energy agenda – Ian Stephenson, Chief Executive, Derbyshire County Council
- Growing the Renewable Energy Economy – Nina Skorupska, Chief Executive, Renewable Energy Association
- Distributing Power: A transition to a civic energy future – Dr. Stephen Hall, Research Fellow, University of Leeds
- What can we learn from Europe? – Hugh Ellis or Diane Smith, TCHA SPECIAL Project

3.00p.m Tea/coffee break

3.30pm **Municipal Energy – Generation, distribution and supply**

Chair: Councillor Ramsay Milne, Aberdeen City Council

Speakers:
- Challenges, constraints and opportunities – Steve Cinnt, APSE Energy Lead Consultant
- Delivering local authority projects – John Harrison, Corporate Director of Resources, Peterborough City Council
- Setting up a Municipal Energy Company – Andy Vaughan, Strategic Director, Commercial and Neighbourhood Services and Gail Scholes, Head of Energy Services, Nottingham City Council
- Establishing local authority ESCOs: legal powers and structures – David Kilduff, Senior Partner, Walker Morris LLP

5.00p.m Comfort break

5.15pm **Strategic forums**

(a) Generating Heat
Opportunities for renewable heat – DECC HNDU; Colin Rowland, Southampton City Council; Steve Luker, APSE Energy Consultant.

(b) Retail and supply
Steve Cinnt, APSE Energy; Dawn Muspratt, Renewable Power Exchange; Dr. Richard Williams, Southampton University

(c) Communities and energy
Ruth Binny, Local Partnerships Manager, DECC; John Harrison/Cllr. Gavin Elsey, Peterborough City Council; Louise Marie Evans, Quantum Strategy and Technology Ltd

Evening programme

7.30pm Pre-dinner drinks

8.00pm Dinner followed by **special guest speaker Dave Anderson, Vice President of Business Development, Ameresco.** Dave will discuss experiences from the United States of America in developing municipal scale energy management systems.

Programme: day two

Networking Breakfast

9.30am **Strategic Forums**

(a) Overcoming grid issue and the potential for electricity storage
British Solar Renewables, Marc Wyn, Grid specialist, Dr. Jacky Lawrence, Warwickshire CC, Ray Noble, APSE Energy Consultant

(b) Bankable projects: Financing energy schemes
Summit Partner; Bill Kirkup CAG Consultants, David Kilduff, Walker Morris LLP; Chris Garside, SOCL;

(c) Energy Efficiency and local authorities
Energy Managers Association (invited); Dr Steven Fawkes EnergyPro Ltd. Andrew Herbert, Yorkshire Energy Services

10.30am Tea/coffee break

11.00am **Municipal Energy – Delivering the vision**

Chair: Councillor Robert Boswell, Preston City Council

Speakers:
- Next steps for the energy collaboration – Mark Bramah, Director of APSE Energy
- From vision to action – Mick Lovatt, Corporate Director of Environment, Preston City Council
- Angus McDonald, Managing Director, British Solar Renewables to close

12.30pm Networking lunch

1.30pm Depart

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