Action: DE0202

Holiday Factors

Holiday Factors

- "xoserve to consider what can be done to review/change the holiday factors for the remainder of the year and establish a flexible mechanism for future application"

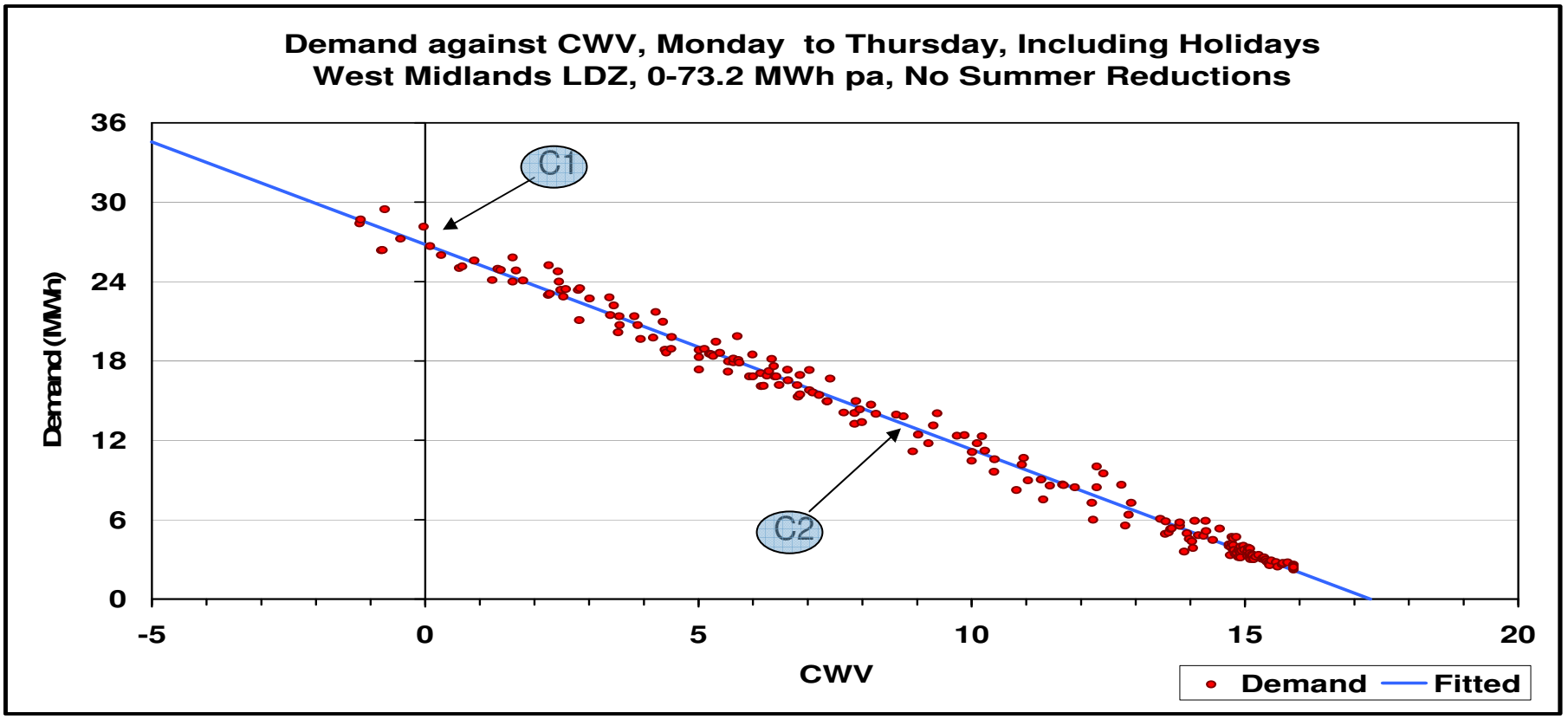
- Presentation aims to clarify how holiday factors are derived and where they are applied in the calculation of Annual Load Profile (ALP) and the Daily Adjustment Factor (DAF)

- Presents analysis of scaling factor results over christmas holiday period 2009

- Provides suggestion on how holiday factors could be reviewed as part of limited Autumn 'adhoc' analysis

Holiday Factors – EUC model parameters

- EUC Model parameters derived from non holiday Mon-Thurs sample demand – 01B includes holiday



Holiday Factors - Calculation

- Holiday Code Days – e.g. Christmas/New Year for period from 21st December to second New Year bank holiday in Scotland
  - Code 1: 25th, 26th December, 1st January
  - Code 2: 24th, 27th to 31st December, 2nd January
  - Code 3: 21st to 23rd December and remaining days of period above
- For each of the individual 3 years of sample data calculate the 'fitted demand' for each day (C1+C2*CWV). Sum these demands for each holiday code.
- For the same gas days sum the total actual demand from the sample for each holiday code
- Total sample demand / Total fitted demand = Holiday Factor (for holiday code) for year
- Average of 3 individual years = Overall Holiday Factor (for holiday code)

Holiday Factors - Application

- Using results from sample regression and holiday / weekend factors:
  - For each EUC derive demand for each day in target gas year (SNDt)
    - (C1+C2*SNCWV)*Factor (Pt)
    - Factor is either a holiday factor or weekend factor
  - For each EUC derive weather sensitivity for each day (WSENSt)
    - C2*Factor (Pt)
- ALP: For each day in target year:
  - SNDt / Average SNDt
- DAF: Numerator in DAF calculation derived from sample:
  - WSENSt / SNDt = EUC DAF Ratio

Holiday Factors – Aggregate NDM demand model

- Aggregate NDM demand model required for denominator of DAF formula only – required to compare to EUC weather sensitivity (numerator)
- Denominator calculation:
  - WSENSt / SNDt for agg. NDM in LDZ
  - Both WSENSt and SNDt are calculated from historical aggregate NDM model using same principles as EUC calculation
  - Consistent approach – regression to derive constants, same holiday code days used to derive holiday factors, historical model derived from 3 years' models
  - Only significant difference is gas years are used rather than April to March years
- Consistent approach in calculating and applying holiday factors for both sample and agg. NDM data

DAF Calculation

- DAF calculation:
  - WSENSt / SNDt (For EUC)
    WSENSt / SNDt (For agg.NDM in LDZ)

  - EUC Ratio
    LDZ Ratio

- DAF expresses each EUCs proportional weather sensitivity – this is key element of NDM algorithm i.e. WCF * DAF

- Changes to values of WSENSt / SNDt for LDZ will result in a different DAF value but proportionally the effect to allocation is very small

- To conclude, the values of WSENSt and SNDt derived from the aggregate NDM demand model are merely calculated in order to provide an 'LDZ ratio' (denominator)
  - Amending values within this model will not significantly change allocation as every EUC ratio (numerator) is divided by the same 'LDZ ratio'

2009/10 Proposals – Raised Re. 28th December

- A comparison has been undertaken of SF values during December 2008 and December 2009.
- SF values on each 28th December (in 2008 and 2009) have been compared with the average SF values for:
  - All December dates in that particular year between Christmas and New Years Day with the same holiday code as 28th December.
- Results are presented as percentage changes
- Objective to highlight any significant & material difference between the two 28th Decembers for the two years.

Comparison of relative SF Values

LDZ	28th December Relative to Other December Dates with Same Holiday Code	
	2009	2008
SC	-0.04%	0.03%
NO	0.00%	-0.03%
NW	0.01%	-0.01%
NE	-0.01%	0.12%
EM	0.00%	-0.03%
WM	-0.02%	-0.04%
WN	-0.01%	0.00%
WS	-0.01%	-0.04%
EA	-0.01%	-0.16%
NT	0.00%	-0.10%
SE	-0.03%	0.08%
SO	-0.02%	0.13%
SW	0.00%	-0.08%

2009/10 Proposals – Raised Re. 28th December

- Comparison also done based on RMS Deviation of Scaling Factor from 1

- RMS Deviation calculated for 28th December 2009 for each LDZ and compared to:

  - Holiday Code 1 Average
  - Holiday Code 2 Average (incl.28th Dec)
  - Holiday Code 3 Average
  - December non-holiday days Average
  - 29th December

Comparison of RMS Deviation results for 28th December 09

LDZ	December 28th	Holiday Code 1 Average	Holiday Code 2 Average	Holiday Code 3 Average	December Non-Hol Average	December 29th
SC	0.0008	0.0011	0.0010	0.0009	0.0046	0.0009
NO	0.0026	0.0025	0.0026	0.0031	0.0021	0.0027
NW	0.0024	0.0026	0.0030	0.0049	0.0051	0.0028
NE	0.0002	0.0009	0.0005	0.0015	0.0036	0.0000
WM	0.0016	0.0011	0.0015	0.0022	0.0028	0.0017
EM	0.0002	0.0016	0.0007	0.0016	0.0047	0.0002
WN	0.0052	0.0043	0.0053	0.0066	0.0058	0.0056
WS	0.0008	0.0012	0.0009	0.0005	0.0014	0.0008
EA	0.0024	0.0019	0.0025	0.0042	0.0033	0.0027
NT	0.0003	0.0007	0.0004	0.0003	0.0019	0.0004
SE	0.0007	0.0022	0.0011	0.0016	0.0040	0.0005
SO	0.0002	0.0009	0.0003	0.0011	0.0026	0.0002
SW	0.0032	0.0031	0.0033	0.0043	0.0027	0.0033
AVG	0.0016	0.0019	0.0018	0.0025	0.0034	0.0017

- Green: RMS Deviation for 28th better (closer to 1) than average for category
- Red: RMS Deviation for 28th worse (further away from 1) than average for category

Commentary on Scaling Factor analysis results

- For 2008 and 2009 the same dates in December were assigned the same specific holiday codes
- Comparison of SF values on 28th December in each LDZ relative to the SF values over Christmas with the same holiday code suggests 28th December was not materially different from other days with the same holiday code for both 2008 and 2009.
- Comparison of RMS deviation of Scaling Factor from 1 for 28th December 2009 with other combinations showed on average that results for 28th December on their own were better (closer to 1)
- Both sets of results indicate that treatment of 28th December 2009 (i.e. holiday code assigned) was not inappropriate

Holiday Factors

- Evidence of Scaling Factor analysis indicates that December 28th 2009 was not treated inappropriately
- Therefore no evidence exists that changes to holiday codes need to be considered for 2010/11
- To make changes to the holiday codes and factors in 2010/11 you would need the appropriate analysis and calculations to base those changes on
- The best time to review and (if justified) amend the holiday codes is in the Autumn prior to the demand modelling and analysis carried out in the Spring
- If DESC agrees analysis of holiday codes can be carried out in Autumn 2010. Next slide highlights potential scope for analysis

Proposed Analysis for Autumn 2010

- Proposed limited review of days to which holiday codes apply for spring 2011 NDM analysis
- Retain existing number of holiday codes but redefine them if appropriate
- Retain existing summer reduction period
- Analysis based on residuals (demand – fitted) from current EUC models for the most recent four NDM analysis years
- Separate review of whether holidays should continue to be included in regressions for band 1 (0-73.2 MWh pa)