Price shock absorber

Temporary electricity price relief during times of gas market crisis

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European policymakers are weighing possible responses to the extraordinary surge in energy prices and the consequences for citizens and industry. The European Commission expects to issue additional guidance in May, following analysis due in April from the Agency for the Cooperation of Energy Regulators. We offer this proposal for consideration as a measure fit for purpose, designed to acknowledge and address the essential aspects of the current crisis:

- This is a gas market crisis — it is an extraordinary event that is adversely affecting all sectors of Europe's economy. The priority for the electricity sector must be measures that allow the electricity market to ride through this shock to the system, and similar future shocks, preserving its functionality whilst minimising harm to consumers.
- The midst of a crisis is the wrong time to take decisions with long-term implications that will be difficult to walk back once the crisis has passed. The fundamental design of the electricity market is sound; improvements are needed, but they have no direct bearing on the causes of or remedies for this crisis. An "optimised" market would adopt measures that enable it to bend, not break, in response to crises such as this.
- This crisis has revealed in stark terms the true cost of dependence on a volatile fossil gas market, including the risks inherent in the prominent position Russia will continue to occupy in global supply. This may be an extraordinary event, but it is not the first nor will it be the last. It is critical that any measures adopted ensure that the market reflects this true cost in a sustained but equitable manner. The value of the only durable response — an accelerated transition away from fossil fuels — must remain apparent.
- Consumers and industry have the power to contribute to the response to these risks, by procuring the energy services they need more efficiently and flexibly. When responding to the crisis, policymakers should intensify the electricity market's role in mobilising and empowering consumers rather than concealing the true cost of 'business as usual.'

Shock absorber mechanism

The 'price shock absorber' described hereafter is an additional market feature to bring consumers cost relief, while addressing concerns about windfall profits. Importantly, it leaves electricity market fundamentals in place to deliver energy efficiency, beneficial demand flexibility and a 'normal' level of expected inframarginal rent to compensate investors for the value of their investments. This proposal assumes that policymakers are seeking to provide broad-based relief from the impacts of the current gas market crisis across all electricity customer segments, it should not be interpreted as an endorsement of doing so. Targeted relief to low-income consumers is something that can and should be done in any case, whereas proposals such as this one to intervene more broadly in the electricity market, with broader and potentially longer-term implications, should be considered separately.

The mechanism is modelled on similar "circuit breaker" mechanisms that have been in place for some time in other markets to prevent run-away scarcity pricing from harming consumers

once their cumulative impact has reached a point where it no longer serves a valid market function.[1] It triggers a temporary cap on the ability of fossil gas generation to set wholesale market clearing prices based on a nominal benchmark for when, as a result of an extraordinary event (a 'shock'), the accumulated inframarginal rents occasioned by extraordinarily high market prices are deemed to reach a level beyond which they are no longer contributing to the market's objective of maximising social welfare. Gas-fired generation required to serve demand is eligible for reimbursement of the fuel costs incurred in excess of the market cap; however, those excess fuel costs would cease to set the market clearing price for as long as the cap remains in effect.

Core proposal

Trigger: In a given time period (we propose a month), the accumulated inframarginal rent for a basket of zero-carbon resources reaches a multiple of levelised fixed cost[2] of those resources.

Cap: The trigger introduces a temporary cap on wholesale electricity market clearing prices at a pre-determined absolute price level (euro/MWh); or at either the price cap or the most expensive non-gas resource to clear the market, whichever is higher.

Specifics of the price shock absorber:

- Trigger: We suggest setting the trigger at a low multiple (like 2 or 3) of the levelised fixed cost to reflect the fact that recovery of fixed costs is never consistent from one period to the next and periods of over-recovery are necessary to compensate for what may be (and in recent history, have been) long periods of under-recovery.
- Cap: A pre-determined price per MWh (or perhaps the higher of that price or the most expensive non-gas-fired resource to clear the market).
    - We suggest it be set close enough to average pre-crisis levels to constitute a meaningful level of relief but high enough to provide a normal level of market-clearing efficiency.
    - The cap remains in effect for the balance of the period (month). The cap is removed and the meter restarts at the beginning of the next period.
- Scarcity pricing mechanisms continue to apply where they are in place. These may include their own trigger-and-cap mechanism.
- Gas-fired generators continue to offer at their marginal cost.
    - They are entitled to recover excess operating costs from the system operator on the condition that the relevant operating hours were the result of market bids at least equal to their full marginal cost. Self-scheduled operations would not be eligible for recovery.
    - The system operator recovers an amount equal to the excess fuel costs from electricity suppliers on a load-weighted basis, in order to fund reimbursement of gas-fired generators.

[1] The cumulative pricing threshold in the National Electricity Market in Australia and the peaker net margin in the ERCOT market in the U.S. are examples of similar mechanisms currently in use in the electricity sector.

[2] Levelised Fixed Cost is the flat payment per period (monthly, in this case) that would amortise capital costs over a given number of years.

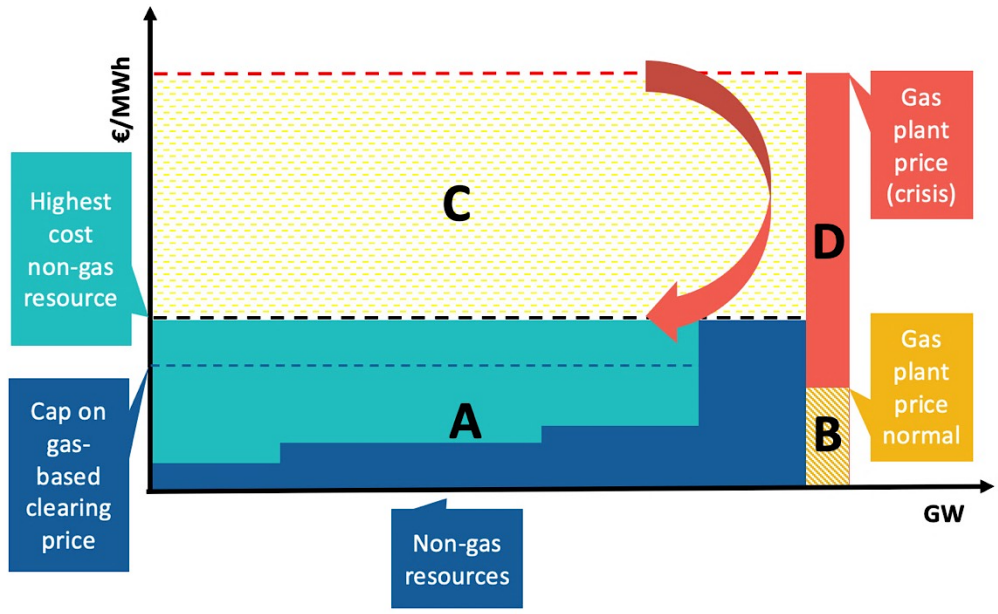
Table 1 summarises some of key design options that would have to be decided upon.

Table 1. Design elements of the smart cap for further consideration

Parameter		
Geography	Entire EU27	Regional (or Member State)
Cap level if crisis persists over multiple trigger periods	Fixed for the duration	Step down after X consecutive periods
Clean technology basket	All zero-emission technologies	Solar, wind and demand-side resources

As illustrated in Figure 1, the shock absorber temporarily decouples wholesale electricity and gas prices, thus providing cost relief to consumers. The full cost of generating electricity with fossil gas would continue to flow through to consumers, however, for the duration the absorber is in force, the excess costs would be recovered as a direct assessment rather than as the marginal cost setting wholesale market prices. As such, much of the conservation and demand flexibility incentives would continue to operate, and the full incentives would be renewed for a given period of time in each relevant period until such time as the crisis has abated.

Figure 1. Simple merit order diagram illustrating the price cap once shock absorber is triggered. Consumers pay A+B+D, and avoid C.



This pricing mechanism has relatively low administrative costs and preserves as much of the efficiency of a price-as-cleared market based on marginal cost as possible while protecting electricity consumers from the extreme impacts of extraordinary events. It retains the critical role of inframarginal rent in compensating zero-carbon resources (as well as other critical non-marginal system resources) for total costs. It deactivates automatically when the event is over.

Calculating the levelised fixed cost of a weighted average basket of clean resources is a task for an independent regulator, based on transparent and publicly available data. This should mitigate the risk of information imbalance and thus manipulation. It is important to note that the calculation of the cost levels only impacts the trigger. The cap level is set independently. This is a key difference with proposals seeking to re-introduce bygone concepts of fixed 'cost-plus' or 'pay-as-bid' price levels or re-regulated 'average cost' prices for energy.

Shock absorber versus blunt gas price cap

The shock absorber compares favourably against other proposed measures to mitigate price impacts on electricity consumers such as a blunt price cap on gas or a windfall profits tax. A blunt gas price cap for electricity generation artificially lowers the cost of gas-fired generation, which creates perverse incentives, rather than creating a mechanism for decoupling wholesale market clearing prices from current crisis-level gas prices. It lacks a clear and objective trigger and is therefore a one-off measure which requires an active political decision to exit. A gas price cap risks advancing gas generators in the electricity merit order, needlessly raising costs, displacing clean resources and increasing greenhouse gas emissions. For a comprehensive assessment, see the recent analysis by Lion Hirth.[3] A windfall profits tax does not reduce prices and, in order to provide the desired relief, must be collected, cycled through national coffers and paid out to consumers on a pre-determined basis, all of which introduce unnecessary costs and potential inefficiencies. While the tax could be used to raise funds needed for targeted relief to low-income consumers, other options exist.

The shock absorber is a market design feature that can remain in place as a pressure relief valve with limited adverse consequences. The shock absorber ensures that non-gas-fired resources are able to earn a minimum amount of the inframarginal rent that is critical to a sustainable energy market before the cap is triggered. This makes it more feasible to set a relatively low price cap. The nature of a blunt gas price cap, by contrast, makes such a relatively low price cap more problematic.

Multi-criteria evaluation of policy options

In this briefing we mainly discuss market adjustments that can deliver cost mitigation for consumers, given the sustained price crisis. The price shock absorber is a tool that has a market-wide impact in addressing undue harm. In Table 2 below, we briefly assess a series of options to contribute to cost mitigation. We refrain here from an extensive description and analysis of each option. Rather we mean to point to the importance of considering the many aspects involved in deciding between alternative policy measures.

Some of the options included here are and others are not mutually exclusive. In fact, the optimal policy path forward may well be a smart combination of several of the options put forward in Table 2.[4] Each criterion is color-coded and scored with 1/red being undesirable, 2/orange being neutral and 3/green being desirable.

[3] Hirth, L. [@LionHirth]. (2022, March 31). *Erdgas für Gaskraftwerke soll in Spanien in Zukunft nur noch 30 €/MWh kosten, das ist eine 70%-Subvention. Ich habe gestern … [Fossil gas for gas plants is expected to cost only 30 €/MWh, which is a 70% subsidy. Yesterday I…]* [Tweet]. Twitter. https://twitter.com/LionHirth/status/1509598254853414914?s=20&t=CNmLHvHwmzhFCFRozqaNvw

[4] Brown, S., Vangenechten, D., Claeys, B. & Lovisolo, M. (2022). *EU can stop Russian gas imports by 2025.* Bellona Europa, Ember, Regulatory Assistance Project (RAP), E3G. https://www.raponline.org/knowledge-center/eu-can-stop-russian-gas-imports-by-2025/

Table 2. Assessment of policy options to mitigate high energy prices

	Effective	Fast	Efficient	Robust	Fair	Adaptable	Cost		Score
Price shock absorber: during price shock, time-limited mechanism to cap price of clean technologies, plus strict cost recovery for gas generators.	3	2	2	2	3	3	3		18
Blunt electricity price cap: for all capacity in the market, socialising costs above cap via taxation or other means.	3	3	1	1	2	2	1		13
Long-term contracts or affordability options[5]: supporting clean investment and stable/low-cost electricity to off-takers.	2	2	2	3	3	2	2		16
Average pricing: market participants are paid their asking price, resulting in a market price at a weighted average of market offers, which may very well increase prices above current market model.	2	1	1	1	2	2	2		11
Targeted financial support for vulnerable consumers, limited in time and usually as lump-sum payments.	3	3	3	1	3	3	2		18

Specific consumer groups need additional direct and urgent support to avoid or alleviate energy poverty, which is best delivered with targeted measures. We discussed consumer protection measures in a November 2021 briefing on fossil gas price volatility.[6] In that briefing, we also analysed possible revenue sources for governments to fund cost mitigation measures. Governments have used carbon revenues from EU Emissions Trading System auctions and net increases of VAT in the past months. In recent weeks, windfall profits taxes or a tax on Russian energy imports to Europe have gained interest. It should be clear that those are not cost mitigation measures in and of themselves. They can, however, fund cost mitigation measures.

Scoring criteria for Table 2

Effective: Does the option achieve the goal of mitigating costs for consumers?

Fast: Can the option be implemented quickly?

Efficiency: Does the option enhance dispatch and investment efficiency?

Robust: Is the option robust against regulatory risk?

Fair: Does the option increase fair access and equity?

Adaptable: Can the option adapt automatically to changing conditions?

Cost: Does the option create secondary cost?

[5] Batlle, C., Schittekatte, T. & Knittel, C. (2022, 31 March). *Power price crisis in the EU 2.0+. An MIT Energy Initiative working paper.* https://energy.mit.edu/publication/power-price-crisis-in-the-eu-2-0-desperate-times-call-for-desperate-measures/

[6] Claeys, B., Hogan, M. & Scott, D. (2021) *Responses to fossil gas price volatility.* https://www.raponline.org/knowledge-center/responses-to-fossil-gas-price-volatility/

Illustrative calculation

The following illustrates how a shock absorber mechanism would operate under one simplified scenario. All data points are fictional, and the chosen parameters are simply one possible set of suggestions.

- Assumed trigger (T) for imposition of cap: 2x weighted average levelised fixed cost (FC) of basket. See Table 3 below.
- Assumed capacity factor (CF) of basket: 70%.
- Assumed average uncapped clearing price (UP): €250/MWh (gas power plant).
- Weighted production cost (PC): See Table 3 below.

Results:

- Hours to trigger cap = [T/(UP-PC)]/CF = 197 (8.2 days).
- Assumed price cap through end of month: €75/MWh.
- Cap would be a pre-determined fixed price, but in this scenario would equal 70% below pre-cap average. Note: average price during capped period is likely to be less than the cap.

Table 3. Specifics of technologies in basket of clean resources

Technology	Share of basket (%)	Levelized FC (€/MW/month)	Weighted FC	Production cost (€/MWh)	Weighted prod. cost
A	40	10,000	4,000	2	0.8
B	30	7,560	2,268	2	0.6
C	10	26,000	2,600	4	0.4
D	20	39,000	7,800	35	7.0
Total			16,668		8.8