SUSTAINABLE ENERGY ASSOCIATION

Sustainable Energy Association

Manifesto 2015

Policy measures for **low carbon**, **affordable** and **secure energy** in the UK, using our buildings.

www.sustainableenergyassociation.com

The Rt Hon David Cameron MP

Prime Minister

"I applaud the launch of the Sustainable Energy Association and its plans to promote energy saving solutions in the UK. The Association's mission – to develop cost effective and innovative ways for people and communities to reduce energy consumption – is a welcome contribution to our long-term economic plan. It will help families secure lower fuel bills, improve the UK's energy security and reduce the UK's emissions. This comes with my very best wishes for the Association's future success."

Contents

Foreword

As we approach the next General Election, the public and political spotlight on energy issues has never been brighter. Rising household energy bills are of increasing concern to consumers; with frequent references in the media and Parliament bringing them into even sharper focus. Political positions on energy are increasingly polarised, and we are now a long way from the strong consensus of 2008, a year that saw the United Kingdom's world-first Climate Change Act become law.

While political consensus on energy policy breaks down, scientific consensus on climate change continues to solidify,[i] with notable recent shifts in polling data[ii] towards a positive view of policy that prioritises the deployment of low carbon or demand reduction energy solutions, particularly after the winter's widespread flooding.

Outside of climate change, global energy demand and security of supply are also an increasing risk for the UK, with some predicting a global rise in energy demand of one third by 2035, whilst two thirds of the economic potential for energy efficiency at this time will remain untapped.[iii]

The focus of the UK's political debate has emphasised energy prices, rather than energy costs, yet it is really costs that are at the heart of consumer concerns. Cost is driven very strongly by the amount of energy used as well as the price at which it is sold, and we call on all political parties to recognise this with strong and specific policy commitments in their forthcoming General Election Manifestos.

At the heart of a new cross-party consensus needs to be a strong recognition that energy measures in buildings are cheaper.[iv] In fact, in this Manifesto we set out how using the Government's own "Pathways" calculator.[v]

By placing buildings at the heart of delivering all our energy policy goals, making them efficient, and using them to produce energy directly through low carbon and renewable sources, we will deliver more affordable, secure and low carbon energy for the UK. This will cost the economy around £12bn per annum less than the Government's current plan. This is equivalent to a £189 saving per year, every year, for every UK citizen[vi].

Technology manufacturers, installers, merchants, financiers and engineers; all have mobilised to identify how we can deliver an ambitious and affordable energy future for the UK. This Manifesto is our appeal to all the main political parties to come with us and build new consensus on energy policy, with buildings at its heart.

Bill Rumble
CCO, Mark Group
Chairman of the
Executive Committee

Dave Sowden
Chief Executive

MITSUBISHI ELECTRIC
LIVING ENVIRONMENTAL SYSTEMS

Mitsubishi Electric: Heating via the River Thames for Urban Development

An eco-friendly housing development in London is getting the energy directly from the Thames using a heat pump system which harvests energy from the river. The system was formally switched on by the Rt Hon Edward Davey MP, Secretary of State for Energy and Climate Change in October 2013. It is hoped that the model could be replicated in many towns and cities.

The Development

Kingston Heights is a £70 million development which has been created by NHP Leisure Developments on the site of a former power station right in Kingston upon Thames. One third of the river-sides 137 flats are affordable housing. Christopher White Associates were the consulting engineers for the project.

The Heat Pump

The community heating scheme can draw up to 13 million litres of water from the Thames each day; roughly equivalent to five Olympic-sized swimming pools. It uses Ecodan heat pump technology to upgrade heat from the Thames water and deliver it to the apartments via 200m of underground piping; the system generates approximately 2.3 MW of heat output. A state-of-the-art filtration system has been installed to ensure that no marine life can enter the system, and river taken from the Thames is returned untreated.

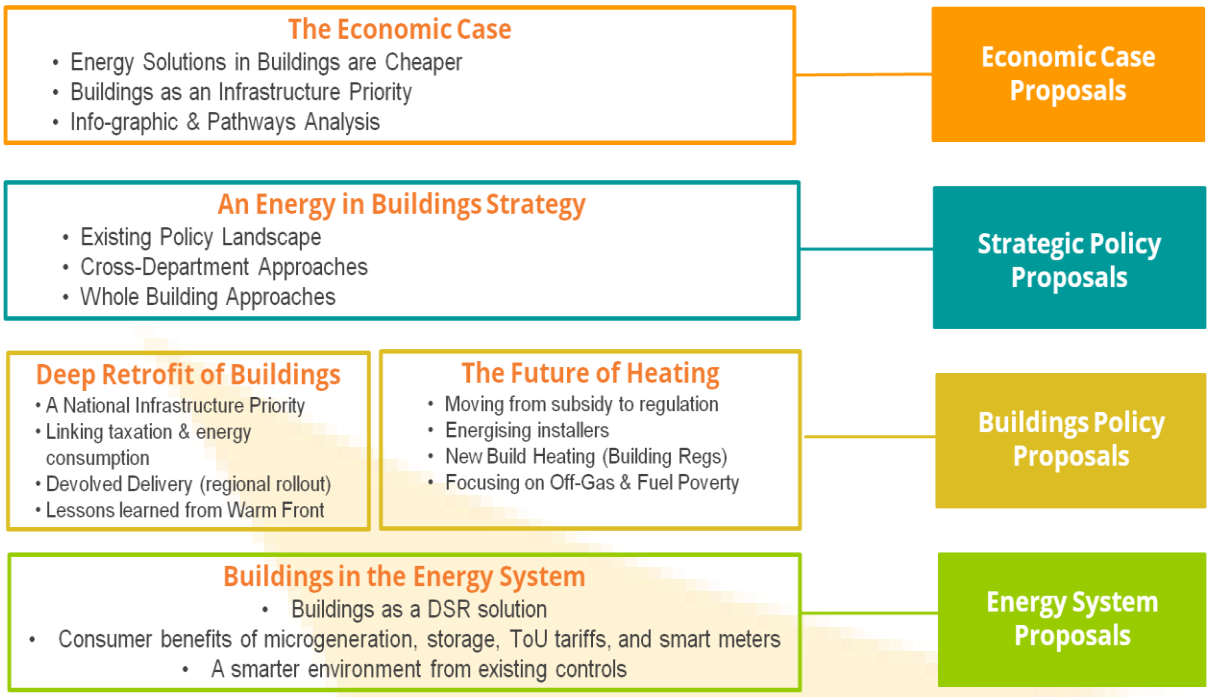
Next Steps

Towards the end of 2014, the construction of a new 142-bedroom hotel will also be completed at the site. The Doubletree by Hilton hotel will derive its heating, hot water, and cooling, from the heat pump installation. Heat recovered from cooling hotel rooms will be reclaimed and returned to the system.

“This system will be capable of producing over two megawatts of thermal energy for this development and will provide it 24/7, 365 days a year, even in the depths of winter”

Mike-Spenser Morris, MD of NHP Leisure Developments.

Our Proposals



The Coalition Government Agreement in 2010 laid out an ambitious set of energy policy priorities.[vii] Our proposals for the next Government recognise what has been achieved, and build on the work done by policymakers and industry so far. Though high-level, we believe they offer the basis of a blue-print for the demand-side of the UK energy sector. Here, we summarise our key "asks" for Government.

In this Manifesto, we have broken down our proposals into chapters. Each chapter deals with a separate set of proposals. Firstly we recommend that the Government firstly changes its views on the economic case for investment in the demand side of energy and sets an overall strategy to enable Government Departments to drive forward and monitor change. Thereafter, we propose several key individual policy changes and new interventions for both energy efficiency and energy production in buildings. Finally, we have made some suggestions about how buildings should be understood by Government to be part of the wider energy system.

What is missing from Government policy is an overarching plan for energy solutions in buildings which stretches across Government Departments and individual policies. Crucially, this failure to look at buildings holistically, consider their role in the wider energy system, and develop effective monitoring and feedback loops means that opportunities are being missed to cost-effectively and imaginatively deliver change to the benefit of UK consumers.

What has been achieved?

Policy Development

- ✓ Introduced the Renewable Heat Incentive (RHI) and the Feed in Tariff (FIT)
- ✓ History of energy efficiency schemes: Carbon Emissions Reduction Target (CERT), Community Energy Saving Programme (CESP), Green Deal and the Energy Company Obligation (ECO)
- ✓ Setting a Zero Carbon trajectory into the Building Regulations
- ✓ Preserving the Planning and Energy Act
- ✓ Introduced Community Energy Strategy
- ✓ Smart Metering rollout listed as a National Infrastructure priority[viii]
- ✓ Formed and capitalised the Green Investment Bank (GIB)

Deployment:

3.8m

insulated lofts

2.0 million cavity walls

58,000 solid walls **since 2008**

...with estimated **$C0_2$ savings of 15 $MtCO_2$**[ix]

903MW renewable heating to May 2014[x]

2.5 GW of solar since 2010[xi] on **500,000 homes**

19.7 $MtCO_2$ savings from the Domestic RHI (1.0 MtCO2 2013-17)[xii]

2.1-3.2 $MtCO_2$ savings

From Non-Domestic RHI (between 2013-17[xiii])

53m smart meters by 2020[xiv]

2000 district heating installations

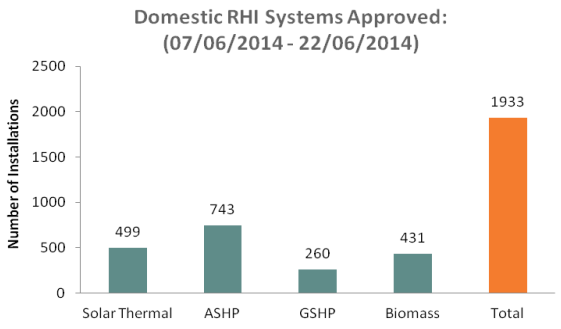
serving approximately **327,000**

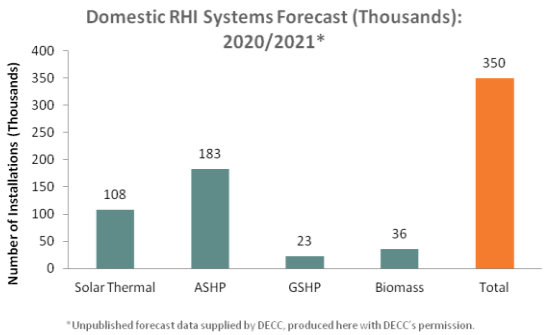
buildings[xv]

Deployment Scenarios for Demand Side Technologies

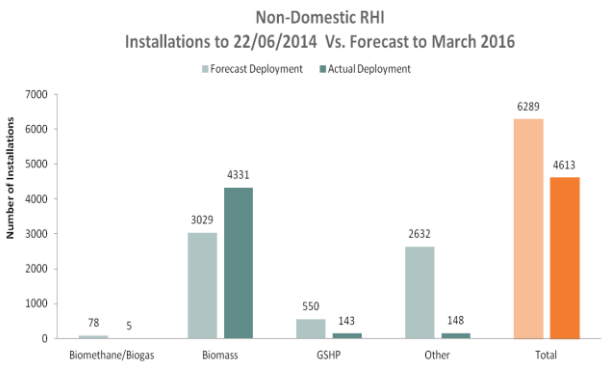
The graphs on this page illustrate the progress made in deployment of technologies to date for some key policies, compared to the Government's own projections and ambitions. They are a useful reminder of the good work being carried out every day by the energy in buildings sector, and of how much there remains still to be done.

Domestic RHI[xvi]

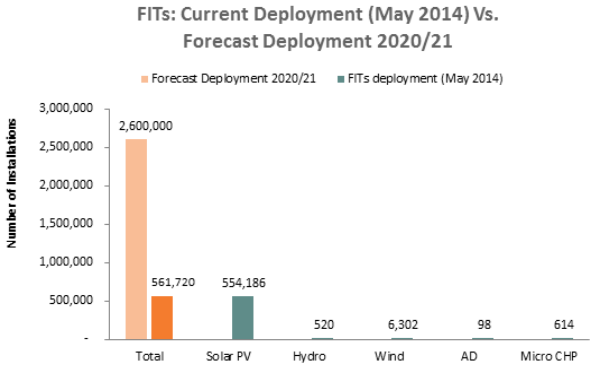




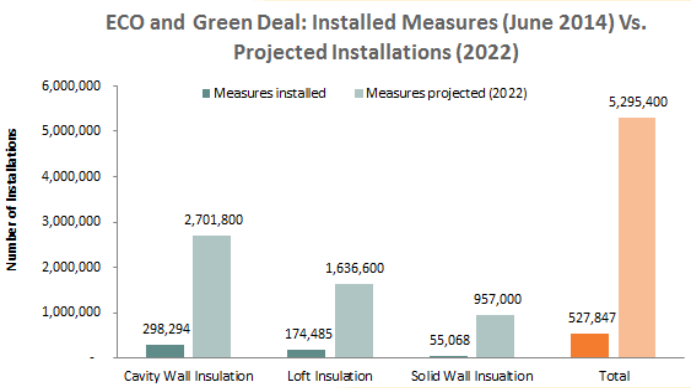
Non Domestic RHI[xvii]



FITS[xviii]



GREEN DEAL AND ECO[xix]



Why Our Proposals Matter:

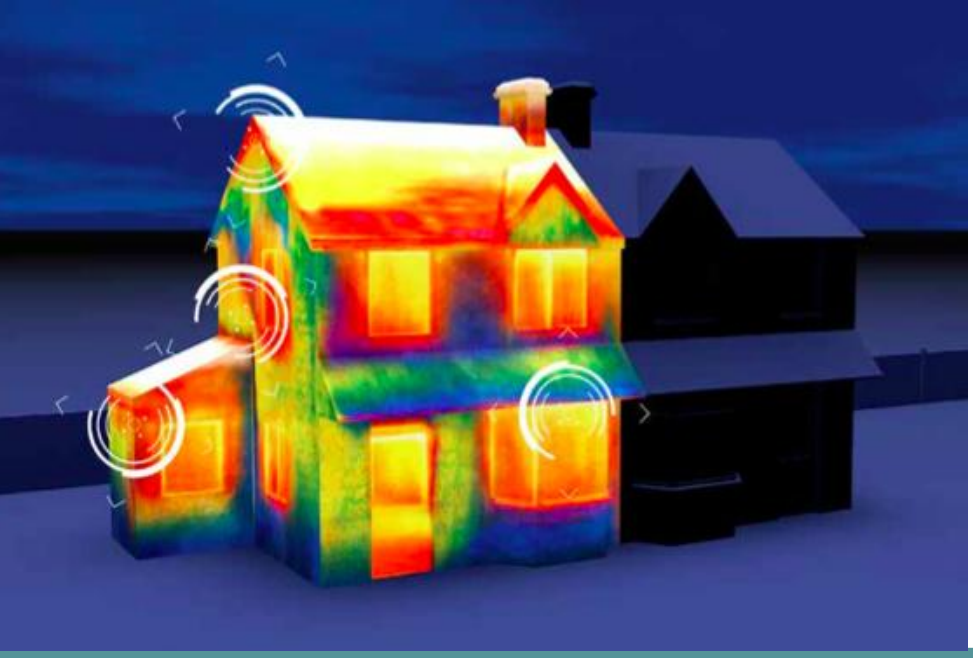
Recognise building level energy solutions as a policy priority. The Economic Case suggests that energy solutions in buildings are some of the most cost effective methods of reducing the amount of carbon that is emitted and using resources efficiently; modelling suggests that prioritising these solutions would save the Government over £12billion per annum compared with current preferred options.

Introduce an "Energy in Buildings Strategy" which combines Microgeneration, Energy Efficiency, and Heat Strategy. Government policy is missing a joined-up strategic approach to energy in buildings, which is reflected in the overlap between the existing strategies. The Energy in Buildings Strategy would also encourage: cross-Departmental working; long-term policy planning; managed transitions from current policies to new mechanisms; and continuous feedback loops to industry.

Plan for the Future of Heating. The world-first RHI policy has been well received. It is crucial that the RHI and the DECC Heat Networks Delivery Unit be protected at the next Spending Review; however the Government should consider regulation rather than subsidy as the mechanism to drive the future retrofit of low carbon, efficient and renewable heat. In the new build sector, the "zero carbon" trajectories should be adhered to or EU renewables and CO_2 targets will be at risk. Heating policy success also depends on Government understanding the market: energising installers and indentifying the needs of consumer groups such as the fuel poor is crucial.

The approach to retrofitting the UK's building stock has been piecemeal. The age and quality of the UK's building stock is a key contributor to our high rates of fuel poverty relative to EU countries.[xx] A step-change is needed in investment in building retrofit. It must become a National Infrastructure Priority, with the costs and benefits of mass intervention according to Treasury Green Book principles modelled, leveraging Green Investment Bank funding. However, when it comes to on the ground delivery of any measures, a one-size fits all approach will not work; in particular, central Government must keep oversight of the administration of any scheme. It is noted, however, that regional approaches could have merit as part of a centrally-operated strategy, particularly for complex measures or projects.

Buildings are a key component of a smarter, integrated energy system. Demand-side measures can help to solve grid-level issues such as a capacity crunch through participation in demand side response, aggregated generation, or potential load-shifting. In addition, the benefits for consumer bills of allowing flexible tariffs to be employed with microgeneration technologies installed into efficient buildings are considerable. In addition, by using existing building level technologies, and prioritising the development of "transition technologies" Government does not have to reinvent the wheel to deliver innovative and smart solutions for the future grid.



Knauf Heat Bleed Consumer Marketing Campaign & PLUG tool

Background

Driving consumer engagement and behavior change in the retrofit sector has historically presented a challenge. Knauf Insulation's "Heat Bleed" Campaign was trialled as a pilot in 2014 in the North West of England, across a variety of marketing channels including online media, in-store kiosks, a 2 week TV advertising campaign, and direct marketing.

Their aim was to drive traffic to www.stopheatbleed.co.uk where homeowners could enter their postcode to obtain a "Heat Bleed" calculation for their property, using the "PLUG" calculator tool, with a further opportunity to book a free in-home assessment with one of Knauf's supply chain partners.

About Heat Bleed

Heat Bleed repositioned messaging to consumers as a conversation about avoiding the loss of energy in the present, rather than framing the debate in terms of comfort gains or savings made on bills in the future.

"Your home could be losing you up to £600 a year to Heat Bleed"

The PLUG tool is a simple online assessment tool which is able to calculate energy losses for 27million UK homes in less than 5 seconds, using the consumer's postcode and a calculation methodology drawing on RdSAP.

The Heat Bleed campaign increased consumer awareness of the potential of energy efficiency, converted this awareness into personal interest with use of the PLUG calculator, and even caused some consumers to ask for contact with an installer or assessor. Overall, there were 11,852 visits to www.stopheatbleed.co.uk in 3 months, 4950 uses of the PLUG tool, and 873 requests for action.

The Economic Case

Since the 2008 financial crash, the conversation around policies which are perceived to be "green" has changed; polling shows that public support for policy intervention depends on "value for money". The Sustainable Energy Association (SEA), alongside many of our colleagues in industry, believes that economic case alone justifies a set of policy initiatives which prioritise Government investment into energy solutions in buildings. We further believe that the benefits of investing in buildings, and then integrating these buildings together, far outweigh the cost of investment.

If value for money is central to Government policy decisions, then Government must either offer more support to demand-side technologies or justify their exclusion. The SEA Infographic analysis (see overleaf) which uses the Government's own numbers shows that energy solutions in buildings can be as cost effective as large scale solutions. The Government must invest in large scale infrastructure, but buildings could also improve energy security, reduce carbon, and cut consumer bills- and they stack up in terms of value for money.

Investments in more efficient, low carbon and renewable technologies in buildings should be modelled according to the principles of the Treasury's Green Book. The full benefits of policies to future-proof UK buildings are not understood. The most recent Impact Assessment for the Building Regulations, for instance, did not consider the savings that consumers would make from living in more efficient homes as part of its costs/benefits analysis;[xxi] policy that offered a clear net benefit to the UK economy was listed as a deficit. Recent research from the Institute of Public Policy Research (IPPR) demonstrated that the extent of the social benefits of investing in the retrofit of insulation had also been overlooked.[xxii]

A large-scale investment in the retrofit of the UK's building stock should be treated as a National Infrastructure project. The SEA has worked on retrofit policy across several Government administrations on schemes such as CERT or ECO. While significant numbers of measures have been installed, the inconsistent nature of policy means that challenges presented by our building stock still remain. The National Infrastructure Strategy lists investment in buildings as a possible infrastructure priority,[xxiii] and the SEA is part of an industry coalition calling for this to be Government's preferred approach to financing building improvements, targeting 1m deep retrofits each year by 2020.[xxiv] We will report our modelling of this proposition, according to the Treasury's Green Book principles, later in 2014.

The Government's Pathway to CO_2 reduction can be achieved at less cost with more demand side technologies in the mix. Using the Department of Energy and Climate Change (DECC) Pathways calculator, we can show that energy security and 80% CO_2 reduction can be achieved by less reliance on large scale generation and greater reliance on demand side and small-scale measures; our analysis showed greater energy security and billions of pounds of additional savings for the UK. We present some of this analysis on the pages overleaf.

CLEAN ENERGY MEASURES IN BUILDINGS ARE CHEAPER

Low carbon or renewable production from energy efficient buildings is a cheaper way to meet our energy needs

SUSTAINABLE ENERGY ASSOCIATION

Energy saving measures

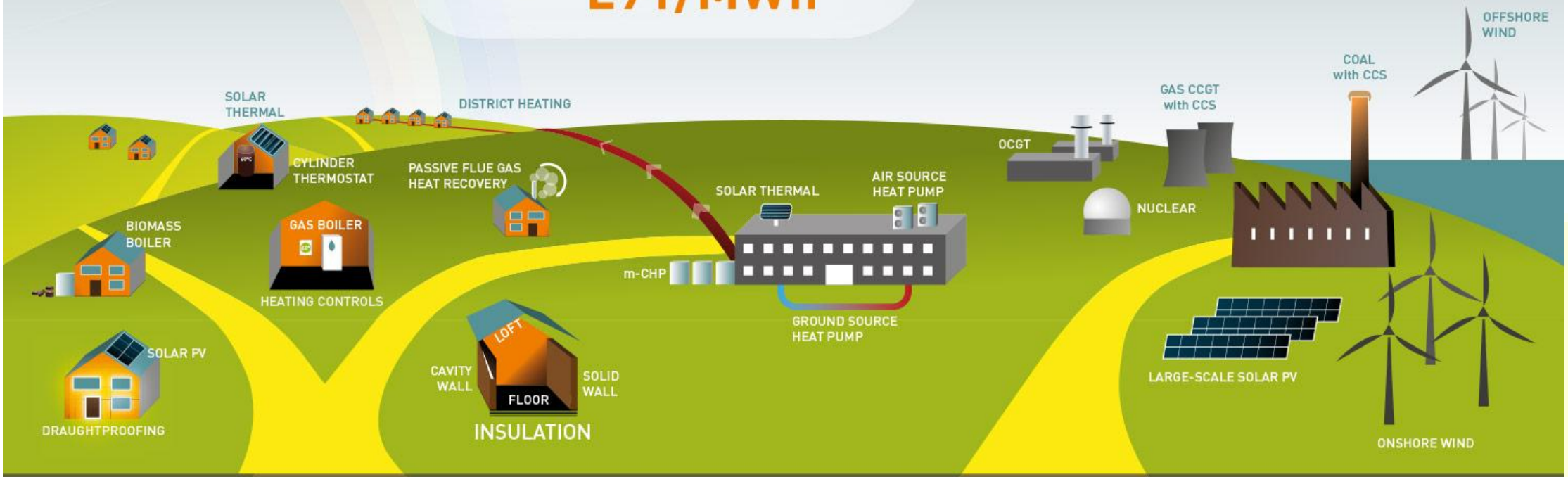
Average cost **-£9/MWh**

Low carbon and renewable production in buildings

Average cost **£91/MWh**

Large-scale power generation

Average cost **£108/MWh**



Join the SEA in promoting an affordable, secure, low carbon energy future for the UK

Go to www.sustainableenergyassociation.com for more information

Energy Solutions in Buildings are Cheaper

Depicted on page 11 is a summarised merit order for the cost/savings per Megawatt hour (MWh) of a range of energy solutions. These can be captured in three broad groups: energy saving measures, low carbon and renewable production in buildings, and large-scale power generation. The analysis demonstrates that "demand-side" measures in buildings are a cheaper way of meeting our energy needs. We are not investing enough in these measures as policy makers generally look only to the supply side to meet our energy needs. It is unquestionable that large-scale power generation requires investment and attention. However, there is a huge opportunity for a step change in investment on the demand side. Doing this would mean warmer, more comfortable, more affordable homes and buildings and cleaner, more secure energy for the people and businesses of the United Kingdom.

Pathways to 2050: Building based solutions would achieve CO_2 reductions AND save over £12 billion per year compared to the Government's own preferred options

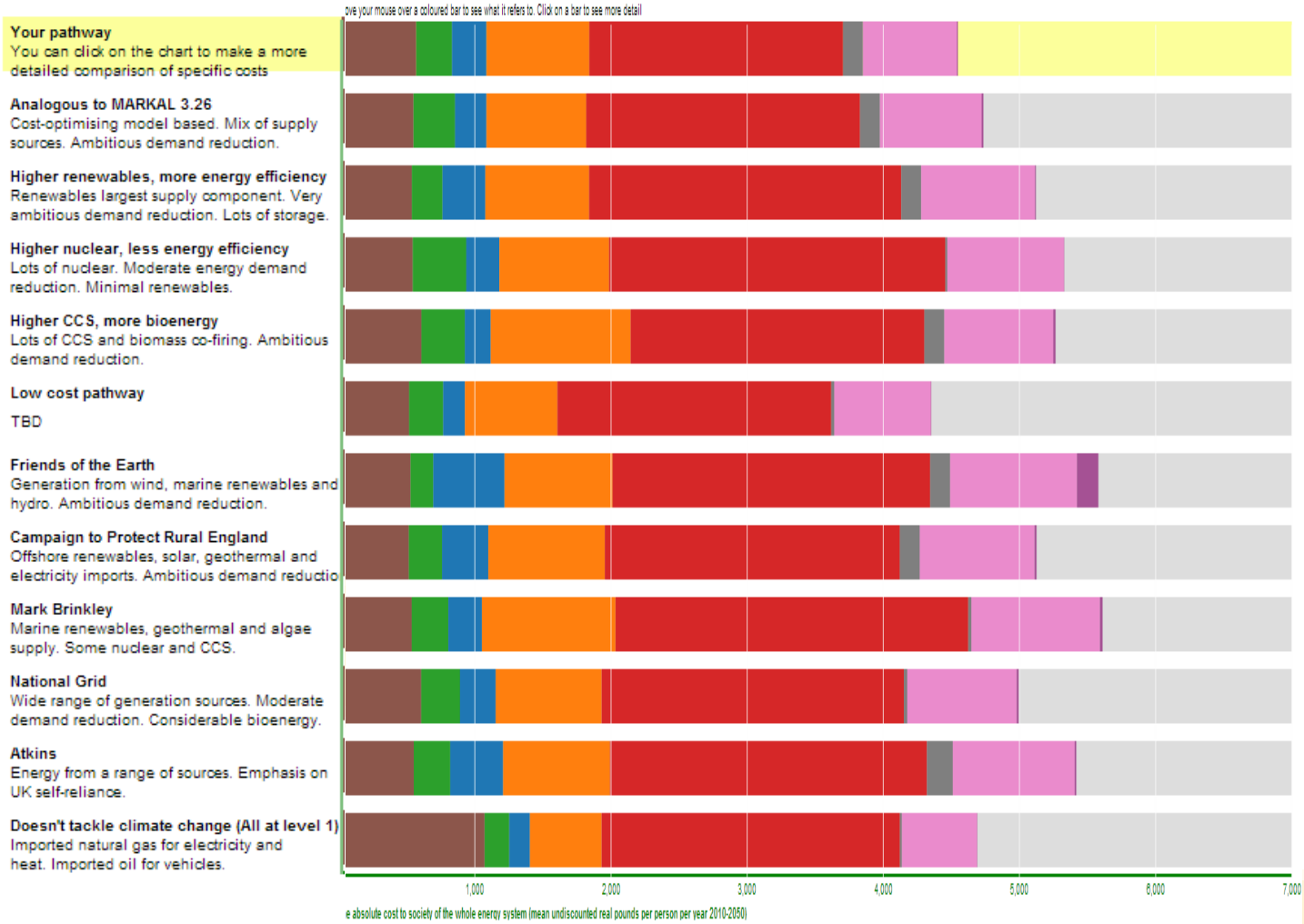
The Government has published four possible energy scenarios (or 'Pathways') to 2050. These Pathways demonstrate how to achieve energy security ('keep the lights on') and ensure that CO_2 emissions are reduced by 80% as required by law. Each Pathway contains a number of 'supply side measures' for electricity (i.e. large scale options for electricity production such as nuclear, fossil fuel-based power generation with carbon capture and storage, and large-scale renewables) and a number of "demand side" measures (i.e. how energy is used and saved such as home insulation, options for providing heat in buildings, including the relative importance of gas, electricity and renewables in the future heating mix). By altering the levels of activity for each of the demand side and supply side measures (i.e. how vigorously each measure is pursued) a 'Pathway to 2050' scenario is created.

This information is published on the DECC Calculator Tool website (referenced overleaf). The Calculator is a public tool, and various organisations, including the SEA, have been invited to consider and alter the levels of activity for the different demand and supply side measures and thereby produce their own Pathways to 2050. The SEA has produced several Pathways scenarios, all of which rely more on demand side than on large scale supply side measures.

Our Pathways

- ✓ Achieve 80% CO_2 reduction by 2050
- ✓ Ensure energy security
- ✓ Rely on less imported energy than the government pathways and so make energy security more likely
- ✓ Extensively utilise many building scale generation technologies
- ✓ Rely on less large scale generation (such as nuclear, wind and CCS) than the government pathways

Moreover, they save the country money. Our lead pathway entails £189 per capita of annual savings, amounting to an annual saving for UK PLC of £12.09 billion (assuming a population of 64 million).



This chart shows the cost to society of the various pathways currently on the DECC website. The top pathway entitled 'your pathway' is the SEA pathway that will be on the DECC website shortly. The next four pathways are the four government ones.

The length of the bars shows the total cost of each pathway broken down into sections and colour coded. Because the chart is replicated as a screen shot from the DECC pathways website we cannot replicate all the detail here but they can be found by clicking here or by following the URL replicated in the footnote below.[1] The SEA pathway has the shortest bar (apart from one non-credible pathway on which we comment below) and so the least cost. Indeed, it can be seen that the SEA pathway costs even less than not tackling climate change.

We do not consider the 'low cost' pathway to be credible as it entails UK industry declining and reducing output by 30%-40%.

So the SEA first choice pathway (we have others) is the most cost effective – it results in a £189 per capita annual saving. Over £12bn per year compared with the MARKAL projections (the Government's preferred pathway). The cost of all the Pathways is comprised of the following areas (represented by the different colours in the chart above). The full assumptions for the Pathway can be found on the DECC website.

KEY

- Fossil fuels *(buildings, transport & electricity gen & industry)*
- Bioenergy (*buildings, transport & electricity gen & industry)*
- Electricity
- Buildings
- Transport
- Industry
- Finance

[1] http://2050-calculator-tool.decc.gov.uk/pathways/e1c1gc11112211b113441121141143314441142123143114211 21/costs_compared_overview

Mark Group ECO House Project with the University of Nottingham

The Mark Group ECO House Project in partnership with the University of Nottingham showed that energy saving measures can work together to reduce energy bills, reduce carbon emissions and provide a more comfortable living environment. It also aimed to showcase how these measures might be used either individually or collectively to improve the energy efficiency of the UK's social housing stock and help tackle the rising issue of fuel poverty.

The project was a collaboration with the University's Creative Energy Homes Project, as one of the buildings on their "Green Close". This is a collection of test houses that have been constructed near the Department of Architecture and Built Environment. Each of the model "homes" is designed to showcase (to various degrees of flexibility and innovation) different aspects of modern new build construction and of the sustainable or renewable technologies installed in the properties. The Creative Energy Homes project aims to promote sustainable design by showcasing examples of affordable and efficient homes; it also aims to bring together academics, engineers and architects with leading industry partners.

The Mark Group ECO House Design

The key point about the Mark Group ECO house is that it mixes together multiple measures, from Solar PV to External Wall Insulation..

Monitoring

The University of Nottingham monitors the ECO House with multiple sensors. Their researchers collect data on the mains electricity, mains water, use of rain water harvesting, use of kitchen appliances, cooker, lights and sockets, use of the white goods such as the washing machine, use of the hot water, and the heating system. The monitoring also considers external and internal temperatures and humidity, personal infrared detectors (PIR) on the floors will monitor occupancy rates; carbon dioxide sensors will measure the heat recovery ventilation and window opening. It is hoped that this will provide extensive key data to drive future innovation and will provide a blueprint for energy-efficient future living.

Energy in Buildings Strategy

As part of its commitment to reduce emissions, tackle climate change and ensure energy security and efficiency in the UK, the Government has introduced three key strategies: a Heat Strategy, an Energy Efficiency Strategy and a Microgeneration Strategy. In addition, the Zero Carbon Homes policy for new build covers many of the same objectives. We believe that these could be combined into a single Energy in Buildings Strategy to ensure joined-up thinking and to send a clear signal about Government commitment to industry and investors.

Combine Energy Efficiency, Heat, Microgeneration, and Zero Carbon Homes Strategies for an Energy in Buildings Strategy. Such a Strategy would provide a simple mechanism to ensure cross-departmental co-operation and shared objectives to delivering low carbon buildings, a reduction in fuel bills and the eradication of fuel poverty. Creating a specific Government strategy would also send a clear message to industry that the Government both understands and is keen to promote demand side measures to meet the UK's energy, environmental, and social objectives.

Joined-up thinking in policy and across Government Departments. Whilst all four strategies differ by definition there are several easily identifiable, cross-cutting policy areas across all four. Furthermore, a common theme is the identification to barriers; there is potential for more collaborative work to identify and deal with these. It is also sensible to align the objectives of Government departments when policy intent can overlap. An example would be that a Department for Communities and Local Government (DCLG) decision on Building Regulations will impact the UK's future buildings - potentially storing up legacy issues which would eventually require the kind of subsidy for retrofit which is DECC's prerogative.

Whole-building approaches. Industry itself is moving away from single-measures and instead taking "whole building" approaches to installation in both retrofit and new-build markets. Government must ensure that policy matches the market. The strategy should include such measures for energy efficiency, on site production of heat and electricity, local generation of heat and electricity and the development of new technologies. The Energy Efficiency Strategy includes a diagram of "the 19th century house.... 21st century management".[xxv] This highlights the justification of integrating individual policies which deal with building-level technologies.

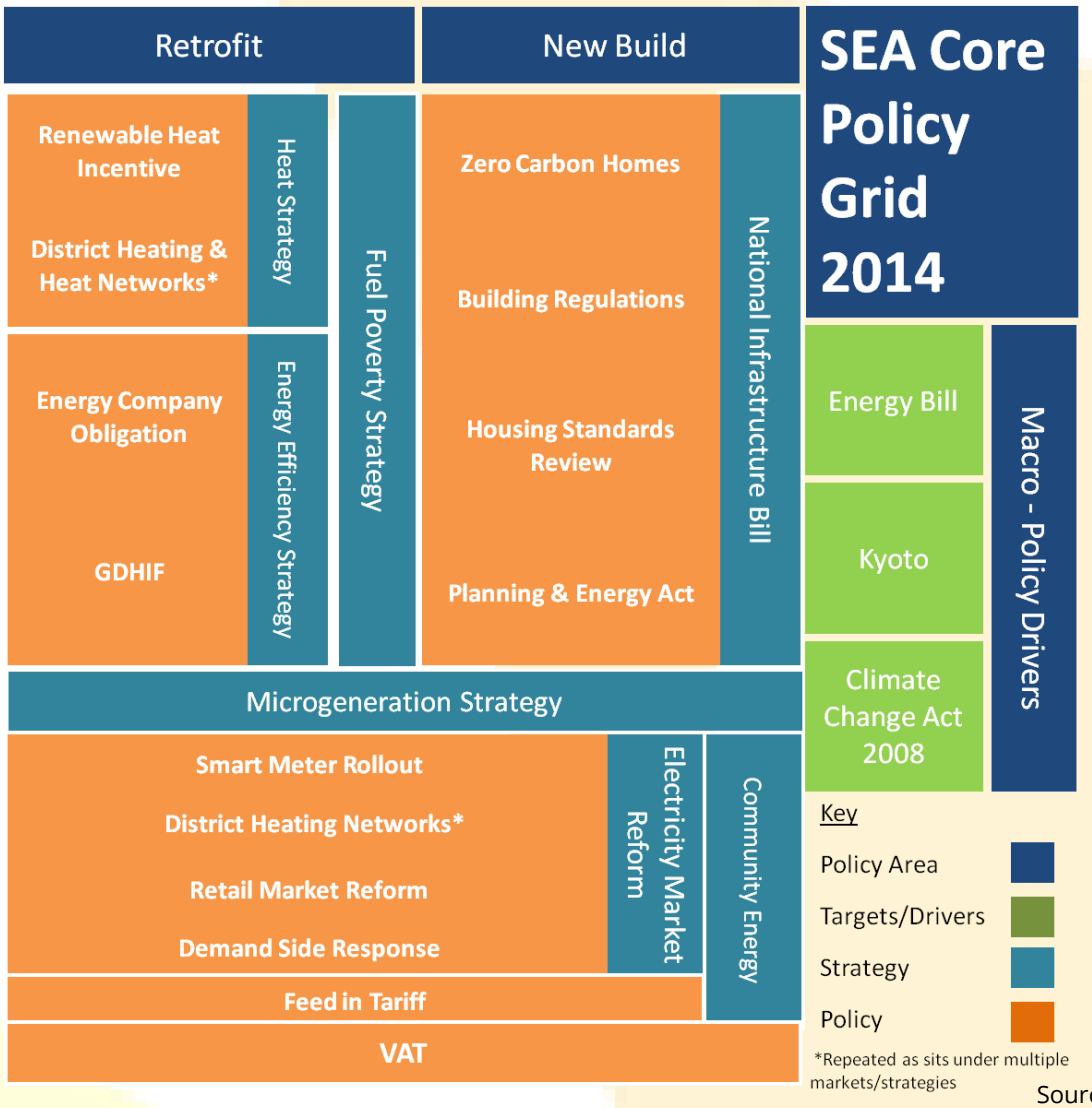
Government must set clear policy ambitions, monitor development, share data, and feedback to industry. The instability of policy in the UK has affected industry's ability to deliver Government objectives. Government must manage transition periods; it would be better to ensure that the elements of current policy such as ECO, which are successful, are maintained and extended than create a cliff-edge between the end of the 2017 Obligation and the beginning of a new policy, for instance. However, what would really transform the delivery profiles in future would be for Government to develop better ways of working with industry. Extensive data should be collected on buildings and the delivery of measures across policies, collated, and shared in a rapid feedback loop with key stakeholders. Any necessary changes to extant policy would then be quicker, more transparent, and effective.

Key themes across Government Policy

Theme	Energy Efficiency	Microgeneration	Future of Heating	ZCH
Role for integration of incentives e.g. RHI/Green Deal	★	★	★	★
Upgrades to infrastructure and networks	★	★	★	★
Tackling fuel poverty	★		★	★
Security of fuel supply	★	★	★	★
District Heating	★		★	★

Source: SEA

Which Policies could affect a "Whole House" approach in 2014?



Source: SEA

The Rt Hon Ed Davey MP

Secretary of State for Energy and Climate Change

"Our shared ambition is to build one of the least wasteful, most energy efficient, most climate friendly societies in the developed world. And to drive home that ambition we will all need to work together to bring about a radical change in the way we approaching powering and heating our homes"

The Future of Heating

Currently, the main Government incentive scheme for supporting the deployment of renewable heat is the RHI which pays consumers a tariff for the kilowatt hours (kWh) of renewable heat they produce. Other schemes such as the Green Deal and ECO can also provide support for the installation of on-site and renewable low carbon heat. We believe that the Government should have a longer-term approach to these technologies which aims to move them from subsidy to regulation, as was achieved with condensing boilers, energises installers, and ensures stable and long term industry growth.

Secure the RHI Budget until 2020. The current confirmed spending review settlement for the RHI is fixed until 2015/16. Those already accredited on the scheme will continue to receive payments beyond this date (payments are made for 7 years for domestic customers and 20 years for non-domestic customers). The most recent domestic RHI Impact Assessment includes three different deployment all of which show peak expenditure in 2020, and spend falling away after this point. (See Page 21) However, increased deployment of RHI technologies will bring down cost over time as installers learn to cost-effectively install them. Industry will also invest in jobs, training, and manufacturing to drive increased delivery. It is therefore critical that the industry has a long-term view of the future of any incentive scheme.

Low Carbon Heating in New Build must be driven by Building Regulations. Zero Carbon Buildings and the Building Regulations should deliver progressive standards in new build, seeking to achieve "zero carbon" in 2016. However, recent policy decisions from DCLG have not been consistent with this intent. The 2014 Building Regulations changes only required a 6% improvement on 2010 standards (instead of 26% - the zero carbon halfway point).[xxvi] From 2016, the Infrastructure Bill allows developers to choose not to go "zero-carbon", but instead build a home with emissions 44% lower than 2006 levels and make up the remainder by contributing to "green schemes".[xxvii] The next Government must understand the true costs and benefits of more rigorous building regulations and ensure that 2016 standards are not watered down but set at the optimal point supported by industry in original zero carbon home proposals.[xxviii]

Prioritise off-gas and fuel poor heating. Around 80% of UK homes are on the gas grid.[xxix] With the price of gas low compared with off-gas grid alternatives such as electricity and oil, there is a high correlation between fuel poverty and off-gas grid homes (although clearly there are fuel poor consumers on gas). Government has targeted policy mechanisms at the off-gas grid consumer; the RHI targets off-gas heating specifically, and there are proposals to offer uplifts on ECO delivery of off-gas heating technologies. The DECC Heat Networks Delivery Unit has also produced some good work in the off-gas grid sector, and we suggest that it should be retained beyond 2015.

However, more could be done. In terms of financing renewable, low carbon and efficient heating systems in the off-gas grid sector, Government could do more to

specifically target finance that addresses the significant capital cost barriers for consumers. Government must also resolve the barriers to delivery.

Crucially, Government should ensure that relevant stakeholders (such as installers or local authorities) have access to centrally-held data about where fuel poor, off-gas, or vulnerable consumers are located. There are currently several sources of this data: English and Scottish Housing Surveys, Department of Work and Pensions (DWP) data, campaign organisation surveys etc. Government must collate these and undertakes further research to develop and share a convincing map of target households.

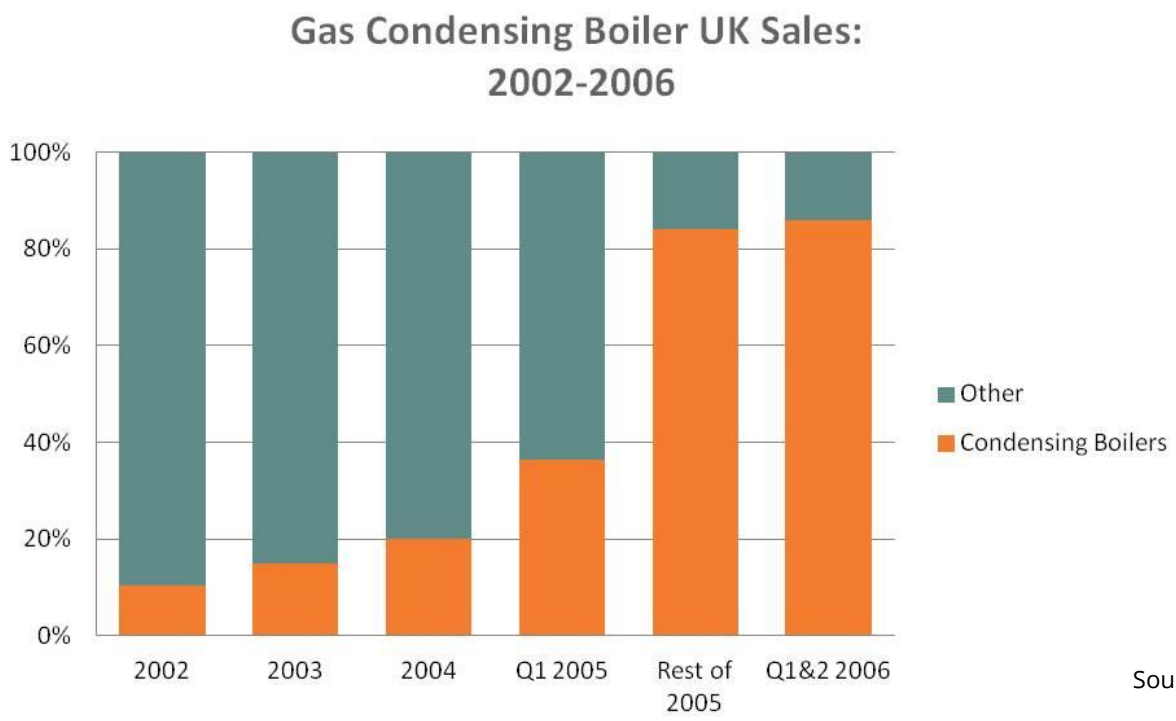
Policy must energise installers and work for distress purchase scenarios. Industry is crucial to innovative solutions for the heating sector. Around 20,000 'broken boiler' conversations happen every day in the UK[xxx] and every conversation represents a sales opportunity for whole-house energy retrofits. To realise these sales opportunities an additional area of focus must be to ensure installers are adequately equipped to carry out these conversations and offer retro-fit solutions; this partly relies on simple and clear messages about priority technologies coming from simple and clear policy frameworks. The SEA would be in favour of a stronger presence for microgeneration in the ECO scheme out to 2017, for instance. The SEA will produce an initial report following stakeholder engagement highlighting barriers and issues at present.

Optimise use of existing technologies. Industry is permanently evolving and there are now technologies available to Government that could help policymakers meet energy policy goals. The next Government must firstly integrate technologies such as smart controls, heat recovery, and "gas transition" technologies such as Gas Absorption Heat Pumps into their thinking (and certainly in any future Energy in Buildings Strategy). It is important that heating policy recognises that "whole building" approaches to heating are becoming typical, with heating installers taking an approach to installation, addressing the building "fabric first" and utilising smart controls which could be fully integrated into "traditional" heating. This may require trials, at scale, to test new products, or new ways of using products - and we suggest that a more structured Research and Development (R&D) approach could be worth considering by Government.

Move from subsidy to regulation for low carbon and renewable heating. After 2020, support from Government incentives such as the RHI is expected to fall away. However, DECC anticipate that the costs of installation will reduce over time due to increased uptake and efficiencies in a bigger market, as installers learn how to deliver more cost-effectively. Looking at the example of condensing boilers (see below) the SEA intends to build a model on the development of the renewable heating market and cost of technologies to understand when this is likely to become a reality. We will then make a recommendation to Government about integrating this into their legislative programmes.

Condensing Boilers: A Case Study in moving to Regulation

On the 1 April 2005 it became a requirement that when installing a new or replacement boiler, the installation must be a condensing boiler in order to meet higher energy efficiency standards. As a result the number of condensing boiler units sold more than doubled in 2005 (See Below). Whilst condensing boilers are more costly than traditional models the costs are returned by savings made through lower heating bills. USwitch estimates that replacing a 60% efficiency boiler with a new 90% efficiency boiler costing £1,800 would save £237 a year on gas bills meaning the boiler will pay for itself in 7.5 years. Furthermore, in a breakdown of the estimated average impact of energy and climate change policies on average gas and electricity bills boiler regulations were said to account for savings of £49 in 2013 and could account for £81 in 2020. This is the model that the SEA believes could be introduced to ensure that rather than just replacing like with like, installers could be replacing broken boilers with demand-reduction measures or controls, or renewable and low carbon heating.



Source: SEA

RHI Budget & Deployment: the case for regulation

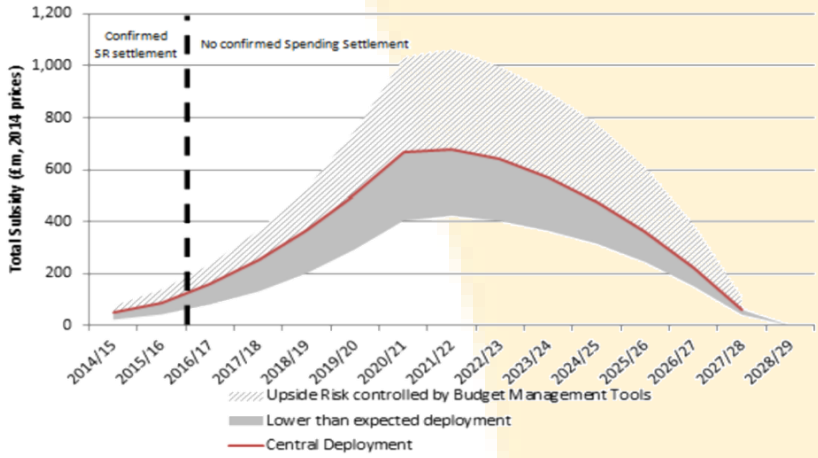
The RHI budget has been allocated up until the 2016 Comprehensive Spending Review, with projected expenditure out to 2020 so far in the Government's Impact Assessments. When a technology gets RHI accreditation, it becomes eligible to receive a tariff which is calculated against the capital costs of installation to generate a specific return, and to be paid over a 20 year period.

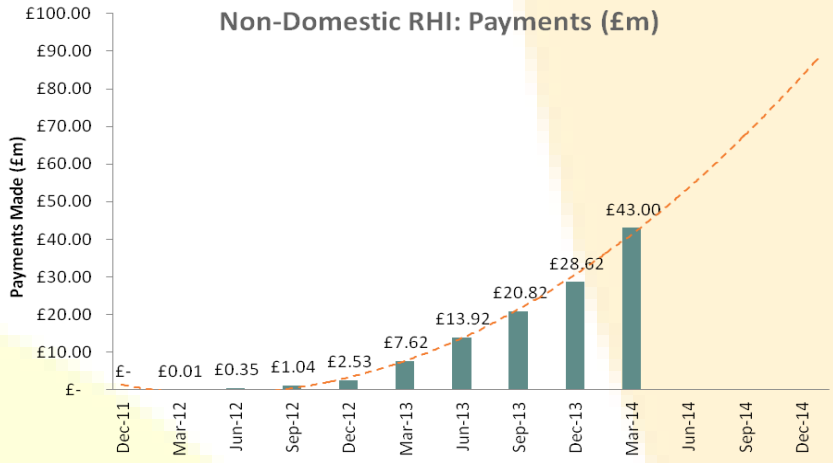
For the Domestic RHI, this 20 year period of payments is condensed down to 7 years so that consumers receive more money back up front. For the Domestic RHI, the scheme pays out on a Rate of Return (ROR) of 7.5% and the Non Domestic RHI pays out an ROR of 12%. This means that for each year of the RHI, tariffs are being paid out on existing installations (legacy) and any new installation.

Therefore, the amount of budget required for each new Comprehensive Spending Review envelope will have to increase, in order to finance both legacy RHI installations and to ensure market growth through the installation of new systems. This will continue until the first "legacy" systems which were installed in early years of the RHI reach the end of their 7 (or 20) year tariff payment periods.

The Graph below from the DECC Domestic RHI Impact Assessment (2012) shows this trend. The other Graph shows deployment trajectories for the Non Domestic RHI based on Government data. We want to argue that these scenarios indicated that as 2020 approaches, it may be more cost-effective to start to regulate the deployment of technologies, rather than subsidise them.

Chart 1: Indicative Spend on domestic RHI scheme





Baxi: 800 boiler retrofits for vulnerable and fuel poor people

Rock Ferry is an area of Birkenhead on the Wirral Peninsula in Merseyside. Following the decline of industry in the region in the 1950s and subsequent high rates of unemployment, Rock Ferry is now classed as one of the most deprived areas in the country. The independent housing provider in the area, Magenta Living, wanted to replace old and outdated heating systems and install Solid Wall Insulation to improve living conditions and reduce energy bills for tenants on income support or in fuel poverty.

Constraints

Magenta living had planned to replace inefficient standing Back Boiler Units (BBU) with modern wall-hung condensing boilers. However, it was discovered that this was not a suitable or cost-effective option for most of the homes on the estate due to either space issues or the location of flues. Baxi suggested that the replacement heating systems instead be "like for like" BBU units, A Rated high efficiency versions.

Consumer Benefits

This project demonstrated that approaches to retrofit have to take into consideration the practicalities of delivery and the unique qualities of each property. However, with a flexible approach by Magenta Living, over 800 old BBU units were replaced in 2012-2013.

"We already have hundreds of high efficiency heating units installed across the Woodward Estate, and the tenants who have benefited from the programme to date have been pleased with both the time taken to replace their BBUs and also the savings they are achieving on their energy bills"

Installer Training

Baxi also provided training and support scheme for the provider's chosen installers, many of whom had no experience with BBUs. Installers were trained at a nearby facility in Warrington, and a specialised customer support van and engineers were stationed on site during the first phase of installation.

Achieving Deep Retrofit

There are 22 million homes in the UK. Only 18% of these have Energy Performance Certificate (EPC) ratings of C or above.[xxxi] Even with a future "Energy in Buildings Strategy" in place, designing suitable policy interventions to support retrofit remains a challenge. The SEA has joined others in calling for energy-retrofit to become a National Infrastructure priority. We also believe that innovative financing and delivery mechanisms exist to support specific sectors in addition to these, and here highlight several options. These are by no means exhaustive, so we will continue to monitor and model good ideas from industry and offer these to Government going forward.

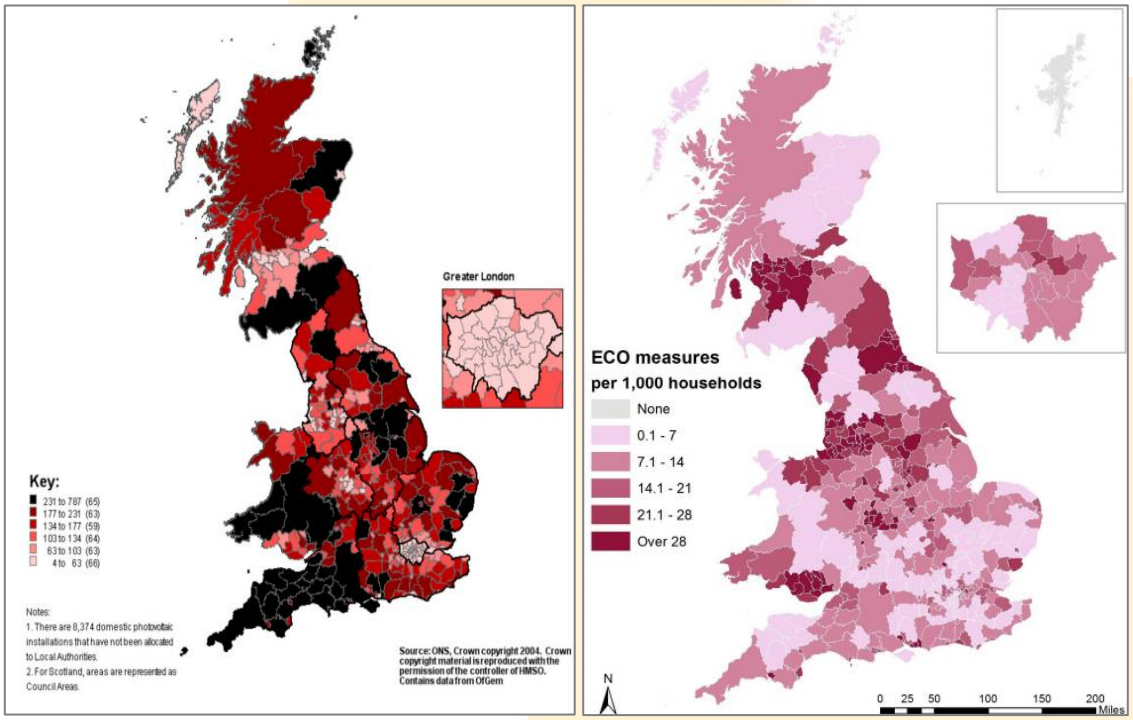
Make retrofit a National Infrastructure priority & model it accordingly. Investment in the UK's buildings, and the need to deliver more low carbon energy infrastructure, were both identified as options for prioritised funding in the National Infrastructure Strategy 2010.[xxxii] Moreover, in the National Infrastructure Strategy for 2013, renewable energy technologies such as biomass or solar PV and demand reduction technologies such as smart meters were mentioned as in scope.[xxxiii] What is missing is a clear narrative for the holistic deployment of these technologies into buildings. Treating building retrofit as a big infrastructure commitment will offer strategic clarity, prioritise a stable policy environment for the sector, and enable private investment and industry growth. According to estimates, UK energy efficiency investment between 2000 and 2010 caused a Gross Domestic Product (GDP) rise of 0.1% relative to no policies being implemented.[xxxiv] We believe that this kind of strategic driver would also justify central Government financing, as the benefits of a retrofit rollout can be compared with (and justified against) projects such as High-Speed 2. The SEA is modelling this proposition, and will produce a report with our findings in 2014.

Start hypothecating taxes and using energy consumption. Retrofit energy efficiency measures are currently financed through ECO - but this primarily targets domestic consumers. Making building retrofit a National Infrastructure priority would, by its very nature, allocate central taxation and/or Green Investment Bank (GIB) or private sector funding to address retrofit in commercial buildings. However, the Government could consider additional or alternative mechanisms to specifically target the business sector. The British Retail Consortium recently suggested that a "polluter pays" principle could be applied to the business community, where rising energy bills are an increasing risk; they suggested that Business Rates should be linked to the energy performance of a company's premises.[xxxv] There is money available to offer reduced business rates in the £35billion raised each year from European Union Energy Trading Scheme revenues and in the Carbon Floor Price, which currently goes straight into the Treasury.

Recognise the roll of devolved groups in delivery; include energy efficiency rollout in the Community Energy Strategy. During the early months of the Green Deal, DECC Minister the Rt Hon Greg Barker MP frequently made reference to his desire for there to be Green Deal "show homes" in communities. This was indicative of a belief held by policy makers that a key barrier to the uptake of technologies in the able-to-pay retrofit market was a lack of understanding amongst consumers

about demand-side technologies. A look at the data collected through the well-established FITs scheme for Solar PV suggests that demand-side technologies deploy in a "clustered" fashion even when the consumer offering remains geographically consistent. Deployment patterns suggest that consumers are highly influenced by seeing buildings in their local communities which have been retrofitted with particular technologies.

However, "regionalised" deployment is not an able-to-pay phenomenon. Local Authorities have played a significant role in the success or otherwise of the deployment of ECO measures. Moreover, the most recent quarterly statistics for ECO show that a Local Authority which had many measures installed per household of its population was likely to be bordered by a local authority showing similar trends. As a first step, DECC should recognise a "whole house" approach to retrofit in the Community Energy Strategy. The use of technologies such as smart meters, or of distributed energy such as Solar PV, goes with a more efficient building. We also believe that targeting a retrofit rollout through a regionalised delivery mechanism could have advantages for specific groups of consumers. The financing and administration of any rollout should remain centralised in order to ensure equitable and efficient delivery across the UK.



Source: Ofgem

Regional and Street-by-Street Rollout: Lessons Learned from Warm Zones

The announcement of the Community Energy Strategy and the increasing interest in area based, or "street by street" delivery of energy efficiency measures has reignited the debate about the role of devolved delivery of energy efficiency.

The Warm Zones programme has been operational since 2001. The key concept of its approach is the concentrated, co-ordinated and comprehensive areas based delivery of energy services. Their aim is to tackle fuel poverty and improve the energy efficiency of the UK's housing stock. The organisation also adopted street-by-street approaches to delivery. This programme therefore may offer many potential lessons for policy makers keen to utilise the benefits of regional rollout without compromising industry's ability to deliver measures quickly and cost effectively.

The success or otherwise of the Warm Zones model depended on several environmental factors. Firstly, a key quality of successful projects was an ability to communicate to stakeholders; sales skills were in demand even when projects were not a commercial sales job. Individual stakeholders in any project - both in the supply chain and the end-users - had to be fully bought in to the aims and ambitions of the project at the outset.

In turn, being able to identify consumers was important, particularly where the needs of consumers might well vary from house to house down a single street. Engaging with local groups as well as Government proved to be important in working out the approach to individual householders. A decision to be made for energy efficiency policy in the future will be the level of support that the Government provides with consumer identification and engagement, and who has access to any Government-sourced information on householders.

At Government level, the key to delivering projects was that policy timelines and messaging remained consistent, as large-scale projects take time to design and implement. Related to this the availability of government finance was also critical. Local Authority tendering processes could also be complex or unreliable in terms of accessing local level financing. This suggests that regardless of the delivery mechanism, which could be regionally targeted or otherwise, Community led projects are most successful when underpinned by central administration and government finance.

Whether or not the street-by-street approach is endorsed, Warm Zones found the delivery of more than one measure into households to be a cost-effective approach. This "whole house" ambitions is one which is endorsed by the Sustainable Energy Association and its members.

npower & West Whitlawburn Housing Co-operative Community Energy Project

Over 540 high rise and low rise properties in Whitlawburn in Cambuslang, Scotland will benefit from a new District Heating system as part of an exciting partnership between West Whitlawburn Housing Co-operative (WWHC) and npower.

The project will provide residents with a modern, affordable and controllable heating system to replace the existing electric storage heaters. A new energy centre - housing a biomass boiler and fuel store - will provide heat and hot water for the entire estate. The changes are expected to lead to a 20%* reduction in residents' heating bills.

The project is also an interesting case study in blended financing, as it is being jointly funded by npower's ECO (Energy Company Obligation) scheme, European Structural funding and a Warm Homes loan. npower has contracted Turner & Townsend to manage the project delivery and Vital Energi to deliver the installation. A Tenant Liaison Officer will be employed by npower to keep tenants fully informed during the changes.

"The new biomass District Heating scheme is a true community energy project. We are delighted to be moving this project forward, making a real difference to the West Whitlawburn Community, which has been made possible through all the hard work of the project partners like npower."

Stephanie Marshall, Deputy Director of West Whitlawburn Housing Co-operative

*Source ECO Hub, npower - May 2014

Buildings in the Energy System

Rising energy demand will continue to put pressure on the UK's energy system. Globally, the International Energy Agency (IEA) estimates that demand will increase by one-third from 2011 levels to 2035.[xxxvi] Building energy solutions could offer system benefits such as load-shifting, aggregated generation, demand side response, and community energy. Current proposals for the future grid, tariff reform, smart metering and the capacity market should consider innovative, bottom-up approaches to meeting system-wide energy policy objectives.

Time of Use Tariffs must remain an option in the future retail market and smart meters must be able to collect half-hourly data. By introducing Time of Use (ToU) tariffs together with half-hourly smart metering, both consumers using electricity generating technologies, such as Solar PV and storage, and consumers using electrically driven heating, such as an Air Source Heat Pump with smart controls, would save money through either self-consumption or load-shifting.[xxxvii] At current prices, the annual electricity bill of a 7.5kW heat pump would be nearly £700. With the introduction of dynamic ToU tariffs, by 2020 this could fall to £345. For Solar PV and storage consumers, static ToU tariffs would enable savings of £773 from the avoided cost of electricity.[xxxviii]

Building-level solutions should be able to participate in Demand Side Response. National Grid has proposed a series of measures to provide additional grid capacity. One of these, the Demand Side Balancing Reserve (DSBR) allows participation over and above 100kW. We believe that the Government should be incentivising the aggregation of energy produced by microgeneration in buildings. Our analysis shows that if micro-CHP (mCHP) units in many buildings were aggregated to be a "mini power station" and participated in DSBR, the value per installation for the consumer could be up to £1445 per year.[xxxix]

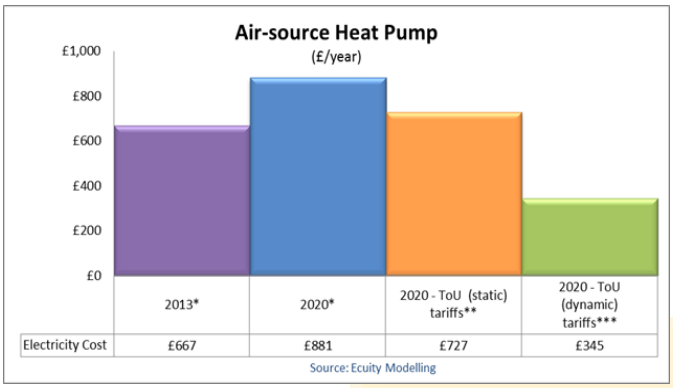
Government must find a way to incentivise the development and installation of storage technologies. There is no storage strategy in the UK at present, but storage offers a genuine opportunity to address some system level issues for the UK energy sector. Certainly, in order to properly re-balance consumer demand profiles, or store up excess generation for bidding into a capacity market mechanism, storage is a requirement. In particular, allowing District Network Operators (DNOs) to own and operate storage facilities would enable the demand-side to participate in balancing services and are a basic necessity for the Local Energy Markets suggested in the Community Energy Consultation.

Many "smart grid" objectives could be achieved using existing technologies and developments. Manufacturers are already invested in producing "smart" integrated control systems for heating systems. The lessons learned with the smart metering specification suggests that policy makers could do better at engaging with technology manufacturers and other key stakeholders, rather than designing complex hardware specifications, developing sophisticated IT systems which are capable of integrating and communicating with different technologies. Government's role should be to set clear objectives for these technologies, rather than necessarily to specify or restrict their design.

Heating Technologies in the Smart Grid

Air Source Heat Pump:

The introduction of ToU tariffs could encourage smarter uses of ASHPs with smart heat pump controls utilising thermal storage with immersion heaters to run the heat pumps at least cost. Our modelling shows that at current prices, the annual electricity bill of a 7.5kW heat pump would be nearly £700. With the introduction of dynamic ToU tariffs, by 2020 this could fall to £345.

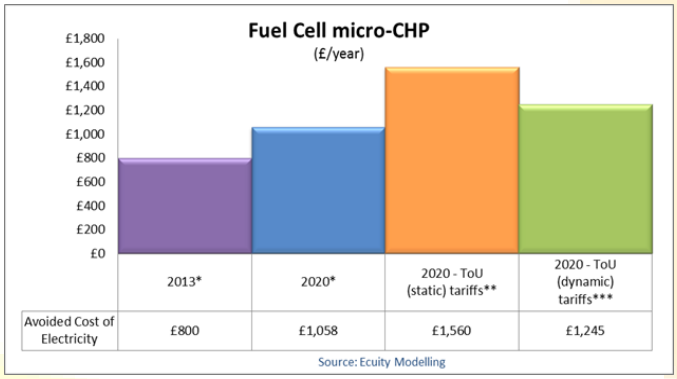


ASHP	Scenario 1	Scenario 1*	Scenario 2	Scenario 2*
Set up payment	£15	£15	£15	£15
Utilisation Fee – Low	£72		£27	
Utilisation Fee – High		£2,160		£810
Total	£87	£2,175	£42	£825

Scenario 1: DR called on 48 days of the year, 1 hour per day
Scenario 2: DR called on 12 days of the year, 1.5 hours per day

Micro-CHP:

Micro-CHP generates mostly during peak demand periods, and therefore has the potential to act as a grid support mechanism for short-term spikes in demand. Comparing the value of exporting electricity to that of self-consumption export tariffs for mCHP are just 4.6p/kWh compared to the cost of importing, at a wholesale price of 15.2p/kWh. Increasing the levels of self-consumption by putting excess generation into storage provides additional value to that of exporting excess generation. For a typical Fuel Cell Combined Heat and Power (CHP) unit, this value could double by 2020 through ToU tariffs from £800 to nearly £1,600 per annum. Alternatively, if a number of mCHPs are aggregated together, the combined capacity could form an effective virtual power plant. Under National Grid's proposed DSBR service, the modelling results displayed show the value that could be obtained per installation under 4 scenarios (figures in £/year per unit). If generation capacity can be incorporated into the scheme, this could mean values of up to £1,445 per unit per year if Demand Side Response (DSR) is called on a high utilisation fee.



mCHP	Scenario 1	Scenario 1*	Scenario 2	Scenario 2*
Set up payment	£10	£5	£10	£5
Utilisation Fee – Low	£15		£48	
Utilisation Fee – High		£450		£1,440
Total	£25	£455	£58	£1,445

Scenario 1: DR called on 15 days of the year, 2 hours per day
Scenario 2: DR called on 48 days of the year, 2 hours per day

The Rt Hon Gregory Barker MP

Minister of State for Energy and Climate Change

"I warmly welcome the creation of the Sustainable Energy Association. Further integration of energy efficiency and low carbon distributed energy fits exactly with my vision of a much more distributed and dynamic energy sector... I am delighted that industry is adopting a more ambitious and more joined up approach and look forward to working with the new Association."

Conclusion

There has been enormous progress made over the past ten years in the energy sector in terms of meeting the often conflicting demands of the "trilemma" of energy: which is how we can deliver affordability, carbon emissions reduction, and energy security. Over this period, demand reduction, renewable and low carbon solutions have begun to be understood as not simply ways to deliver the carbon emissions reductions required to meet mandatory EU targets, but as key tools for helping reduce energy bills and reduce reliance on imported fuels in a global climate of increasing energy demand and rising energy prices.

However there is still work to do. There are ominous signs that the political consensus on climate change and energy at the last General Election has broken. With polling data currently showing a close result in May 2015, the policy environment is increasingly politicised, and commitments for the next phase of Government are polarised and partisan. However, for industry to continue to invest and grow, it needs cross-party, long-term commitments on energy policy. We would urge all the political parties to ensure that their promises on energy policy reflect this.

In addition, political attention on energy policy is usually focussed on the supply side. Our analysis, some of which is presented in this Manifesto, suggests that on an economic rationale it would be at least as cost effective for the Government to finance energy measures in buildings as it would be to finance large-scale measures. We are not saying that you don't need to invest in the supply side. Indeed, to meet challenges with capacity and rising demand, we will need to; but we believe that Government could be much more ambitious with policy to tackle energy demand reduction and provision in the UK's buildings.

The policy ideas laid out in this Manifesto will offer this ambitious new vision for energy policy: instituting an Energy in Buildings Strategy, delivering energy efficiency retrofit as a National Infrastructure priority, regulating an innovative future for the heating market and its installers, and understanding the benefits of integrating buildings into both decentralised energy markets and the wider grid. Over the coming months, we will be publishing further details of each of the proposals in this Manifesto, which we will share with policy and industry stakeholders alike. We do not expect that the ideas in this Manifesto are final; we look forward to working with colleagues in the sector on developing them.

The IPPR recently described climate change as being at a crucial "tipping point" beyond which, mitigation becomes impossible. But the urgency of the climate change agenda is also an opportunity for the UK. Energy policy too is at a "tipping point" where there is still scope for genuine innovation to address the issues facing us in terms of capacity, low carbon, and affordability. The Sustainable Energy Association believes that our buildings, often thought about as a barrier to sustainable energy use, are in fact the solution. Our industry leaders call on the political parties to realise this vision for sustainable energy in buildings in their programmes for Government beyond May 2015.

About the SEA

The Sustainable Energy Association are a member based industry body offering innovative policy solutions that link up building-level technologies and the wider energy system to achieve a low carbon, secure energy future for the UK, benefits for UK consumers, and commercial growth for businesses working in the sector .Our membership is comprised of a wide range of organisations that engage our to develop policy positions, establishing member-led working groups and a governing body of members to discuss and authorise policy positions that have real commercial impact.

BAXI
British Gas
Carbon Limiting Technologies
Carillion
Ceramic Fuel Cells
CES
CPL Industries
Daikin
DELTA
Dimplex
EDF Energy
Encraft
Energy Saving Trust
EON
EOS Energy
Flow Energy
Gemserv
Geotherm
GMI
IE-CHP
Johnson & Starley
Kingspan
Knauf Insulation
Mark Group
Mitsubishi Electric
NAPIT
NIBE
npower
Panasonic
PTS
SIG Ice Energy
SolarTech Ltd
Superglass
Vaillant
Windhager
WILLMOTT DIXON
Wolseley
Zenex

Julie Elliott MP

Shadow Minister for the Department of Energy and Climate Change

"I welcome the focus the Sustainable Energy Association is putting on empowering energy consumers in self-production and efficient use of energy. Their vision is a powerful one which they argue could help lower bills, reduce the UK's reliance on imported energy, and help us meet our carbon targets. It will be interesting to watch them develop their arguments and I would endorse their efforts to encourage joined-up and economically-sound policy suggestions for the energy sector from Government. I look forward to working with them. "

Glossary

ACE	Association for the Conservation of Energy
BRC	British Retail Consortium
CERT	Carbon Emissions Reduction Target
CESP	Community Energy Saving Programme
CHP	Combined Heat and Power
CO_2	Carbon Dioxide (usually referring to emissions)
DCLG	Department for Communities and Local Government
DNO	District Network Operator
DSBR	Demand Side Balancing Reserve
DSR	Demand Side Response
DWP	Department of Work and Pensions
ECO	Energy Company Obligation
ESN	Electricity Storage Network
EST	Energy Saving Trust
ETS	Emissions Trading Scheme
EU	European Union
FIT	Feed In Tariff
GDP	Gross Domestic Product
GIB	Green Investment Bank
HM	Her Majesty's
IEA	International Energy Agency
IPPC	Intergovernmental Panel on Climate Change
IPPR	Institute for Public Policy Research
kWh	Kilowatt hours
mCHP	Micro Combined Heat and Power
MPC	Micropower Council (Now the SEA)
MWh	Mega Watt Hour
R&D	Research and Development
RHI	Renewable Heat Incentive
RHPP	Renewable Heat Premium Payment
RMR	Retail Market Reform
SEA	Sustainable Energy Association
Solar PV	Solar Photo-Voltaic (usually referring to panels)
ToU	Time of Use tariffs
UKGBC	UK Green Building Council

End Notes

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[xxxix] Ibid

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