

## Carbon Cost Assessment

At present, gas with high levels of CO<sub>2</sub> concentration flows from offshore fields and under normal circumstances is blended in the FUKA pipeline with gas of lower CO<sub>2</sub> concentration feeding into the pipeline from other fields such that the combined commingled flow of gas exiting the St Fergus terminal and entering the NTS meets the current NTS entry specification for CO<sub>2</sub> at 4 mol%. Therefore, the tonnage of CO<sub>2</sub> associated with gas with high levels of CO<sub>2</sub> concentration already flows into the NTS albeit in a diluted form.

The options for addressing the possible increases in CO<sub>2</sub> levels in export gas during periods when dilution in the FUKA pipeline is unavailable or reduced are to either allow such gas to flow directly into the NTS up to an agreed level (5.5 mol%) or to remove the excess CO<sub>2</sub> above the current allowable specification (4.0 mol %) using CO<sub>2</sub> removal technology.

Modification <sup>1</sup>0498 and 0502 considered the following three scenarios which are relevant to this modification request:

1. Non removal of CO<sub>2</sub>
2. Removal Offshore
3. Removal Onshore

The removal technology in this scenario remains the same as that considered in Modification 0498/0502 and the significant cost (c. £200m) and long lead time (c. 3 years) associated with the brownfield engineering modifications required for options 2 and 3, all of which remain unchanged from 0498/0502 renders these options non-viable for use here on an ad-hoc basis. In addition, the key conclusion of the Teesside carbon cost assessment is that significantly more CO<sub>2</sub> is emitted by removing CO<sub>2</sub> from the gas due to the fact that CO<sub>2</sub> removal using amine units, the optimal technology for CO<sub>2</sub> extraction given the CO<sub>2</sub> concentration, requires process heat which generates additional CO<sub>2</sub>. The magnitude of expected CO<sub>2</sub> emissions here is similar to the Teesside modification and when the fact that the CO<sub>2</sub> would already flow to the NTS is taken into account, the conclusion from the Teesside report that the least impact in terms of overall CO<sub>2</sub> emissions is to allow the gas with high CO<sub>2</sub> to flow into the NTS is also valid for the proposed St Fergus modification.

<sup>1</sup> Final Modification Report 0498: Amendment to Gas Quality NTS Entry Specification at BP Teesside System Entry Point and 0502: Amendment to Gas Quality NTS Entry Specification at the px Teesside System Entry Point