Gas
Transmission

Modification 0714
NTS Penetration Analysis

Transmission Workgroup
6th February 2020

nationalgrid

Mod 0714 – NTS Penetration Analysis

National Grid NTS annually performs a two part process to inform the long term (10 year) adequacy, utilisation and development needs of the NTS pipeline network

- Industry consultation via Future Energy Scenarios (FES) to help to define scenarios of future flow into and out of the NTS
- Modelling of gas flows within the NTS network which may arise from these future scenarios. The results of this analysis are summarised in the Gas Ten Year Statement

The results of the 2019/20 cycle of this modelling for the 'Consumer Evolution' FES scenario* were examined for the Perenco entry point at Bacton for gas years 2019/20 and 2025/26

*** Similar FES supply values were present for the 'Steady Progression' and 'Two Degrees' scenarios**

Mod 0714 – NTS Penetration Analysis

The purpose of the analysis was to determine the penetration of gas into the NTS with a Wobbe Index below 47.2 MJ/m^3 for a number of scenarios:

1. Set WI to 46.5MJ/m^3 for Perenco and 47.2MJ/m^3 for all other Bacton supplies

2. Set WI to 46.5MJ/m^3 for Perenco and to 2019 average WI for all other Bacton supplies

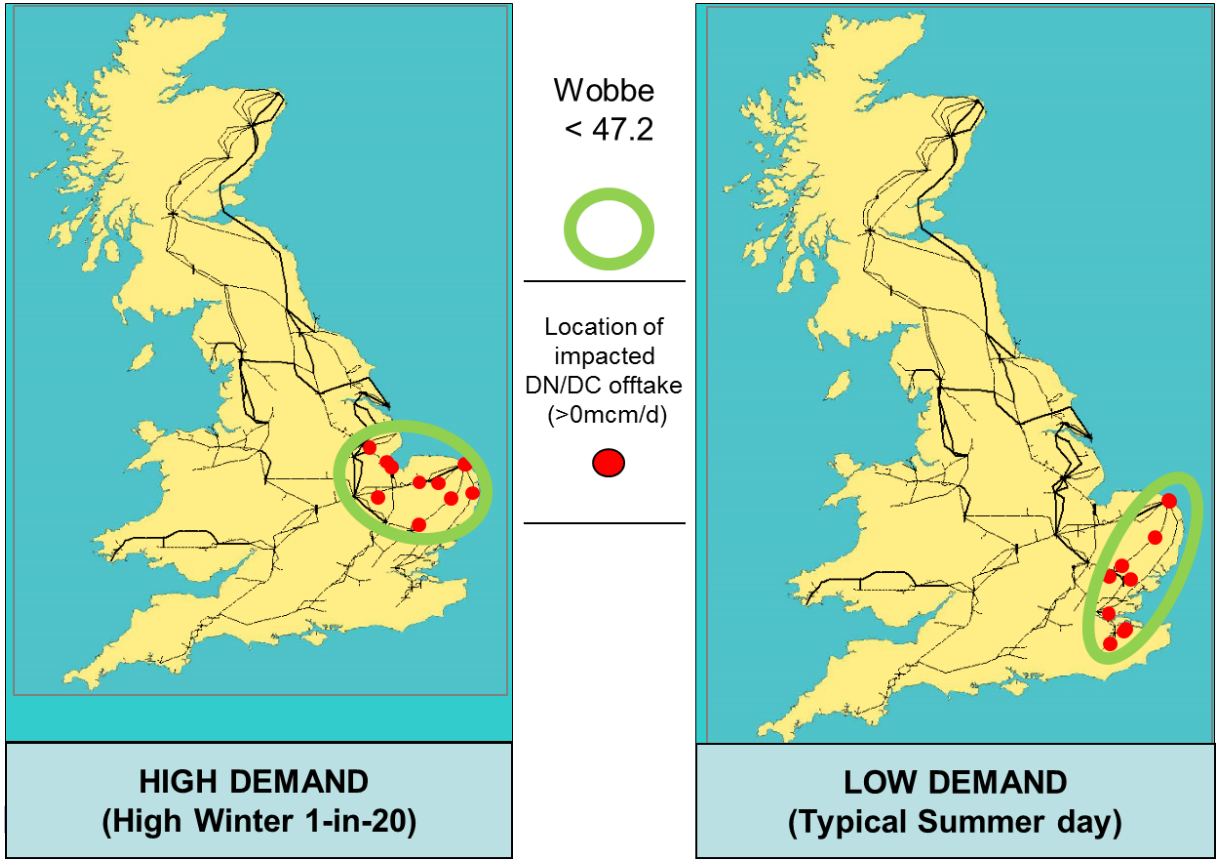
3. Set WI to 46.5MJ/m^3 for Cygnus maximum flow, other UKCS supplies set to zero, interconnectors as per FES forecasts for flow and WI (2019/20 only)

For each scenario, for each of the gas years, high and low demand scenarios were analysed using peak (winter) and day 300 (summer)

The modelling assumes a flow-weighted commingling of Wobbe Index for all Bacton supplies within the NG terminal

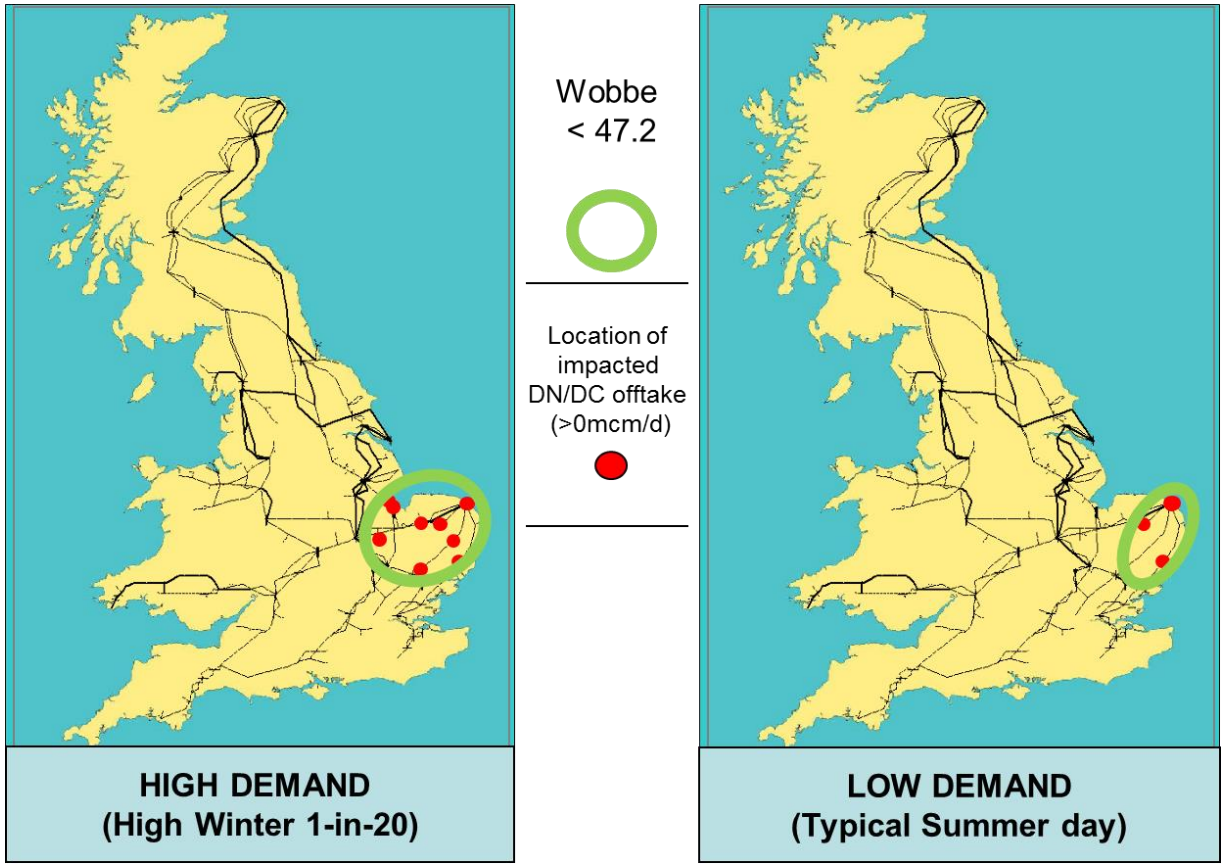
Heat Maps: 2019/20 Scenario 1

Perenco WI 46.5MJ/m³, Other Bacton Supplies WI 47.2MJ/m³



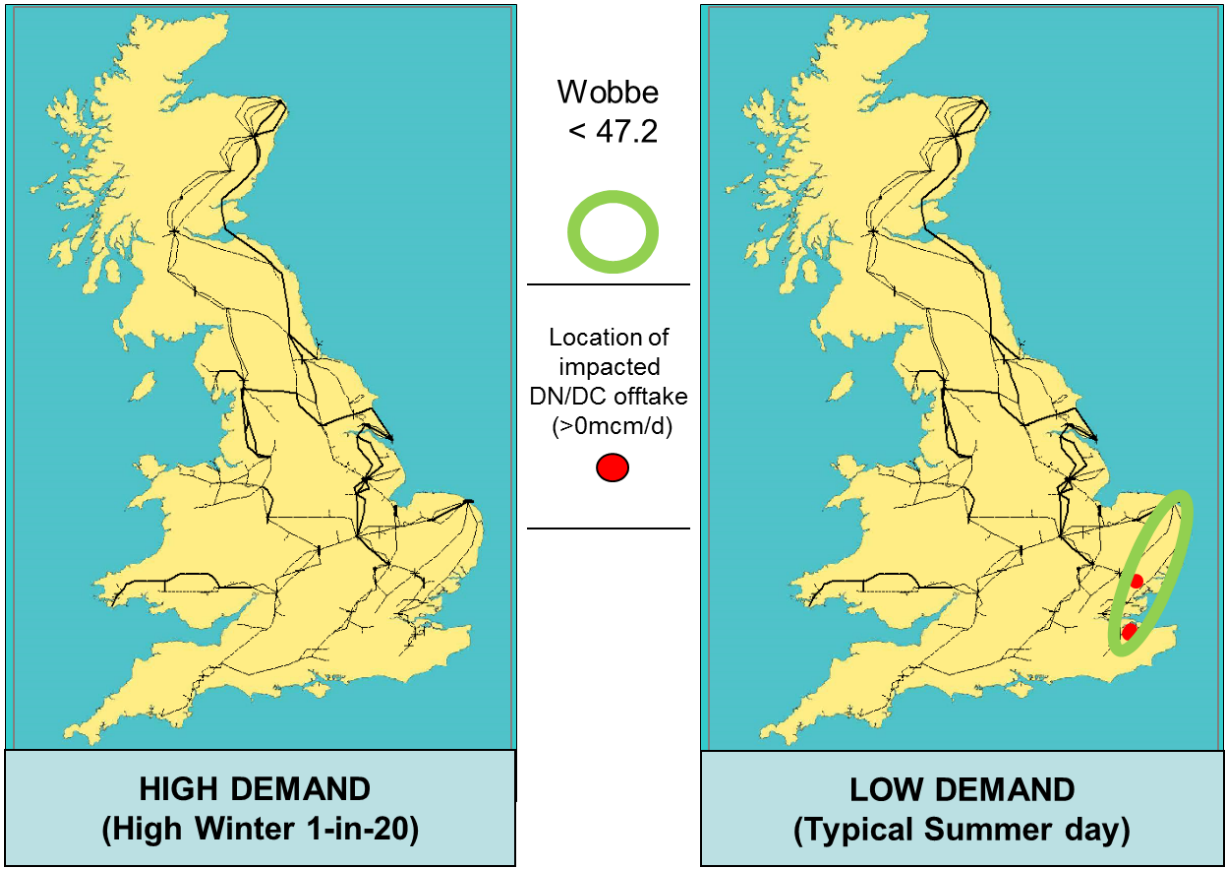
Heat Maps: 2025/26 Scenario 1

Perenco WI 46.5MJ/m³, Other Bacton Supplies WI 47.2MJ/m³



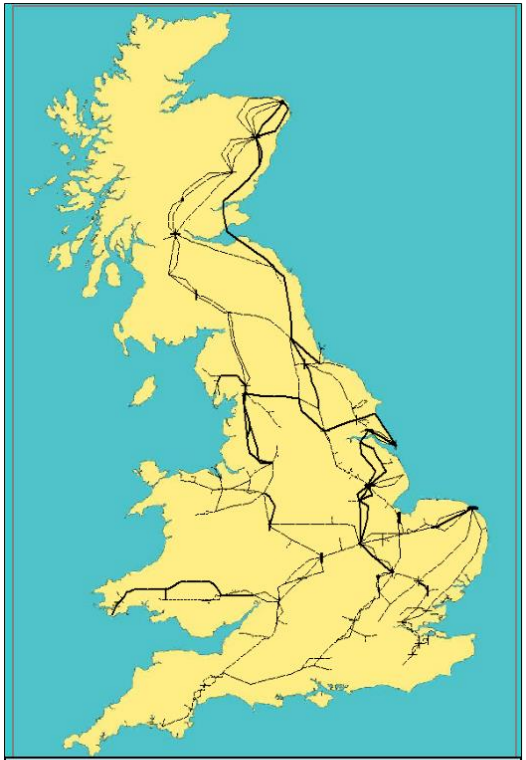
Heat Maps: 2019/20 Scenario 2

Perenco WI 46.5MJ/m^3, Other Bacton Supplies WI 2019 Average



Heat Maps: 2025/26 FES Network Scenario 2

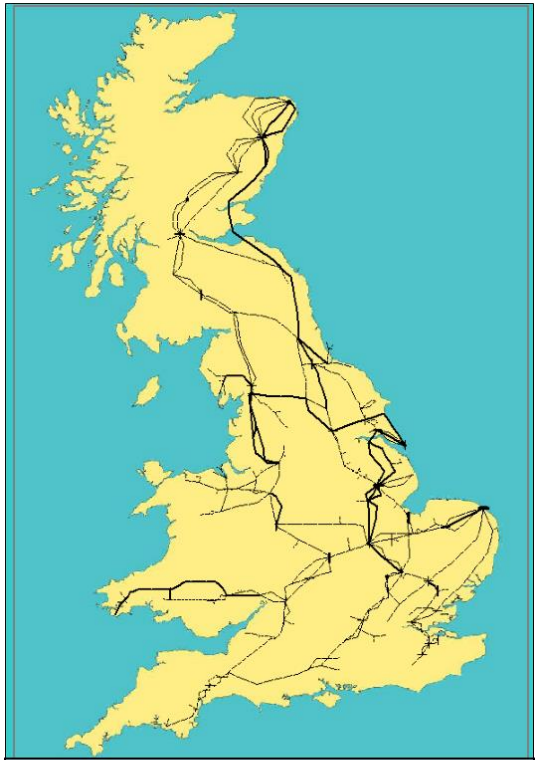
Perenco WI 46.5MJ/m^3, Other Bacton Supplies WI 2019 Average



HIGH DEMAND
(High Winter 1-in-20)

Wobbe
< 47.2

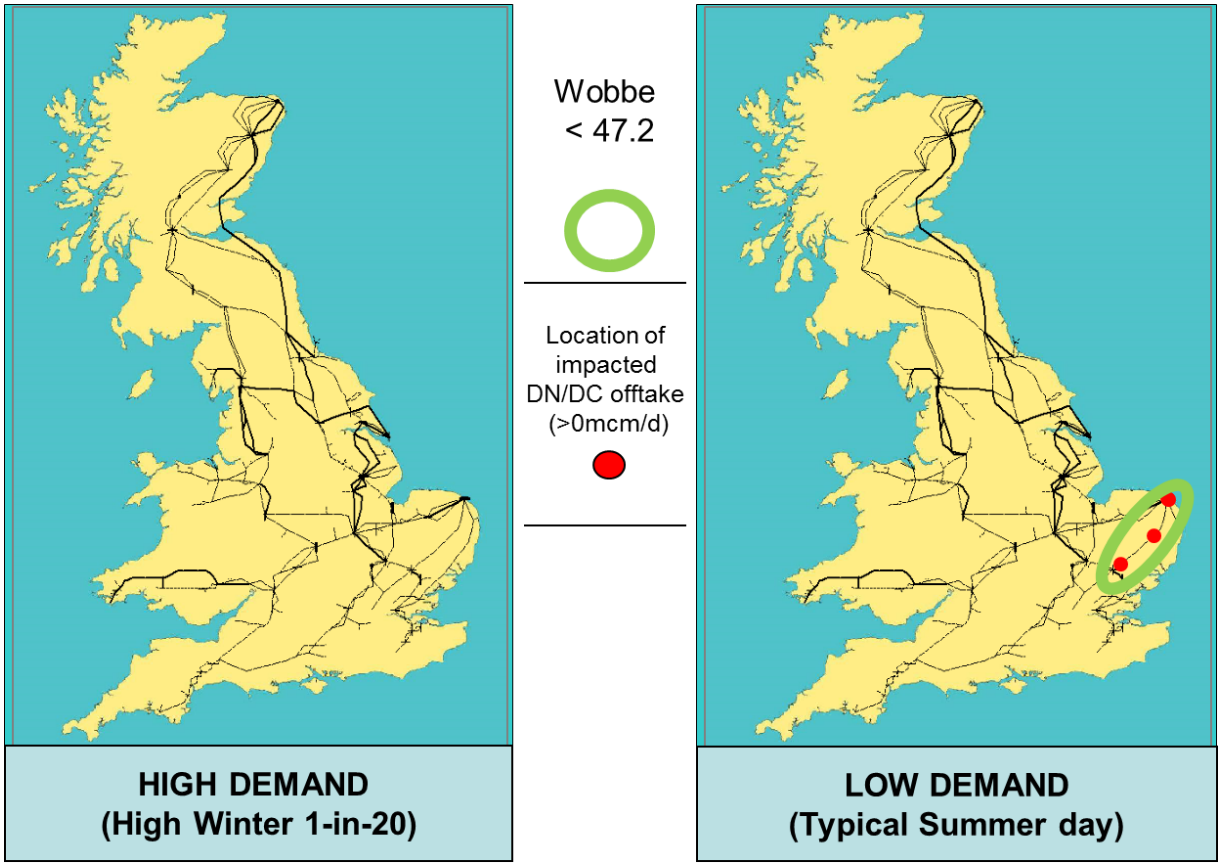
Location of impacted DN/DC offtake (>0mcm/d)



LOW DEMAND
(Typical Summer day)

Heat Maps: 2019/20 FES Network Scenario 3

Max Cygnus flow at 46.5 MJ/m3, all other UKCS flows at zero, interconnectors as per FES forecasts (flow and WI).



Observations

Scenarios 1 and 3 are theoretical and unlikely to occur in reality

Scenario 2 is more realistic but could still overstate the impact:

- Not all Perenco inputs would be expected to be delivered at 46.5 MJ/m3

The degree and direction of penetration depends on the seasonal geographic pattern of supplies and demands

Penetration is lower in the 2025/6 scenarios due to decline in UKCS flows

The direction of penetration is affected by flow to/from Bacton

- Where flow is towards Bacton (in summer when ICs assumed to be exporting), low WI gas tends towards the south-east
- Where flow is away from Bacton (in winter when ICs assumed to be importing), low WI gas tends towards west of Bacton not moving far south

Offtake points located at Bacton terminal (to IUK, BBL, Great Yarmouth PS and Bacton DN offtake) could potentially see <47.2 MJ/m3 gas under all scenarios, depending on the configuration of Bacton terminal on the day