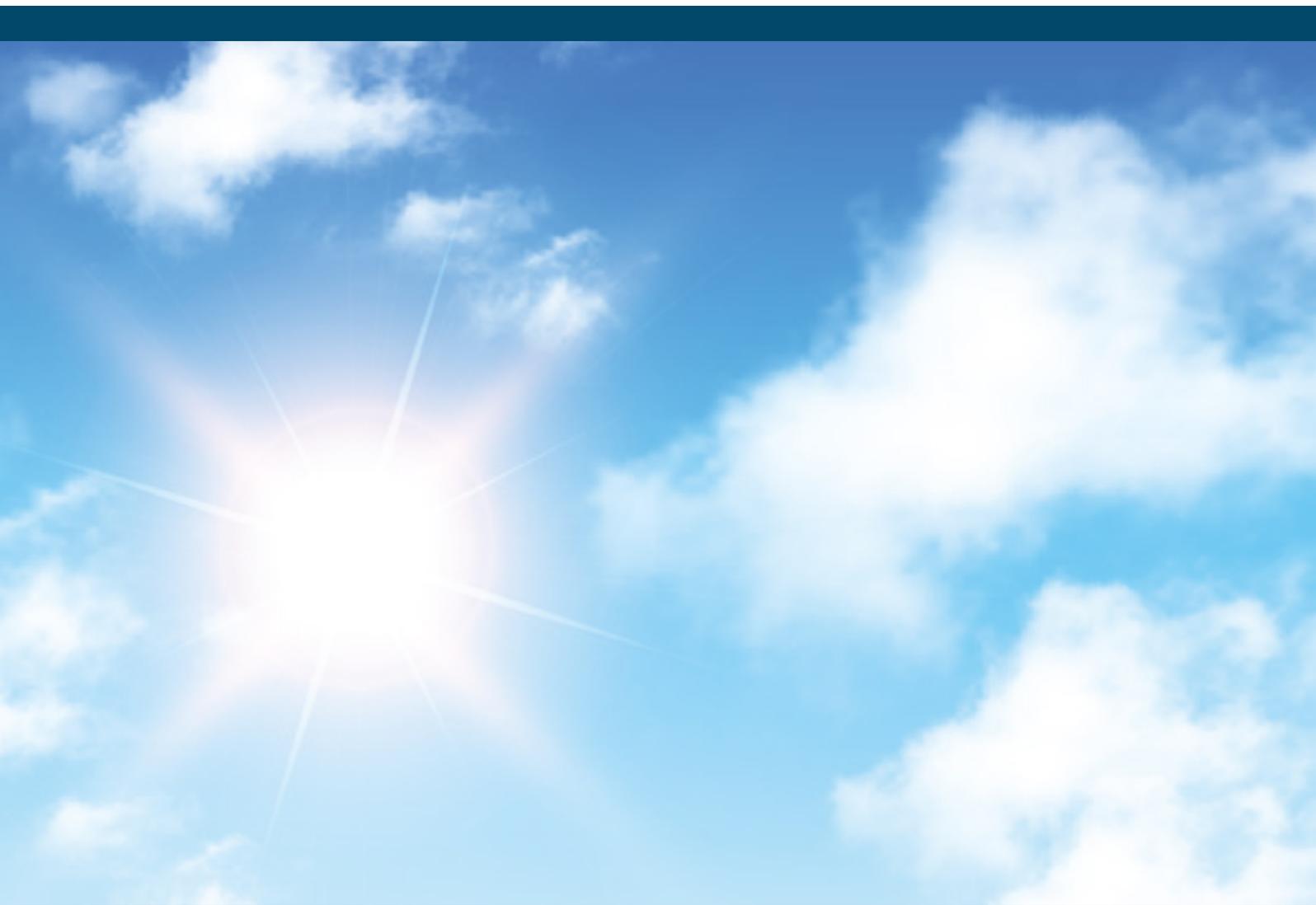




ENERGY: THE AGE OF CLEAN



www.powerforpeople.org.uk

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Emphasis in Quotations

Where part of a quotation is in bold this is our emphasis.

Energy: The Age of Clean
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ENERGY: THE AGE OF CLEAN

The Vision: Great Expectations

Our vision is of an energy system that has changed

- From centralised energy to local energy.
- From generating polluting energy to generating clean energy.
- From a top-down system to one that is accountable to and engages the public.
- From waste and ever-increasing consumption to consuming less because homes and other buildings are well insulated, less wasteful and are generators of energy.
- From a society in which millions of people live in cold homes and are either 'just about managing', or are in fuel poverty, to one where no one must choose between eating and heating.
- To one that enables people and communities to produce and consume their own energy and sell any surplus locally.

Energy: the Age of Clean lays out the changes our energy system needs in order to achieve this vision.

Recommendations

These recommendations are contained in the three draft Parliamentary bills at the end of this report.

Local Supply – Recommendation 1

That the right to local electricity supply be enshrined in law, with the following characteristics:

1. The ability for generators to be local suppliers and to set local prices,
2. The costs of a local supply licence, connection, balancing and local grid maintenance to relate to the size of a local supplier's operation, and
3. The bureaucratic processes that a new local supplier would need to undertake must be simple and straightforward.

See page 9 for evidence and rationale.

Government Subsidies – Recommendations 2 and 3

That a new energy subsidy policy is established with the purpose of addressing the current subsidy imbalance, achieving the “radical shift away from dependence on fossil fuels” called for by the Secretary of State for Business Energy and Industrial Strategy and ensuring that the government meets the carbon budgets set by the Committee on Climate Change.

That clean energy generation is made exempt from the Climate Change Levy.

See page 14 for evidence and rationale.

The Use of Clean Before Dirty – Recommendation 4

That a merit order system be established in the UK, ensuring that electricity generated from renewable sources is used before energy generated from other sources. That this system also ensures that less polluting fuels are used before more polluting ones.

See page 16 for evidence and rationale.

Planning – Recommendation 5

That, with the exception of national infrastructure projects, all proposed sites relating to renewable energy be determined at a local level. Furthermore, that this local determination process allows all local voices to be heard and ensures that new projects cannot be vetoed or blocked by one person or a small group of people.

See page 19 for evidence and rationale.

Energy Efficiency - Recommendations 6 and 7

That the government sets national targets for energy efficiency and energy demand reduction and publishes strategies for meeting those targets, in order to ensure that the emissions reduction targets set out by the Committee on Climate Change carbon budgets are met.

That the government produces and then carries out a revenue neutral plan to bring the entire domestic sector housing stock up to Energy Performance Certificate Band C by 2035 and that the work be done through a locally led programme. Also that, as part of this, all fuel poor households be brought up to Energy Performance Certificate Band C by 2030.

See page 21 for evidence and rationale.

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Part 1: The Need for Change

Climate Change – Hard Times

There is overwhelming evidence that dangerous climate change is happening and that it is caused by human activity.¹ The Prime Minister, the Secretary of State for Business, Energy and Industrial Strategy and the Chancellor of the Exchequer, as well as the Opposition parties, agree that urgent action is needed to reduce carbon dioxide emissions by cutting down the use of fossil fuels.²

However:

- In 2015, 82% of the UK's energy came from fossil fuels.³
- The government acknowledged in 2015 that it will have difficulty in fulfilling its statutory duty to meet the fourth carbon budget, set by the Committee on Climate Change, and accepts that “projections for emissions have increased since the 2014 update. This means that the shortfall we have over the fourth carbon budget has increased, from 133 MtCO₂e [metric tons of carbon dioxide equivalent] last year to 187

MtCO₂e.” This therefore threatens our ability to meet the tougher fifth carbon budget.⁴

- National Grid predicts that the UK's legally binding target of 15% of energy from clean sources by 2020 will not happen until 2029.⁵

Despite this situation, UK government spending and subsidies on fossil fuel energy in 2015 amounted to £26 billion.⁶ As Professor Ian Arbon at the Institute of Mechanical Engineers said, “The UK is the only country in the world who thinks it is going to hit its renewable targets by doing more fossil fuels.”⁷ The International Monetary Fund has shown that the UK's fossil fuel subsidy actually increased from £22.39 billion in 2013 to £26 billion in 2015.⁸

Does this make sense?

1 http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf

2 The Prime Minister has recognised this saying that, “it is now vital that we stick to these [carbon dioxide reduction] targets”; source: <https://www.carbonbrief.org/revealed-when-theresa-may-spoke-out-on-climate-change>; the Secretary of State for Business, Energy and Industrial Strategy, on taking office, emphasised the importance of delivering “clean energy and tackling climate change”; source: <https://www.gov.uk/government/news/statement-from-greg-clark-secretary-of-state-for-business-energy-and-industrial-strategy>; and in his speech to the Conservative Party Conference on 3rd October 2016 he made a similar point, saying that the country needed “an upgrade in the resilience – and the cleanness – of our energy supplies”; source: <http://press.conservatives.com/post/151282679955/clark-an-industrial-strategy-that-works-for>; and the Chancellor of the Exchequer on 29th October 2015, speaking in the United Arab Emirates, urged them to invest in clean energy, saying: “an investment in clean energy is an investment in a safe climate.” Source: <https://www.gov.uk/government/speeches/foreign-secretarys-clean-energy-future-speech>

3 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/577712/DUKES_2016_FINAL.pdf

4 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501292/eepReport2015_160205.pdf

5 <http://www.bbc.co.uk/news/science-environment-36710290>, 5 July 2016

6 <http://www.imf.org/external/pubs/ft/survey/so/2015/NEW070215A.htm>

7 <https://www.theguardian.com/environment/2016/feb/04/from>

8 <http://www.imf.org/external/pubs/ft/survey/so/2015/NEW070215A.htm>

Affordability and Social Justice – Bleak Houses

Our energy system is not serving the most vulnerable people in our society. In her first speech as Prime Minister, Theresa May focused on social justice being for all and not just the wealthy.⁹ However:

- Currently 4.5 million households are in fuel poverty¹⁰ in the UK.¹¹ Their homes are cold: they must choose between eating and heating. This problem has massive health implications and, according to Age UK, costs the NHS £1.36 billion per year in England alone, excluding social care costs.¹²
- The Chief Medical Officer has estimated that every £1 spent on keeping homes warm saves the NHS 44p.¹³
- National Energy Action’s analysis highlights that over the past five years there were 41,000 excess winter deaths “directly attributable to vulnerable people inhabiting cold homes” and that “over 125,000 vulnerable people are likely to die needlessly between 2015 and 2030.”¹⁴

This all looked about to change, given the government’s manifesto pledge to end fuel poverty by 2030:

“An energy efficient home is a more affordable and healthy home. We will improve the energy efficiency of existing homes, especially for the least well off, by committing to upgrading all fuel poor homes to EPC¹⁵ Band C by 2030. We will also review requirements on new homes.”¹⁶

This commitment was not in the June 2017 Queen’s Speech – which set out the legislative plan for the government for the next *two years*. How much longer must people in fuel poverty wait? Such an unequivocal manifesto pledge requires an immediate national programme.

There is a consensus in Parliament that fuel poverty must be ended by 2030. The Labour Party has also pledged in its manifesto to “insulate four million homes as an infrastructure priority”,¹⁷ while the Liberal Democrats pledged to “ensure that at least four million homes are made highly energy efficient (Band C) by 2022, with priority given to fuel-poor households.”¹⁸

However, in addition to the issue of fuel poverty, the Prime Minister has highlighted the plight of Britain’s six million¹⁹ “just about managing” families²⁰ for whom “rising housing costs... mean that the proportion of income spent on housing (including fuel and power) has increased sharply... equivalent to

9 <https://www.gov.uk/government/speeches/statement-from-the-new-prime-minister-theresa-may>

10 In Scotland, Northern Ireland and Wales fuel poverty is defined as needing to spend at least 10% of household income on keeping warm; in England fuel poverty has been re-defined and is measured using the Low Income High Costs (LIHC) indicator. Under the LIHC indicator, a household is considered to be fuel poor if: they have required fuel costs that are above average, i.e. the national median level, and were they to spend that amount, they would be left with a residual income below the official poverty line.

11 http://www.nea.org.uk/wp-content/uploads/2016/05/FPM_2016_low_res.pdf

12 <http://www.ageuk.org.uk/latest-news/archive/cold-homes-cost-nhs-1-point-36-billion/>

13 Chief Medical Officer’s Annual Report 2009, page 31, http://www.sthc.co.uk/Documents/CMO_Report_2009.pdf

14 <http://www.nea.org.uk/media/news/the-need-to-put-an-end-to-the-cost-and-suffering-of-living-in-a-cold-home/>

15 Energy Performance Certificate – this is the standard UK rating system for how energy efficient a building is

16 Conservative Election Manifesto May 2017, page 60

17 Labour Election Manifesto May 2017, page 20

18 Liberal Democrat Manifesto May 2017, page 49

19 <http://www.resolutionfoundation.org/publications/hanging-on-the-stresses-and-strains-of-britains-just-managing-families/>

20 <https://www.gov.uk/government/speeches/statement-from-the-new-prime-minister-theresa-may>

an extra 14p on the basic rate of income tax.”²¹ Nearly 200,000 of these families are behind with their fuel bills.²²

The Conservative manifesto stated that these are:

*“... people who can just about manage but worry about the cost of living... these families have been ignored by politicians, and by others in positions of power, for too long. Yet they do not ask for much: they want to get on with their lives, to do their best for their children, to have a fair chance. Under Theresa May’s leadership, they will no longer be ignored. They are the people to whom this manifesto is dedicated.”*²³

However, the manifesto contains no policies for insulating the homes of these people who are ‘just about managing’ in order to deal with their rising fuel bills and rising debt.

Is this social justice?

Energy Security – The Battle of Life

Security of energy supply, commonly referred to as ‘keeping the lights on’, is indeed a battle for life: without a reliable energy supply, our country, as we know it, could not function. The Prime Minister and the Chancellor of the Exchequer accept this, yet they also say **that our current system, which relies on fossil fuels, threatens this vital objective.**²⁴

Indeed, Greg Clark, the Business, Energy and Industrial Strategy Secretary of State, is proud to explain on his web site that he was responsible for a Conservative policy document on this matter, ‘The Low Carbon Economy’,²⁵ which states that “our economic stability, our energy security and our desire for social justice all argue for a radical shift away from dependence on fossil fuels”.²⁶

Since that document was published in 2009, there *has* been a decrease in the reliance on fossil fuels: from 89.1% in 2009 to 82% in 2015.²⁷ This is, by no means, a ‘radical shift’.

Does this make sense?

What the Dickens does all this mean?

It means that our current energy system is not delivering enough clean energy, it is not delivering social justice and its over-reliance on fossil fuels threatens energy security.

It also means that our energy system should be changed. It needs a great renewal so that it is clean, affordable and secure and also so that it involves local organisations, communities, councils and citizens in moving to **the Age of Clean.**

21 <http://www.resolutionfoundation.org/publications/hanging-on-the-stresses-and-strains-of-britains-just-managing-families/>

22 <http://www.resolutionfoundation.org/publications/living-standards-2016/>, using figures in Table 11, page 76

23 Conservative Manifesto May 2017, page 8

24 As the Prime Minister said, in the same speech that we quoted above: “To stay reliant on fossil fuels would mean tying ourselves to increasingly unstable supplies which could endanger our energy security...” The Chancellor of the Exchequer expressed a similar view when speaking in Boston, USA in 2014 when he said: “Moreover, in addition to creating jobs and growth, embracing green technology increases our energy security.” Source: <https://www.gov.uk/government/speeches/foreign-secretary-speech-on-climate-change>

25 <http://www.gregclark.org/about-greg>

26 The Low Carbon Economy <https://www.conservatives.com/~media/Files/Downloadable%20Files/lce.ashx?dl=true>, page 9; similar points are made on pages 11, 13, 27 and 31

27 DECC Digest of UK Energy Statistics 2009 – 2016; source: <https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes#2016>

Part 2: The Future is Local

The future is already emerging. It is clean, affordable, better able to ensure energy security and it involves people and communities. It is already creating great changes to the energy systems of the world and has the potential to change them completely.

At the heart of this change are new technologies and, in many other nations, major changes to the legislation and markets that underpin their energy systems. The costs of clean energy generation are continually falling.²⁸ Targets for energy efficiency and cutting energy use are becoming widespread.

The international examples below are a small sample of what is happening across the world. They show how cities, towns and communities are being made better off. They have cheaper, clean energy that is owned by citizens and is fuelling local prosperity. Clean energy sources are given priority access to their grids and, in some cases, communities are even buying their local grids.

A Tale of Two Countries

The USA and Germany both have a wealth of impressive examples that show what the UK's energy future could be like.

The USA: American Notes

In the United States, nearly fifty million people, in over 2,000 cities and districts, have their electricity supplied by public sector

companies at a **price which is on average 12% lower than the price charged by private energy companies**. This represents 14.5% of the total market. A further 13% of the market is supplied by electricity co-operatives. Local municipal suppliers are gaining public trust because of their transparency.²⁹

In California, a community scale programme allows collectively generated solar power to be shared equally between tenants in the scheme.³⁰ Over 6,000 social tenancies receive almost 100% of their electricity from such schemes. Any surplus electricity is exported to the grid. California also has a target to double the energy efficiency of its existing buildings by 2030.³¹

The state of New York has a target of 50% clean energy by 2030. It also has a 2030 target of a 23% cut in energy consumption in buildings, based on 2012 levels.³²

Brooklyn, one of New York city's districts, has set up a 'TransActive Grid' which allows individuals in the scheme to become local electricity providers: excess electricity produced by their rooftop solar panels can be **sold directly to other local residents or businesses**.³³ Surplus electricity that is generated causes people's meters to reverse and so **financially incentivises energy saving**.³⁴

Perhaps the most ambitious US city is San Diego, with its legally binding commitment to

28 See Electricity Generation Costs BEIS November 2016, page 30, Table 7; source: <https://www.gov.uk/government/publications/beis-electricity-generation-costs-november-2016>

29 <https://weownit.org.uk/sites/default/files/downloadable-resources/Public%20ownership%20of%20the%20UK%20energy%20system%20%E2%80%93%20benefits,%20costs%20and%20processes.docx>

30 <http://www.renewableenergyworld.com/articles/2013/08/california-solar-energy-apartments-virtual-net-metering-allows-energy-savings-one-tenant-at-a-time.html>

31 http://www.energy.ca.gov/releases/2015_releases/2015-03-09_energy_efficiency_existing_buildings_nr.html

32 2015 New York State Energy Plan, energyplan.ny.gov/Plans/2015

33 <http://decentralized-energy.com/articles/2016/03/brooklyn-to-host-pioneering-microgrid-project.html>

34 <https://www.slideshare.net/JohnLilic/transactive-grid>



Martha, member of Brooklyn Microgrid community, New York (brooklynmicrogrid.com)



People tour the solar panels on the top of the Moscone energy scheme, Center, San Francisco (David Paul Morris)

100% renewable energy by 2035. The idea is to boost the local economy with the creation of work for local people.³⁵

Germany

Germany has around 1,000 community energy co-operatives³⁶ and 170 municipalities have bought back their electricity grids from private companies.³⁷ Also, 190 German communities have been successful in bidding to run their local electricity distribution grid. Many of these community-owned grid operators and suppliers are not only offering **cheaper tariffs** than their competitors, but are **fuelling the prosperity of their locality**.³⁸

Germany's Renewable Energy Act has set up a merit order system that ensures that **electricity from renewables has priority on the grid**. This has resulted in a high level of investment security and has limited red tape, which are cited as reasons why there has been a **dramatic reduction in the cost of**

renewable energy.³⁹ Meanwhile, over half of the clean electricity generation infrastructure in Germany is **owned by citizens**.⁴⁰

A typical household in Germany can choose to buy energy from around 72 different suppliers and there are 1,100 supply companies nationally. Almost half of these companies are owned by local government, communities and small businesses.⁴¹

Near Berlin, in the control centre of the grid operator's headquarters, they have had to solve the problems that have arisen from the burgeoning amounts of electricity coming from wind and solar generation. They do this by using information technology that gives accurate and real-time data about electricity generation and consumption.⁴² This allows them to ensure that electricity is available at all times, known as 'balancing' the grid's supply against its demand. At the same time, they ensure renewable energy is used first,

35 http://www.nytimes.com/2015/12/16/science/san-diego-vows-to-move-entirely-to-renewable-energy-in-20-years.html?_r=0

36 <https://www.theguardian.com/public-leaders-network/2015/oct/02/energy-cooperatives-uk-germany-denmark-community>

37 <http://www.theguardian.com/big-energy-debate/2014/oct/22/councils-coops-buy-control-energy-grid-europe>

38 <http://www.respublica.org.uk/wp-content/uploads/2015/01/creating-local-energy-economies-lessons-from-germany.pdf>

39 Policy 3B, The German Energiewende Book: Policies for Clean Energy by Craig Morris <https://book.energytransition.org>

40 <https://energytransition.org/2013/10/citizens-own-half-of-german-renewables/>

41 Leo Murray <https://www.theguardian.com/sustainable-business/2015/jul/10/uk-energy-system-in-thrall-to-giant-utilities-customers-budget-renewables>

42 <http://www.stromnetz.berlin/en/controlling-the-electricity-grid.htm>

in accordance with Germany's merit order system.

Germany is incentivising home and building designs that generate more energy than they use and so are going beyond zero net energy use home designs (known as 'passive house'), which they have also championed;⁴³ the German government also supports building refurbishments that create near zero energy use.⁴⁴

In 2013, Hamburg's citizens were able to **buy back their local grid**, as they believed this would better serve the city.⁴⁵ In Munich, the energy for all of the city's private households, subways and trains is 100% renewable. It is provided by an organisation that is 100% owned by the city council. It also works with local welfare organisations in providing free energy advice to low income families with the aim of reducing energy use through energy efficiency. The city has built a smart grid that co-ordinates the distribution of energy from the various local generation sources.⁴⁶

Wildpoldsried, a small village in southern Germany, is an astounding example of what is possible. It produces five times as much electricity as it needs, all of which is **100% clean**. Its scheme is run by local residents together with the municipal council and is made possible by a national incentive called the Energiewende and Germany's Renewable

Energy Act. In 2011, the village received \$5.7m for its energy surplus, which it invested into the community. **Local jobs have been created** and businesses have moved to the village, boosting the local economy.⁴⁷ In the village there are many solar panels (with a generating capacity of five megawatts), five biogas facilities, eleven wind turbines and a hydropower system.

Travelling Abroad – More Inspiration Across the World

Since the 1976 oil crisis, Denmark has made collective, sustainable energy a central – and popular – part of its planning system. New developments are required to be based on sustainable energy systems and local energy networks.⁴⁸ Most of the country's onshore wind turbines are community-owned and the rapid approval rate of applications has been cited as a major reason for this.⁴⁹ Denmark also aims to reduce primary energy consumption by 13% by 2020, based on 2006 levels.⁵⁰

The Danish island of Samsø generates far more energy than it uses and so exports the excess energy to neighbouring regions.⁵¹

France has a target to increase renewables to 32% of its energy mix by 2030⁵² and to halve national energy use by 2050, based on 2012 levels.⁵³ New laws require all new buildings to have solar panels.⁵⁴

43 http://www.passivehouse-international.org/upload/2015_07_16_Passive-House-Plus_Press-Release.pdf

44 <http://www.buildup.eu/en/news/german-federal-environment-agency-moves-zero-energy-building>

45 <https://energytransition.org/2013/10/hamburg-citizens-buy-back-energy-grid/>

46 <https://www.swm.de/english/company/energy-efficiency.html> and <http://www.swm.de/english/company/energy-generation/renewable-energies.html> and <http://www.swm.de/english/company/commitment>

47 "Wildpoldsried Innovativ Richtungsweisend" (WIR-2000)

48 <http://energiyahistud.ee/wp-content/uploads/2015/01/Danish-wind-coops-2009.pdf>

49 <http://www.power-technology.com/features/featureonshore-wind-energy-turbines-farms-uk-community-protests/>

50 <http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-denmark.pdf>, page 11

51 <http://www.newyorker.com/magazine/2008/07/07/the-island-in-the-wind>

52 <http://www.scientificamerican.com/article/france-plans-to-reduce-nuclear-in-favor-of-renewables/>

53 <http://www.gouvernement.fr/en/cop21-france-s-national-commitments>

54 <http://linkis.com/csglobe.com/VoSSj>



Horb Ecumencial Energy Co-operative, Stuttgart, Germany



Freiburg, Germany (FWTM-Spiegelhalter) (Bernward Janzing)

Japan has a target to improve energy efficiency by 30% by 2030, based on 2006 levels. Following the Fukushima nuclear reactor incident in 2011, the Japanese government launched 'Setsuden' (Energy Saving) which saw a nationwide demand reduction of 15% at all times for large-scale users of electricity during peak hours for the population⁵⁵

Brazil intends, by 2024, to build 1.2 million homes that each generate enough energy to be self-sufficient.⁵⁶ India plans to increase its solar generating capacity to 100 gigawatts by 2020.⁵⁷ To put this into context, the entire generating capacity of the UK is currently around 80 gigawatts.⁵⁸ In Bangladesh, Pakistan and Indonesia, many people are taking advantage of cheap renewables and smaller sized energy grids.⁵⁹

Many nations and regions have, or nearly have, 100% renewable energy including Norway,⁶⁰ Iceland,⁶¹ Costa Rica,⁶² Quebec in Canada,⁶³ Albania, Angola, Bhutan⁶⁴ and El Hierro in Spain's Canary Islands.⁶⁵ Paraguay generates far more energy than it uses and so exports the excess energy to neighbouring nations.⁶⁶

Going into Society – the UK Energy Revolution

Government ministers are saying the right things about climate change targets, affordability and security of energy supply. Greg Clark, the Secretary of State for Business, Energy and Industrial Strategy, said:

“Our current energy system of rules and regulations was set up to move power from big power stations, down long wires, to people's homes and businesses. It has served us very well. But new technology is challenging that model.”⁶⁷

55 Howard Johns, *Energy Revolution*, pp.107–108.

56 <https://www.evwind.es/2016/03/11/1-2-mln-brazilian-homes-to-be-self-powered-by-2024/55624>

57 <https://www.greentechmedia.com/articles/read/india-wants-more-battery-storage>

58 https://www.ofgem.gov.uk/sites/default/files/docs/2015/07/electricitysecurityofsupplyreport_final_0.pdf, Appendix A2

59 <https://energytransition.org/2017/02/pay-as-you-go-solar-and-microgrids-considered-new-class-of-infrastructure-investment/>

60 <http://www.altenergy.org/renewables/wholly-renewable.html>

61 <http://reneweconomy.com.au/2012/iceland-a-100-renewables-example-in-the-modern-era-56428>

62 <http://www.fastcoexist.com/3044360/costa-rica-is-now-running-on-100-renewable-electricity>

63 <http://www.hydroquebec.com/sustainable-development/pdf/energy-supplies-and-air-emissions-2013.pdf>

64 <http://cleantechnica.com/2013/01/06/94-renewable-energy-by-2017-is-goal-for-nicaragua/>

65 http://elpais.com/elpais/2015/08/20/inenglish/1440063550_895429.html

66 <http://cleantechnica.com/2013/01/06/94-renewable-energy-by-2017-is-goal-for-nicaragua/>

67 <https://www.gov.uk/government/speeches/greg-clark-speech-at-energy-uk>

The idea that the future is local has been gaining ground. This view is shared by former Government Energy and Climate Change Minister, Greg (now Lord) Barker. Speaking as a minister in 2013, he said:

*“I want to unleash a completely new model of competition and enterprise. I want to encourage a vast new army of disruptive new energy players... From individual consumers to community groups, entrepreneurs, SMEs and FTSE giants, I want them all to consider generating their own energy at real scale, as well as starting to sell their excess energy on a commercial basis. A decentralised power to the people energy revolution – not just a few exemplars but tens of thousands of them. The ‘Big Six’ need to become the Big 60,000.”*⁶⁸

Consider also the words of the Executive Director of National Grid, Nicola Shaw. She said:

*“From an historic perspective we created energy in big generating organisations that sent power to houses and their businesses. Now we are producing energy in those places... All of that is a real revolution... a smart energy revolution that’s changing the way we think about energy across the country.”*⁶⁹

This was echoed by the Head of Infrastructure at the Confederation of British Industry (CBI), Michelle Herbert, who said:

“Over the next decade, the UK’s energy system will see a profound shift towards a more flexible and dynamic system. Consumers – both businesses and households – will become much more engaged in how they use, manage and even produce energy. This will play an important role in supporting the UK’s transition to a diverse energy mix, helping to meet our goals of affordable, low-carbon and



Japanese ‘Setsuden’ (Energy Saving) Public Posters

*secure energy across the country.”*⁷⁰

Carl Ennis, **Managing Director of Energy Management at Siemens PLC**, said, on behalf of CBI members:

*“Our energy system is going through profound change at the moment. Industry needs to work with government so we can continue to invest with confidence as we move to a low-carbon economy, where our energy comes from a wide range of sources and businesses and households are in more control of the energy they use.”*⁷¹

An energy revolution is taking place. We have shown above that this revolution is about the future being local. There *are* pioneers in the UK, some of whom we discuss in Part 3. If these welcome efforts are to become the national norm then system change at a national level is needed.

68 <https://cleantechnica.com/2013/10/14/decentralised-power-people-energy-revolution-uk/>

69 <http://www.bbc.co.uk/news/business-37220703>

70 <http://www.bbc.co.uk/news/business-37220703>

71 www.cbi.org.uk/business-issues/energy

Part 3: How We Produce and Deliver Energy – A Flight from the Future

LOCAL SUPPLY

What currently happens in the UK?

In the UK, generated electricity goes into the national grid, which is the national network of wires run by a private company, National Grid.⁷² This network is separated into higher voltage trunk route wires and lower voltage local wires that connect electricity to customers, for example people's homes. The trunk route wires are like the motorways and 'A' roads on the road network, while the local wires are like the smaller roads.

It is important to distinguish between what it means to generate electricity and to supply electricity in the context of the UK system. Generation means the physical creation of electricity, for example by a wind turbine or a coal power station. Supply means the selling of that electricity to customers, which currently must be offered nationally. This means that smaller organisations can build their own electricity *generation* sources and export the electricity to the grid, but to become an electricity *supplier* they must go through expensive and onerous steps in order to supply to customers nationally.

What happens, physically, is that electricity is used closest to where it is generated.⁷³ This means that when a clean source of electricity,

such as a wind farm, is generating, customers nearby are using that electricity before any others who are further away.

When this happens, the rest of the grid benefits. There are three reasons for this:

- Less electricity is lost: the further electricity travels down wires the more is lost as heat.⁷⁴
- Less infrastructure is needed to transmit electricity over larger distances across the grid.⁷⁵
- The need to ensure that supply meets demand, known as balancing, along the high voltage trunk route wires is reduced because the locally generated and used electricity never goes beyond the local low voltage network of wires. This therefore ensures greater energy security as the demand from the high voltage trunk network is less.

This is what is physically happening. The electricity supply market, however, is not aligned with it.

The market was based on a centralised model when it was set up, whereby electricity was only generated by large power stations and sent down wires to customers. This means that local, clean electricity generators do not get fully paid for the benefits that they create. This is a disincentive to the development of locally based clean energy.

72 <http://www2.nationalgrid.com/uk/our-company/electricity>

73 <http://www.parliament.uk/documents/post/e5.pdf>

74 <http://www.bbc.co.uk/schools/gcsebitsize/science/aqa/mains/generatingelectricityrev8.shtml>

75 <http://www.bbc.co.uk/schools/gcsebitsize/science/aqa/mains/generatingelectricityrev8.shtml>

As we said above, market rules require that any supplier must offer electricity to customers nationally. This creates huge barriers for new suppliers to enter the market – the associated grid connection costs are often well over £1 million for a new supplier.⁷⁶ There are then further costs associated with national grid balancing and transmission.⁷⁷ These costs arise because new supply companies must employ technical specialists in order to deal with thousands of pages of grid balancing codes and agreements that were originally written for a system with only a few large suppliers.⁷⁸ If we are to have more local, clean energy then something different is required.

A report published by the energy regulator, the Office of Gas and Electricity Markets (Ofgem), has itself stated that, “The licensed supplier model tends not to be a viable proposition for very small-scale supply – compliance with industry codes, in particular, requires significant upfront costs.” Ofgem also stated that the requirement for an electricity supplier to supply nationally “seems a cumbersome mechanism for enshrining consumer protection, and simpler arrangements may be more likely to deliver the benefits local can afford, such as improved choice.”⁷⁹

This means that existing *or potential* smaller generators of clean local electricity – for example households, schools or communities

– do not receive the full benefit for that generation. It also means that the value of the benefits from supplying local, clean electricity is not realised, in the form of revenue, by the generators of that electricity. Those who generate this electricity are paid on average around 4.1p/kWh (pence per kilowatt hour),⁸⁰ yet electricity costs customers around 14.5p/kWh.⁸¹

As Community Energy England (CEE) said,

*“The idea of supplying electricity direct to consumers via the distribution network is at the core of many communities’ vision for local energy systems and is a major policy objective for CEE. Currently, it is necessary to be a registered electricity national supplier to be able to sell directly to members of the public. This is way beyond the resources of most community energy organisations.”*⁸²

Community Energy Scotland and Community Energy Wales also hold the same view.⁸³

This all helps explain why currently only 22.4% of our UK electricity is from clean generation⁸⁴ and why the supply market is dominated by the six largest supply companies, which control 85% of it⁸⁵ with the remaining 15% of the market supplied by 31 other companies.⁸⁶

This could all be so different.

76 <https://www.theguardian.com/sustainable-business/2015/jul/10/uk-energy-system-in-thrall-to-giant-utilities-customers-budget-renewables> and statement by Julian Packer (Low Carbon Investment Director at the Greater Manchester Combined Authority) that the assessment of setting up a Greater Manchester Energy Company showed it would cost ‘several million pounds’, Carbon Co-op’s Hacking the Energy System conference, Manchester, 29th September 2016

77 <https://www.ofgem.gov.uk/key-term-explained/how-do-we-calculate-network-costs>

78 <http://www.theguardian.com/sustainable-business/2015/jul/10/uk-energy-system-in-thrall-to-giant-utilities-customers-budget-renewables>

79 https://www.ofgem.gov.uk/system/files/docs/2017/01/ofgem_future_insights_series_3_local_energy_final_300117.pdf

80 <https://www.ofgem.gov.uk/publications-and-updates/feed-tariff-fit-tariff-table-1-april-2017>

81 https://www.ukpower.co.uk/home_energy/compare_electricity; as accessed on 30th May 2017

82 <http://communityenergyengland.org/policy/direct-energy-supply/>

83 www.communityenergyscotland.org.uk, <http://communityenergywales.org.uk/wp-content/uploads/COMMUNITY-ENERGY-WALES-MANIFESTO.pdf>

84 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/547977/Chapter_6_web.pdf

85 <https://www.ofgem.gov.uk/chart/electricity-supply-market-shares-company-domestic-gb>

86 <http://switch.which.co.uk/energy-suppliers/suppliers-atoz.html>

What could happen? ...and once did

We have established that clean electricity generators create benefits, yet they are not paid fully for those benefits because of the way the market is currently set up. If clean electricity generators had the right to supply local customers this would allow them to sell electricity to local people at a price that would be lower for customers and higher for the generator. A win-win situation for customers and clean energy.

Local supply rights exist elsewhere in Europe, for example Germany and Denmark.⁸⁷ They allow households or community organisations to sell their surplus electricity to a local energy supplier. Whilst in the UK there are almost 40 supply companies, in Germany there are over 1,000.⁸⁸ Due to the direct benefit communities see in their areas, wind turbines that are community owned and supplying cheaper electricity have been popular rather than highly contentious and controversial with the public.⁸⁹

In the UK it was not so different in the past. Before 1948, most local authorities owned their local energy companies.⁹⁰ The supply of local electricity and gas that these local energy companies provided to local people was a source of income for those local authorities.⁹¹

This money provided things like street lighting⁹² and urban improvements such as libraries and parks.⁹³

Local authorities were clear about their intention to do this because they regarded it as reinvesting money that local people were paying for their energy back into their own communities.⁹⁴ By 1928, the number of municipal energy companies had grown to 362.⁹⁵ However, in 1948 nationalisation changed things by creating a single national market.⁹⁶

UK Pioneers – The Best of Times, the Worst of Times

There are some laudable examples of local authorities and others that are striving to provide clean energy at cheaper prices to people locally. However the huge barriers, blockages and disincentives explained above are hindering them. This is not their fault, it is the system that needs to change.

Bristol City Council has set up its own supply company called Bristol Energy. They aim to eradicate fuel poverty by offering cheaper energy⁹⁷ and actively seek to source energy from renewables.⁹⁸ Nottingham City Council has also set up its own supply company called Robin Hood Energy with some of the energy

87 As referenced in Part 2 of this report

88 <http://www.respublica.org.uk/our-work/publications/creating-local-energy-economies-lessons-germany/>

89 <http://www.power-technology.com/features/featureonshore-wind-energy-turbines-farms-uk-community-protests>

90 The Cambridge Economic History of Modern Britain Volume 2, 1870 to the Present by Professor Robert Millward (Manchester University), Chapter 15 – The Growth of the Public Sector

91 *Ibid*, page 326, Table 11.2

92 Katrina Hyde, *Profession v Trade: a defining episode in the development of the gas lighting industry in the late 19th century*

93 *From Private to Public Ownership of Gas Undertakings in England and Wales, 1851-1947* by Professor Robert Millward, Manchester University Press

94 The Cambridge Urban History of Britain edited by Martin Daunton, Chapter 11 – The Political Economy of Urban Utilities by Robert Millward, page 333

95 *From Private to Public Ownership of Gas Undertakings in England and Wales, 1851-1947* by Professor Robert Millward, Manchester University Press, page 326, Table 11.2

96 <http://www.nationalarchives.gov.uk/cabinetpapers/themes/transport-electricity-gas-iron-steel.htm>

97 http://news.bristol.gov.uk/new_proposal_for_municipal_energy_company_in_bristol

98 <https://bristol-energy.co.uk/renewable-generators-0>

that the company supplies being from local sources and with cheaper prices offered to customers who live in Nottingham.⁹⁹

There are more ambitions at a combined municipal level: the Greater London Authority (GLA) have an ambition to set up a supply company that would purchase low carbon electricity, mostly from combined heat and power plants in London, and then sell this output to the London Underground.¹⁰⁰ Similarly the Greater Manchester Combined Authority (GMCA), after a detailed feasibility study, has plans¹⁰¹ to set up an energy supply company that will supply electricity from local sources and reduce energy costs to the fuel poor.¹⁰²

However, both Bristol Energy and Robin Hood Energy are not able to offer local, clean electricity to local people only, because of the difficulties we have detailed earlier in this section. If the GLA and GMCA do set up energy companies they will still face the problem Bristol Energy and Robin Hood Energy face regarding electricity: they will have to supply nationally and so will not be able to sell local, clean electricity only to local people because of the market restrictions we have detailed earlier in this section.

Woking Borough Council set up Thameswey Energy company in 1999.¹⁰³ It generates and supplies low carbon and renewable energy to a wide range of public and private sector customers in Woking and Milton Keynes.¹⁰⁴

However, the gas and electricity supplied by Thameswey Energy is done so through its private gas pipe network and private electricity wire network. The cost of building such a network is one of the barriers facing local generators of renewable electricity who could otherwise supply their generated electricity locally.

Some electricity supply companies are making welcome efforts too. For example, Good Energy has offered cheaper local prices linked to several of their wind turbine sites.¹⁰⁵ Another example is Ovo Energy's setting up of Ovo Communities which offers organisations the opportunity to supply electricity in partnership with Ovo Energy. Cheshire East Council are using the Ovo Communities service with the aim of providing cheaper electricity to local people.¹⁰⁶

However, the business initiatives of Good Energy and Ovo Energy do not change the fact that they are national supply companies. Therefore, whilst welcome initiatives, they do not overcome the major barriers and restrictions that militate against local, clean electricity being supplied to local customers.

In summary, the examples above are inspiring. Some are resulting in cheaper prices for local customers, others are resulting in more clean, or low carbon, electricity being used and some are even doing both. We welcome and applaud these and similar initiatives because of this, yet they do not

99 The Guardian, 7th September 2015 and the leader of Nottingham City Council's blog, 23rd September 2015 <http://www.nottinghamleader.co.uk/?p=102>

100 <https://www.regensw.co.uk/Handlers/Download.ashx?IDMF=9b4bd983-7ee6-4b65-b45f-25d22c5f277d>

101 GMCA Report by Councillor Sue Derbyshire, 18th January 2016

102 https://www.greatermanchester-ca.gov.uk/download/downloads/id/221/change_and_low_emissions_implementation_plan_2016-2020.pdf

103 <http://www.thamesweyenergy.co.uk>

104 <https://www.regensw.co.uk/Handlers/Download.ashx?IDMF=9b4bd983-7ee6-4b65-b45f-25d22c5f277d>

105 <https://www.regensw.co.uk/Handlers/Download.ashx?IDMF=9b4bd983-7ee6-4b65-b45f-25d22c5f277d>

106 http://www.cheshireeast.gov.uk/council_and_democracy/council_information/media_hub/media_releases/save_by_switching_to_fairerpower.aspx

change the fact that the barriers to supplying local, clean electricity to local customers are stopping it from developing.

Conclusion and Recommendation

A right to local supply in the UK could, and should, mean that new local suppliers would face costs to enter the market in proportion to their proposed size of operation because they would only be supplying to local customers.

To ensure that these costs and thus barriers to entry are proportional, the bureaucratic processes that a new local supplier would need to undertake should be simple and straightforward in order to encourage and enable potential new local suppliers.

As the Ofgem report cited above says, the requirement for an electricity supplier to supply nationally “seems a cumbersome mechanism for enshrining consumer protection, and simpler arrangements may be more likely to deliver the benefits local can afford.”

RECOMMENDATION 1:

That the right to local electricity supply be enshrined in law, with the following characteristics:

- 1. The ability for generators to be local suppliers and to set local prices,**
- 2. The costs of a local supply licence, connection, balancing and local grid maintenance to relate to the size of a local supplier’s operation, and**
- 3. The bureaucratic processes that a new local supplier would need to undertake must be simple and straightforward.**

GOVERNMENT SUBSIDIES

What currently happens in the UK?

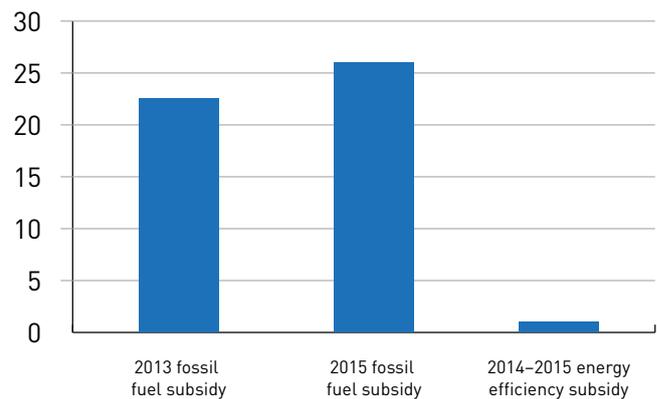
Government money, i.e. subsidy, is used to ensure energy supply. Few people would argue with that policy: but far more questionable is the current situation whereby subsidies for fossil fuels are increasing. In 2013 they were **£22.39 billion** and in 2015 they had risen to **£26 billion**.¹⁰⁷ As the Overseas Development Institute states, “the UK stands out as a member of the G20 that, despite its pledge to phase out fossil fuel subsidies, has dramatically increased its support to the production of fossil fuels in recent years.”¹⁰⁸

Meanwhile subsidies for clean energy are *decreasing* and those for energy efficiency (that we discuss in Part 3 below) were only £893 million in 2014–2015,¹⁰⁹ i.e. more than 25 times smaller than the fossil fuel subsidy of 2015, as Figure 1 shows.

We strongly support the idea of a self-sustaining and growing renewables sector in the long run.

As Dave Prescott from New Leaf Solar Energy Co-op says, “The system needs to be much more effectively streamlined so a community group can feasibly and realistically sell to

Figure 1. UK Fossil Fuel and Energy Efficiency Subsidies (£ billions)



a third party user. **If that happened, we wouldn't need subsidies because we could sell our electricity at a decent rate.**¹¹⁰

However, that has not happened yet: indeed local and clean energy faces all the hurdles we have already outlined. Meanwhile subsidy for fossil fuel energy is increasing:

- Electricity costs customers around 14.5p/kWh.¹¹¹ Yet the Feed in Tariff, a subsidy given to providers of smaller scale solar, wind, hydro and anaerobic digestion energy has been consistently cut from 2010 when it was introduced. For example, in December 2015, the tariff for rooftop solar panels was cut by 65% from 12.47p/kWh to 4.39p/kWh¹¹² and it is now at 3p/kWh.¹¹³ If this was not enough of a deterrent, the government could announce further cuts to the tariff levels in any given year.¹¹⁴

¹⁰⁷ <http://www.imf.org/external/pubs/ft/survey/so/2015/NEW070215A.htm>, country database spreadsheet

¹⁰⁸ Overseas Development Institute: Empty Promises: G20 subsidies for oil, gas and coal production November 2015 <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9957.pdf>

¹⁰⁹ Department for Energy and Climate Change Annual Budget Core Tables, Table 1, 2014–2015 column, rows 8, 38 and 69; these show a total of £848 million, the Treasury subsidy figure is a result of the reduced VAT rate of 5% on the Energy Company Obligation of £45 million, therefore the overall public spending and subsidy is £853 million, <https://www.gov.uk/government/publications/decc-annual-report-and-accounts-2014-to-2015>

¹¹⁰ <https://www.theguardian.com/public-leaders-network/2015/oct/02/energy-cooperatives-uk-germany-denmark-community>

¹¹¹ https://www.ukpower.co.uk/home_energy/compare_electricity, as accessed on 30th May 2017

¹¹² <https://www.utilitywise.com/2015/12/17/decc-confirm-changes-to-renewable-subsidies-with-tariff-cuts-scaled-back/>, rates in pence per kilowatt hour

¹¹³ <https://www.ofgem.gov.uk/environmental-programmes/fit/fit-tariff-rates>

¹¹⁴ <http://www.fitariffs.co.uk/eligible/levels/depression>

- Subsidy for onshore wind generation ceased in April 2017.¹¹⁵
- Tax relief for community renewable energy projects has been removed.¹¹⁶
- Most bizarrely, since 1st August 2016, the government has *taxed* renewable energy. This is because the Climate Change Levy exemption for renewable energy has been removed.¹¹⁷ This levy is a tax paid by generators of polluting energy. Now it is to be paid by non-polluting energy.

Compare this to the government proposal of a £1bn Shale Wealth Fund¹¹⁸ to support hydraulic fracturing: a way of extracting gas – a fossil fuel – currently held in shale rock.

Clean Energy: Our Mutual Friend

Indeed, the Chancellor of the Exchequer, Philip Hammond, when speaking in the United Arab Emirates on 29th October 2015, then as the Foreign Secretary, urged them to invest in clean energy. He said:

“I believe the time to invest in that future is now. As we all know, this is not an investment decision like any other. An investment in clean energy is an investment in a safe climate.”¹¹⁹

We agree.

We do accept that, if our energy system moves increasingly to renewables, as it should, fossil fuel power stations will be left idle for increasingly longer periods of time, yet they may well need to be maintained to ensure the security of electricity supply. This may mean that fossil fuels need more subsidy per unit of electricity to ensure that they are available

when needed because the costs of their upkeep does not fall in line with the fall in the amount of electricity they are generating and earning revenue from. What is crucial is that the total fossil fuel subsidy continues to decrease, even if the fossil fuel subsidy per unit may need to rise, so that our energy system can become clean, be affordable and be secure.

Conclusion and Recommendation

If reliance on fossil fuels threatens energy security, as the Prime Minister and the Secretary of State have stated; and threatens economic stability and “our desire for social justice”, as the Secretary of State argues; and if we are really serious about providing clean energy in order to meet our statutory targets, as the Prime Minister and the Secretary of State are; then a more sensible subsidy policy is needed.

RECOMMENDATION 2:

That a new energy subsidy policy is established with the purpose of addressing the current subsidy imbalance, achieving the “radical shift away from dependence on fossil fuels” called for by the Secretary of State and ensuring that the government meets the carbon budgets set by the Committee on Climate Change.

RECOMMENDATION 3:

That clean energy generation is made exempt from the Climate Change Levy.

115 <https://www.ofgem.gov.uk/environmental-programmes/fit/fit-tariff-rates>

116 <http://www.theguardian.com/environment/2015/nov/05/treasury-tax-plans-will-decimate-community-energy-projects>

117 <https://www.ofgem.gov.uk/environmental-programmes/ccl/generators>

118 <https://www.gov.uk/government/consultations/shale-wealth-fund>

119 <https://www.gov.uk/government/speeches/foreign-secretarys-clean-energy-future-speech>

THE USE OF CLEAN BEFORE DIRTY

What currently happens in the UK?

The UK has around 80 gigawatts of electricity generating capacity. 30 gigawatts of this is installed renewables with around 17 gigawatts being from wind and around 8 gigawatts being from solar,¹²⁰ as Figure 2 shows.

It was estimated that in 2014 wind and solar generation reduced the wholesale cost of electricity by £1.55 billion. Furthermore the overall value of the benefits solar and wind brought to the UK in 2015 was estimated at £2 billion.¹²¹

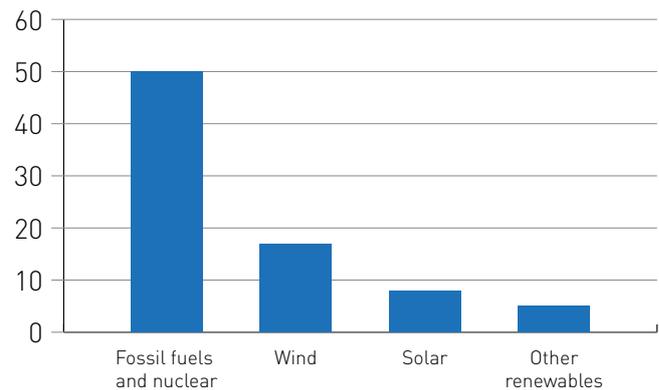
The UK's energy system favours dirty energy rather than clean, thus resulting in more emissions of carbon dioxide and exacerbating dangerous climate change. In stark contrast to the situation in Germany, there is no system in place in the UK to ensure that clean energy that is produced is used.

Currently priority is not given to electricity from clean sources, for example wind turbines or solar panels. This is because they are more decentralised, i.e. smaller and more geographically dispersed, than large power stations.

This has had some quite bizarre results.

Wind generation plants have been told to switch off at times when the wind has been blowing because the current system has meant that, at those times, electricity from

Figure 2. UK Electricity Generating Capacity (Gigawatts)



dirty sources was prioritised. When this has happened the wind farms have been paid for doing so, to reduce their lost revenue. In 2015, these payments exceeded £90 million and they have been increasing at around £30 million per year.¹²²

Consider what this means: public money is used to pay clean electricity plants to not generate so that fossil fuel energy can generate. Then public money is used to fund government policies to reduce the carbon dioxide that has been emitted. This is absurd.

What happens in Germany – the merit order system

Germany currently has over 80 gigawatts of wind and solar capacity.¹²³ This is a very substantial amount – it is about the same as the UK's entire generating capacity.¹²⁴ This capacity difference may be surprising, however consider that Germany's population is 20 million (about 30%) larger than the UK and it also has a larger economy and industrial

¹²⁰ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/547977/Chapter_6_web.pdf

¹²¹ <https://www.goodenergy.co.uk/media/1194/wind-and-solar-reducing-consumer-bills-an-investigation-in-to-the-merit.pdf>

¹²² <http://euanmearns.com/uk-wind-constraint-payments/>

¹²³ <https://www.cleanenergywire.org/factsheets/citizens-participation-energiewende>

¹²⁴ https://www.ofgem.gov.uk/sites/default/files/docs/2015/07/electricitysecurityofsupplyreport_final_0.pdf, Appendix A2

sector. Importantly, this 80 gigawatts of wind and solar capacity is enough to serve more than Germany's electricity needs on a sunny and windy day.¹²⁵

To ensure that as much, and ideally all, of the electricity that is produced by Germany's wind and solar plants is used, the country operates a merit order system. The system was adopted in the 1990s, long before the rise of renewables. It requires that as electricity demand increases, new generating plants come online on a cost basis. The cheapest fuel costs determine which power plants to turn on first so that, in theory, the cheapest power source is the next to be turned on. More recently Germany's Renewable Energy Sources Act (Erneuerbare Energien Gesetz), however, states that all renewable energy must be used by the grid first.¹²⁶

The marginal cost for renewables is very small because the sun and the wind are free. This means that the cost order is solar and wind first, then hydro and biomass, then nuclear and finally fossil fuels. The overall effect of the system is that the more renewables come on line, the less is produced by fossil and nuclear generation.¹²⁷

Another effect of the merit order system has been the **lowering of power prices due to an increased supply of renewable energy**. Power stations with high generation costs such as gas-fired and hard coal-fired plants, which are often owned by the large utilities or municipal utilities, are vulnerable to being pushed out of the market as they cannot compete at the lower prices.

The average wholesale price for power on the spot market fell 11% from €42.60 per megawatt-hour in 2012 to €37.78 per megawatt-hour in 2013. In 2014, the average spot market price fell to an even lower €33 per megawatt-hour.¹²⁸

A further effect of increased supply from renewables, particularly solar power, is the flattening out of the daily lunchtime peak price at the electrical power exchange. At this time of high demand, gas-fired and coal-fired plants used to be able to achieve high returns, however with solar power production also peaking around noon, conventional power plants lost this important advantage.¹²⁹

A study by the Fraunhofer Institute found that the 'merit order effect' meant that the savings in electricity costs to German consumers more than offset the support payments paid for renewable electricity generation.¹³⁰ A 2013 study estimated the merit order effect of both wind and photovoltaic electricity generation in Germany between the years 2008 and 2012. For each additional gigawatt-hour of renewables fed into the grid, the price of electricity in the day-ahead market is reduced by €1.10–€1.30/MWh (Euros per megawatt hour). The total merit order effect of wind and solar ranges from €5/MWh in 2010 to more than €11/kWh in 2012.¹³¹

Prices have dropped almost 70% since 2008, and wholesale prices hit a twelve-year low (below €30/MWh for year-ahead delivery) in August 2015. Wholesale prices have continued to fall in 2016, with S&P Global Platts reporting on 22nd January that "Baseload

125 <http://energyandcarbon.com/the-declining-value-of-wind-and-solar-to-the-german-power-system/>

126 <http://www.powermag.com/germanys-energie-wende-new-turning-point/?pagenum=1>

127 <http://www.powermag.com/germanys-energie-wende-new-turning-point/?pagenum=1>

128 <https://www.cleanenergywire.org/factsheets/setting-power-price-merit-order-effect>

129 <https://www.cleanenergywire.org/factsheets/setting-power-price-merit-order-effect>

130 <http://www.isi.fraunhofer.de/isi-wAssets/docs/e-x/working-papers-sustainability-and-innovation/merit-order-effect.pdf>, page 21

131 [http://ceem.unsw.edu.au/sites/default/files/documents/CEEM%20\(2013\)%20-%20MeritOrderEffect_GER_20082012_FINAL.pdf](http://ceem.unsw.edu.au/sites/default/files/documents/CEEM%20(2013)%20-%20MeritOrderEffect_GER_20082012_FINAL.pdf)

power for weekend delivery was last heard at €25.50/MWh,” and year-ahead power traded below €23/MWh “for the first time since early 2002.”¹³²

One of the key arguments against the German state support of renewable energy (known as the *Energiewende*), both inside and outside Germany, is that it has led to higher prices. However, the 2016 market power price in Germany was at its lowest level in over a decade and is actually declining. Even at €31.60/MWh in 2015, Germany had the second-lowest market price for power in Europe, after hydro-rich Scandinavia.¹³³

A report by Agora *Energiewende*, a Berlin-based energy think tank, published in 2016 forecasts that record low wholesale electricity prices will continue into 2018 at least.¹³⁴ The report said that German “consumers will start to see gains in terms of a gradual and permanent decline in retail electricity prices over the next five to ten years as the near-term peak” government subsidies pass.

A valid criticism of the German system is that electricity generated from burning coal is at times used before burning gas. This is clearly something that should be avoided because coal produces significantly more carbon emissions than gas.

Conclusion and Recommendation

The merit order system in Germany is an effective way of ensuring energy generation from their renewable plant is maximised. At the same time it has also caused a reduction in energy prices, because the system runs on the basis that the cheapest source of energy at

any moment is used first. Renewable energy, because of its very low marginal generation cost, has created this welcome result that benefits customers and the climate.

The German approach is a system that is the effect of saying, if you want to move from dirty to clean electricity, then you remove the obstacles that are in the path of clean. Meanwhile, the UK electricity market rules and structure, at present, greatly favour the existing large operators and therefore a system heavily reliant on fossil fuels whilst restricting the use of clean energy.

The UK’s system should ensure that clean electricity is used before that generated from other sources. Furthermore, any merit order system the UK implements should ensure that gas is used before coal because of its higher carbon intensity.

RECOMMENDATION 4:

That a merit order system be established in the UK, ensuring that electricity generated from renewable sources is used before energy generated from other sources. That this system also ensures that less polluting fuels are used before more polluting ones.

¹³² <http://www.powermag.com/germanys-energiewende-new-turning-point/?pagenum=2>

¹³³ <http://www.powermag.com/germanys-energiewende-new-turning-point/?pagenum=3>

¹³⁴ https://www.agora-energiewende.de/fileadmin/Projekte/2016/Jahresauswertung_2016/Agora_Jahresauswertung_2015_Slides_web_EN.pdf

PLANNING

What currently happens in the UK?

Hydraulic gas fracturing, known as fracking, is a technique designed to recover gas and oil from shale rock. The extracted gas is a fossil fuel and will therefore pollute and contribute to climate change.

However, the government has set up a £1 billion Shale Wealth Fund to support fracking (see detail on this in the above section on government subsidies) and it has passed legislation to enable it to step in when councils block or delay fracking planning applications.¹³⁵ This has already happened in Lancashire, where the government overruled a planning decision taken by Lancashire County Council to not allow Cuadrilla's fracking proposals.¹³⁶

Compare how the planning process treats onshore wind turbines. The government recently changed the rules regarding onshore wind generation: they put local authorities in control and specified that planning permission should only be granted if two conditions were met:

1. the site must be in an area identified as suitable for wind turbines as part of a Local or Neighbourhood Plan and,
2. following consultation, the planning impacts identified by affected local communities have been fully addressed.¹³⁷

Whilst we strongly agree that communities should be involved in decision making, this

change actually **restricts** that involvement because it came in with immediate effect. So even where councils and communities may support new wind turbines they cannot do so until they have changed their Local Plan (in the case of larger councils) or drawn up a Neighbourhood Plan (in the case of parish councils). As this takes a long time, councils and communities are now unable to have a say on whether wind proposals go ahead in their area.

This planning restriction has placed an effective moratorium on onshore wind in the UK, at a moment when falling costs and business appetite could make it a key part of a transition to a cleaner energy system. These new planning rules were introduced by the government in 2015 and have been criticised by the onshore wind industry as “effectively freezing development of onshore wind” just at the point when new technology now makes it cheaper.¹³⁸

As believers in involving local people in energy accountability, we can hardly condemn the principle of a council and community led planning process, but we do ask the question: Why the stark discrimination between how onshore wind is treated and how fracking is treated?

Furthermore, renewable energy developments under five megawatt capacity are treated as ‘community-scale’ under the UK’s Feed in Tariff regime (a subsidy given to smaller scale, clean energy generators). This provides reasonable grounds to exempt applications for smaller scale onshore wind applications

¹³⁵ <http://www.theguardian.com/environment/2015/aug/13/government-will-step-in-if-councils-dont-fast-track-fracking-applications>

¹³⁶ <http://www.telegraph.co.uk/business/2016/10/06/fracking-by-cuadrilla-approved-at-one-lancashire-site-overruling/>

¹³⁷ House of Commons Briefing: Planning for Onshore Wind <http://researchbriefings.files.parliament.uk/documents/SN04370/SN04370.pdf>

¹³⁸ <http://www.telegraph.co.uk/finance/economics/12090394/Britain-abandons-onshore-wind-just-as-new-technology-makes-it-cheap.html>

from the current planning restrictions, yet they are not exempt under the current rules.

Conclusion and Recommendation

Fracking currently is favoured by the planning process. Even if a council rejects a fracking planning application the government can overrule this and allow the fracking project to go ahead, indeed the government already have. Onshore wind faces the opposite situation. The current planning rules have created an effective moratorium on all new onshore wind projects.

In short: every single local person could object to a new fracking site but can still be overruled by the government, whilst a new onshore wind site could be stopped by the objection of one single local person. This is a glaring inconsistency.

All sources of energy that are not national infrastructure projects should face a level playing field, where decisions made about them are done via the democratic process at a local level. This would mean that businesses, farmers and others seeking to self-supply alongside community energy groups could then progress small to medium scale onshore wind energy developments without prejudice under the standard planning system.

RECOMMENDATION 5:

That, with the exception of national infrastructure projects, all proposed sites relating to renewable energy be determined at a local level. Furthermore, that this local determination process allows all local voices to be heard and ensures that new projects cannot be vetoed or blocked by one person or a small group of people.

Part 4: Energy Efficiency – the Long Voyage

What currently happens in the UK?

Energy saving is the ‘low hanging fruit’ of the possible ways to create a clean energy system. It creates jobs, saves lives and reduces the wastage in our energy system.¹³⁹ In Part 1 we described the problem – bad enough to be described as a national scandal – of fuel poverty, whereby people must spend a large portion of their income on heating their homes.¹⁴⁰

Here are the stark facts again:

- Currently 4.5 million households are in fuel poverty in the UK.¹⁴¹
- Fuel poverty costs the NHS £1.36 billion per year in England alone, excluding social care costs.¹⁴²
- The Chief Medical Officer has estimated that every £1 spent on dealing with fuel poverty saves the NHS 44p.¹⁴³
- Over the past five years there were 41,000 excess winter deaths “directly attributable to vulnerable people inhabiting cold homes” and that “over 125,000 vulnerable people are likely to die needlessly between 2015 and 2030.”¹⁴⁴

This national problem is caused by the fact that the vast majority of UK homes are poorly

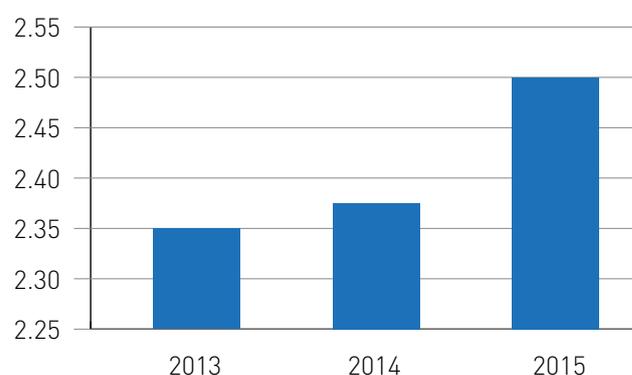
insulated against the cold and so use energy for heating very inefficiently.

Dealing with the Problem: Government Action to Date

Progress on ending fuel poverty is going backwards. National Energy Action (NEA) has shown over the last five years there are over 500,000 more fuel poor households living in cold homes.¹⁴⁵

Government figures show that the number of households in fuel poverty in England alone rose from 2.35 million in 2013 to 2.38 million in 2014 and again to 2.5 million in 2015,¹⁴⁶ as Figure 3 shows.

Figure 3. UK Households in fuel poverty (millions)



¹³⁹ <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>

¹⁴⁰ In Scotland, Northern Ireland and Wales fuel poverty is defined as needing to spend at least 10% of household income on keeping the home adequately warm; in England fuel poverty has been re-defined and is measured using the Low Income High Costs (LIHC) indicator, whereby a household is fuel poor if a) they have required fuel costs that are above average (the national median level), and b) were they to spend that amount, they would be left with a residual income below the official poverty line.

¹⁴¹ NEA/Energy Action Scotland Annual Fuel Poverty Monitor http://www.nea.org.uk/wp-content/uploads/2016/05/FPM_2016_low_res.pdf

¹⁴² <http://www.ageuk.org.uk/latest-news/archive/cold-homes-cost-nhs-1-point-36-billion/>

¹⁴³ Chief Medical Officer's Annual Report 2009, http://www.sthc.co.uk/Documents/CMO_Report_2009.pdf

¹⁴⁴ <http://www.nea.org.uk/media/news/290615-01/>

¹⁴⁵ http://www.nea.org.uk/wp-content/uploads/2016/05/FPM_2016_low_res.pdf

¹⁴⁶ Annual Fuel Poverty Statistics 2013, 2014 and 2015 <https://www.gov.uk/government/collections/fuel-poverty-statistics>

The Director of NEA, Jenny Saunders, has pointed out that, although the government has a manifesto commitment to end fuel poverty by 2030,¹⁴⁷ their current progress will not see fuel poverty ended until after 2095.¹⁴⁸

NEA give more detail on their Fuel Poverty and Energy Efficiency Timeline. It states that in 2015:

- The Conservative manifesto stated that it would deliver one million low cost insulation measures by 2020. This represented a considerable reduction on the then current rates of installation which were already a considerable reduction on the 2008 installation rates.
- The UK Government announced they would scrap the Zero Carbon Homes policy and the Allowable Solutions Fund which would have helped retrofit existing housing with better insulation.¹⁴⁹
- The Secretary of State announced there would be no further funding to the Green Deal Finance Company or the Green Deal Home Improvement Fund.¹⁵⁰ These bodies had been set up to help improve the energy efficiency of homes.

The Prime Minister has highlighted the plight of Britain's six million¹⁵¹ 'just about managing' families¹⁵² for whom, "Rising housing costs... mean that the proportion of income spent on housing (including fuel and power) has increased sharply... equivalent to an extra 14p on the basic rate of income tax."¹⁵³ Nearly

200,000 of these families are behind with their fuel bills.¹⁵⁴ Improving the thermal efficiency of these homes will help to alleviate some of the pressures faced by these families; making their homes warmer, cheaper to heat, and more comfortable.

We welcome these words. What is now important is for the government to establish policies that will make them a reality. The policies outlined at the end of this section would ensure the government's energy saving intentions are realised.

The government has a tough task. The Committee on Climate Change, the Parliamentary body set up to recommend and monitor the progress that the government is making on reducing greenhouse gas emissions, has reported that:

*"The government, working in partnership with industry, aims to set the long-term direction needed to give business the confidence to invest through supporting sector partnerships, innovation of new technologies and developing skills. In order to decarbonise its building stock, the UK will need a highly skilled workforce that can retrofit a range of heating systems and efficiency measures, and understands the interactions of these at a building-level. This is a major challenge, but also an opportunity to support large numbers of high-quality jobs."*¹⁵⁵

The Committee has also stated that:

"Heating and hot water for UK buildings make up 40% of our energy consumption and

147 Conservative Election Manifesto May 2017, page 60

148 <http://www.nea.org.uk/media/news/i-daniel-blake-lead-actor-dave-johns-back-national-campaign/>

149 <https://www.gov.uk/government/publications/fixing-the-foundations-creating-a-more-prosperous-nation>, page 46

150 <http://www.nea.org.uk/campaigns-policy/fuel-poverty-energy-efficiency-timeline/>

151 <http://www.resolutionfoundation.org/publications/hanging-on-the-stresses-and-strains-of-britains-just-managing-families/>

152 <https://www.gov.uk/government/speeches/statement-from-the-new-prime-minister-theresa-may>

153 <http://www.resolutionfoundation.org/publications/hanging-on-the-stresses-and-strains-of-britains-just-managing-families/>

154 <http://www.resolutionfoundation.org/publications/living-standards-2016/>, Table 11, page 76

155 <https://www.theccc.org.uk/publication/next-steps-for-uk-heat-policy/>, page 67

20% of our greenhouse gas emissions. It will be necessary to largely eliminate these emissions by around 2050 to meet the targets in the Climate Change Act.”¹⁵⁶

The Committee has further stated that:

“Energy efficiency should be improved across the existing building stock. This can reduce emissions and energy bills, improve competitiveness and asset values for business, improve health and wellbeing, help tackle fuel poverty and make buildings more suitable for low-carbon heating in future.”¹⁵⁷

And that:

*“Across the housing stock standards could provide a clear trajectory and help in shifting social norms. A mutually reinforcing package could combine these with a fiscal incentive for early adopters, access to low-cost, long-term capital, plus support for fuel-poor households. Minimum standards based on annual g CO₂/m² [grams of carbon dioxide per square meter] would encourage both an improvement in energy efficiency and a movement towards lower-carbon heating systems in a technology neutral way. Such standards could be introduced at the point of sale and rental of homes when financial decisions are being made and when renovation is more likely. **This could set a target for 2030 with a clear trajectory of how the standard will be tightened over time, thus providing a clear signal to households and suppliers.**”¹⁵⁸*

We therefore make the two recommendations below.

Conclusion and Recommendation

For nearly twenty years there has been a political consensus that the cheapest, cleanest energy is the energy that is not used in the first place.¹⁵⁹ The evidence also clearly shows this. All buildings should be properly insulated and efficiently heated so that less energy is wasted in keeping them warm.

RECOMMENDATION 6:

That the government sets national targets for energy efficiency and energy demand reduction and publishes strategies for meeting those targets, in order to ensure that the emissions reduction targets set out by the Committee on Climate Change carbon budgets are met.

RECOMMENDATION 7:

That the government produces and then carries out a revenue neutral plan to bring the entire domestic sector housing stock up to Energy Performance Certificate Band C by 2035 and that the work be done through a locally led programme. Also that, as part of this, all fuel poor households be brought up to Energy Performance Certificate Band C by 2030.

156 <https://www.theccc.org.uk/publication/next-steps-for-uk-heat-policy/>, page 7

157 <https://www.theccc.org.uk/publication/next-steps-for-uk-heat-policy/>, page 7

158 <https://www.theccc.org.uk/publication/next-steps-for-uk-heat-policy/>, page 93

159 For example the Labour Party’s Energy White Paper, 2003; David Cameron’s speech launching DECC’s energy efficiency mission <http://www.businessgreen.com/bg/opinion/2241323/camerons-greeneconomy-speech-in-full>

DELIVERING A NATIONAL PROGRAMME

A locally led programme to do this work is recommended in the analysis by Cambridge Economics and VERC0, *Building the Future*.¹⁶⁰ This report recommends that this should be done as a National Infrastructure Priority. That is one possible mechanism; another could be to make it part of the Industrial Strategy and we accept that there may be other viable ways as well. What is important is the policy commitment and the subsequent action that deals with the problem.

This policy would deliver these considerable benefits for the UK. It would:

- End fuel poverty;
- Cut fuel bills by £245 per annum for those in fuel poverty and by £203 per annum for those classed as 'able to pay';
- Save 23.6 MtCO₂ (metric tons of carbon dioxide) by 2030 – roughly equivalent to cutting the emissions of the UK transport fleet by a third;
- Create 108,000 jobs per annum from 2020-2030 spread fairly evenly across all UK regions and parliamentary constituencies of the UK;
- See £3.20 returned per £1 invested by the government through increased GDP;
- See a 0.6% relative GDP increase by 2030, increasing annual GDP in that year by £13.9 billion;
- See £1.27 in tax revenue per £1 invested by the government, via increased economic activity.¹⁶¹

Financial Incentives

A major issue, as government ministers have said, is how to incentivise people to ensure that the needed works are carried out. We suggest:

- That the works should be carried out free of charge for households in fuel poverty. Building the Future calculated that this would cost £26.1 billion.
- Introducing interest-free loans for people not in fuel poverty (i.e. the interest should be paid for by the government). Building the Future estimated that this would cost £27.4 billion.
- An income tax rebate on the cost of the works. For the 15.2 million homes on standard rate of tax that would mean an average rebate of 20% of £4,385 = £13.3 billion.¹⁶²
- A rebate of stamp duty land tax to home buyers who increase the energy efficiency of their new home within six months. This could be made revenue neutral by increasing stamp duty on energy inefficient homes.
- Giving local authorities the power to give council tax rebates on energy efficient homes. Again this could be made revenue neutral by also giving local authorities the power to increase council tax on energy inefficient homes – other than those occupied by people in fuel poverty.

¹⁶⁰ <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>

¹⁶¹ <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>

¹⁶² <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>, page 14

A Revenue Neutral Balance Sheet for the National Programme

Cost of financial incentives to get the works done		Revenue generated by the scheme	
'Able to Pay' households		Income from the scheme	
1. Interest-free loans ^a (interest to be paid by the government)	£27.4 billion	1. Increased tax revenue by 2030 ^e	£51.1 billion
2. An income tax rebate on the cost of the works (for those on the standard rate this would mean an average rebate of 20% of £4,385 ^b = £877 x 15.2 million homes ^c)	£13.3 billion	2. Savings to the NHS (The Chief Medical Officer has stated that every pound spent on fuel poverty saves the NHS 44p. A £26.1 billion fuel poverty programme would therefore save this amount. ^f)	£11.48 billion
3. A stamp duty rebate to buyers who increase the energy efficiency of their new home in a specified time and increased duty on energy inefficient homes	Revenue neutral	3. Energy Company Obligation spending 2017-2022 at £640 million p.a. ^g Income from existing UK schemes that would go towards overall cost	£3.2 billion
4. Giving councils the power to give council tax rebates on energy efficient homes, with the power to increase council tax on energy inefficient homes and Fuel Poor Households	Revenue neutral	4. Welsh Government energy efficiency scheme: £100 million over 4 years ^h	£0.1 billion
5. Upgraded to Energy Performance Certificate Band C by means of government grants ^d	£26.1 billion	5. Scottish Government Home Energy Efficiency Programmes for Scotland scheme money for councils to 2035 ⁱ	£10.00 billion
Total cost	£66.8 billion	Total revenue	£75.88 billion

^a <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>, page 7

^b <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>, page 14

^c The English Housing Survey 2014-15 (Table 2.6) shows that there are now 6,125,000 English households at EPC A, B or C. (26.2%). Applying this portion to the rest of the UK: 26% of 4.4 million = 1,144,000; there are therefore: 6,125,000 + 1,144,000 = 7,269,000 households not needing works; therefore the number needing works: 22,500,000 (total number of households) – 7,269,000 = 15,231,000

^d <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>, page 7

^e <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>, pages 9 and 14

^f Chief Medical Officer's Annual Report 2009, http://www.sthc.co.uk/Documents/CMO_Report_2009.pdf and Age UK report The Cost of Cold, November 2012, http://www.ageuk.org.uk/Documents/EN-GB/Campaigns/The_cost_of_cold_2012.pdf?dtrk=true; and the Chartered Institute of Environment Health report Good Housing Leads to Good Health 2008, http://www.cieh.org/uploadedFiles/Core/Policy/Housing/Good_Housing_Leads_to_Good_Health_2008.pdf

^g <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06814>, page 4

^h <http://gov.wales/newsroom/environmentandcountryside/2017/170214-104million-to-heat-wales-most-vulnerable-households/?lang=en>

ⁱ <http://www.gov.scot/Resource/0051/00514144.pdf>

Revenue Neutral

The programme will cost £66.8 billion. This can be revenue neutral, based on how the government views its income. The financial benefits of a scheme should be set against the cost, as the Treasury Green Book states on page 19:

“the relevant costs and benefits to government and society of all options should be valued, and the net benefits or costs calculated... wider social and environmental costs and benefits also need to be brought into any assessment.”

Therefore, if the government applies its own method of calculating costs and benefits to the programme of works that we recommend, then the whole scheme will be revenue neutral, as the Balance Sheet we present above shows.

Other income currently not assessed

As we have shown in the table above, using the methodology in the Treasury’s Green Book, the revenue from this programme of works exceeds the outlay. There are, in addition, further revenue streams that we have not included which would reduce the estimated £26.1 billion of UK government spending. For example, local authority fuel poverty programmes and spending by the Northern Ireland Assembly. Also, if the right to local supply was enshrined in law, there could be significant surpluses from municipal energy schemes (as we described in Part 3). These surpluses could be used for insulating homes. Below we indulge in some ‘blue sky’ thinking with regards to the possibilities of these.

Non-Financial Incentives

We emphasise that although this should be a national government policy, the delivery would be local. Indeed, we strongly agree with Greg Clark, the Business, Energy and Industrial Strategy Secretary of State, when he said, “In my view any successful industrial strategy has to be local.”

Top-down schemes have not had great success in persuading people to insulate their homes, but there appears to be a consensus, based on evidence, that a local approach is more likely to succeed. A report by ResPublica¹⁶³ indicated that financial incentives alone would not be sufficient to persuade people to take out loans to insulate their homes, as they “ignored the much greater aspirations that people have for themselves in their home: comfort, wellbeing and health.”

The report explained that “When the state of Oregon tested different messages when marketing their energy efficiency programmes, they found that comfort was the most effective messaging. A comprehensive study from the United States also stresses that focusing on issues such as comfort and health greatly enhances the attractiveness of energy efficiency from the consumers’ perspective. The emerging evidence on why consumers decide to retrofit in the UK which supports this wider narrative of comfort and wellbeing.”

This approach to persuading people to take up energy efficiency measures is thus essential. Building the Future explains what is perhaps the best mechanism – and why: “a local authority led street-by-street approach to delivery is intended to ensure effective targeting and drive consumer demand for energy efficiency by engaging households...

163 <http://www.respublica.org.uk/our-work/publications/after-the-green-deal/>, page 4

the area based nature of the scheme would encourage social awareness of the benefits of energy efficiency as well as reduce costs due to economy of scale.”¹⁶⁴

The government’s Community Energy Strategy provides further evidence as to how community energy can affect energy awareness. For example, “the evaluation also found evidence of changes in attitudes within the wider community towards installing energy efficiency measures and micro generation technologies. A survey of 1,300 people living within an average distance of 1.25km from community buildings that participated in the projects found that 41% were aware of the Green Streets project in their neighbourhood. Of those who were aware, 30% said it had changed their attitudes towards energy efficiency and renewable energy, and 46% said they had been inspired to take action on energy efficiency and renewable energy (with half of those inspired to take action on insulation). A further 61% said they would be more likely to take action on energy in the future.”¹⁶⁵

This is heartening; it suggests that the best approach is via local authorities and community based initiatives. Interestingly, that is exactly the road that those local authorities that are setting up their own energy schemes, that we described in Part 3, are taking.

We therefore support the following ideas put forward by ResPublica:¹⁶⁶

- The government should enable city regions to retain the revenue generated from Stamp Duty Land Tax, and harness this

new power to introduce more local and bespoke incentives for people to improve their homes. This approach should initially be trialled within a leading city region, then rolled out to other cities and local authorities over time.

- As part of ongoing city devolution deals, a portion of national infrastructure funds should be devolved to cities to invest in energy efficiency schemes via an open competition.
- The government should devolve revenue from a range of low carbon taxes and levies to City Regions. This should initially be piloted with a percentage of the overall amount. A portion of these funds should be used to deliver home energy efficiency schemes.

We also draw attention to a report by Frontier Economics. This draws up a detailed action plan as to how Energy Performance Certificate Band C for all homes by 2035 can be achieved, and also recommends “a new nationally coordinated programme of locally-led, area-based delivery to low income households in every Local Authority.”¹⁶⁷

¹⁶⁴ <https://europeanclimate.org/building-the-future-economic-and-fiscal-impacts-of-making-homes-energy-efficient/>, page 122

¹⁶⁵ DECC Community Energy Strategy 2014, https://www.r-e-a.net/upload/community_energy_strategy_20140126.pdf, page 74

¹⁶⁶ <http://www.respublica.org.uk/our-work/publications/after-the-green-deal/>

¹⁶⁷ *Affordable Warmth, Clean Growth*; Frontier Economics; not published at the time of writing

BLUE SKY THINKING – ANOTHER WAY FOR A NATIONAL PROGRAMME?

Little known about, except to economic historians, is the remarkable UK history of local supply of energy and the benefits it brought.

Many local facilities across the UK such as parks, swimming baths and libraries were built from the profits made by municipal energy companies of the 19th and early 20th centuries.

These companies sold gas to commercial customers and the revenues increased local authority incomes and reduced the cost of street lighting.¹⁶⁸ Their roles expanded because of “the desire of local authorities to get access to gas company profits in order to relieve local taxes and finance urban improvements.”¹⁶⁹

Indeed, as Professor Robert Millward has said, “Our thesis is that a driving force behind municipalisation was the desire of local councils to get their hands on the surpluses of these trading enterprises and use them to relieve the rates... [and carry out]... essential town improvements.”¹⁷⁰ Moreover, “the building of Strangeways Prison was financed from the profits of Manchester gas department.”¹⁷¹

By the 1930s, a third of gas and two thirds of electricity generation and supply was

municipally owned: a policy adopted by many local authorities because “the public health programmes put much pressure on local finances... and data from 1903 from a sample of towns show trading profits net of loan charges averaging £25,000 per town, enough to finance a good 30% of a local authorities running costs.”¹⁷²

However, this is a selective group. Let us look at the whole picture. By 1928 there were 362¹⁷³ municipal electricity generating companies¹⁷⁴ and from the same source we know their total net trading profit was £2.6 million or an average of £7,182 per company.

All that is historical fact. Now let us update the figures and postulate some possibilities.

In 1928 the market was small: total demand was 7,744 GWh (gigawatt-hours).¹⁷⁵ In 2014 and 2015 it was 303,000 GWh¹⁷⁶ – a 39 times increase. Therefore the potential trading surplus per company could be £7,182 x 39 = £280,098. Converted into today’s money that would be £15.7 million. Over 20 years that could be £314 million per local authority-run company. If then adopted by, say, 200 authorities, the total trading profit could be £62.8 billion. Think of the community benefits such a sum could bring.

This is ‘blue sky’ thinking, we accept. However there are indications that something like this, perhaps yielding smaller surpluses, could be achieved again. Acorns to oak trees.

168 Katrina Hyde, *Profession v Trade: a defining episode in the development of the gas lighting industry in the late 19th century*

169 From *Private to Public Ownership of Gas Undertakings in England and Wales, 1851-1947* by Professor Robert Millward, Manchester University Press, <http://www.tandfonline.com/doi/abs/10.1080/00076799300000084>

170 *The Cambridge Urban History of Britain* edited by Martin Daunton Chapter 11 – The Political Economy of Urban Utilities by Robert Millward, page 333

171 *Burning to Serve: Selling Gas in Competitive Markets* (1999) by Francis Goodall, page 164

172 *The Cambridge Economic History of Modern Britain, Volume 2, 1870 to the Present*, Chapter 15 – The Growth of the Public Sector by Professor Robert Millward (Manchester University)

173 *Ibid.*, page 326, Table 11.2

174 Professor Millward gives the figures for 1926 as 360 and for 1938 as 373

175 *Electricity Before Nationalisation* by Leslie Hannah, page 428

176 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/552059/Chapter_5_web.pdf, page 115

Part 5: A Way Forward

Upon the publication of this report we will contact Greg Clark, Secretary of State for Business, Energy and Industrial Strategy to ask him for his thoughts on these three draft Parliamentary Bills:

The Local Energy Bill

A Bill to enable electricity generators to become local suppliers and set local costs of electricity; to give certain duties to the Office of Gas and Electricity Markets; and for connected purposes.

1. Purpose of this Act

The purpose of this Act is to encourage and enable the local supply of electricity.

2. Local Supply of Electricity

- (1) Subject to this Act an electricity generator may be a local supplier and may set local prices.
- (2) A local supplier must have a local supply licence.
- (3) A local supplier must pay any costs and adhere to any regulations set by the Office of Gas and Electricity Markets.

3. Duty of the Office of Gas and Electricity Markets (OFGEM)

- (1) It shall be the duty of OFGEM to issue local supply licences to an electricity generator if, in the opinion of OFGEM, that generator understands, is capable of complying with and will comply with the conditions of that licence.
- (2) In accordance with the purpose of this Act OFGEM shall ensure that
 - (a) the cost of a local supply licence and any related costs are proportionate to the size or projected size of a generator's business; and
 - (b) the regulations that a generator must adhere to are as simple and straightforward as possible.
- (3) OFGEM must, after consultation, specify the radius to which a local supply licence shall apply, and may specify different radii to different local supply licences.
- (4) Before making any decision pursuant to subsection (3) OFGEM must consult
 - (a) Local authorities;
 - (b) Existing local generators;
 - (c) Organisations representing existing or proposed local generators; and
 - (d) Such other person who, in its opinion, have an interest in this matter.

4. Interpretation

In this Act

'A local supplier' is a person who supplies electricity only to customers within a specified radius of the generation of that electricity.

'A local supply licence' is a licence granted to a local supplier to supply electricity in accordance with this Act.

'Business' includes individuals and not for profit organisations.

5. Citation, Commencement and Extent

- (1) This Act may be cited as the Local Energy Act.
- (2) This Act shall take effect on the day it receives Royal Assent.
- (3) This Act shall apply to England, and subject to the agreement of the Welsh Assembly Government, to Wales.

The Promotion of Renewable Energy Bill

A Bill to promote renewable energy; to give duties to the Office of Gas and Electricity Markets and to the Secretary of State; and for connected purposes.

1. Purpose of this Act

- (1) The purpose of this Act is to promote renewable energy.
- (2) Any person discharging any function pursuant to this Act must act in accordance with this purpose.

2. Government Subsidy Policy

- (1) The Secretary of State must carry out a review of government subsidy policy with a view to decreasing the total amount of subsidy for fossil fuels and increasing the subsidy for renewable energy and energy efficiency.
- (2) When carrying out the review the Secretary of State must consult
 - (a) Local authorities;
 - (b) Energy generators;
 - (c) Organisations representing energy generators;
 - (d) Organisations representing persons who produce, distribute or install energy efficiency measures or renewable energy systems; and
 - (e) Such other person who, in his opinion, have an interest in this matter.
- (3) In this section 'subsidy' includes exemption from taxation that would otherwise be paid if that exemption did not exist.

3. The Climate Change Levy

Renewable energy is hereby exempted from the Climate Change Levy.

4. Priority Access to the Grid

It shall be the duty of the Office of Gas and Electricity Markets within twelve months of the passing of this Act to ensure that electricity generated from renewable sources is used by the national grid before energy from other sources.

5. Planning

- (1) That, with the exception of national infrastructure projects, applications for planning permission relating to the generation of energy shall be decided by the local planning authority as specified by this section.
- (2) In the case of an application for planning permission to erect wind turbines those turbines must
 - (a) either be situated in an area designated for wind energy in a local or neighbourhood plan; or
 - (b) where there is no such plan, following consultation, it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed and therefore the proposal has their backing.
- (3) In the case of subsection (2)(b) of this section whether a proposal has the backing of the affected local community is a planning judgement for the local planning authority.

6. Citation, Commencement and Extent

- (1) This Act may be cited as the Promotion of Renewable Energy Act.
- (2) This Act shall take effect on the day it receives Royal Assent.
- (3) This Act shall apply to England, and subject to the agreement of the Welsh Assembly Government, to Wales.

The Energy from Buildings and Communities Bill

A

Bill to place duties on the Secretary of State regarding the energy from buildings and communities; to require the Secretary of State to take specific action regarding energy efficiency; and for connected purposes.

1. Duties of the Secretary of State

- (1) It shall be the duty of the Secretary of State to
 - (a) include measures to promote energy from buildings and communities in
 - (i) any Industrial Strategy that he may draw up;
 - (ii) a National Infrastructure Project;
 - (iii) or otherwise.
 - (b) Either as part of that Strategy or of the National Infrastructure Project or otherwise to publish a plan ('the plan') to make
 - (i) all households in fuel poverty reach Energy Performance Certificate Band C by 2030; and
 - (ii) all domestic buildings reach Energy Performance Certificate Band C by 2035.
- (2) Before publishing the plan the Secretary of State must consult such persons who, in his opinion, have an interest in the matter.
- (3) The Secretary of State must take all reasonable steps to implement the plan.
- (4) The Secretary of State must review the plan if it appears to him that the objective specified in section 1(1)(b) is not likely to be met.

2. Interpretation

In this Act

'measures to promote energy from buildings and communities' includes measures to save energy.

'fuel poverty' has the same meaning as in "Cutting the cost of keeping warm – a fuel poverty strategy for England" Presented to Parliament by the Secretary of State for Energy and Climate Change by Command of Her Majesty March 2015 Cm 9019.

3. Citation Commencement and Extent

- (1) This Act may be cited as the Energy from Buildings and Communities Act.
- (2) This Act shall come into force on the day it receives Royal Assent.
- (3) This Act applies to England and, subject to the agreement of the Welsh Assembly Government, to Wales.



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