

Modification Proposal 0355: Alignment of the CV and Wobbe Limits at NTS Entry Points



CV Shrinkage Analysis
03/02/2011

Modification Proposal

- Seeks to align the wobble number and calorific value limits for certain NTS System Entry Points
 - Bacton Seal, Bacton Shell, St Fergus Total, St Fergus Mobil, Burton Point and Hole House Farm
- TPD I2.2 provides for the gas quality limits in respect of a System Entry Point to be amended
 - Proposed changes have been agreed between the Transporter and relevant DFO

CV Shrinkage Analysis

- If the relevant DFOs delivered gas at their proposed new contractual CV/wobbe limits this might affect CV shrinkage levels
- Analysis conducted to forecast any change in CV shrinkage risk
- Scenarios modelled
 - Current CV Shrinkage forecast risk (“Base Case”)
 - Aggregate effect “current theoretical” and “incremental” risk of amending CV upper limits and wobbe lower limits
 - “Current theoretical” and “incremental” risks for individual NTS System Entry Points

CV Shrinkage Analysis

NTS System Entry Point	Gas Quality Characteristic	Current Specification	Proposed Specification
Hole House Farm	Wobbe Lower	48.14 MJ/m ³	47.2 MJ/m ³
Bacton Seal	Wobbe Lower	48.1 MJ/m ³	47.2 MJ/m ³
Bacton Seal	Wobbe Upper	51.4 MJ/m ³	51.41 MJ/m ³
Bacton Shell	Wobbe Lower	48.2 MJ/m ³	47.2 MJ/m ³
Bacton Shell	Wobbe Upper	51.2 MJ/m ³	51.41 MJ/m ³
St Fergus Total	Wobbe Lower	48.2 MJ/m ³	47.2 MJ/m ³
St Fergus Total	CV Upper	41.9 MJ/m ³	42.3 MJ/m ³
St Fergus Mobil	CV Upper	41.9 MJ/m ³	42.3 MJ/m ³
Burton Point	Wobbe Lower	48.2 MJ/m ³	47.2 MJ/m ³
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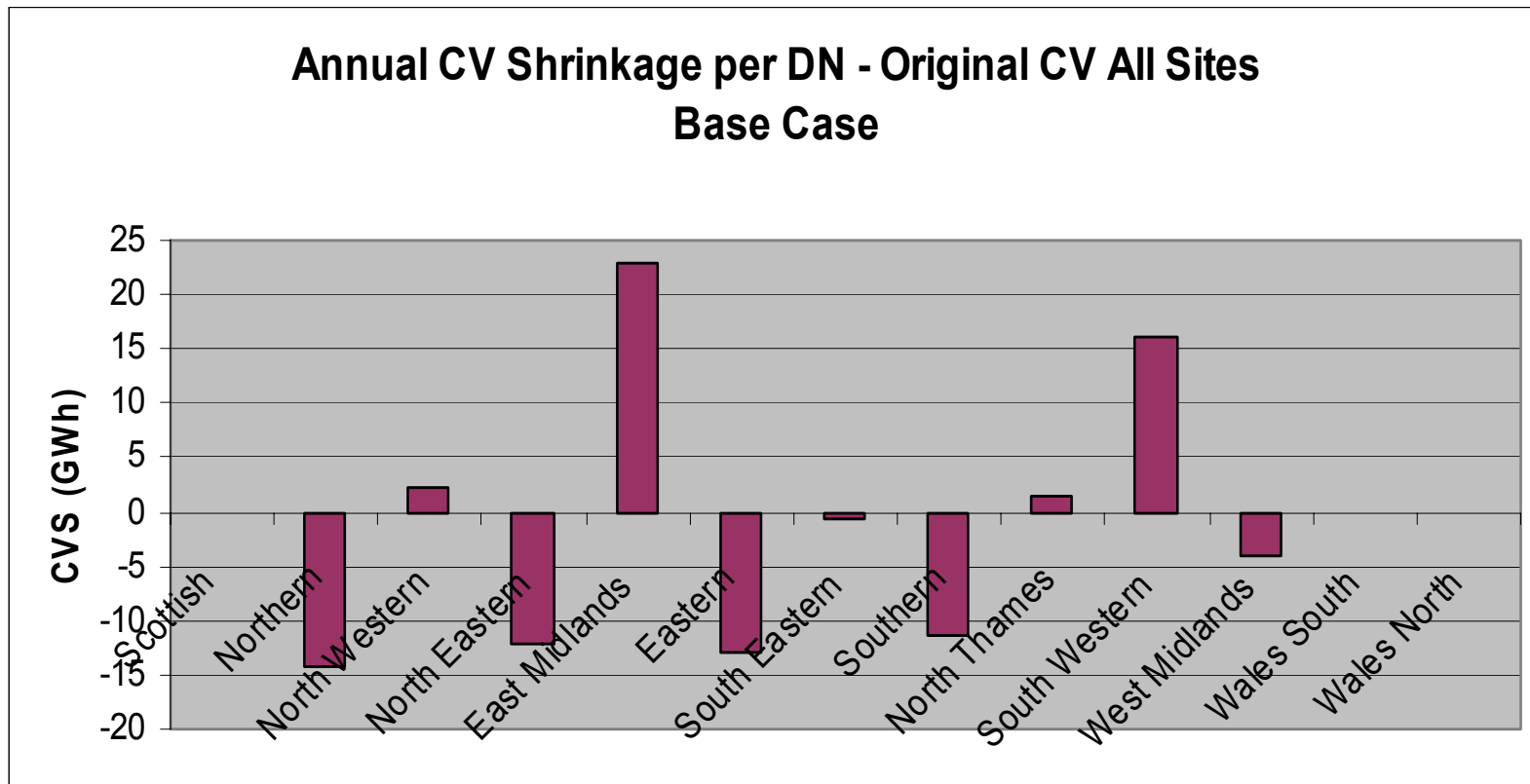
* Excluded from analysis

CV Shrinkage Analysis

- Approach taken:
 - National Grid Simulation tool – Simone
 - Transporting Britains Energy (TBE) 2010
 - forecast supply/demand flows
 - forecast supply gas quality
 - For Gas Year 2012/2013 6 demand days analysed D1, D3, D10, D60, D150 & D300
 - Tool determined CV & volume information for DN offtake
 - Model then calculated daily CV Shrinkage
 - Annual NTS CV Shrinkage derived, using following equation

$$\sum D_1 + 2 * D_3 + 7 * D_{10} + 50 * D_{60} + 90 * D_{150} + 215 * D_{300}$$

CV Shrinkage Analysis: Base Case Results

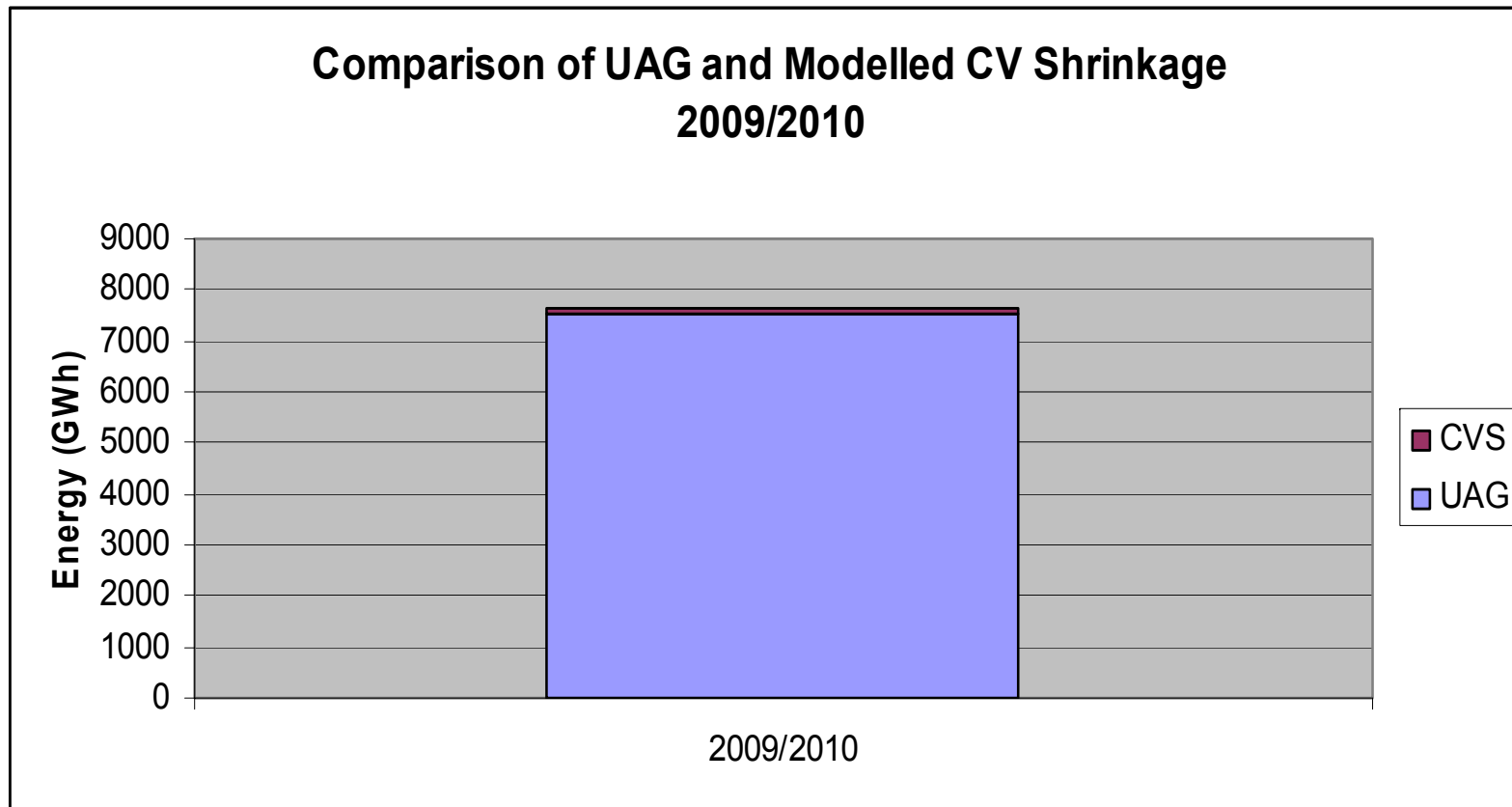


**All terminals deliver at their forecast gas qualities
Resulted in a forecast annual CV shrinkage value of -13 GWh**

CV Shrinkage Analysis

- The greatest CV shrinkage risk of all scenarios using proposed new limits arose at:
 - St Fergus Total inputting new proposed min wobble
 - Incremental CV Shrinkage risk from base case 28.4 GWh
 - Equates to £350k @ average SAP for Gas Year 09/10
 - If additional 28.4 GWh is added to 2009/2010 NTS CVS total of 22 GWh still inside the annual incentive NTS CVS target of 142 GWh
- Some of the grouped & individual scenarios appear to be counter-intuitive
 - Forecast CV shrinkage caused only by rounding not capping
 - Methodology used to create annual forecast from 6 modelled days

CV Shrinkage Analysis



Conclusion

- All scenarios were within the expected annual CV Shrinkage ranges – despite being run without any mitigation, no capping was recorded under any of the scenarios modelled.
- Harmonisation of gas quality limits as proposed by Modification Proposal 0355 is not expected to materially affect NTS CV shrinkage volumes.