



Power failure

Five fundamental faults of our energy system



New Economics Foundation (NEF)

is an independent think-and-do tank that inspires and demonstrates real economic wellbeing.

We aim to improve quality of life by promoting innovative solutions that challenge mainstream thinking on economic, environmental and social issues. We work in partnership and put people and the planet first.

Contents

Summary	2
Introduction	3
1. Risks and costs of competition	4
2. Failure to invest and innovate	8
3. Inaction on climate change	11
4. Instability of centralised energy	14
5. Social injustice treated not cured	17
Conclusion	20
Endnotes	22

Summary

Our energy system is riddled with problems – it is causing dangerous changes to our climate while neglecting and further impoverishing many of the poorest in society. But these are not isolated issues that can be tackled one by one – these faults are all part of the overarching failure of a neoliberal approach to energy.

This is an approach that says profit-making enterprises are the best custodians of our collective future and that we should leave environmental and social justice to be championed by markets. But these are merely assumptions that we have been experimenting with for the past few decades. They are not natural or inevitable advances in the way we organise society. It is high time to face up to the fundamental failure of this approach and instead to start exploring the many alternatives available to us.

Five different faults of the neoliberal approach to energy illustrate the problems and alternatives we face.

- **Fault 1: Risks and costs of competition**

We were told that the only way to ensure consumer satisfaction is to maximise competition between different energy providers. But this ignores the risks and costs that come with competition, including exploitation of supply chains and price obfuscation tactics. It also exaggerates the benefits – energy prices are high and consumer satisfaction is at rock bottom. We should abandon the fiction of competition and seek cooperative ways to achieve quality energy services.

- **Fault 2: Failure to invest and innovate**

Our privatised energy sector is failing to put money into either vital new infrastructure or research and development for new energy technologies. The theory predicted that private companies would be efficient and innovative, but didn't foresee that those companies might prefer to inflate executive pay packages and investors' asset values. We should reimagine the role of strategic public investment in energy that has been so successful in the past.

- **Fault 3: Inaction on climate change**

We care about our environment, and we know that our energy system is gradually contributing to its decay. But the main way we engage with

these issues is by passively paying the green levies that form a part of our monthly energy bills. This system creates a disjoint between the citizens who pay for an energy transition and the benefits that it brings. We should take inspiration from examples of direct involvement of citizens in empowering energy democracies.

- **Fault 4: Instability of centralised energy**

Power in the UK is generated in a small number of very large plants. This unfairly advantages fossil fuel energy sources and discriminates against renewables. It also makes us far more vulnerable to shocks. With all of our eggs in a small number of baskets climate impacts are more likely to be disruptive and there are unavoidable risks to imported fossil fuel supplies. Decentralising our system would make it cleaner and more stable.

- **Fault 5: Social injustice treated not cured**

At the moment we allow our energy system to produce tragic consequences – fuel poverty and winter deaths – and merely attempt to mitigate the impacts after the event. We rely on energy company obligations and piecemeal government payments to limit the damage to society. The statistics show we're not doing a great job. By focusing on prevention rather than treatment we could design out social injustices in our energy system and secure the right of each citizen to sufficient energy.

We can achieve wellbeing, social justice, and environmental sustainability for all, and the energy system is a big part of that. But when a system is failing at its foundations we need to start considering the systemic alternatives, not just the palliatives that will sustain the status quo a little bit longer.

Introduction

Energy is the essential ingredient of our economy and society. It empowers, connects, and sustains us. And since all energy derives from our environment, it is one of the key intermediaries between our natural and social worlds.

Consequently, the manner in which we choose to create and distribute energy in different ways and for different uses – what will be referred to as ‘the energy system’ – is a key determinant of how we experience our lives.

A foundational assumption is that the energy system should function so as to foster human wellbeing in a way that is socially just and environmentally sustainable, a set of objectives we refer to as ‘the common good’. The prevailing neoliberal approach claims that the common good is best served by entrusting the energy system to the private sector and allowing the profit motive to provide the primary engine for progress, on to which we can hook various environmental and social requirements. This report challenges the fundamental assumptions that underpin the neoliberal approach to our energy system.

The arguments and evidence presented in this report seek to demonstrate that this approach has not *and cannot* deliver the common good, and that alternative approaches are better suited. A key theme is that incremental reform that leaves core structures unchanged is not enough to radically improve the outcomes of the energy system.

The following five sections highlight different aspects of the system’s failure resulting from the neoliberal approach, detailing the causes, consequences, and possible alternatives in each case.

1. Risks and costs of competition

Collaboration is more powerful than competition at providing energy for the common good

Summary

Unrestricted competition is inappropriate in our energy system. Our attempts to 'simulate' competition are a never-ending battle against the market's natural tendency towards consolidation and exploitation of consumers. Progress through diversity and collaboration in our essential energy services would be more effective at achieving the common good.

Competition is appropriate in some circumstances and inappropriate in others.

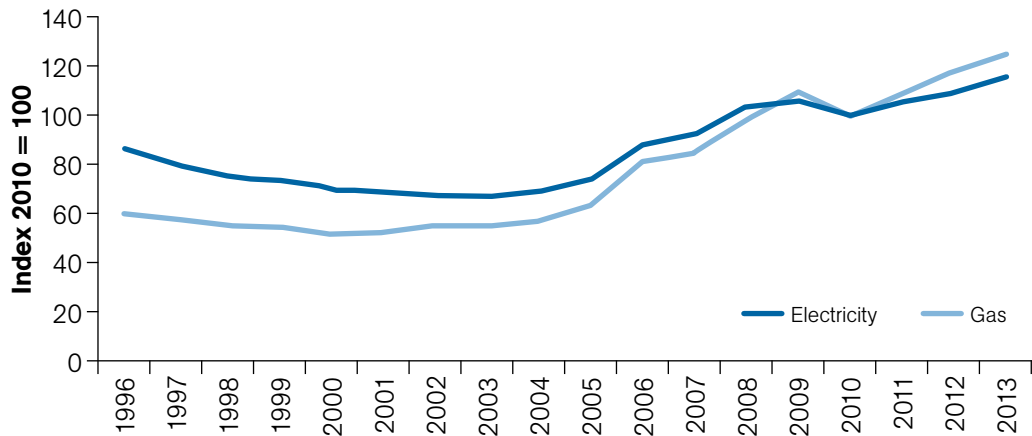
Harnessing competitive forces can have some clear advantages, including expanding consumer choices and reducing average prices. But market competition also has significant risks and costs including an inherent failure to consider social and environmental impacts and the creation of a small number of very powerful private companies.

It is a major problem and block to progress that the incumbent neoliberal view of the economy sees market competition as inherently a good thing. This leads to any potential benefits being exaggerated and risks and costs routinely ignored. Where the activity is the provision of an essential service and where it has major social and environmental implications, such as energy, the price of competition may not be worth paying.

The benefits of competition in the energy system are exaggerated.

Advocates of privatising the UK's energy market heralded 'lower prices, better service and greater security of supply for consumers'.¹ But there have been few clear economic gains from privatisation: a recent State of the Market assessment conducted by Ofgem found 'little evidence of cost efficiency improvements over time'² and while domestic energy prices did fall gradually at first³ those gains have been more than eradicated in the past decade (Figure 1). Excluding taxes, the UK has some of the highest energy prices in Europe.⁴ Moreover, the impact of domestic competition on prices pales in comparison to the volatile influence of the global fossil fuel market. Any cost reductions from competition have been more than cancelled out by increased company profits⁵ and consumer satisfaction with energy companies is lower than any other sector.⁶ Neither has competitive privatisation returned 'power to the people', as Prime Minister

Figure 1: Fuel price indices in the domestic sector in real terms 1996 to 2013.



Source: DECC.⁷

Thatcher claimed it would. The proportion of shares owned by individuals in the UK has fallen continuously from 54% in 1963 to 11% in 2012.⁸ It is clear that the promise of increasingly efficient and high-quality energy provision has failed to materialise under the competitive paradigm.

The failure of competition is not for want of trying. The energy regulator, Ofgem, is 'committed to promoting competition within the energy markets as a mechanism to benefit consumers through increased quality, or decreased prices, or both'.⁹ Despite these efforts, the sector remains highly concentrated and consumer switch rates are significantly lower than other sectors.¹⁰ Stephen Littlechild, the architect of electricity market privatisation and that market's first regulator, admits that '[r]egulation ... is not a substitute for competition. It is a means of "holding the fort" until competition arrives.'¹¹ How long must we wait? It would be more honest to admit, as some have proposed, that the competitive paradigm in essential services was an experiment that has failed.¹²

The risks and costs of competition in the energy system have been ignored.

Rather than revelling in competition, private companies will, in reality, avoid or eliminate it wherever possible. From rapacious acquisition and consolidation tactics in banking to consumer obfuscation tactics and supply chain exploitation in supermarkets, many essential services are the victims of competitive forces that encourage firms to employ any means necessary to gain advantage over their adversaries, including not only horizontal competitors (i.e., producers of similar services) but also vertical competitors (suppliers and consumers) that contend for a share of the value being created.^{13,14}

Collaborative approaches can better achieve the same common goals.

Across the world, collaborative approaches to energy provision are proving that there is an alternative. In Germany, where the monopoly commission declared in 2009 that ‘there is still no workable competition’ in the energy sector, Hall *et al.*¹⁵ have documented the significant shift in the electricity sector over the past decade towards local public ownership, a move that was motivated by increasing prices and lack of trust in private companies. At the same time, more and more German citizens are taking direct action by investing in renewable generating capacity either on their own or as part of a community group. By eliminating or relegating the profit motive, these models remove many of the perverse consequences of competition. Based on this evidence, the current prescriptions from political parties and non-governmental organisations (NGOs) that we ‘need more competition’ are misguided and lack imagination. As Bowman *et al.* argue, ‘What we need is, not more competition in its present stereotyped form, but differentiation of business models around objectives concerned with social and economic sustainability over the longer term.’¹⁶

The free, efficient, and competitive market in energy is a delusion. It does not and cannot exist. Yet the competitive narrative survives with the essential help of regulation and rhetoric. However, for all the while that we continue to insist the fantasy is achievable we suffer the perverse impacts of the market’s reality – high prices and bad service. We must recognise the competitive experiment for what it is – a failure – and seek genuine collaborative solutions for the vital provision of energy.

2. Failure to invest and innovate

Public efforts can drive innovation in a way that private companies cannot

Summary

UK energy companies are failing to invest enough in energy infrastructure, despite the fact that they obtain large pre-tax profits. They are also failing to drive the process of transformative innovation we need to completely overhaul our energy system. This staleness results from a failure to recognise that collective endeavours can achieve change in a way that profit-focused companies cannot.

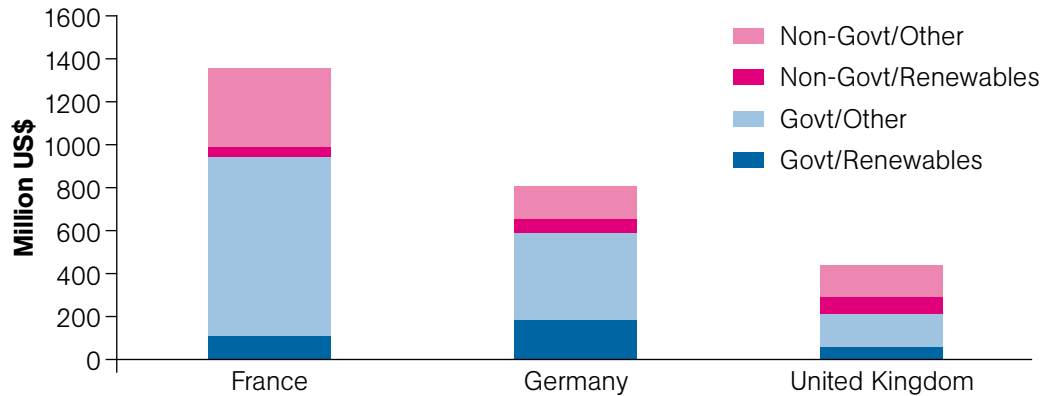
The significant earnings of the energy sector are not directed in the public interest.

Ofgem estimates that the UK's large energy suppliers earned £2.8 billion in profits in 2013,¹⁷ much of which was devoted to dividend payouts and share buybacks (which, in turn, inflated the share price, to the benefit of shareholders). As in many large corporations, the executives of the UK's Big 6 energy companies receive remuneration packages worth millions of pounds each year. In their own words, the profit generated is 'surplus capital',¹⁸ or put another way, money with no useful purpose. Except there is a useful purpose that is currently being neglected: long-term investment. The current model of quarterly profit maximisation prioritises short-term financial considerations over the long-term imperative to secure the UK's energy supply. The evidence suggests that our current system suffers chronic underinvestment in generation capacity.^{19,20} The investment that has taken place has focused on short-term fossil fuel capacity.²¹ Rather than having a confident and pre-emptive strategy for investment in a vital public service, the UK system has relied on indirectly incentivising private companies with significant public subsidy, while simultaneously undermining that incentive through uncertain and protracted policy reform processes and political attacks on specific technologies. This is a painfully circuitous method of aligning profit motives with the public good that has simply not been effective enough.

Our energy system is falling behind on innovation.

Not only is investment in physical kit too low, there is also too little investment in research and development, leaving an innovation deficit compared to other countries. Businesses innovate only when clear paths to market are already available,²² and are no better at 'picking winners' than non-profit organisations. The UK system pumps fewer pounds into energy innovation per person than most other Organisation for Economic

Figure 2: RD&D spending on energy (annual average 2005–2013) for France, Germany, and the UK.



Source: OECD.²³

Co-operation and Development (OECD) countries.²⁴ The erroneous assumption is that transferring the energy system from public to private ownership will mean that companies take over the prime responsibility for innovative research. In the UK's case, however, this has not materialised. Figure 2 compares investment in energy research and development across the three largest European economies. While investment from non-government sources are of the same order of magnitude in all three cases, there are clear differences in total investment, driven by public expenditure. France has a mostly public system, while the UK system is privatised. Germany has a mostly privatised energy sector but with state investments through other channels. Clearly, the innovation deficit created on the British state's exit from the energy sector is not being filled by the private sector.

The dominant understanding of what drives innovation is inaccurate.

The problem is an outdated assumption that only the private sector has the wisdom to make good investments and the vivacity to drive innovation. In recent years this conjecture has been thoroughly discredited. The economist Mariana Mazzucato has pioneered a renewed understanding of what really has driven and does drive innovation and technological breakthroughs. She has shown that, for many emblematic technologies of the past century, it was in fact public 'mission-oriented' research that was responsible for significant leaps forward. The role of the private sector was, in many cases, to subsequently adopt and profit from those public investments by bringing them to the market.²⁵

The transformative power of collective endeavours is under-appreciated.

The paradigm of 'market failure', in which markets are accepted as a fixed entity to be corrected and then left alone, has been criticised for unduly limiting public policy options to only cautious and incremental interventions.²⁶ The necessary alternative should conceive of the public sector with an active role in shaping and creating markets, rather than just

‘fixing’ them, in order to overcome the vast challenges facing the world. This is not a bold suggestion – such a role has historically been adopted by states around the world. There are further advantages to a more active public role in investment and innovation in the energy sector, including cheaper financing and greater democratic control and accountability.²⁷

We currently leave vitally important decisions with long-term strategic and public consequences up to a profit-driven oligopoly. This might not matter if those businesses were clearly making investments in the public interest and at sufficient scale. But they’re not. The resources that should be dedicated to investing in our collective future are diverted to share dividends and buybacks and extortionate executive pay. We must re-focus on the monumental challenges we face in the energy system and re-commit to the collaborative approaches that are most likely to pull us through them.

3. Inaction on climate change

To tackle climate change we need to involve and engage, not disconnect, consumers of energy

Summary

The main relationship that UK citizens have with the energy system is as a consumer, a mere recipient of services from an exogenous supplier. People care about climate change and the environment and want to take action, but they don't know how. The lack of direct engagement with the energy system has led to discontent with climate change policies, stoked by politicians and the media. We need a radical transition from passive energy market participation to active energy democracy.

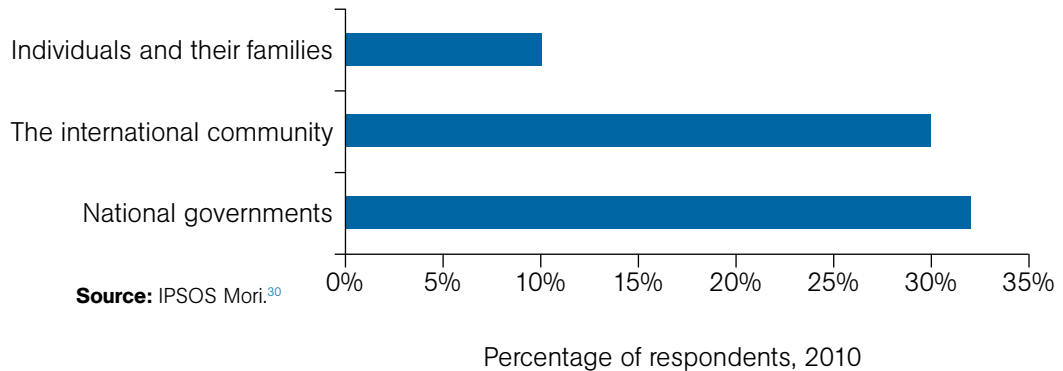
The average citizen's main engagement with climate change is as a passive contributor to mandatory green levies paid through their energy bills.

The primary method of implementing energy and climate change policy in the UK is to place obligations on private energy companies that they then finance by levying charges on consumer bills. The Department of Energy and Climate Change (DECC) estimates that an average household energy bill (gas and electricity) of £1,255 in 2013 contained charges related to energy and climate change policies to the amount of £112, or 9% of the bill.²⁸ In this way, the greatest contribution of most individuals to transforming our unfit energy system and resolving the problem of climate change takes the form of a monetary transaction between consumer and producer, outside of the tax system. Despite broad and persistent public support for clean energy technologies,²⁹ this system has been subjected to vicious attacks by the media and politicians, deeming the levies to be 'green crap', and is widely perceived to be unpopular.

There is no direct link between citizen action and the benefits of clean energy.

This uproar is a symptom of the way in which we've chosen to structure our energy system and its transition to a clean future. In this system consumers transfer resources to energy companies who pool the funds and invest them in renewable energy generation. This clean energy capacity generates benefits in terms of avoided illness and loss of life, greater energy security, and job creation, among others. Thus, citizens are both the ultimate financiers of a cleaner energy system and one of its main beneficiaries; but in between those points the citizen cedes power and control over the process of transforming the energy system,

Figure 3: Responses to the question: “Which one, if any, of these do you think should be mainly responsible for taking action against climate change?”



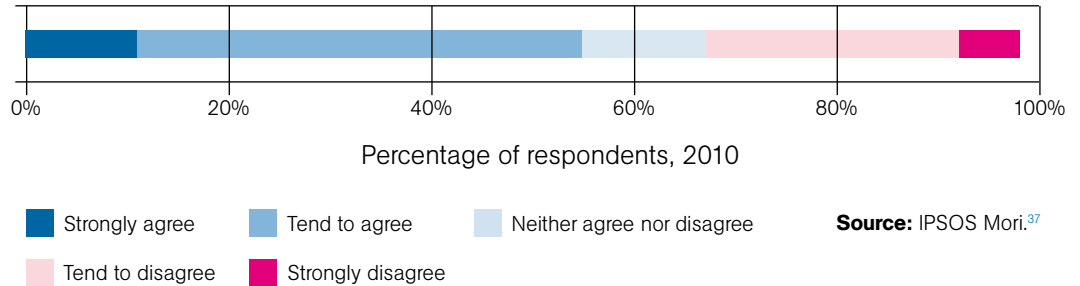
becoming disconnected physically and psychologically from the social, environmental, and financial returns of their investment. The ownership of this process of social change has effectively been contracted out to corporations; there is no clear link between what people feel they're paying and the outcomes that arise, making it easy for the media and politicians to rile consumers through rhetoric.

People expect governments and businesses to take action, despite being hopeful as to the impact they can make individually.

People care about the environment, but they don't typically cite it as a top concern.^{31,32} And most people agree that the responsibility for acting on climate change primarily lies with governments, and less so with individuals or families (Figure 3).

Fifty-five percent of people agree that 'it is hard to take action against climate change even if you want to' (Figure 4), while 53% of people *do* think they can personally make a difference on climate change.³³ However, the primary environmental action that people identify as a personal contribution to the solution is recycling.^{34,35} Unfortunately, we're not going to prevent catastrophic climate change by recycling alone. This is a clear case of 'the governance trap – people expect the government to act but government thinks people don't care about the issue enough.'³⁶ Thus we have created a system in which many individuals feel responsible and willing yet unable to take action, while government feels able to de-prioritise radical action by fomenting resentment for existing policy.

Figure 4: Responses to the statement: “It is hard to take action against climate change even if you want to.”



On the supply and demand sides, a different system could turn citizens into direct stakeholders in clean energy and its benefits.

A different system could engage consumers of energy more closely with the wider issues of its social and environmental impacts, transforming them into an energy citizenry, in other words a population that is conscious of and has meaningful control over how it uses energy. Community-controlled energy generation and supply projects in Denmark, Germany, and the UK, among others, have been designed to engage people with the need to conserve energy³⁸ and have diminished NIMBY (not in my back yard) opposition to clean energy installations.³⁹ Econometric evidence suggests that energy users place a high value on having co-operative or municipal control of generation assets, or some part in the decision-making process.^{40,41} Alan Simpson, an energy expert and former MP, observed that, in Germany, ‘people saw themselves as drivers (not passengers) within the energy transformations taking place around them; as the source of solutions to today’s energy problems, not just as victims.’⁴² Creating conscious energy citizens is both an outcome and a driver of more democratic energy systems, so energy education – creating awareness of the reality and possibilities of our energy system – is a critical part of the transition. Crucially, unlike at present, an alternative system must embody true energy democracy, where citizens face genuine choices and exercise genuine agency over the various ways they consume energy.

Climate change and our energy system are fundamentally and intricately entwined. Yet, it’s as though we have deliberately designed an energy system in order to disengage the public with climate change. We must urgently overhaul this system and foster a flourishing energy democracy based around direct citizen engagement with the generation and supply of clean energy and the benefits that come with it.

4. Instability of centralised energy

Decentralisation will make our energy system cleaner and more secure

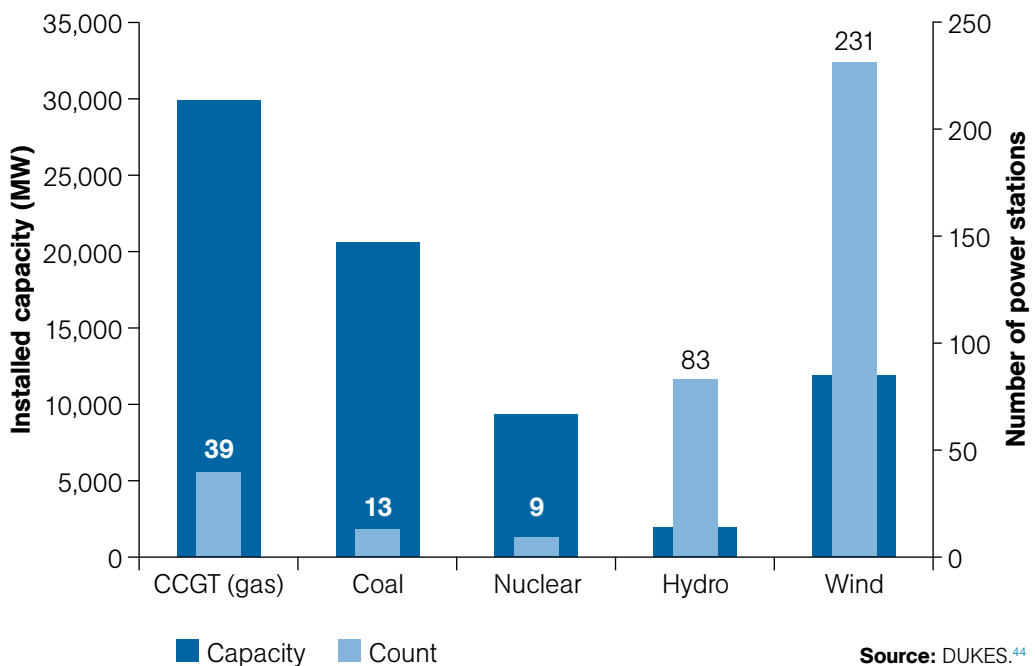
Summary

Our current energy system is based on an understanding that energy should be generated in huge amounts at a small number of generating sites, and then distributed around the country according to demand. But this system is designed for and perpetuates the use of fossil fuels and is subject to significant supply disruption risks. By re-balancing towards more local tiers of organisation we could build a cleaner and more secure energy system, with positive effects for our economy and environment.

Energy generation is highly centralised in the UK.

Nine nuclear power stations contribute 12% of the UK's installed capacity, while the Drax coal and biomass power station in Yorkshire makes up 5% just on its own.⁴³ We are, therefore, heavily reliant on the significant output of a small number of large installations (Figure 5).

Figure 5: Power stations in the UK.



Source: DUKES.⁴⁴

Such a system promotes the use of fossil fuels and can be insecure.

A centralised energy system is ideally suited to fossil fuel exploitation, and *vice versa*. Fossil fuel resources occur in very large concentrated chunks that are exceptionally difficult to get at – the gargantuan fossil fuel companies that dominate the global energy system, some of the biggest companies in the world, are a testament to the economies of scale. Once the fuels are extracted it makes economic sense to burn them all in one place. Renewable energy sources provide precisely the opposite set of circumstances: being found anywhere and everywhere, they are less amenable to monopolistic control. As Michael Grubb, ex-Chief Economist at the Carbon Trust, argues, it is obvious that '[m]oving to a low-carbon economy would not mean just doing the same thing with different supply technologies.'⁴⁵

This centralising tendency leads to insecurity from at least two dimensions. The energy supply network is vulnerable to disruptive events, a possibility that becomes increasingly relevant as a changing climate makes our weather more volatile. The concentration and global interconnectedness of energy systems has led to unexpected impacts; for example, in 2003 a minor fault involving a tree in Switzerland led to a very sudden nationwide blackout in Italy, causing a number of deaths and stranding 30,000 people on trains.^{46,47} The reliance on huge sources of power also necessitates huge amounts of back-up capacity in case of a single outage.⁴⁸ Furthermore, this centralised system relies on significant foreign inputs that are particularly subject to economic and political risk. The UK is currently a net importer of around 80 million tonnes of oil equivalent, which is roughly 40% of our total primary energy consumption.⁴⁹ Influential energy analyst Daniel Yergin has observed that '[e]nergy interdependence and the growing scale of energy trade require continuing collaboration among both producers and consumers to ensure the security of the entire supply chain', which he refers to as 'an awesome task'.⁵⁰

Re-balancing generation towards decentralised models would make our system cleaner and more secure.

Systems analysts talk of 'redundancy', not with its usual negative connotations, but rather as a built-in safeguard that is widespread in biological systems (e.g. multiple metabolic pathways with the same function)^{51,52} and is designed into mechanical systems (e.g. aircraft engine systems that can sustain flight when an individual engine fails).⁵³ Network theory suggests that systems with a greater degree of redundancy and diversity are more robust to shocks.⁵⁴ An energy system based on these principles would still have a place for large-scale generation but would be far more varied, with significant generation from intermediate-scale renewables⁵⁵ and micro-renewables. Energy would be generated and supplied at individual, community, local authority, and

national levels, creating a vibrant and diverse energy economy. Clean technologies and more distributed control support one another because renewable energy is more amenable to small-scale production; as such, adopting a decentralised approach to energy generation will naturally favour decarbonisation. Moreover, with different tiers of generation to rely on and a more diverse network, disruptions are less likely to spread rapidly through the entire system. By delinking from the global fossil fuel system it will also reduce our dependency on insecure imports of fuel, relying instead on our abundance of domestic resources.⁵⁶

Decentralisation may have other desirable effects as well.

A study by the Surrey Energy Economics Centre modelled the outcomes of two different energy strategies for the UK. While the Centralised scenario entails significant offshoring of jobs and industry, the Localised scenario 'envisages a UK with social transformation at all levels in society with no explicit focus on services, instead an industrial resurgence that retains primary manufacturing and energy intensive industry in the UK – i.e., a world of re-localisation rather than globalisation'.⁵⁷ It has also been argued that a more widely distributed generation system can significantly improve on the low efficiency rates of our centralised system, in which a large proportion of energy is lost in conversion and transmission.⁵⁸ More localised generation could capture waste heat and avoid transmission across large distances. Another clear advantage of re-balancing our energy system towards local systems is the possibility of exerting more genuine control over the benefits of production and distribution, embedding democratic principles into the fabric of our energy system.

Our centralised mode of energy generation and supply is outdated and perpetuates a polluting and oligopolistic industry. Changing conditions in our global climate and economy are making this system more vulnerable every day. For our own security, the good of the environment, and in the interest of democracy, we should urgently reorient the way we organise energy supply towards local and regional levels.

5. Social injustice treated not cured

Social justice should be built into our energy system, not corrected subsequently

Summary

Access to energy is an essential component of a dignified life, yet thousands of people in the UK do not have affordable access and some even die as a result. The system we have built to deal with this problem accepts these outcomes as natural and attempts to treat them, with inadequate results. A better system would, in its fabric, recognise the right of access to energy and treat energy provision as a collective goal.

Access to energy should be considered a right.

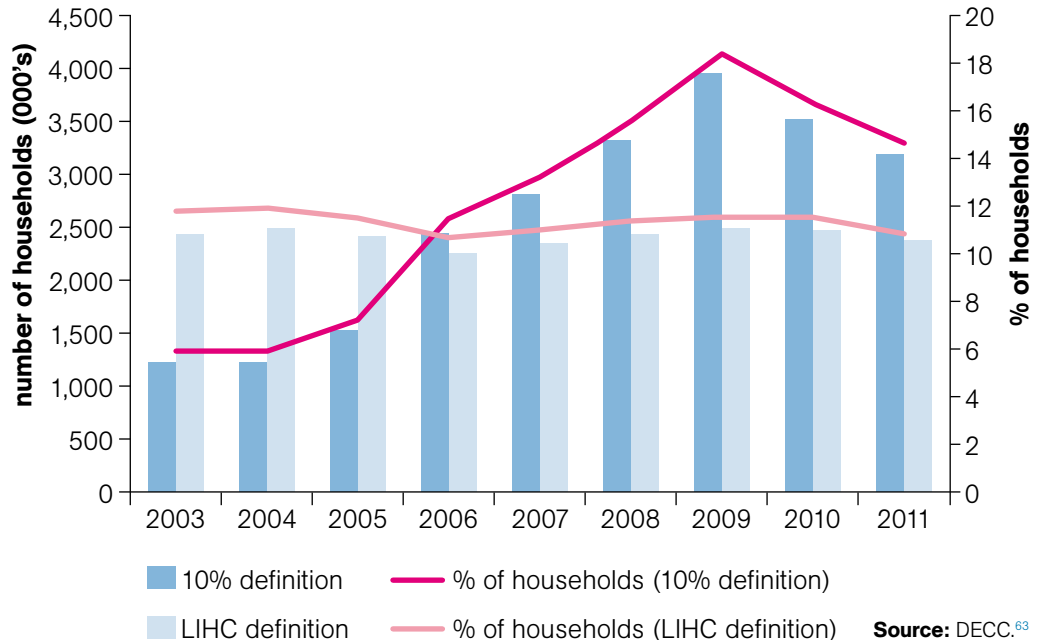
Energy is an essential requirement of life, playing a role in meeting most of our basic human needs and desires. Without it we cannot eat properly, regulate temperatures, travel outside of our immediate communities, communicate across distances, or enjoy some of the basic pleasures of life, such as listening to music. As argued by other organisations and individuals, it should be the right of each person to have access to enough energy to live a life of basic dignity.^{59,60}

Too many people live a reduced quality of life because of restricted access to energy.

Yet energy poverty is rampant in the UK. According to the Office for National Statistics, there were over 30,000 excess winter deaths in England and Wales in 2012/2013, primarily caused by lack of protection from the cold.⁶¹ By any definition of fuel poverty, this is not a problem that is getting better quickly (Figure 6). In developed countries, the limitation is more likely to be one of a lack of economic access, rather than physical access, to energy. So clearly it is a problem of poverty generally as well as energy poverty specifically. That is, energy is too expensive, and people are too poor. But the problem extends beyond the simple purchase of energy – lack of access to credit prevents poorer households from installing energy efficiency measures that would limit their required use of costly energy.

The use of energy is distributed highly unequally: Gough *et al.*⁶² estimate that households in the UK's top income decile are responsible for twice the amount of energy-related greenhouse gas emissions as the lowest decile.

Figure 6: Fuel poverty in the UK over time, on 10% definition and 'low income high cost' (LIHC) definition.



Our current system is based on correcting social injustices, not preventing them.

The current system of energy provision allows socially unjust outcomes to arise and then tries to correct these through mechanisms such as energy company obligations and winter fuel payments. The Energy Companies Obligation (ECO) programme requires energy providers to 'provide measures which improve the ability of low income and vulnerable households ... to heat their homes'.⁶⁴ Recently Ofgem has imposed substantial fines on energy companies that have failed to meet these modest obligations,⁶⁵ and in 2013 the government reduced the ambition of these targets further still.⁶⁶ The Winter Fuel Payment is a cash transfer of up to £300 made to those pensioners who apply for it.⁶⁷ Many may fail to take up these benefits or feel stigmatised when they do. A further apparent tactic for reducing fuel poverty is to voraciously pursue new primary sources of energy, such as shale gas, in the hope that increased supply will depress energy prices. There is no evidence that such a strategy works. A report from the UN Development Programme argues:

*Energy patterns clearly exacerbate poverty in industrialised countries... This linkage is not taken into account in conventional energy planning and policy-making. Rather, conventional energy strategies adopt the 'energy trickle-down' approach to social welfare and implicitly assume that if energy supplies are increased, these problems will take care of themselves.*⁶⁸

These measures are non-automatic, piecemeal, and/or speculative approaches to dealing with a systemic issue – rather than preventing fuel poverty, they attempt to treat it (and largely fail). Prevention is better than cure.

Alternative approaches can eradicate fuel poverty and the corrective measures it necessitates.

Social justice cannot be an inherent part of the current system because it rejects the notion that providing energy should be a social endeavour. An alternative system could make social justice a priority by ensuring basic needs are met automatically. For example, a citizen's energy income would give each citizen the right to a minimum amount of energy; progressive pricing could ensure that small amounts of energy are highly affordable while punishing profligate use; giving communities greater powers to provide energy directly to their own members would allow them to protect the most vulnerable amongst them. These solutions all require, as a prerequisite, the recognition that access to sufficient energy is a basic right and that the provision of energy is a collective challenge.

The unnecessary death of thousands of citizens each winter is a tragedy that we should not accept. Our inhuman system treats energy as it does any other consumption good – if you can't afford it you don't get it, unless you are lucky enough to be on the receiving end of piecemeal government policies. We can build a better system based on the principle of prevention, starting by repudiating the depravity of our current approach and embracing access to sufficient energy as a basic right and shared responsibility.

Conclusion

The neoliberal approach advances the notion that our energy system works best when directed by profit-seeking interests operating large centralised structures and constrained by government-imposed obligations

The preceding evidence and arguments demonstrate that our energy system, under this paradigm, debilitates our economy, divides our society, and degrades our environment. These problems are inherent to the nature of a system based on the principles of competition and unconstrained markets. They are *fundamental* failures that cannot be eliminated through changes that make incremental improvements while leaving the underlying structure of the system intact.

To begin with it was assumed that the energy system should foster human wellbeing in a way that is socially just and environmentally sustainable. Five faults of our neoliberal system were highlighted to show that these objectives are not fully realised.

- 1** The quest to increase competition is doomed to failure and, even if successful, will not necessarily reduce prices or thwart consumer exploitation. Incessantly advocating more competition is a damaging distraction from more promising solutions.
- 2** Entrusting private markets alone to deliver on investment in generating capacity and innovation in new technologies has led to a deficit of effort on these fronts. The imperative to invest in our future is too important to outsource.
- 3** Our current approach to decarbonisation alienates and disempowers the population, while failing to make our energy significantly cleaner. Preventing catastrophic impacts from climate change requires a radical change that can only be driven by popular support and energy democracy.
- 4** A highly centralised system of generation and distribution perpetuates a dirty and insecure approach to energy provision, by naturally favouring polluting fossil fuels and dependence on volatile global markets. A system more diverse in scale and form could be cleaner and more secure.

- 5 Winter deaths and poverty are treated as natural, though regrettable, outcomes. It is not natural – it is an injustice that should be deliberately designed out of the fabric of our energy system.

These outcomes derive from the dominant neoliberal approach. They are all part of the same problem and tend to reinforce one another through various feedback loops. Competition requires companies to exploit economies of scale, which reinforces centralisation. Centralisation takes energy generation and distribution out of everyday lives, contributing to the disengagement of citizens from the problem of climate change. Lack of engagement with climate change allows new investment and innovation in clean energy capacity to be deprioritised. Lack of investment and exposure to volatile fossil fuel markets leads to price increases and shortages that hit the poor hardest. Fuel poverty perversely amplifies calls for more competition, which has been speculatively promised to reduce prices.

Thus, this is a feedback loop of self-reinforcing failure. The error is to assume the profit motive to be the only effective driver for change, while ignoring that the efforts required to align the profit motive with the common good may be too costly or simply unachievable. These paradigmatic assumptions don't stand up to scrutiny and must be challenged.

The route towards an energy system that prioritises wellbeing, social justice, and environmental sustainability requires us to recognise that citizen, community, and public action can be a more direct and effective means of achieving aims that are unalterably collective in nature. Our existing energy system can be incrementally improved, but the radical changes required to erase its tragic consequences can only be achieved by changing the system itself.

Endnotes

- 1 Robinson, C. (1992). *The results of UK electricity privatisation*. Retrieved from <http://www.seec.surrey.ac.uk/research/SEEDS/SEEDS62.pdf>, p. 3.
- 2 Ofgem *et al.* (2014). *State of the Market Assessment*. Retrieved from <https://www.ofgem.gov.uk/ofgem-publications/86804/assessmentdocumentpublished.pdf>
- 3 Though other countries' nationalised systems experienced falling prices at the same time. Cumbers, A., Danson, M., Whittam, G., Morgan, G., & Callaghan, G. *Repossessing the Future: A Common Weal Strategy for Community and Democratic Ownership of Scotland's Energy Resources*. Retrieved from <http://reidfoundation.org/wp-content/uploads/2013/10/Repossessing.pdf>
- 4 NEF. (2013). Why the argument for green taxes is as strong as ever [webpage]. Retrieved from <http://www.neweconomics.org/blog/entry/why-the-argument-for-green-taxes-is-as-strong-as-ever>
- 5 Hall, D., Thomas, S. & Corral, V. (2009). *Global experience with electricity liberalisation*. Retrieved from http://gala.gre.ac.uk/2775/1/COMPLETED_PSIRU_Report_%289816%29_-_2009-12-E-Indon.pdf%20, p. 4.
- 6 Institute of Customer Service. (2014). *UKCSI Customer Satisfaction Index*. Retrieved from http://www.instituteofcustomerservice.com/files/ICS_UK_Exec_Summary-FINAL.pdf, p. 7.
- 7 DECC. (2015). *Domestic energy price indices*. Retrieved from <https://www.gov.uk/government/statistical-data-sets/monthly-domestic-energy-price-stastics>
- 8 ONS. (2013). *Share Ownership – Share Register Survey Report, 2012*. Retrieved from <http://www.ons.gov.uk/ons/rel/pnfc1/share-ownership---share-register-survey-report/2012/index.html>
- 9 Ofgem. (2015). Competition in connections [webpage]. Retrieved from <https://www.ofgem.gov.uk/electricity/distribution-networks/connections-and-competition/competition-connections>
- 10 Energy switch rates are between 2 and 5%; switch rates for broadband, telephone and TV are between 6 and 15%. This is in spite of the government going to significant efforts to make switching easy. Ofcom. (2010). *Consumer Switching and Bundling*. Retrieved from <http://stakeholders.ofcom.org.uk/binaries/consultations/consumer-switching/annexes/switching-bundling.pdf>
- 11 Littlechild, S.C. (1983). *Regulation of British Telecommunications' Profitability*. London: HMSO.
- 12 Bowman, A. *et al.* (2014). *The end of the experiment? From competition to the foundational economy*. Manchester: Manchester University Press.
- 13 *Ibid.*
- 14 On competition in banking: Greenham, T. (2015). What competition cannot solve. Essay 6 in *Competition in Banking: A Collection of Essays*. Retrieved from <http://newcityagenda.co.uk/wp-content/uploads/2015/02/here.pdf>
- 15 Hall, D. *et al.* (2013). Re-municipalisation in the early twenty-first century: water in France and energy in Germany. *International Review of Applied Economics*, Vol. 27, pp. 193-214.
- 16 Bowman, A. *et al.* (2014). *The end of the experiment? From competition to the foundational economy*. Manchester: Manchester University Press, pp. 25-26.
- 17 £1.2 billion from generation, £1.1 billion from domestic supply, and £0.4 billion from non-domestic supply. Ofgem. (2015). Understanding the profits of the big energy suppliers [webpage]. Retrieved from <https://www.ofgem.gov.uk/gas/retail-market/monitoring-data-and-statistics/understanding-profits-big-energy-suppliers>
- 18 Centrica. (n.d.). Centrica's £500 million share repurchase programme [webpage]. Retrieved from <http://www.centrica.com/index.asp?pageid=1158>

- 19 *Financial Times*. (2013). Centrica is no exception to UK under-investment. Retrieved from <http://www.ft.com/cms/s/0/c542ab0e-2aa7-11e3-ade3-00144feab7de.html#axzz3Q7LE4mwt>
- 20 Ofgem. (2014). Electricity Capacity Assessment Report 2014. Retrieved from <https://www.ofgem.gov.uk/ofgem-publications/88523/electricitycapacityassessment2014-fullreportfinalforpublication.pdf>
- 21 Friends of the Earth. (2011). The Dirty Half Dozen. Retrieved from http://www.foe.co.uk/sites/default/files/downloads/dirty_half_dozen.pdf, p.14.
- 22 Mazzucato, M. (2014). A mission-oriented approach to building the entrepreneurial state. Retrieved from <http://marianamazzucato.com/wp-content/uploads/2014/11/MAZZUCATO-INNOVATE-UK.pdf>, p. 2.
- 23 *Ibid.*
- 24 Data downloaded from OECD statistical service: <http://stats.oecd.org/>
- 25 Mazzucato, M. (2014). *The Entrepreneurial State*. London: Anthem Press.
- 26 Mazzucato, M. (2014). A mission-oriented approach to building the entrepreneurial state. Retrieved from <http://marianamazzucato.com/wp-content/uploads/2014/11/MAZZUCATO-INNOVATE-UK.pdf>
- 27 Cumbers, A., Danson, M., Whittam, G., Morgan, G., & Callaghan, G. (2013). *Repossessing the Future: A Common Weal Strategy for Community and Democratic Ownership of Scotland's Energy Resources*. Retrieved from <http://reidfoundation.org/wp-content/uploads/2013/10/Repossessing.pdf>
- 28 DECC. (2013). *Estimated impacts of energy and climate change policies on energy prices and bills*. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/172923/130326_-_Price_and_Bill_Impacts_Report_Final.pdf
- 29 DECC. (2014). Public attitudes tracking survey. Retrieved from <https://www.gov.uk/government/collections/public-attitudes-tracking-survey>
- 30 Spence, A. *et al.* (2010). Public perceptions of climate change and energy futures in Britain. Retrieved from http://psych.cf.ac.uk/understandingrisk/docs/final_report.pdf
- 31 Ipsos MORI. (2010). British Attitudes to the Environment, Climate Change and Future Energy Choices. Retrieved from https://www.ipsos-mori.com/_emails/sri/latestthinking/aug2010/content/4_british-attitudes-environment-climate-change-future-energy-choices.pdf
- 32 Only 2% of the population cite 'Pollution/Environment' as 'the most important issue facing Britain today'. Ipsos MORI. (2014). Issues Index. Retrieved from <https://www.ipsos-mori.com/Assets/Docs/Polls/Sept14issuestabs.pdf>
- 33 Spence *et al.* (2010). Public perceptions of climate change and energy futures in Britain. Retrieved from http://psych.cf.ac.uk/understandingrisk/docs/final_report.pdf
- 34 Ipsos MORI. (2010). British Attitudes to the Environment, Climate Change and Future Energy Choices. Retrieved from https://www.ipsos-mori.com/_emails/sri/latestthinking/aug2010/content/4_british-attitudes-environment-climate-change-future-energy-choices.pdf
- 35 European Commission. (2014). Special Eurobarometer 409: Climate Change. Retrieved from http://ec.europa.eu/public_opinion/archives/ebs/ebs_409_en.pdf
- 36 RSA. (2015). The Seven Dimensions of Climate Change: Introducing a New Way to Think, Talk, and Act. Retrieved from <https://www.thersa.org/discover/publications-and-articles/reports/the-seven-dimensions-of-climate-change-introducing-a-new-way-to-think-talk-and-act/>
- 37 Spence, A. *et al.* (2010). Public perceptions of climate change and energy futures in Britain. Retrieved from http://psych.cf.ac.uk/understandingrisk/docs/final_report.pdf
- 38 For example, Brixton Energy. See <https://brixtonenergy.co.uk/>
- 39 Oteman, M. *et al.* (2014). The institutional space of community initiatives for renewable energy: a comparative case study of the Netherlands, Germany and Denmark. *Energy, Sustainability and Society*, Vol. 4. Retrieved from <http://www.energysustainsoc.com/content/4/1/11>

- 40 Dimitropoulos, A. & Kontoleon, A. (2009). Assessing the Determinants of Local Acceptability of Wind Farm Investment: A Choice Experiment in the Greek Aegean Islands. *Energy Policy*, Vol. 37. pp 1842–1854.
- 41 Ek, K. & Persson, L. (n.d.). Wind Farms – Where and how to put them? A choice experiment approach to measure consumer preferences for characteristics of wind power developments in Sweden. Retrieved from http://www.usbe.umu.se/digitalAssets/107/107281_ues854.pdf
- 42 Simpson, A. (2013). Community Energy Strategy: DECC consultation. Retrieved from <http://www.communityenvironment.org.uk/cms/wp-content/uploads/2013/08/Community-owned-energy-generation-Alan-Simpson.pdf>
- 43 Data downloaded from DUKES at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/337677/dukes5_10.xls
- 44 *Ibid.*
- 45 Grubb, M. (2014). *Planetary Economics*. London: Routledge.
- 46 Berizzi, A. (n.d.). *The Italian 2003 blackout*. Retrieved from http://ewh.ieee.org/soc/pes/psdpc/documents_blackout_panel/PESGM2004-000703.pdf
- 47 Johnson, C.W. (n.d.). *Analysing the Causes of the Italian and Swiss Blackout, 28th September 2003*. Retrieved from <http://crpit.com/confpapers/CRPITV86Johnson.pdf>
- 48 Carrington, D. (2013). *Renewable energy providers to help bear cost of new UK nuclear reactors*. Retrieved from <http://www.theguardian.com/environment/2013/mar/27/renewable-energy-cost-nuclear-reactors>
- 49 DECC. (2014). *Energy Consumption in the UK (2014)*. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/337452/ecuk_chapter_1_overall_factsheet.pdf
- 50 Yergin, D. (2006). Ensuring Energy Security. *Foreign Affairs*, March/April 2006, pp 69-82.
- 51 Also, the related concept of 'degeneracy': Edelman, G.M. & Gally, J.A. (2001). Degeneracy and complexity in biological systems. *Proceedings of the National Academy of Sciences*, Vol. 98. Retrieved from <http://www.pnas.org/content/98/24/13763>
- 52 Mason, P.H. (2014). *Degeneracy: Demystifying and destigmatizing a core concept in systems biology*. Retrieved from <http://dx.doi.org/10.1002/cplx.21534>
- 53 Downer, J. (2009). *When Failure is an Option: Redundancy, reliability and regulation in complex technical systems*. Retrieved from <http://eprints.lse.ac.uk/36537/1/Disspaper53.pdf>
- 54 Gonzalès, R. & Parrott, L. (n.d.) *Network theory in the assessment of the sustainability of social-ecological systems*. Retrieved from http://complexity.ok.ubc.ca/files/2013/05/GonzalesParrott_Pre-print.pdf
- 55 Watson, J. *et al.* (n.d.). *Transforming the UK's Energy System*. Retrieved from http://www.foe.co.uk/sites/default/files/downloads/transforming_uk_energy.pdf
- 56 EEA. (2009). Europe's onshore and offshore wind energy potential. Retrieved from <https://www.energy.eu/publications/a07.pdf>
- 57 SEES. (2013). *The UK Energy System in 2050: Centralised or Localised?* Retrieved from <http://www.seec.surrey.ac.uk/research/SEERS/SEERS1.pdf>
- 58 Greenpeace. (2005). Decentralising power: an energy revolution for the 21st century. Retrieved from <http://www.greenpeace.org.uk/MultimediaFiles/Live/FullReport/7154.pdf>
- 59 Fuel Poverty Action. (n.d.). Energy Bill of Rights [webpage]. Retrieved from <http://www.fuelpovertyaction.org.uk/energy-bill-of-rights-2/>
- 60 Bradbrook, A.J. (2005). *Access to energy services in a human rights framework*. Retrieved from http://www.un.org/esa/sustdev/sdissues/energy/op/parliamentarian_forum/bradbrook_hr.pdf
- 61 ONS. (2013). *Excess Winter Mortality in England and Wales, 2012/13 (Provisional) and 2011/12 (Final)*. Retrieved from http://www.ons.gov.uk/ons/dcp171778_337459.pdf

- 62 Gough, I., Abdallah, S., Johnson, V., Ryan-Collins, J. & Smith, C. (2011). *The distribution of total embodied greenhouse gas emissions by households in the UK, and some implications for social policy*. Retrieved from <http://sticerd.lse.ac.uk/dps/case/cp/CASEpaper152.pdf>
- 63 LIHC definition: A household is in fuel poverty if they have required fuel costs that are above average (the national median level) and, were they to spend that amount, they would be left with a residual income below the official poverty line.
- 10% definition: A household is in fuel poverty if they were required to spend more than 10% of their income on fuel to maintain an adequate standard of warmth.
- DECC. (2013). Fuel Poverty Statistics. Retrieved from <https://www.gov.uk/government/collections/fuel-poverty-statistics>
- 64 Ofgem. (n.d.) Energy Companies Obligation (ECO). Retrieved from <https://www.ofgem.gov.uk/environmental-programmes/energy-companies-obligation-eco>
- 65 This Is Money. (2014). *Scottish Power and SSE fined £4.15million for failing to fit free insulation in thousands of vulnerable households*. Retrieved from <http://www.thisismoney.co.uk/money/bills/article-2871241/Scottish-Power-SSE-fined-4-15m-failing-fit-free-insulation.html>
- 66 The Carbon Brief. (2013). *A summary of green levy reforms in the chancellor's autumn statement*. Retrieved from <http://www.carbonbrief.org/blog/2013/12/a-summary-of-the-governments-green-levy-reforms-in-the-chancellors-autumn-statement/>
- 67 HM Government. (n.d.). Winter Fuel Payment. Retrieved from <https://www.gov.uk/winter-fuel-payment/overview>
- 68 UNDP. (2000). *World Energy Assessment*. Retrieved from <http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/sustainable-energy/world-energy-assessment-energy-and-the-challenge-of-sustainability/World%20Energy%20Assessment-2000.pdf>, p. 47.

Written by: Stephen Devlin

Thanks to: Fernanda Balata, Sandra Bernick, Griffin Carpenter, Professor Andrew Cumbers, Aniol Esteban, Dr Jyotsna Ram and Chris Williams.

Designed by: the Argument by Design – www.tabd.co.uk

Cover image: Patrick Lauke via Flickr

New Economics Foundation

www.neweconomics.org

info@neweconomics.org

+44 (0)20 7820 6300

@NEF



Registered charity number 1055254

© July 2015 New Economics Foundation

ISBN 978-1-908506-85-6

