

Modelling Great Britain's gas security of supply to 2035

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Overview

The objective of our research is to understand the scale and nature of security of supply events, how they may impact GB's gas market as well as the wider prevailing circumstances in world gas markets. The decline of indigenous production from the UK Continental Shelf (UKCS) inevitably means that GB is more dependent on imports than previously. Whilst a reduction in indigenous production creates new risks to future gas supply it is also the case that diversification improves GB's gas security.

Methodology

The methodology involved the following steps: (1) identifying the most critical shocks to future GB gas security, including how the combination of those shocks might impact on gas security; (2) modelling the likely development of future GB gas supply and demand from the present to 2035; and (3) stress testing the system against unforeseen shocks under different demand conditions.

Critical shocks were identified from multiple sources, including stakeholder workshops and a literature review. We deliberately considered only those shocks that are likely to have the largest impact on the GB gas system and assessed the likelihood and potential impact of each identified shock. We modelled three distinct supply-side shocks, each with a deliberately high severity and duration in order to understand the impact of a severe shock on GB's gas security.

Preliminary findings

Our preliminary findings suggest that gas security of supply shocks that may lead to unmet gas demand in GB are extremely unlikely to occur and the scale and disruption of these shocks are completely unprecedented. Nevertheless, our objective was to fully understand GB's exposure to these shocks. In this regard, the main findings are:

- We found that GB's gas system is robust to almost all significant individual shocks under normal demand conditions. Thus, we decided to focus on combined shocks during periods of high demand to stress test the system, even though these are less likely to occur simultaneously.
- Thus, the modelling results show that even where there is an extreme shock to global LNG markets, GB demand can be met if GB consumers are willing to pay for it¹.
- The modelling shows that GB demand for gas will be met in circumstances where there is an extreme disruption to Russian gas supplies to Europe (for a 12-month period) if GB consumers are willing to pay for it.
- The modelling shows that as long as GB consumers are willing to pay sufficiently for scarce gas supplies, only in the most extreme (and highly unlikely) scenarios we considered (a long disruption to Russian supplies combined with a GB LNG infrastructure outage in winter) might there be some unmet demand.
- The main insight from this work is that price is the primary determinant of whether sufficient gas is available to meet GB demand, but in some instances the availability of adequate import capacity and key infrastructure may also be critical.

¹ The willingness to pay for GB consumers refers here to their Value of Lost Load (VoLL) and how this compares to the VoLL of consumers in competing markets (for example, in Continental Europe).