How can the wholesale electricity market be used to skim the windfall profits of the gas crisis? A simple and non-intrusive proposal

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One sentence summary: *Tax the revenue from inframarginal electricity production whenever gas-fired power plants are marginal.*

Power plants that do not use natural gas make large windfall profits when high gas prices lead to a sharp rise in wholesale electricity prices. Under normal circumstances, such windfall profits are necessary for investment incentives. However, the entry and exit of coal-fired power plants, nuclear power plants, and renewables is largely managed and controlled by policymakers and regulators, so they are unlikely to require such windfall profits. More importantly, in this crisis windfall profits are a huge burden on electricity consumers, which is why policymakers in Europe are looking for ways to alleviate them.

Many proposals to change electricity market design are known to be ineffective and often even counterproductive. For example, an electricity (or gas) price cap would increase energy demand and decrease supply, only exacerbating the underlying problem.

A proposal by Greece and the EU is essentially to split the market in two segments, one for low-cost production (e.g., wind) and one for high-cost production (gas). This alone would hardly change anything, because – in line with the 'law of one price' – producers would adjust their prices to reflect market value. Therefore, the proposal calls for low-cost producers to be paid based on full costs. This implies, however, that low-cost supply would be fully regulated and no longer subject to market incentives, creating serious challenges, some of which are discussed here.

To mitigate the problems associated with the Greek approach, it has been proposed to cap the price paid for low-cost electricity production (e.g., here and here). However, caps come with problematic challenges: The demand price would be skewed downward relative to market price, increasing electricity demand; the fact that each segment has its own electricity price creates opportunities for market gaming; electricity suppliers would attempt to evade the cap by selling outside the capped market or exchange; etc.

There appears to be a simpler and much less intrusive way to use the wholesale electricity market to skim the windfall profits of the gas crisis:

Tax the revenues from inframarginal power production, but only when gas-fired power plants are marginal.

Because the tax is levied only when gas-fired power plants are operating, the tax effectively skims (only) the windfall profits from high gas prices. Of course, the net price paid to inframarginal producers must remain above the marginal costs of supply. Then, all available

low-cost generation capacities are delivering electricity whenever gas-fired plants set a high market price, implying that all windfall profits are equally affected, regardless of what contracts underlie them or where trade takes place.

At the same time, the market mechanism remains intact: Because price-setting gas-fired power plants are not taxed, this proposal will neither affect the market price nor the 'law of one price' at any point. The proposal also avoids the complications and drawbacks that come with other proposed market design interventions as mentioned above.

The tax revenues should be used to relieve the burden on those facing energy poverty in a way in a way that does not jeopardize market efficiency.

The proposal does not yet address important implementation complications. For example, the tax should not impair market efficiency by disrupting the merit order. If this proves to be a problem, instead of taxing when gas is marginal, the tax could be triggered whenever the market price exceeds a threshold. Alternatively, to improve bidding incentives, one might tax all production, yet power plants could be allowed to deduct variable costs from the tax (which would likely require the regulator to estimate those costs, as with redispatch, though).

One problem that arises with all proposals addressing windfall profits is that spot market transactions do not necessarily reflect profits. This is due to hedging and forward contracting: For example, power producers often sell their electricity on forward markets at prices that can be significantly lower than spot market prices. The current proposal is consistent with, for instance, (partially) excluding previously contracted power obligations for taxation, depending on what is deemed necessary. However, partly because it is hard to observe which market player engaged in what forward hedging, this is a serious challenge for which there is unlikely to be a simple solution.

Another potential concern is leakage of supply to interconnected neighboring states if such taxation were implemented at the state level.

While there are other interesting proposals on how to skim windfall profits (including proposals to cut Putin's energy rent), many policymakers seem determined to intervene in the design of wholesale electricity markets. Unlike other proposals, this one shows how the gains and burdens of high gas prices can in principle be redistributed with the help of wholesale electricity market design without compromising on the contribution of competition and market price signals to addressing the crisis. However, whether it is better to skim windfall profits on an hourly basis, using wholesale power markets, as this conceptual framework suggests, or downstream using more standard profit taxation techniques to aggregate profits, will depend on how well the economic, legal, and political complications of those interventions can be resolved.