European Commission response to the energy crisis of 2022

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1. Introduction

The increase in gas prices from 2021 onwards, exacerbated by Russia's invasion of Ukraine in 2022 and other energy supply problems have led to a triple-headed crisis of: energy affordability; reliability of energy supply; and climate change. Measures that will help alleviate these problems – unaffordable prices, risk of blackout and failure to meet greenhouse gas reduction targets - will also have political advantages if they reduce the EU's dependence on Russian gas.

There will be a requirement for measures that will take some time to implement, such as reforms to the energy markets and strengthening of renewables programmes, while some measures will be needed to allow EU citizens to survive the coming winter of 2022/23 without serious detriment to their welfare. This report focuses on the measures needed to get through the winter of 2022/23.

Governments of Europe Union countries are being forced to introduce measures to mitigate the risks of energy shortages and the adverse effects of high prices on consumer welfare, public services including education and health, and business and commercial enterprises' viability. The European Commission is now asking whether there are measures covering the whole of the Union that could help reduce these risks. The President of the European Commission, Ursula von der Leyen outlined five main proposals (European Commission, 2022a), a leaked paper (European Commission, 2022b) provided some more detail behind some of the proposals and a proposal by the Commission was published on September 14, 2022 and agreed by the Council on September 30, 2022.[1] By mid-October the proposals were still being discussed.

2. The Commission proposals

President von der Leyen noted the measures already taken including:

1. Demand reduction particularly for gas and creation of a joint storage facility for gas with an objective, already achieved by early September 2022, to reach 80% of capacity.
2. Diversification away from Russian oil and gas.
3. Massive investments in renewables.

We focus on the five specific measures proposed by von der Leyen for the electricity and gas markets designed to have a significant effect in the upcoming winter, 2022/23. These include:

1. Reductions in peak demand for electricity.
2. A cap on the revenues of companies producing electricity at low cost with the revenue diverted to support vulnerable consumers and companies.
3. A 'solidarity' contribution from fossil fuel companies making 'unexpected' profits, essentially a windfall tax.
4. Measures to improve the liquidity of the electricity markets to help secure the futures markets.
5. A price cap on Russian gas.

The concern with the fourth proposal appears to be the liquidity of futures markets which is said to be low, affecting the ability of energy companies to purchase long-term contracts, which in turn affects their ability to offer consumers deals because the companies will not know what

[1] https://data.consilium.europa.eu/doc/document/ST-12249-2022-INIT/en/pdf

price they will have to pay for their power. The liquidity measures were not expanded in the leaked Commission proposal and are not mentioned in the Proposal passed by the Council. They appear to be still under discussion but while they may be useful, they will have a limited impact if adopted and they are not discussed further here.

In addition to the proposals made by President von der Leyen, other proposals have been put forward by Member State governments and might implemented. The main ones are an extension of the price cap proposal to all imported gas supplies and a proposal to subsidise gas used to generate electricity. For the purposes of analysis, it is useful to divide the proposals into three groups: those designed to reduce demand; those designed to generate funds through what would essentially be windfall taxes that could be recycled to provide support for low-income and vulnerable consumers; and those designed to reduce the price of gas.

Prior to analysing the proposals, it is useful to identify the causes of the situation and to examine the market model used for electricity and gas, which is often portrayed as having aggravated the problems.

3. Causes of the problem

Russia's invasion of Ukraine, leading to sanctions on Russia and action by Russia to reduce gas supplies to Europe, exacerbated problems with gas supply that already existed. The international gas price had already increased 400% between April and October 2021 (ACER, 2021). Severe problems have emerged in the French nuclear sector with, on average, about half of France's nuclear reactors off-line for 2022 reducing expected output by about a quarter compared to 3-4 years ago. This has led to France importing significant quantities of electricity generally generated using gas. These issues are expected to continue through 2023.[2] The drought of summer 2022 has also affected hydro-electric availability across Europe.

4. The gas and electricity markets model

The issues causing the high energy prices can be divided into those affecting wholesale and retail gas prices directly and those affecting electricity prices. A key element of the problem is the use of the commodities market model for international gas trade, national wholesale gas markets and national wholesale electricity markets.

The commodities model, used for most internationally traded commodities, is based on international spot markets in which the commodities are traded at visible prices. The spot price is set by the price offered by the highest cost producer. The market would also include several derivatives and instruments such as long-term contracts, futures, and options but the price for these would be strongly influenced and generally indexed, at least in part, to the spot price of the day. The claimed advantages of this model are:

[2] As a result, France will be a net importer of power all year in 2022 and 2023 instead of just in the winter months and a cold winter will put the French system under severe strain because the high level of electric space heating use in France. Some of these reactors will return to service before winter 2022/23 after routine refuelling and maintenance is completed. However, 12 of the 56 are closed due to serious corrosion problems that will take at least a year to remedy with other reactors potentially affected.[2] At any one time and through the winter a further handful of reactors will also be closed for several months for upgrades required by the 10-year Periodic Safety Review to allow for life-extension. EDF forecasts that its nuclear output in 2022 will be 280-300TWh compared to 393TWh in 2018.[2]

- It would provide a visible easily accessed reference price that would determine, or be a strong influence through indexing, the price paid for the commodity.
- Supply and demand would generally balance because the market would pay enough to meet the costs of the most expensive producer needed to meet demand and it would result in the lowest cost combination of suppliers being used to meet demand.
- Price signals from the market would stimulate the required investment in new capacity, giving potential producers the incentive to enter the market and forcing high price producers out of the market if the spot price is lower than their production cost. High prices would also tend to reduce consumption reducing prices and low prices would tend to increase consumption increasing prices.

Intrinsic to this design is that speculators are an inevitable presence. They usually make profits when the market price does not reflect the real costs of the marginal producer. They buy options when the price is too low and sell options when it is too high. In addition, because the spot price reflects the costs of the highest successful producer, most producers will have lower costs and will receive more income than is needed to cover their costs because successful bidders receive the highest successful bid price.

In times of shortages, there is often a price premium on top of the costs of the marginal producer as producers exploit their market power to drive up prices. However, in times of surplus, prices will plummet with producers willing to sell at prices as low as their marginal costs rather than their total costs, so they have at least some net income even if this does not cover their total costs. This income may allow them to survive until prices increase but the position of not covering costs in full is only sustainable for a short period of time and eventually the supplier would have to exit the market if prices paid continue to fall short of their costs.

The dramatic rise and fall of prices, known as the 'hog cycle' is characteristic of commodities markets. Shortages lead to investment which pushes down prices, which in turn leads to high-cost producers exiting, pushing prices up again. The range of these fluctuations will depend on the characteristics of the commodity. For example, a commodity with ready substitutes and that is easily stored will be able to tolerate an imbalance between supply and demand much more easily than one without these characteristics.

For gas, there is some scope for stores at a supplier level but not at a consumer level and some scope for substitution for some large consumers, but not for smaller consumers. For electricity, the scope for storage is very limited and only for short-term (a few hours using batteries) and generally there are no substitutes. In addition, there is a requirement that supply and demand must always balance if a catastrophic system collapse is to be avoided. This is one of the primary issues that using such a market for national electricity markets raises.

The gas and electricity markets have been criticised because they provide inframarginal producers with large profits and the electricity market has been criticised because the price is set by the costs of the most expensive producer, in most cases gas-fired generation. However, this is exactly how the commodities market model is meant to work. Price signals should be stimulating an increase in supplies and the promise of high profits inframarginal producers should be stimulating new entrant producers. The issue, discussed below, is whether the commodities model is appropriate for energy.

5. The international and national gas markets

The international gas market has grown rapidly in the past couple of decades as Liquified Natural Gas (LNG) has expanded the supplier options for many gas-user countries. Gas is also being used, for example, in Southeast Asia, as a transition fuel away from more polluting fuels such as coal. For example, the UK can now receive gas supplies from any LNG supplier through each of its three LNG terminals. It can also receive gas via pipelines from producers in Norway and Netherlands, and from its own significant production as well as trade with other European countries via the gas pipeline from UK to Zeebrugge. This puts it is an enviable position with regards to diversity of supplies and this may improve its security of supplies. Nevertheless, because the UK market is fully integrated into the European market, it is still required to pay the European market price for gas. Other countries, particularly land-locked countries, or those in Eastern Europe without LNG terminals, will be heavily dependent on Russia for their supplies with the only alternative to reverse the flow of gas to Western Europe from Russia.

The European Commission does not have the scope to make changes to the way the international wholesale gas market operates. Many producers will be making very large profits because of the high world gas prices, but this is an inevitable consequence of trading via a commodities market. The high prices will stimulate existing producers to maximise their production in the short term to take full advantage of the high prices. These will replace the supplies from Russia that have been cut and will tend to bring the price down.

Most wholesale gas is bought and sold at prices set on the international market. Mainland European Union member states, few of which have significant domestic production, that use natural gas are connected by pipeline to international markets. There is therefore little scope for nations to influence the price in their national gas markets

6. National electricity markets

While there is international trade in electricity the characteristics of electricity mean that there is scope for variation in the design of the wholesale price setting mechanisms in member states. EPSU has consistently argued that these characteristics, set out in Appendix 1, mean an efficient, competitive national or regional market in electricity is not achievable. Without a competitive wholesale electricity market there can be little justification for a competitive retail market because if all retailers pay the same for their power supplies, there will be essentially nothing for retailers to compete over. The Commission claims it is the 'right' of consumers to have choice of electricity supplier.[3] However, given that electricity is a standard product, if there is no economic advantage to having choice and because the extra costs that competition imposes - duplication of functions, lost scale-economies - may increase prices, this may well be a right that has no advantages for consumers and which they do not want.

If a competitive electricity wholesale market is to be judged to be operating efficiently, it must meet at least three criteria:

- It must set a reference price that determines the price most power is bought and sold at, either directly or indirectly via indexing of contracts.

[3] 'Consumers' right to choose the energy supplier who offers them the best price and service lies at the heart of the internal electricity market.' European Commission, 2022b, p 9.

- It should provide a forum to buy and sell power at reliable, cost-reflective prices so that new entrant sellers (generators) and buyers (retailers) can enter the market to prevent existing players exploiting market power, with the new entrants knowing they will be able to compete on fair terms with other buyers/sellers.
- It should provide timely price signals so that high prices reflecting a potential shortage of power reduce demand and stimulate investment in time to prevent power shortages. Equally in periods of low prices/surplus capacity, suppliers that cannot compete at these low prices will be forced out of the market.

No EU electricity wholesale market has met all three criteria even while fossil fuel capacity was an acceptable option for new generating capacity. For fossil fuel generation, the marginal cost is the cost of fuel, and this dominates the total price so the marginal price will not be dramatically less than the full price. However, for low-carbon sources, especially renewables, the marginal price is close to zero so in times of surplus, the wholesale price could be close to zero or even negative as generators bid lower, so they at least get some net income. Given the lead-time even for quickly built new generating capacity is five or more years, it seems unlikely that price signals would ever have been a reliable enough mechanism to balance supply and demand. Ensuring supply and demand balance by this mechanism makes the implausible assumption that just enough capacity will be profitable enough to meet demand even at demand peaks. Unlike other commodities the marginal (most expensive) electricity producer will only be required for a few hours each year and in a mild winter, might not be required at all and plant owners would receive no income. In order for peak generators to be economically viable the price at peak time must be very high so they generate enough income to meet their fixed costs.

To combat these concerns about building new generating capacity and retaining peaking plant on-line, many Member States have introduced capacity auctions to produce the new capacity needed and capacity payments to reward generators simply for promising to be available to generate if required. These measures meet a clear need, but they seriously compromise the efficiency of the market.

EPSU has argued since the 1996 Electricity Directive was adopted (Directive 96/92/EC)[4], that the commodities market is an inappropriate design for electricity. In the past decade as its flaws become more obvious, it has been widely acknowledged that the existing design would not be appropriate for a market dominated by low-Carbon generating sources. Some argue that modifications to the design will solve the problem, but proposed new designs are conspicuously absent. In Appendix 2, EPSU's arguments that the commodities model is not appropriate for trade in electricity are summarised.

7. Critique of President von der Leyen's proposals

7.1. Reductions in demand for electricity

There will inevitably be a steep reduction in electricity demand this winter compared to previous winters irrespective of whether these proposals are implemented because high prices will force consumers to cut back on non-essential consumption of electricity.

[4] https://www.legislation.gov.uk/eudr/1996/92/adopted

The measures set a mandatory target for Member States to reduce their peak demands by at least 5%. This is aimed at reducing the risk of blackouts as well as reducing consumption of gas, potentially allowing further reduction of imports of gas from Russia.

The proposal requires:

> "…a mandatory target of at least a 5% reduction in gross electricity consumption during selected peak price hours covering at least 10% of the hours of each month where prices are expected to be the highest. This mandatory target would result in selecting on average 3 to 4 hours per weekday, which would normally correspond to peak load hours, but can also include hours where electricity generation from renewables is expected to be low and the generation from marginal plants is necessary to cover the demand. To account for this, Member States have a certain margin of discretion when identifying these hours."

The Commission argues that this would reduce gas demand for power generation by 3.8% (1.2bcm). If peak demands can be reduced, the risk of blackouts will also be reduced.

The Commission states: "The binding target specifically addresses consumers who can deliver flexibility through EN 5 EN demand reduction or demand shifting offers on an hourly basis.' And should be implemented via 'economically efficient and market-based measures such as auctions or tender schemes for demand side response or electricity not consumed."

It is therefore clear, unlike the original draft proposals where all consumers would be targeted, the focus is not on residential consumers. This is sensible given that such consumers, especially low-income consumers, will have already cut their consumption to a minimum because of the high prices, and may even be consuming less than would be necessary for their welfare. It is vital that such consumers should feel no additional pressure to reduce their demands because of the risk this would impose on their welfare.

A well-designed scheme should avoid the risk that the peak in demand will simply be shifted forwards or backwards as consumers shift their demand patterns away from expected demand peaks. However, so-called Demand Side Management measures are relatively little used in the EU so far and it may be that to achieve the target, only large consumers can be targeted.

It is not clear why only peak demands are being targeted. This would be logical if the concern was that there would be insufficient capacity to meet demand, but it is clear the problem is more the supply of gas might be insufficient to meet demand through the winter season.

7.2. Windfall taxes on entities making supernormal profits

There are two proposals being discussed: one taxing inframarginal generators who are receiving much higher prices than previously despite their costs remaining largely the same; and one taxing fossil fuel who are receiving a higher price for their oil and gas, again, despite their costs not increasing. The Commission chooses not to refer to these measures as 'windfall taxes', preferring 'solidarity contributions.' Windfall taxes are always likely to have popular appeal as they appear to be recovering excess profits from companies which are making these profits while those paying the high prices are suffering.

7.2.1. Taxes on inframarginal generators

The proposal is that for inframarginal sources - it mentions renewables, nuclear and lignite - an *ex-post* price cap be set with the excess revenue recovered from generators redistributed to final consumers. The Proposal states:

> "In view of the role that the electricity prices in the day-ahead market have as a reference for the pricing of electricity across all the other market timeframes, this measure reduces the impact that the margin-setting technology (typically coal, today often gas-fired power plants) has on the revenues of other generators with lower marginal costs such as most renewables, nuclear, and lignite." And "The surplus revenues resulting from the application of the cap shall be channelled to final electricity customers. This includes all purchasers of electricity for their own consumption. In selecting the beneficiaries of the redistribution, Member States should target as much as possible the final customers, be it private or commercial ones, who are most strongly exposed to high electricity prices."

Of the generation sources targeted, in 2021, renewables accounted for 35% of generation in the EU, nuclear for 28% and lignite 9%, most of which was in Germany. In Czechia, Greece and Bulgaria, lignite accounts for a significant proportion of generation. The rest of generation was covered by gas and coal. The cost of renewables, lignite and nuclear has not been affected by the gas price rises whereas coal prices have been dragged upwards. The *ex-post* nature of the proposal means that the Commission claims the market and the prices set should not be affected and the functioning of the market not compromised. This proposal has attractions but there are several areas where it appears poorly conceived

The Commission mentions renewables and nuclear as inframarginal sources. However, these sources have low marginal costs and do not usually compete in day-ahead markets. Most renewables are paid at non-market prices, for example, through Feed-in Tariffs or take-or-pay fixed price contracts. They are therefore not generally benefiting from the high market prices. Nuclear cannot participate meaningfully in day-ahead markets because of its inflexibility and, because of its high fixed costs, it is risky for it to be dependent on spot prices for its revenue. So, it tends to be bought and sold outside the power exchanges via hedging contracts. For example, EDF claims: 'Due to EDF's strategy of forward-selling its output, the average realised price for the nuclear fleet's power [in UK] in 2022 has been delivered to the market at an average realised price much lower than current and forecast market prices.'[5]

A significant proportion of power is bought and sold with integrated generator/retailers supplying their own retail division. There is also significant use of bi-lateral contracts at prices known only to the two sides of the deal and which may have a limited relationship to the prevailing market price. Determining these outside-market prices would require new regulatory powers and impose a significant regulatory workload. Whether this could be achieved in time to recover excess profits and redistribute them to consumers most affected by high prices remains to be seen in winter 2022/23.

The Commission asserts that electricity systems are dispatched in 'merit order', in other words, 'that electricity prices are determined by the variable cost of the marginal technology, i.e., the last and most expensive plant that is needed to meet demand.' This is simplistic. In a competitive market, prices are determined by ***prices*** bid, not ***costs.*** Generators have no

[5] https://www.edfenergy.com/sites/default/files/uk_nuclear_fleet_strategy_update.pdf

obligation to bid all their available plants although withholding capacity might be seen as unfair exploitation of market power. Generators are not required to bid prices that reflect their costs, and, in any market, prices bid are set by what the bidders believe the market will bear. In most power exchanges generators bid a quantity of power, they do not bid the specific plant that would fulfil the bid. It is for them to decide which plants to use. For the purposes of dispatch, they are required to notify the System Operator which plants they intend to operate in each given 30-minute period. It may not therefore be a straightforward task to determine which plants have been paid what price and generators might try to allocate their highest prices to types of plants not covered by the price cap. These proposals seem likely to place a significant extra burden on regulatory bodies.

More details are needed which must be evaluated by the regulatory authorities before it can be determined whether workable proposals can be produced in the time available. It may be that the quantity of renewables and nuclear that bids into the market is rather small, while lignite generation is largely confined to Germany, so the sums of money generated could be small.

7.2.2. A solidarity contribution from fossil fuel companies

Fossil fuel companies are profiting heavily from the high fossil fuel prices and measures therefore seem attractive that recover some of these excess profits from the companies. Windfall taxes are always strongly and bitterly resisted by the companies on which they are imposed. They will argue that they are required to absorb losses when prices are low, so it is a reasonable *quid pro quo* for them to make large profits when prices are high. For example, at the start of the pandemic, energy demand fell sharply causing significant falls in fossil fuel prices. Producers will argue that, as a 'solidarity' measure, consuming countries did not offer to pay more for their supplies to pay for these losses.

Where producers are making large profits, the normal way for these excess profits to be recovered is via varying the level of taxation in the country of production. The rationale for this is that resource is the property of the producing company and if windfall profits are made, it is the producer country that is entitled to them. Fossil fuel producing countries adjust taxation levels for fossil fuel companies up or down according to production costs and world prices so that profits are high enough to retain capacity but not unreasonably high.

Given that the level of production of fossil fuels in the EU is very low, taxation by the producer country is not relevant. Taxation in the country of consumption is not a normal practice and may be difficult to implement however attractive the concept is.

7.3. Measures to reduce the price of gas

7.3.1. A cap on Russian gas prices

It was proposed in President von der Leyen's speech and in the leaked draft proposals that the price of gas from Russia be capped and there have since been discussions amongst ministers that prices for all producer countries would be capped. The level of the cap was not specified. However, there was no mention of a price cap in the Proposals agreed by the Council.

President von der Leyen stated that Russian gas represented only 9% of the Union's imported gas in September 2022, down from 40% before the 2021 gas price rises. While imports of gas account for more than 90% of the EU's supplies, the impact of a gas cap on Russian gas on consumer prices can only be small and this policy appears more a politically-motivated one (albeit a potentially valid one) than one based on consumer welfare. From a practical point of

view, the risk would appear to be that Putin would cut off all supplies to the Union increasing the pressure on gas prices. Putin must calculate that it will be a long time before Europe will choose to buy gas from Russia and cutting off supplies now would just be bringing forward the inevitable.

From an overall point of view the quantity of Russian gas that would have to be replaced would be relatively small but for Eastern European countries heavily dependent on Russia for supplies, it may be practically difficult or even impossible to replace these supplies. Extending the cap to other producer countries would risk damaging relations with producer countries that the EU will be dependent on for many years to come. If a price cap for all producers is introduced, producer countries are likely to direct their supplies to countries that do not have a price cap. A gas price cap is therefore an option that needs to be studied very carefully before implementation is attempted.

7.3.2. A cap on other gas producers

A price cap on other producers has also been mooted. President von der Leyen pointed out that prices at the hub at which the European gas prices are set, the Dutch Title Transfer Facility or TTF produces prices higher than in other international gas markets. It was proposed that there be central EU buying of gas to prevent national procurement policies bidding up the price of gas. She was quick to thank US and Norwegian producers for increasing supplies to allow reliance on Russian gas to be significantly cut (not that a significant proportion of the US gas will have been produced by fracking).

A cap on the price, central procurement of gas and measures to bring prices at the TTF in line with those in other markets appear risky. The EU can ill-afford to lose the goodwill of its gas suppliers and, particularly the USA and Norway might see the reward for their assistance in substituting for Russian gas was a unilaterally imposed price reduction while other producers might choose to send their gas elsewhere if the premium on the price at the TTF is removed.

7.3.3. A subsidy on the price of gas used for power generation

This has been introduced in a number of countries, for example, Spain. This appears an expensive and poorly targeted measure, subsidising all consumers regardless of need. It will also reduce the incentive to minimise gas use for power generation and will not help with the critical issue of how consumers who use gas for space heating will be able to afford their bills.

8. Conclusions

At the centre of many of the analyses of the problem is the operation of the electricity wholesale market with the implication it is not operating correctly particularly the role of generation from natural gas setting the spot price. This criticism is misguided. The market is operating entirely as it is designed to do. Potential shortages and high costs generate high prices which should provide the incentive for new lower cost entrants to come into the market. Inframarginal generators, as happens most of the time except in periods of surplus capacity, earn more than enough to cover their costs. Again, this is an important incentive to incentivise new entrants into the market to bring down prices. The problem is therefore not that the market is operating inappropriately, but that the model chosen is inappropriate for the electricity wholesale sector.

In terms of getting through the winter with power supplies intact, the best option may well be to do nothing. High wholesale gas prices will motivate suppliers to increase their volumes while

high energy prices will cause consumers to cut their consumption significantly. However, the human cost of such a policy makes it unthinkable.

EPSU has consistently argued this since the Electricity Directive of 1998 mandated competitive wholesale markets. In the past 10 years, as more and more measures have to be taken to override the operation of the market to ensure security of supply and to cover up the shortcomings of the market (particularly laid bare by the increasing proportion of renewables), there is an increasing recognition that a new model for the wholesale electricity sector is required. President von der Leyen stated:

> *"The current electricity market design – based on merit order – is not doing justice to consumers anymore. They should reap the benefits of low-cost renewables. So, we have to decouple the dominant influence of gas on the price of electricity. This is why we will do a deep and comprehensive reform of the electricity market."*

It is important that the EU starts to think about the organisation of the sector can meet the triple objectives for energy supplies of affordability, reliability, and sustainability. However, it is seldom wise to implement long-term policy changes during a crisis when perspectives can be distorted by immediate concerns. It is important to start thinking about the options for a sector design that will be effective in a low-carbon context. However, in terms of actions, the focus must be to take short-term measures to ensure security of energy supply and protect consumers from the worst effects of the current high prices with most help directed to those least able to survive these high prices. Measures should be easily reversible when the crisis is over.

The three main measures discussed, reductions in peak electricity demand, 'solidarity' contributions from electricity generators and oil & gas companies and reductions in the price of gas have superficial attractions but it is far from clear they can be implemented in time to be valuable if at all.

It is hard to understand why the demand reduction measures focus on peak demands given the potential shortage is of fuel, not generating capacity. The decision to focus these efforts on large consumers is wise and there must be no additional pressure on small consumers especially low-income and vulnerable consumers, to further reduce their demand given the risk to their welfare this would lead to.

'Windfall taxes' have a clear public attraction appearing to take unearned profits from companies redirecting them to those in need of help. These proposals will be strongly resisted, and it is far from clear that worthwhile sums of money can be generated.

The proposals to reduce the price of gas by placing a cap on wholesale prices and by subsidising gas for power generation are problematic. A cap on the price of Russian gas seems likely to just force the complete cutting off of supplies from Russia placing more price pressure on supplies from elsewhere. A cap on the price paid to other producers risks damaging relations with countries the EU can ill afford to alienate.

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European Commission (2022b) ‘Proposal for a Council Regulation on an electricity emergency tool and a solidarity contribution of the fossil sector’ COM (2022) 475, Brussels.

Appendix 1 Why free markets in gas & electricity are not achievable

Inability to store power and expense of storing gas. Storing products allows consumers and producers to smooth out demand and price peaks by drawing down stores when prices are high and building stores when prices are low.

Need for supply and demand to always match. In an electricity system, supply and demand must always match if the whole system is not to collapse. Without control over producers, a system operator does not have the tools to ensure security of supply. A free market implies free entry and exit and does not oblige producers to offer their products to the market. For gas, the requirement for supply and demand to match is not quite so stringent but still strong.

Lack of substitutes. For most products, there are ready substitutes that can be used if supplies are scarce, or prices are high. The threat of switching to substitutes acts as a discipline on producers on price and availability. For many uses, electricity has no ready substitutes and even where substitution is theoretically possible, consumers are generally locked into electricity by the equipment they use. For gas, there are substitutes in some cases, mostly for large industrial users, albeit not so convenient but users are again often locked into gas by the equipment they use.

Vital role in modern society. Modern society is now dependent on reliable supplies of electricity for it to function. A failure of the electricity system will lead to immediate and serious welfare and economic impacts, as the blackouts of 2003 amply demonstrated. For most products, a market failure can be mitigated by use of substitutes and stores, but this is not possible for electricity. As a result, the demand for electricity cannot easily be influenced in the short-term by price changes.

Electricity and gas are standard products. In an interconnected network, electricity and gas are standard products. Switching to another supplier cannot produce ‘better’ electricity or gas, so markets are purely price driven and will be exploited by those who have most to gain by cheaper power (large users) as well as the skills and negotiating power to get the best deal. If the market is functioning well, prices will inevitably be driven down to the short-run marginal cost, too low a level to justify new investment. And

Environmental impacts. The environmental impact of electricity generation and gas use must be added to the traditional list of special features. Electricity generation and gas combustion play key roles in greenhouse gas emissions and attempts to deal with climate change must focus on the electricity and gas sector (and transport). The market will not deliver the necessary emissions reductions and market mechanisms are no more than one of many tools that will have to be used, not the complete answer.

Appendix 2 Issues arising with electricity markets in the past decade

Practical problems with the electricity wholesale market were the integration of generation and retail which meant that a large proportion of power was passed from the generation to the supplier division of the same company at prices only known to the company itself. There were also long-term bi-lateral power purchase contracts again at prices that were known only to the two parties, and which might have little reference to spot market prices.

In the past decade, as renewable generation has come on-line there has been an increasing recognition that existing market designs are unsuitable for an increasingly low-carbon dominated system. In some countries, regulators introduced measures to force generators to offer more of their power to the visible market to improve the reliability of prices and give new entrants easier access.

Other countries introduced capacity payments to give incentives, particularly to peaking plants to remain available. Demand peaks are sensitive to weather conditions, and in a mild winter, might not be required at all therefore generating no income. This mechanism overrides price signals stimulating exit from the market.

There is a clear recognition that the market alone will not bring investment in low-carbon technologies such as renewables and, in some countries, nuclear even if it is expected that the generation cost will be competitive with fossil fuel generation costs. These technologies have a cost structure dominated by upfront construction costs with low operating costs. So, unlike fossil fuel generation plants which, if they cannot compete, can save most of their costs by not operating, such plants still must meet high costs. So low-carbon generation has always been built with comprehensive protection from the market such as Feed-in Tariffs (FiTs) and take-or-pay power purchase agreements at fixed, non-market prices. FiTs, mostly applied to small sources such as solar photovoltaic roof panels and the Commission is trying to phase them out. However, for larger sources, capacity auctions are becoming common under which bids are solicited and long-term, fixed price power purchase contracts awarded based on the price bid. This overrides the price signal mechanism for new capacity.