Action 804
0498/0502
Additional Support Data for CO_2 Impact Assessment

Teesside Gas
Processing Plant

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Background

- CATS/TGPP existing NTS entry CO_2 spec is 2.9 mol%
- CATS & TGLP have requested a revised CO_2 spec to 4 mol%
- Two main benefits
  - Avoid restricting throughput of existing gas fields
  - Avoid risk of potential new gas fields not being developed e.g. Jackdaw
- Previous assessment considered impact of CO_2 emissions for 3 scenarios around a new gas field project in period 2019 to 2040
  - Scenario1 – Offshore CO_2 removal
  - Scenario 2 – Onshore CO_2 removal
  - Scenario 3 – NTS Delivery at 4mol%
- Additional actions requested
  - Consider overall CO_2 impact of new field on overall CATS flows
  - Separate the cost of Amine unit from CO_2 impact assessment

CO_2 Assessment of Total Gas Flow in CATS

- Single field CO_2 content will be diluted by other field flows into CATS
- Analysis of CATS forecast flows post 2019 shows gas exports on spec to NTS (CO_2 <2.9 mol%) but could increase during field outages such as summer maintenance periods
- Assess annual impact of CO_2 excursions on Option 2 (Onshore CO_2 removal) & Option 3 (NTS CO_2 Spec increase)
- Assumptions
  - CO_2 content of inlet gas 4 mol% for limited period – 10% of year (note – conservative assumption, actual time when CATS gas at 4 mol% will be less)
  - Flow rates during high CO_2 flows reduced to circa 450 mmscfd (this would occur as only the high CO_2 field(s) flowing to lead to the high CO_2)
  - Amine units required to remain on "warm standby" duty when not in use – continued CO_2 emissions
  - CO_2 ETS charges and downstream usage split as per DECC & Grid data

Annual CO_2 Impact Assessment - Total CATS flow

Example of Annual CO_2 Impact for overall CATS flow	Scenario 2 Onshore CO_2 Removal	Scenario 3 NTS Delivery at 4 mol % CO_2
CO_2 Removed by Amine unit (4 mol% to 2.9 mol%) (te/d)	305	
CO_2 in fuel gas consumed by Operational Amine unit (te/d)	138	
Total CO_2 Generated while spec exceeded (te/yr)	15,948	
CO_2 from Amine unit on standby (te/d)	122	
CO_2 from Amine unit on standby (te/yr)	40,138	
Total Additonal CO_2 Generated (te/yr)	**56,086**	**11,439**

CO_2 Total ETS Traded Cost (£)	£280,430	£14,871
CO_2 Total Traded Cost with Carbon Price Support (£)		£60,398
Total CO_2 Cost Traded & Carbon Price Support (£)	**£280,430**	**£75,269**

CO_2 Total Non-Traded Cost (£) (non-ETS consumption)		£377,490

Total Cost (£/yr)	**£280,779**	**£452,759**

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Conclusions

- In normal operation, single field CO_2 at 4 mol% will be diluted by fields exporting into CATS pipeline with lower CO_2
- CO_2 removal required when blending unavailable through field outages e.g summer maintenance programme or unplanned trips/outages
- 5x greater CO_2 emissions per year from occasional use of amine units than NTS delivery at 4 mol%
- c.3.7x greater emissions cost per year for removal by amine compared to NTS delivery at 4 mol% (excluding non-ETS consumption)
- Increased emissions from amine unit fuel gas usage and from operational standby of unit when CATS gas meets NTS CO_2 spec
- Installed onshore amine units c. £200M (BP estimate)
- Proposers contend that the installation of Amine units is worse for the environment and an inefficient use of capital for the rare occasions when offshore blending does not occur