

Gas crisis – Tradable gas usage certificates to bring down price

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Executive Summary

In large parts of Europe, the gas import capacity will be at its limits next winter, restricting the overall amount of gas available. To balance demand with scarce supply, European gas prices have risen substantially above world LNG prices. This is because gas users effectively outbid each other on domestic gas markets – for a resource that is physically limited by import constraints. Gas exporting countries and LNG regasification capacity owners benefit from this domestic scarcity, while European consumers are paying high prices and face a challenging and uncertain winter. Various regulatory interventions are being discussed to remedy the gas crisis, but many fail to combine the intention to provide financial relief with the need to limit demand to the physically available quantity.

We propose introducing tradeable gas certificates, which are freely allocated to European industrial gas users based on, e.g., 80% of last year's consumption. Under the policy, industrial gas users within the import-constrained region are required to own a gas usage certificate to be allowed to use one unit of natural gas. The actual gas continues to be traded separately such that all gas contracts and hedging arrangements remain valid, making the intervention legally lightweight. The total amount of issued certificates is based on the physically possible import capacity (plus current storage), and the initial allocation of the certificates is proportional to last year's consumption. The idea is to first distribute the overall gas available within Europe on the certificate market, thus stopping European gas users from outbidding each other on the gas market. As a result, gas prices in Europe may fall to the international LNG price. The regulator can react flexibly to supply changes by releasing some certificates only month-by-month as winter progresses and gas demand by households is realized.

The proposed policy has four attractive properties. First, it transfers the scarcity premium away from gas exporters to the EU industry and thus provides financial relief. Second, the possibility to trade certificates between firms ensures that the necessary savings in gas consumption will take place where they cause the least economic costs. Third, the policy does not interfere with existing gas purchase contracts and is thus likely to prevent the legal problems from which other proposals suffer. Fourth, households will benefit from lower gas prices.

1 The price in Europe’s import-constrained region

Current situation. For the coming winter (2022/23), a large part of Europe will be import-constrained. This means that LNG import terminals and non-Russian pipelines into the region will be fully used at capacity, following Russia’s almost complete supply stop. The region of European countries affected by the binding import constraint then effectively constitutes a “high price island” in which higher prices cannot attract more supply in the short term, i.e., until further LNG terminals come online. The region includes, amongst others, the Netherlands, Germany, Poland, Denmark, Italy, Austria, and the Czech Republic (but not Spain or France). In that region, there will be physical limits to the amount of gas available next winter.

Problem of outbidding on the gas market. Faced with limited available supplies, gas consumers outbid each other on the gas market (Figure 1), such that the demand entities with the highest willingness to pay continue to consume gas (at high prices), while those with lower willingness to pay drop out. Firms differ in how well they can substitute away from gas, and prices serve an important function to allocate overall supply to the most efficient uses. Industrial gas demand in Western Europe has already dropped by 21.7% in 2022 compared to the 2018-2021 average, according to market analysis firm ICIS – an effect that is likely to be attributable to high prices. However, managing the existing scarcity solely through high gas prices has important downsides. The unprecedented price increase has resulted in large windfall profits for gas exporters, including Russia, Norway, but also to LNG terminal capacity holders, at the cost of EU industry and households. The regressive incidence of rising energy costs across the income distribution imposes significant hardship on poor households.

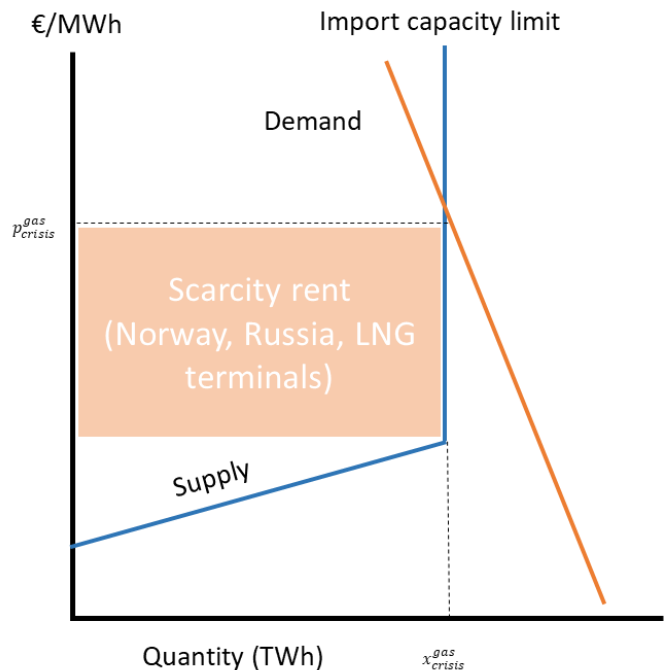


Figure 1: Gas market in crisis: binding import capacity limit. Prices are set by demand and exceed world prices for LNG.

Way forward. We propose to manage the domestic (import-constrained) scarcity no longer through the gas price, but through a separate instrument. This distributes the available gas volumes efficiently within Europe first and thus avoids overbidding on the gas market and reduces payments to supplier countries.

2 Proposed solution: Cap-and-trade for gas usage

2.1 General concept

Overview. We propose a “tradable gas usage certificates” policy, similar to the European Emissions Trading System (EU-ETS), which leads to the abatement of CO₂ emissions where it is least costly for the economy (for a review, see Ellerman et al., 2016). For each unit of natural gas (e.g., 1 MWh) consumption, a covered firm must surrender one gas usage certificate. Importantly, the certificates only provide the right to use gas that a firm already owns. The gas itself still must be procured additionally such that gas trading and existing forward contracts are unaffected. The regulator issues a total amount of certificates that is below the sum of current storage plus the gas import capacity, thus replacing the physical constraint with a regulatory constraint. As a result, the scarcity rents are shifted away from the current suppliers to the EU. By allocating most certificates free of charge based on firms’ historical consumption levels, the rents are distributed across the economy.

Market mechanism. Since the certificates are tradable, gas consumption will be allocated efficiently across firms (illustrated by **Figure 2**). On the demand side, a firm’s willingness to pay for a certificate is equal to its total willingness to pay for gas minus the price in the gas spot market. The market allocates certificates (and thus gas consumption) to the firms that create the most value and therefore have the highest willingness to pay. In other words, gas usage is reduced where it creates the least economic value.

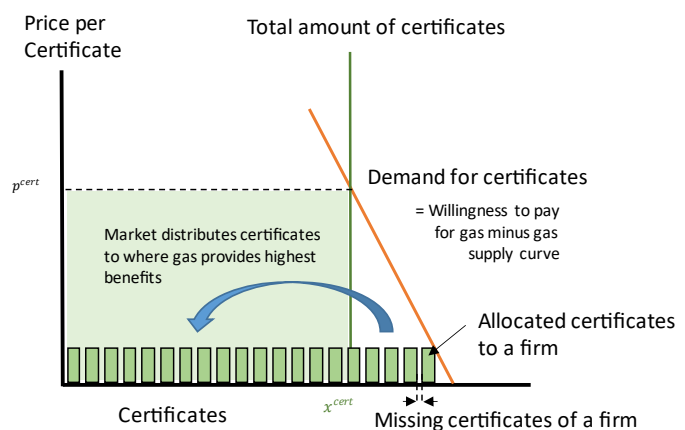


Figure 2: Trade in the certificate market

Regulated firms and time frame. The scheme applies to the countries that comprise the “high price island” and could also be expanded to include others. Households are not included in the scheme but will profit from the lower resulting market prices. The certificate market covers gas usage until the end of winter, e.g., through March 2023. After that, the import capacity limit is not expected to be binding anymore (or, at any rate, the scarcity is less than in winter). Alternatively, the system could be left in place, but in this case, it would be crucial not to allow borrowing certificates from future months.

2.2 Important aspects for implementation

Getting the quantity right. The price for a certificate will depend on the cap. Ideally, the cap is set such that total gas consumption (the sum of the cap and household demand) is only slightly less than the capacity limit. If the cap turns out to be too high such that more certificates exist

than can be used (as there is simply not enough gas), the certificate price will drop to zero, thus making the instrument ineffective. An unnecessarily low cap, on the other hand, would lead to high certificate prices and thus to a total marginal price that is significantly above the current market price. While the scarcity rent now accrues to domestic entities rather than to suppliers abroad, some economically valuable production would not take place, leading to a welfare loss.

Flexibility. Household gas consumption depends on weather conditions and is therefore not known with certainty in advance. Because getting the quantity right is crucial, the policy implementation needs to provide the regulator with enough flexibility to perform possible fine-tuning and respond to economic or political realities. For instance, the regulator may allocate the certificates on a periodical basis (e.g., monthly) and reserve the right to adjust the amount based on import updates and realized household demand. Because current storage is part of the cap, the system can absorb mean-reverting shocks by increasing or decreasing the rate at which the reservoirs are depleted.

Price formation. In theory, the certificate price will be equal to the marginal cost of reducing gas usage to one unit below the cap. Evidence from the EU ETS suggests that allowance prices have, in fact, been driven by marginal abatement costs (Hintermann et al., 2016). Since many firms covered by the proposed gas usage market are also covered by the EU ETS, they already have experience with a cap-and-trade market.

Penalty as a backstop. To enforce the policy, a penalty for noncompliance is needed, which should be set high enough such that firms have a strong incentive to comply with the system. This is because if enough firms do not comply, gas consumption will reach the capacity limit and the scarcity rents revert to the gas suppliers. The penalty for noncompliance additionally serves as an upper limit for the certificate price.

3 Benefits of a cap-and-trade approach

Gas price declines. The tradable gas usage scheme directly affects the spot gas market (Figure 3). Provided that the total gas consumption from households and industry is below the capacity limit, the spot gas price will decline to the LNG world market price.

Incentives to save gas remain. To use natural gas, firms must pay both the gas spot price and the certificate price, the sum of which will be (slightly) above the spot-

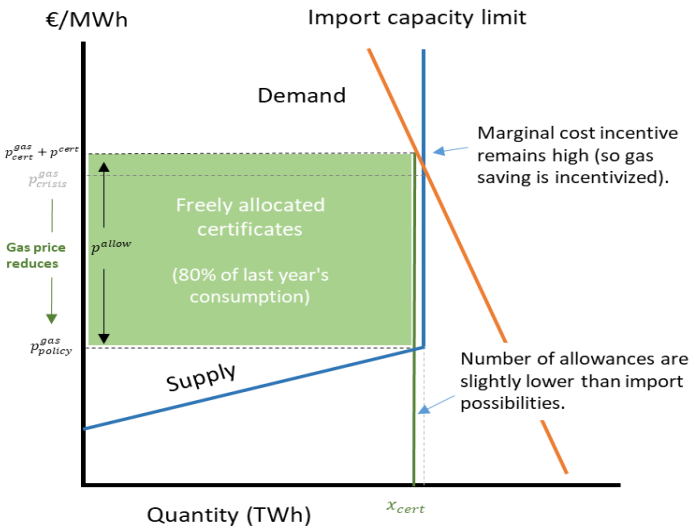


Figure 3 Gas market after implementation of the policy

only market price in the crisis. Therefore, the firms still face a high marginal cost for gas consumption and thus remain incentivized to reduce gas consumption.

EU industry gets the scarcity rent for free. The proposed scheme repatriates the scarcity rent, which corresponds to the light green areas in **Figure 2** and **Figure 3**. Short-term market trades and long-term supply contracts (to the extent that they are indexed to the spot market) will clear at lower prices. The firms with the lowest willingness to pay for gas are expected to sell some (or all) of their certificates and benefit from a “shutdown compensation” by obtaining the certificate market price. Compared to the current situation, certificate buyers are also better off as they benefit from some free-of-charge certificate allocations, e.g., equivalent to 80% of the previous year’s consumption. For the remaining share, they pay about the same as in the current conditions.

4 Further considerations

Incentives for new LNG terminals. Given that the policy leads to lower spot gas market prices, investment incentives in new import or generation facilities may be reduced. To maintain financial incentives to expand capacity, new LNG terminals or domestic generation sources should be compensated, e.g., by providing them with new tradable certificates that correspond to their contribution to alleviating the gas shortages.

Better than price caps. Because the proposed policy provides incentives for gas usage to be reduced where this is cheapest for the economy, it is superior to a price limit that would have to be accompanied by uniform rationing that would be inefficient (Schmalensee & Stavins, 2017). Furthermore, reverting to the world market price (rather than some artificial price limit) will provide continued incentives for firms and households to preserve gas and invest in green technologies.

Countries to be included. Some countries (e.g., the UK) are sometimes capacity constrained and sometimes not. When deciding which countries to include, the situation during the winter season should be relevant. Therefore, it would be desirable to also get the United Kingdom on board for the measure. Should that not be possible, a gas export tax should be considered as an accompanying policy to counteract leakage of low-priced gas into the UK.

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