

Analysis of higher CO2 gas penetrating the NTS

UNC Modification 0780

Transmission Workgroup 7th September



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Background

National Grid NTS (NG NTS) annually performs a very well established two part process to gauge the long term (10 year) adequacy, utilisation and development needs of the NTS pipeline network.

Firstly, NG NTS widely and extensively consults industry stakeholders, via the “Future Energy Scenarios (FES)” process, to help to define scenarios of future flow into and out of the NTS pipeline network.

The second part is extensive modelling of gas flows within the NTS network ,which may arise from these future scenarios , covering a wide envelop of potential flow patterns. The results of this analysis, in terms of the impact on NTS network development, are summarised in the “Gas Ten Year Statement” .

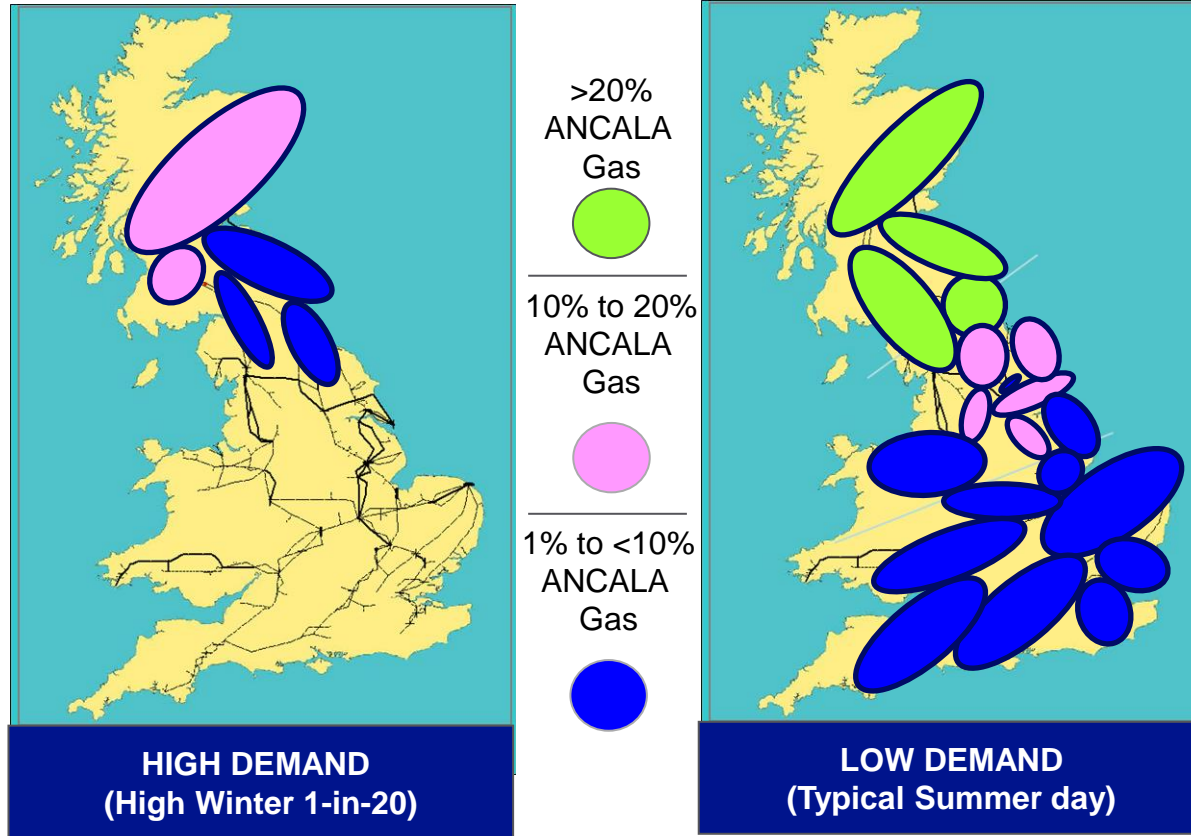
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The results of the 2020/2021 cycle of this modelling were examined for the specific case of flows from ANCALA's entry point from 2020 onwards, determining an indication of the penetration of ANCALA gas into the NTS network.

The degree of penetration depends on a number of factors, particularly the seasonal geographic pattern of supplies and demands. In the worst case conditions modelled, the ANCALA gas is expected to supply exit points throughout the NTS at different levels. CO₂ levels will be dependant on other ASEPS supplying gas on the day for blending.

Percentage of gas received from the ANCALA Operator

These diagrams show the % of gas received throughout the UK from Ancala on a high demand (high winter) and low demand (typical summer) day.



Assumptions for the Analysis

Based upon the worst case CO₂ levels at each of the supply terminals assumed:

- ANCALA gas will be blended at St. Fergus Terminal, but may still be above 4%
- The higher content CO₂ gas will blend with other terminals as it passes
 - This will depend which shippers are supplying gas on a given day, from where and at what quantities / quality

The following slides show the highest CO₂ levels expected in the NTS under various scenarios. The slides are an average from Gas Years:

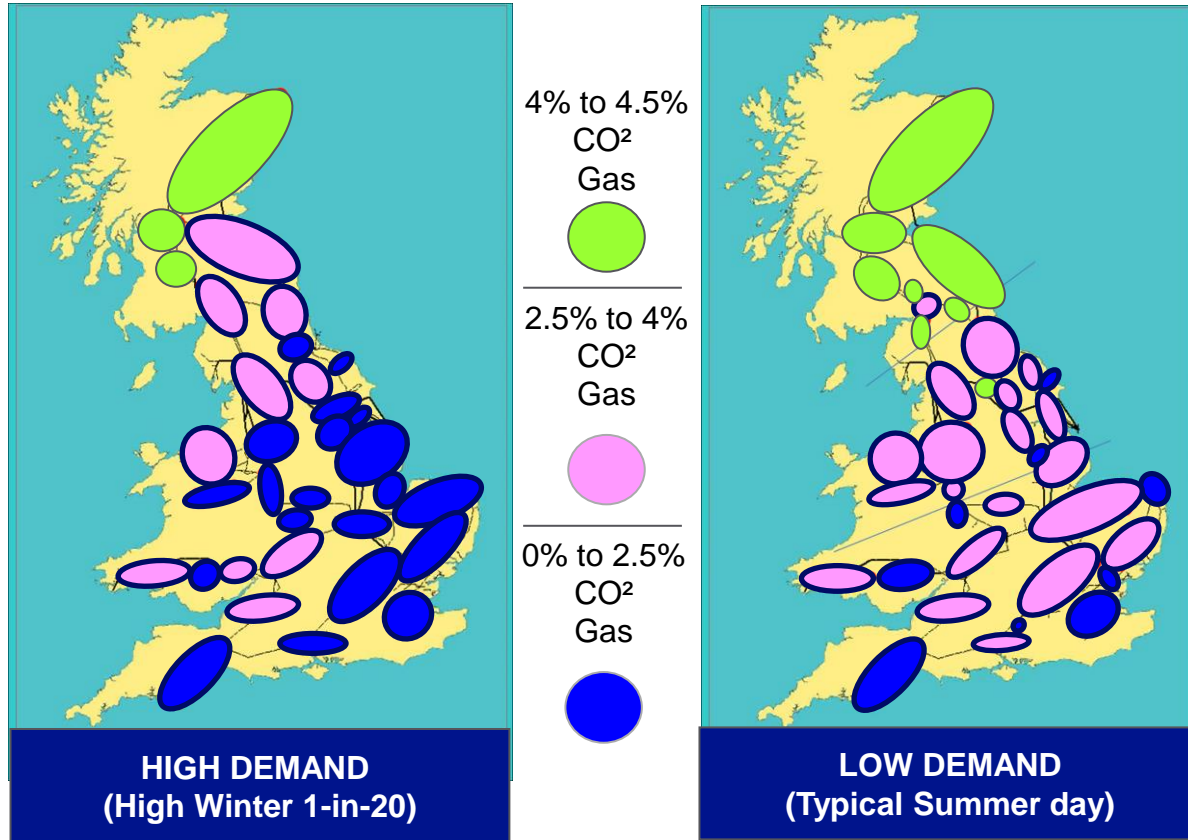
- 2020/21
- 2025/26
- 2030/31
- 2040/41
- 2050/51

Penetration of Gas onto the NTS

This analysis assumes 4% CO₂ at ANCALA, 5.5% CO₂ at NSMP and CO₂ maximums currently at all other supply terminals.

The diagrams reflect how deep the St Fergus gas will penetrate into the NTS and at what CO₂ level.

No gas is anticipated to be above 4.5% CO₂



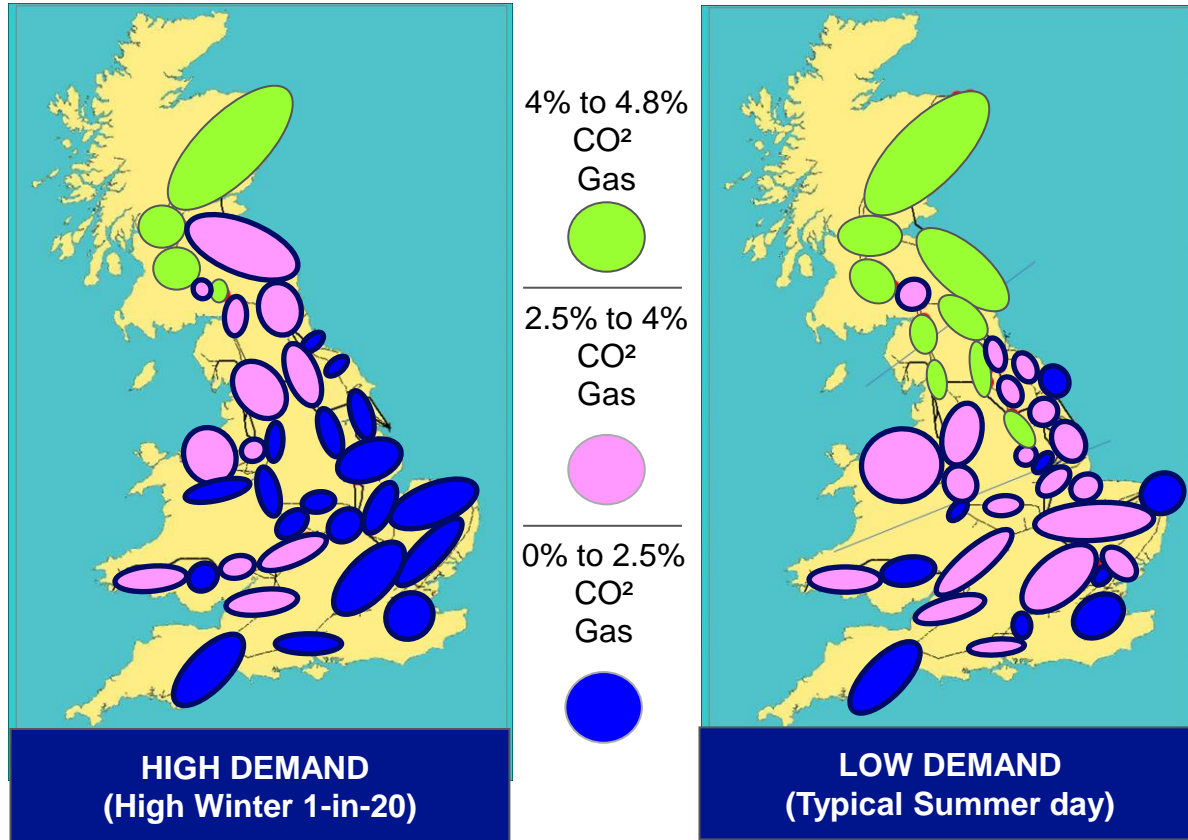
Penetration of Gas onto the NTS (2)

This analysis assumes 6% CO₂ at ANCALA, 5.5% CO₂ at NSMP and CO₂ maximums currently at all other supply terminals. This is the worst case scenario.

The diagrams reflect how deep the St Fergus gas will penetrate into the NTS and at what CO₂ level

No gas is anticipated to be above 4.8% CO₂

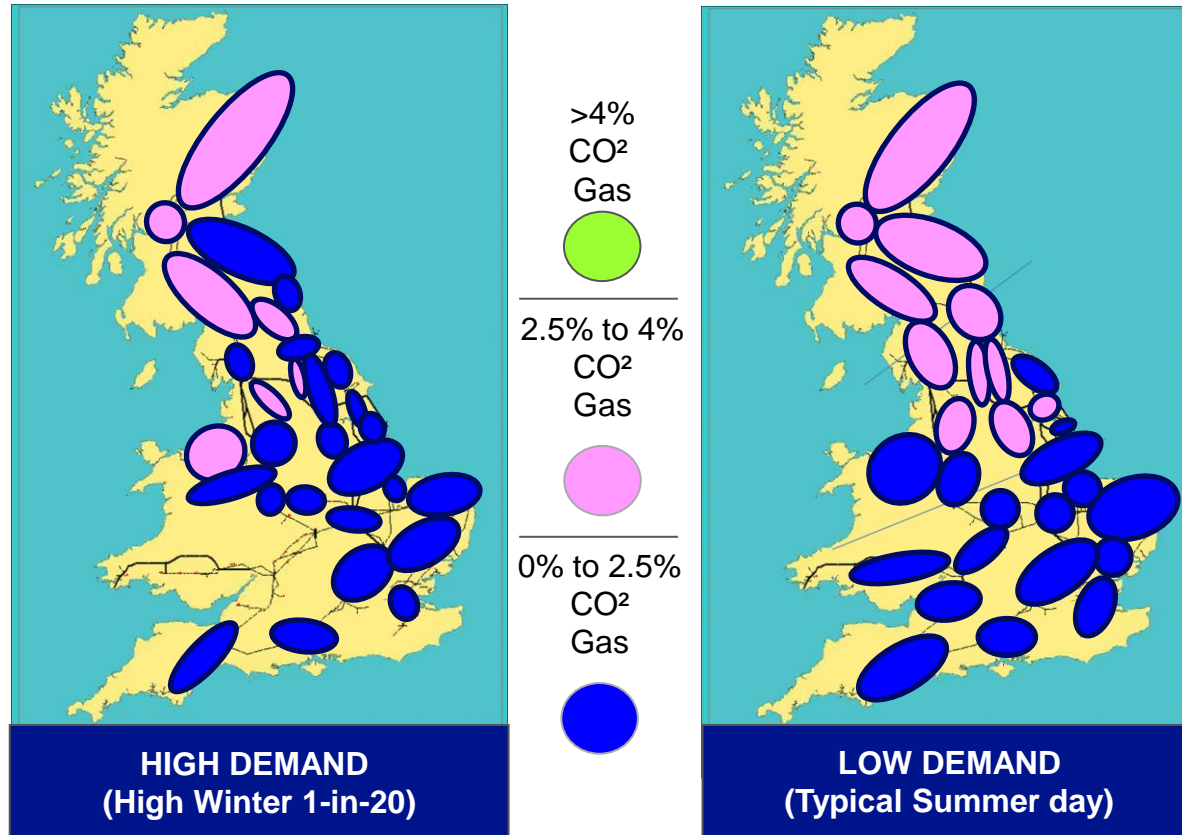
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Penetration of Gas onto the NTS (3)

This analysis assumes average historic levels for the last 12 months at all supply terminals.

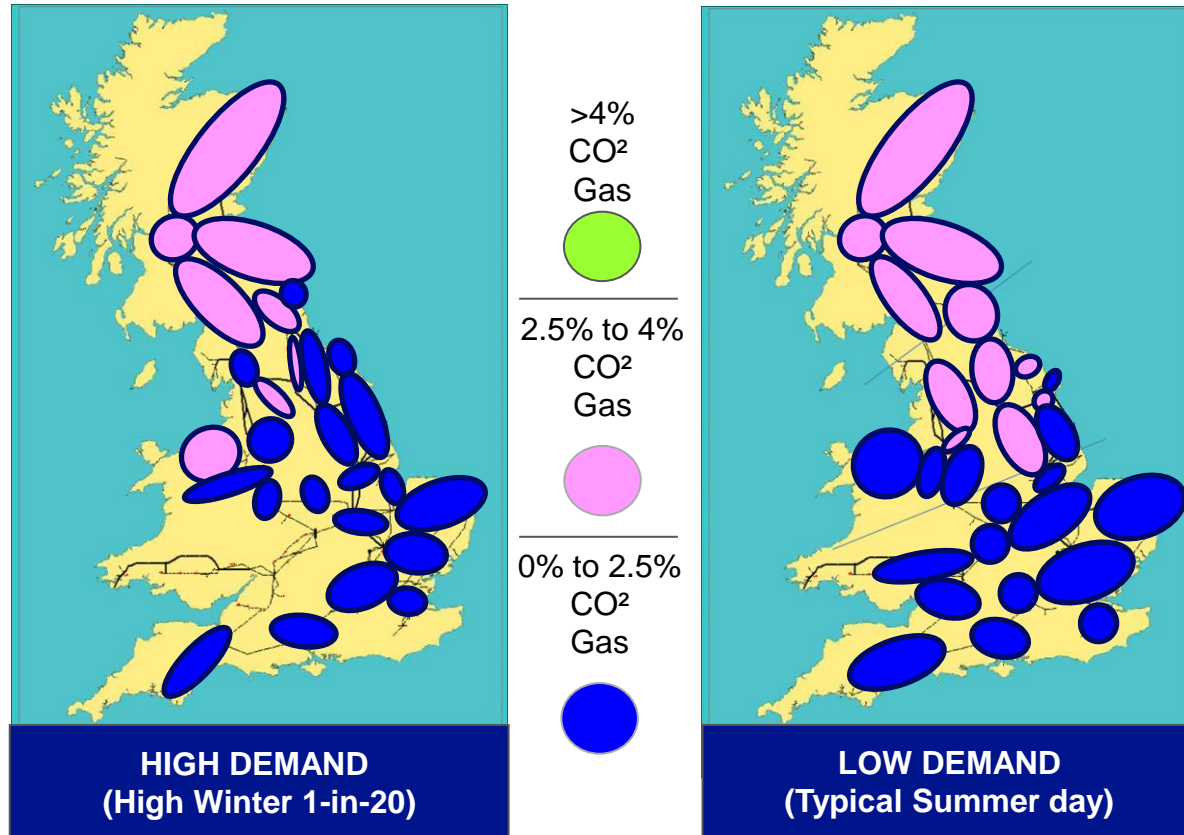
The diagrams reflect how deep the St Fergus gas will penetrate into the NTS and at what CO₂ level



Penetration of Gas onto the NTS (4)

This analysis assumes 6% CO₂ at ANCALA and average historic levels for the last 12 months at all other supply terminals.

The diagrams reflect how deep the St Fergus gas will penetrate into the NTS and at what CO₂ level



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