The gas and electricity crisis - causes and consequences

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The gas crisis has caught ministers, OFGEM and companies out. What is a foreseeable event – a commodity price going up sharply – appears to be something that the main players assumed would not happen. Was not competition supposed to deliver a one-way bet for customers, providing lower prices? Was not the wholesale price supposed to trend downwards so suppliers could buy short in real time in the knowledge that the deals they offered would not be out of the market? Was not the price cap meant to encourage suppliers to hedge forward for the periods between price cap revisions? Was not the exit from fossil fuels supposed to weigh down gas demand, driving down market prices? Weren't Norway and Russia supposed to offer long-term contracts and stable prices? Weren't multiple supplies of gas, including LNG, supposed to moderate any divergences between supply and demand?

These various assumptions created the complacency which now confronts the energy markets and their customers. Combined with the complacency about the costs of decarbonisation, it led to a failure to take system security seriously (as well as just specific company security). It is not for a lack of ideas that the current circumstances have crept up on us. It is just that ministers, officials and regulators forgot that systems are more than the sum of their parts, and that security of supply is a public and not a private good. And they seemed to believe that competition would always work. Like the slogan in George Orwell's *Animal Farm* ("four legs good, two legs bad"), it became commonplace to think "competition good, planning bad".

The government commissioned the *Cost of Energy Review* that I carried out in 2017, focused on how to achieve security of supply and decarbonisation simultaneously. The recommendations spelt out what needed to be done and what should have been done. Four years later, ministers and officials cannot claim that they were flying blind. Instead of listening to all the lobbyists circling around the pork barrel of subsidies and the quick bucks from energy supply start-ups, they could have focused on: the need for capacity and an Equivalent

Firm Power (EFP) market to guarantee that there would be enough capacity, the urgency about creating and developing serious independent system operators at the national and the regional levels, storage, sorting out the legacy renewables costs, and setting the price cap on the basis of margins.

To this set of recommendations in the *Cost of Energy Review*, recent experience has added some further insights that require urgent action. Dithering about whether to proceed with more nuclear power stations is an obvious example, as is the dithering over funding carbon capture and storage (CCS), which the Treasury has kept up since 2007. Most immediately, it is remarkable that any supplier could hold a licence whilst being unable to meet its contractual obligations with customers under the price cap in the event of commodity price rises. There has been a big regulatory failure, and behind this lies the core issue of the reliance on spot real-time pricing and the relative absence of long-term contracts. This bears a remarkable resemblance to the failure of Northern Rock, which relied on spot market funding. The socialised cost of supplier failures may cost over £1 billion. The state – in the guise of the regulator – has to step in to make all customers pay. So much for the one-way bet of supplier competition.

It is easy for ministers to pretend that the current gas price crisis is a shock that will go away, as demand responds to higher prices. Closing down a fertiliser factory does indeed reduce demand and in the process make other customers a bit more secure. But this simply illustrates that the distinction the Secretary of State makes between physical security of supplies and price is wholly bogus. There is always a price that makes supply equal demand. But that price is not necessarily optimal, and currently we are discovering how seriously suboptimal it can turn out to be.

We should follow the old adage – never waste a crisis – and use the current woeful circumstances to rethink, rebase and sort out the energy markets properly. We should do this, too, because we are just 14 years away from the 2030 78% target and just 29 years from the full net zero legal requirement. We simply do not have time to faff around and treat each issue in isolation. The market will not sort this out on its own, and decisions have to made – urgently. To do this, the immediate causes and the longer-term fundamentals need to be understood.

The immediate causes

Ministers would have us believe that gas prices have shot up because of the unexpected global bounce-back from Covid-19. Really? Unexpected? It is true

that demand has gone up and especially in the Far East. But why would supply not respond, and, especially in the European context, supply from Russia and from Norway (and more fracking in the US)? It is not as though the gas in the Ukrainian and Nord Stream 1 pipelines can go elsewhere as LNG.

Russia is the first immediate cause of the current gas crisis. Russia claims that it is fulfilling all its gas contracts. Presumably it could add some spot gas too, and especially at these prices. Might the political ambitions around Nord Stream 2 have something to do with Russia's unwillingness to step up to the plate? It could probably on its own solve much of the European problem. Did nobody see what was going on, as storage in Europe remained unfilled, the German election approached, and Biden engaged with the Ukrainian government? The Russian motivations surrounding Nord Stream 2 have always been in plain daylight for all to see. There have been repeated attempts to manipulate supplies through Ukraine since Putin came to power, and the Nord Stream pipelines have all the hallmarks of a Russian–German project bypassing the Baltic States and Poland, and deliberately isolating Ukraine. The EU failed to centralise its buyer bargaining power, as Donald Tusk once proposed, and allowed Russia to divide up the market and exploit its market power. Nothing unpredictable about all this.

For the UK and with its preoccupations with BREXIT, there are obvious implications. Despite the claims of ministers and officials, we are not decoupled from European gas markets as we once were with North Sea gas and storage facilities like Rough. Fast-track depletion and the closure of Rough in 2017 have changed the game. We now need European supplies, notably from Norway, and Norway is part of the European gas market.

The European supply situation matters, and European prices profoundly influence the UK. Even more surprising is that ministers apparently believe that LNG is a good substitute and frees us from such concerns. We have indeed diversified supplies, but not all supplies are equally secure (as the animals in *Animal Farm* are not all equal), and it turns out few are on anything other than a spot price basis. Ministers should have seen Gazprom and the associated problems coming and taken precautions. They clearly did not.

To summarise, the gas price shock was predictable, Russia's conduct was predictable, and (in the absence of longer-term contracts and with little storage) relying overwhelmingly on spot markets, successive ministers and officials have been asleep at the wheel. They may be right that the price shock probably will ameliorate, but that should be no consolation to them and

certainly not an excuse for doing nothing. Complacency will breed the next crisis.

The second immediate cause of the gas crisis is the recent low wind contribution. Intermittency is a well-known variable, and one for which an energy system should have adequate back-up, non-wind capacity and storage support. Now and for the foreseeable future, gas is the main back-up, and the closure of Rough and the rundown of the North Sea gas fields should be seen in the context of this predictable increased importance of gas as the way to back up the renewables en route to decarbonisation. Relying on keeping the remaining coal-fired power stations burning for longer, as in the case of DRAX, is hardly consistent with the decarbonisation programme and an embarrassment in the run-up to COP26.

In the old days of the state-owned British Gas, we had long-term contracts which enabled British Gas to flex supplies and optimise against the Rough storage facility. By switching so much dependency to LNG terminals like Milford Haven, the assumption was that the world was now a source of diverse and secure supplies, and the more local security of supplies and storage would no longer be needed. That was, however, forgetting that world demand fluctuates too, and world spot markets, not long-term contracts, determine the prices of LNG gas. The great hope that Qatar would provide stable long-term supplies ran into the competition from other (notably South East Asian) markets.

The third cause of the immediate problems is the way the electricity market operates and how the price of electricity generation for customers is determined. The developments in the gas markets this autumn (and remember this is only September, not a January or February with cold high pressure and low wind) play out into the electricity market. Instead of the price of electricity reflecting the overall costs of producing it, it reflects the marginal cost of the last generating station to meet the last bit of demand. This is the system marginal cost pricing principle that dominated the wholesale energy markets of the twentieth century. But in a world of lots and lots of other zero marginal cost generation, customers are still paying the marginal cost of gas, not the capacity costs of the wind, solar and other intermittent generators. Price definitely does not equal cost anymore. Hence there are some considerable windfall profits being reaped at the expense of customers.

The fourth immediate problem arises as a result of the behaviour of the suppliers in the face of the price cap. The way to think about the price cap is as a longer-term contract for customers, shielding them from fluctuations within six-

month periods, smoothing out prices, and in the process preventing monopoly pricing and the sort of margins that I reported in the *Cost of Energy Review*. Shielding customers from very short-term fluctuations, and in particular shocks, is a good thing: few customers want this sort of uncertainty and many – as we are now seeing – cannot cope with it.

What suppliers need to do – and should be forced to do in exchange for holding a licence – is to back these price cap periods with contracted supplies so that they can meet shocks. They should hedge for the relevant periods, and not just for a month ahead, for example. Whilst OFGEM says it has carefully modelled the financial position of these suppliers, it clearly has not done this properly, and it is all the more worrying that it has been urging customers to switch to low-cost providers without checking that these providers can absorb shocks. The Secretary of State points out that at this time of the year around five or six companies tend to leave the market (go bust in other words), but this is hardly a mark of success. Companies regularly going bust is hardly a "good thing" for an essential energy system. Proper prudential regulation is what is required and, in return for holding a supply licence, the issue of director responsibility and liability should have been brought into the equation. Limited liability allows the company directors to run away from the consequences of their behaviour.

The result is that the much-hyped "success" of getting over 70 suppliers into the market turns out to be less good than the ministers and regulators told us it would be. It is not even clear why this is any better than a properly regulated market from the perspectives of the bulk of the customers. Few of those who took the advice of the regulator this summer can be very pleased with the delights of the competition they are supposed to have benefited from.

The fundamental causes

All of the above is hardly surprising or unpredictable. It is the result of the market incentives and regulatory architecture that have been put in place. It is not rocket science to provide a secure energy supply and decarbonise. But it does require the setting of clear objectives for each of these, and having willed the ends, government has to will the means as well, including how it is going to be paid for.

Let's start with security of supply. In a world of more and more low-density, disaggregated and intermittent generation, it is critical that there is sufficient firm capacity to meet peak demands. The key word here is "firm" – we have to be able to rely upon it. Wind and solar contribute to security, but they cannot be

relied upon 100%. For this reason, the *Cost of Energy Review* sets out the core market requirements: an EFP capacity market. It is the key issue for the transition to net zero – how to provide the back-up capacity for the intermittent renewables – and it is the most neglected in the current energy policy discussions.

EFP auctions leave it to the market to find ways of firming up the non-firm generation, and this creates a powerful incentive on those who cause intermittency to find ways of reducing it. This can be done by markets and through contracting, but there may need to be a strategic reserve of capacity specifically for this purpose. Having (rightly) closed the coal, this is going to be gas for some time to come, and well into the next decade.

A strategic reserve is something that is paid for to be standing by in case it is needed – just-in-case not just-in-time. In that role, the gas does not drive the market price. The price of energy is the sum of its costs, and for the renewables (and nuclear) these are overwhelmingly about capacity not energy. The reason is that most of the low-carbon technologies are near-zero marginal costs. They are more like utilities and networks, with fixed, sunk capacity costs. Whether they generate or not does not add to these costs significantly.

As noted above, in the current, very twentieth century, market, price is determined by the system marginal costs, the marginal cost of the last generator needed to meet total demand. This means that the price of electricity is often equal to the price of gas, despite the fact that the costs of the renewables and nuclear are not changed because the gas price goes up. We are paying too much for the other sources of zero marginal cost generation because the price of gas is setting the electricity price.

With more and more zero marginal cost generation, the wholesale electricity market will in any event wither away. So it should, and it should be pushed aside by an EFP set of auctions and an EFP market now.

This does not mean that the price of gas does not matter, and that its security of supply is not of critical importance. It is, and will remain so for quite a while. As noted, one of the great mistakes the Secretary of State makes is to think that the physical security of supply is a separate issue from the price, and then the further mistake is to argue that because there are various sources of gas supply, therefore it is secure.

Let’s take the first claim. The required amount of gas depends upon price, and demand depends upon price, therefore the amount of gas needed at any point in time (the security requirement) is a function of both the physical infrastructure and the price of gas. If the price of gas was to go up dramatically, we would not be using very much gas. Indeed, the current price rises have reduced the demand for gas for fertiliser production because the fertiliser factory stopped operating at these gas prices. Many other energy users have also taken this path.

On the physical infrastructure, not all sources of supply are as reliable as others. The Secretary of State and BEIS seem to think that LNG is a good substitute for Rough. It is not: a shipload of LNG on the oceans is not certain to arrive, and indeed may be diverted to other markets. Gas in an LNG terminal is better than gas in an LNG ship. Norway is a better source, with its pipelines, but the question is whether it is contractually tied into fixed prices, or it is physical supply at whatever the spot price turns out to be. In any event, Norway is tied into the continental gas systems, and these hinge on the supplies from Gazprom through Ukraine and now Nord Stream 1 and shortly Nord Stream 2.

In the current gas crisis, it is interesting that Gazprom has made of point of honouring its contracted supplies, but not added further spot market volumes. This highlights the differences between long-term contracts and short-term spot markets.

The determination of the price of gas and the importance of long-term contracts

In the “bad old days” before British Gas was privatised, the market architecture hung on long-term, take-or-pay contracts and the price to customers was determined by these long-term contracts. In the electricity market, then 80%-dependent on coal, the contract between the National Coal Board (NCB) and the Central Electricity Generating Board (CEGB) determined the costs that went into the bulk supply tariff.

British Gas carried out the conversion to natural gas from town gas through a string of back-to-back, long-term contracts, driven off the contracts with the North Sea gas producers. It could then vary the take from the North Sea against demand and set a stable long-term price to customers. It built its National Transmission System (NTS) and regional pipelines in the solid knowledge of the supply and cost of gas to its customers.

One of the features of privatisation was that the long-term contracts were broken up. We moved from a market driven by these long-term contracts to a spot market, and in the late 1990s this worked because the spot prices were well below the long-term contract prices. The gap between the two virtually bankrupted British Gas, and was a major reason for spinning off Centrica, so that it could renegotiate those long-term contracts with the North Sea oil and gas companies, against the credible threat that if the oil and gas companies did not lower their prices, Centrica would default through bankruptcy.

And so it has been ever since: spot traders and multiple layers of spot contracts determine the price, and hence it is volatile and vulnerable to shocks, like the one we have now. The imposition of a price cap, driven by the excess margins the suppliers of electricity were making (documented in the *Cost of Energy Review*) forces a rethink. It is a longer-term contract, but one some suppliers have ignored. The price cap is the bottom-up way to start to put in place a more resilient and robust contractual framework that meets what customers actually want, as opposed to what regulators and ministers have decided they ought to have. It is a "good thing" and those who claim it should be scrapped need to think again, and explain how its abolition creates the price stability that customers require.

What now needs to be done

Brazening it out, pretending that the market will sort all this out, might make short-term sense to ministers and regulators. After all, if they admit they got it wrong, the obvious question is why they did nothing about it. The defences sound hollow: the claims that suppliers are always going bust, that the regulatory clean-up mechanisms after failures are working, that gas prices will go back down again, that there is no problem with supplies, and so one. Best ignore them all, except the shorter-term consolation that gas prices might fall.

Sticking their heads in the sand will not work, because there are both immediate and fundamental problems with the current arrangements. They will come back to haunt the ministers and the regulators.

Fortunately, there is another way, which is to recognise that the fundamentals have indeed changed: from baseload and flexible generation to intermittent wind and solar, from baseload coal and nuclear to gas plus wind and solar, from the wholesale market to the capacity market, and from the declared wonders of supply competition to the stark reality that most customers do not really want to switch and that there are serious market power issues at stake.

Much of this is driven by the urgent need to decarbonise by 78% within just 14 years. It cannot be done without sorting out heating, transport and agriculture, and without lots and lots more intermittent renewables. There needs to be a massive increase in electricity capacity, much of it intermittent.

It is actually not that difficult to work out what needs to change, once the scale of the challenge and the intermittency are recognised. All the main steps are set out in the *Cost of Energy Review*. The gas crisis has sharpened the case for several of the recommendations (notably socialising the legacy costs, the EFP auctions, the margin-based supply price caps, and the separation out of regional and national system operators). Additionally there is a need for a much more serious engagement with storage, and with recreating the incentives to develop an underlying structure of long-term contracts.

What the gas crisis has really done is to highlight where customers are coming from, and to knock down the pack of cards that is supply competition. Instead of simply assuming that customers want to switch and that suppliers have the interests of their customers in mind, ideologies have trumped these. The implication of supply competition has always been that customers who do not switch are just stupid, and therefore in the end it is their own fault that they are landed with higher prices. The alternative – that customers are the best judges of their own interests, and do not want to spend their evenings searching the internet amongst the bewildering claims of 70 companies offering them such "good deals", and what they really want is a secure stable and not volatile supply at a price with a fair rate of return, and to spend as little time and effort on this – has clearly escaped ministers' and regulators' minds. As one of those "stupid" customers, I am very glad that I did not switch to the latest bunch of companies going bust. Frankly, like most customers, I have better things to do.