The first net zero energy crisis – someone has to pay

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Cost of energy "crises" are nothing new. They happen periodically when prices shoot up, and the voters discover that they are on the sharp end. In the 1970s, there was an external hostile party to blame: the Arab Sheiks. Then it was the miners and Arthur Scargill. Now it is the Russians. Except it isn't just the Russians this time around. This energy crisis is different, and though it may ease, it will not go away once gas prices fall back again. This is the first net zero energy crisis.

Our energy problems are significantly home-grown. This means that it is within our power to do something about them. But it takes the will to act, to take a more strategic view of the causes and tell the public the truth: net zero is going to cost (a lot), decarbonisation already has, and if we want to unilaterally reduce carbon territorial production emissions by 2050, someone has to pay.

Short-term quick fixes to head off energy price rises in April 2022 may be necessary. Socialising the legacy costs was one of the recommendations of the *Cost of Energy Review*. It, and the other recommendations contained in that Review, should be implemented as part of an overall plan to meet the 2035 target of decarbonising the electricity system – in just 13 years. Short-term sticky plasters have a habit of coming off, and further and repeated energy crises will then go on haunting this and successive governments. Better to fix the fundamentals now, than pay yet more later.

The origins of the current crisis

The current crisis was very predictable, and its causes run deep. A series of simple myths have been spun out to the wider population, which simply are not true. It is not yet true that renewables are cheaper than the main fossil fuels once intermittency is taken into account. Simply ignoring the need for back-up in claims about renewables costs will not make them go away. It is not true that the electrification of transport is going to be costless and painless after a short "transition". It is not true that electric cars

have zero emissions, at least not until we have all low-carbon electricity generation, and it is not true that cars and car batteries involve near-zero emissions to make and run. It is not true that heat pumps will pay for themselves in the near future once all the costs are considered, and it is not true that they are at least as good as gas, especially in old houses and in winter, even if the electricity they use is all zero carbon (which it is not). It is not true that carbon capture and storage (CCS) is cheap, tried and tested, and without risks. It is not true that we have a solution to nuclear waste. It is not true that biomass is generally carbon-neutral, nor is growing maize for anaerobic digestors, and that there is lots of "waste wood" to turn into pellets. And so on.

Myths have a nasty habit of crashing into reality, especially when they are mixed with a dangerous dash of cake-ism. These myths are propagated across the piece. The 2010 Coalition Government's *Green Deal* was going to create 250,000 jobs with its street-by-street programme to upgrade the UK's housing stock. The latest *Energy White Paper* could have been written back then – again listing out the jobs, especially in the red/blue wall constituencies, and this time even stretching to predicting the number of smart-tech jobs that would be added in 2050. The Prime Minister's *Ten Point Plan* is full of grand aspirations. It is worth reading alongside his previous statements about the Bridge to Northern Ireland, the London Garden Bridge, or even the London bendy buses.

The facts are rather different. Energy efficiency has not turned out to be the easy win that its advocates told us it would be. It does not generally pay for itself once all the costs are taken into account, and with heat pumps the windows will need to be sealed with all the health consequences that accompany low air circulation (a lesson learned in the coronavirus pandemic). It is easy to make speeches at demonstration concept homes with all the latest technologies that the better-off may one day be able to afford. But the reality is better reflected in the fact that even new homes built now are not net zero.

Energy efficiency is largely a road not much followed. Renewables are very different. The UK has some of the best offshore wind locations in the world. It has ploughed ahead, and the argument has been that the high costs that have been supported by very high subsidises over the last decade have been worth it, because they have caused the costs to fall.

It is true that deployment is a key part of cost reductions, and that the costs have fallen, but it is not true that we can now bask in cheap offshore wind. On the contrary, two inconvenient facts remain. The first is that whilst intermittency was not much of a problem when there was very little wind capacity in the system, it now very much is. The second is that all those subsidies still have to be paid for by someone, and that turns out to be energy customers. The subsidies now make up almost a quarter of energy bills. Let's take a look at each of these.

Intermittency is expensive

Wind and solar farms do not pay for the costs of the intermittency they cause. They therefore have little incentive to minimise them. It is a nonsense to compare the costs of wind with the costs of, say, gas or nuclear without including the back-up costs for wind necessitated by the intermittency. As set out in the *Cost of Energy Review*, the right answer is that every generator should have to bid their Equivalent Firm Power (EFP) cost into the system operator. That is the true system cost, and if it were reflected in the EFP bids, it would tell a very different story about the costs of offshore wind. It would also be a great incentive to do something about it.

Now that wind makes up a much bigger share of total capacity, this really matters – and it needs a much bigger investment in back-up capacity. The economics of that back-up capacity is seriously impaired by the wind at times producing wholesale prices of zero – when the wind is blowing well – and very high prices when it is not. In the old fossil-fuel and nuclear system, total capacity requirements were of the order of 70–80GW. For a system where wind sometimes can produce all the energy demanded and sometimes very little, that firm power capacity needs to remain in place, plus the wind turbines too. We need a great deal more capacity to meet any given demand. That has to paid for by someone.

In the current energy crisis, it is this intermittency that has been a major factor in shaping the huge impact of a gas price spike. Low wind has to be taken into account. 2021 was a year with exceptionally low wind. The worry comes in winter, with low wind, high pressure, and cold air over Northern Europe.

In time, new technologies will start to cut into this intermittency problem. But right now they are eye-wateringly expensive, and will remain so probably at least through this

decade. In any event, the demand for electricity is not going to stand still. The government wants a really fast-track switch from petrol and diesel cars to electric-only vehicles. There is the additional electricity load from digitalisation of the economy generally. Going into the age of electricity will need a lot of electricity generation capacity to support it, even if it is done smartly. A lot of that will be intermittent renewables.

We need not be simply paralysed by these problems, even if we have been caught in the headlights right now. The starting point is realism and the recognition that soaring ambitions and great speeches announcing a future carbon-free nirvana do not get us very far. Simply announcing that the electricity system is going to be decarbonised completely by 2035 – just 13 years from now – could even make matters worse if it is not credible. As the Committee on Climate Change (CCC) rightly points out, with just 13 years to go, there is a yawning chasm between the target and what is actually happening on the ground.

To get to this 2035 target, the government wants 40GW of offshore wind. Some even talk of 60GW. But what the government does not talk about is how exactly the intermittency of 40GW of wind is to be backed up – except that it has to be from net zero carbon technologies if the electricity in 2035 is to be completely decarbonised.

There is only one main way of getting this done. It has to be largely from gas, and that gas has to be almost completely backed up by CCS if it is to be net zero-complaint. Faced with these dramatic requirements, the obvious thing is to have a "plan" that builds the turbines and the gas and the CCS in a timely fashion. There needs to be a Gantt chart with the boxes filled in. Nothing remotely like what is required forms any serious part of the Energy White Paper or subsequent policy developments.

The development of the gas capacity will need a lot of TLC. Building new gas faced with intermittency-causing volatility of electricity prices, as standby rather than baseload, is unlikely to be economic. If CCS is added on, it is going to be very expensive. One more cost of energy for the customers to pay.

With just 13 years to go, successive governments have avoided contributing a repeatedly promised £1 billion to support the development of CCS since 2007 (when Ed Balls and Ed Miliband masterminded the Treasury paper on CCS). There is no adequate

regulatory regime in place, no common understanding about the pipelines, indeed no national effort that, for example, a British CCS plc might advance. Instead, it is all tangled up in the latest enthusiasm of the Prime Minister and the government – for hydrogen and hydrogen clusters.

It bears endlessly repeating that, with just 13 years to go, there is no major CCS project up and running anywhere in the world yet.

If gas has to play this part then it is also sensible to think about gas security. The Rough storage field was closed – apparently too expensive to refurbish – in 2017. That decision has consequences, but BEIS did not think storage mattered because the UK has multiple international sources of supply. It has pipelines to Norway, links to the EU, and access to LNG from countries like Qatar and perhaps the US too.

What BEIS seems not to have grasped is that access is almost always possible if the price does not matter. But it does, and this winter the costs of imports have become painfully apparent. Our gas security depends upon being able to outbid China and the Far East for LNG cargoes. It depends upon Russian gas supplies, on German storage reserves, and on the EU prices that Norway charges us.

Why? Because the UK deliberately gave up on long-term contracts in the dash for the spot market (echoes of Northern Rock here) and because the North Sea is very much out of political fashion (fracking was never going to make much difference, and in a small crowded island with complex geology, it is not in the same league as the US).

It is not hard to envisage that if the betting industry opened a book on achieving the 2035 target, the odds would be very long. The one silver lining is that, faced with intermittency, the UK has not been able to turn back to coal (except at the margin), unlike Germany, which continues to burn lots of coal (some of it the very dirty brown stuff), whilst at the same time closing down its existing nuclear power plants in 2022. There really are worse energy policies than that of the UK!

The legacy of subsidy costs

The intermittency costs are the new and rising problem for the cost of energy. But they are underpinned by a well-known and growing cost of energy caused by the legacy costs of all those subsidies to renewables, not only in the past, but going forward too. DRAX is

paid a £107/MWh inflation-indexed price until 2027 to burn wood pellets. More subsidy costs are piling up – for Hinkley (£97/MWh), current and future rounds of offshore wind, and a host of other supports for everything from solar to tidal power to CCS.

These costs are legacies. In a competitive market, no company can claim to be paid the historical cost of their particular investments, regardless of what happens to the costs of later-vintage investments. My laptop is not priced at the cost of production in, say, 2011. It is priced off the current cost of production, and that of competitors. If the costs of wind farms (minus the intermittency costs) are going down then the price should be falling. (Though note that if the costs of intermittency rise as the share of capacity on the system rises for intermittency costs, then the total EFP is going up, not down.)

Following privatisation, successive governments placed the costs of all these subsidies onto the use of system charges – in effect, taxing the consumers through their bills. In the early post-privatisation days, the assumption was that the efficiency gains that the supporters of privatisation assumed would come tumbling in would outweigh these additional "E factor" costs on bills. That is no longer true – if it ever was. These costs are now, as noted, nearly 25% of total bills – £200 + per household.

These costs were spelt out in the *Cost of Energy Review*. Since they are essentially R&D policy costs, they should be socialised. Taxpayers should pick up the rising tab (which of course does not make the costs go away).

VAT and carbon taxes

Desperately grasping for a short-term fix, the latest idea is that VAT should be removed from domestic energy. Presumably, tax on income or other VAT-covered expenditure should go up by an equivalent amount, especially since the socialisation of legacy costs means that the burden on taxpayers will be increased.

There is nothing new in the VAT argument on domestic fuels. Previous attempts to raise this to the same level as all other goods and services have been rebuffed, just as attempts to raise fuel duty run into a political brick wall.

Apart for the political dishonesty of failing to explain who is going to pay the monies that would no longer be raised from electricity customers, there is also a more

fundamental question about the right level of energy taxation. If the net zero targets are to be taken seriously, and especially if the 2035 target is to be achieved in 13 years, then price has to play a part. If we are not now paying the true environmental costs of energy, it means that the price is too low, however politically unpalatable that might be to politicians urging us all onto net zero and the 2035 target.

In theory, this should be a carbon tax set at the level necessary to meet the target and adjusted as and if progress is made. This should be uniform across the different sources of carbon emissions. At present, motorists are taxed very heavily, whereas electricity and gas are lightly taxed, and farmers and hauliers are subsidised to burn red diesel. As, if and when electricity hits the 2035 target then the tax falls back. But right now there is a lot of carbon emissions associated with electricity and a zero rating is not the right answer.

The confusion about carbon emissions and energy is further exemplified in the offering by some suppliers of "renewable energy only". No customer connected to the grid has zero carbon electricity supplied to them. We all get the mix on the system, and this has a lot of carbon content. The customers may be being greenwashed into believing that they are buying from wind farms only. Worse are the greenwashing offers that are backed up by buying certificates and offsets.

The *Cost of Energy Review* points towards the resolution of the taxation problem by taking carbon pricing seriously. That is how the government should address the VAT issue. Not to reflect the carbon cost of energy in its price is really deciding not to be serious about net zero. If this is the case, the government should at least be honest about it.

Keeping the price cap

In the mid-2010s, there was a limited energy costs crisis. It was caused in large measure by the excess margins and some appalling practices by some of the suppliers. That is why there is (rightly) a price cap. The margins, once recalculated in the *Cost of Energy Review* to take out the pass-through costs, were at times beyond reasonable, and those customers who did not switch were being screwed. After yet more appalling behaviour by some of the entrants into the supply market, and very lax regulation, and as the number of competitors has collapsed back to a concentrated oligopoly once again, the

case for removing the price cap, or reducing the time interval for resetting it, is amazingly weak. Ministers would have to believe that the companies were going to behave themselves, only charge normal profit margins, and forgo the opportunities to multiply the tariffs and exploit the customers. It should be remembered that even the *Retail Market Review* reforms, involving the reduction of tariffs to four, did not stop the behaviours. Profit-maximising suppliers profit-maximise. It is the job of government and regulators to set the rules for private enterprises, not the job of private companies to pursue the social interest.

Comprehensive reforms and the *Cost of Energy Review*

The *Cost of Energy Review* set out a comprehensive package of reforms to move the energy market to one fit for the purpose of decarbonisation, and to do so in a way that would maintain security of supply and at minimum cost. It proposed to socialise the legacy costs, to deal with intermittency through an EFP market, to plan and regulate on a national and local system operator model, to reform the carbon pricing and to set supply price caps on the basis of reasonable margins.

The government chose to ignore the *Cost of Energy Review*. It bowed to the vested interests (and especially those not paying the costs of the intermittency they caused) and the Treasury desire to make sure that the legacy costs do not come back to it. Politicians have always been frightened of carbon taxation. No politician seems willing to tell the voters what they do not want to hear, that decarbonisation is expensive and that it is going to get even more expensive. By failing to follow through on their targets, this woeful lack of leadership risks undermining the whole decarbonisation commitment of the wider population, when they find out that it is just not true that net zero is an almost free lunch. Now the government is faced with the consequences – whether to face up to the costs, or admit that net zero and all the UK's hype at Glasgow was just that.

Having seen fit to ignore the *Cost of Energy Review*, the government has come full circle back to the fundamentals in that *Review*. Legacy costs are not going away; they are building up. Intermittency is costly and getting more so as the amount of wind increases on the system. Someone has to pay the costs of intermittency. Back-up means gas in at least this decade, and security has costs. Someone has to pay all these costs, made

bigger by the impact of renewables on the costs of gas investment. CCS is going to be essential to meet the 2035 target. Someone has to pay for the CCS costs. The price of carbon should reflect the pollution that our consumption causes. If tax is reduced on energy, then someone else will have to make bigger emissions cuts and someone will have to pay for these, and tax revenue will have to be raised elsewhere to compensate for the loss of revenues.

Pretending that the costs do not exist, or that they will all go away in a blitz of new technologies anytime soon, is a dangerous climate change narrative. Worse still is to just assume that it can all be paid for by borrowing – a position that Labour's Shadow Secretary of State appears to be endorsing. That just means that not only are we not prepared to pay the costs of decarbonisation, but we want to dump both the costs and the climate change onto the next generation.

Net Zero: How we stop causing climate change

Paperback published Sept 2021 (William Collins).