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Demand Estimation Sub-Committee Presentation of 2013 Algorithms

10th July 2013



DESC: Objectives of Meeting

- Key objectives of today's meeting:
 - Recap on DESC obligations following amendments to Section H of UNC
 - Inform DESC of process followed in derivation of NDM proposals
 - Provide summary of where TWG has reviewed the output and had the opportunity to challenge the decisions made
 - Provide summary of TWG responses to draft NDM proposals and their overall recommendation to DESC
- Outcome – Obtain DESC approval to submit NDM proposals to Transporters and Users as per UNC requirement

Purpose of NDM Modelling

- Provides a method to differentiate NDM loads and provide profiles of usage
i.e. End User Category (EUC) Definitions
- Provide a reasonable equitable means of apportioning aggregate NDM demand (by EUC / shipper / LDZ) to allow daily balancing regime to work
i.e. NDM profiles (ALPs & DAFs)
- Provide a means of determining NDM Supply Point capacity
i.e. NDM EUC Load Factors
- The underlying NDM EUC and aggregate NDM demand models derived each year are intended to deliver these obligations only
- NDM EUC profiles are used to apportion aggregate NDM demand and do not independently forecast NDM EUC demand

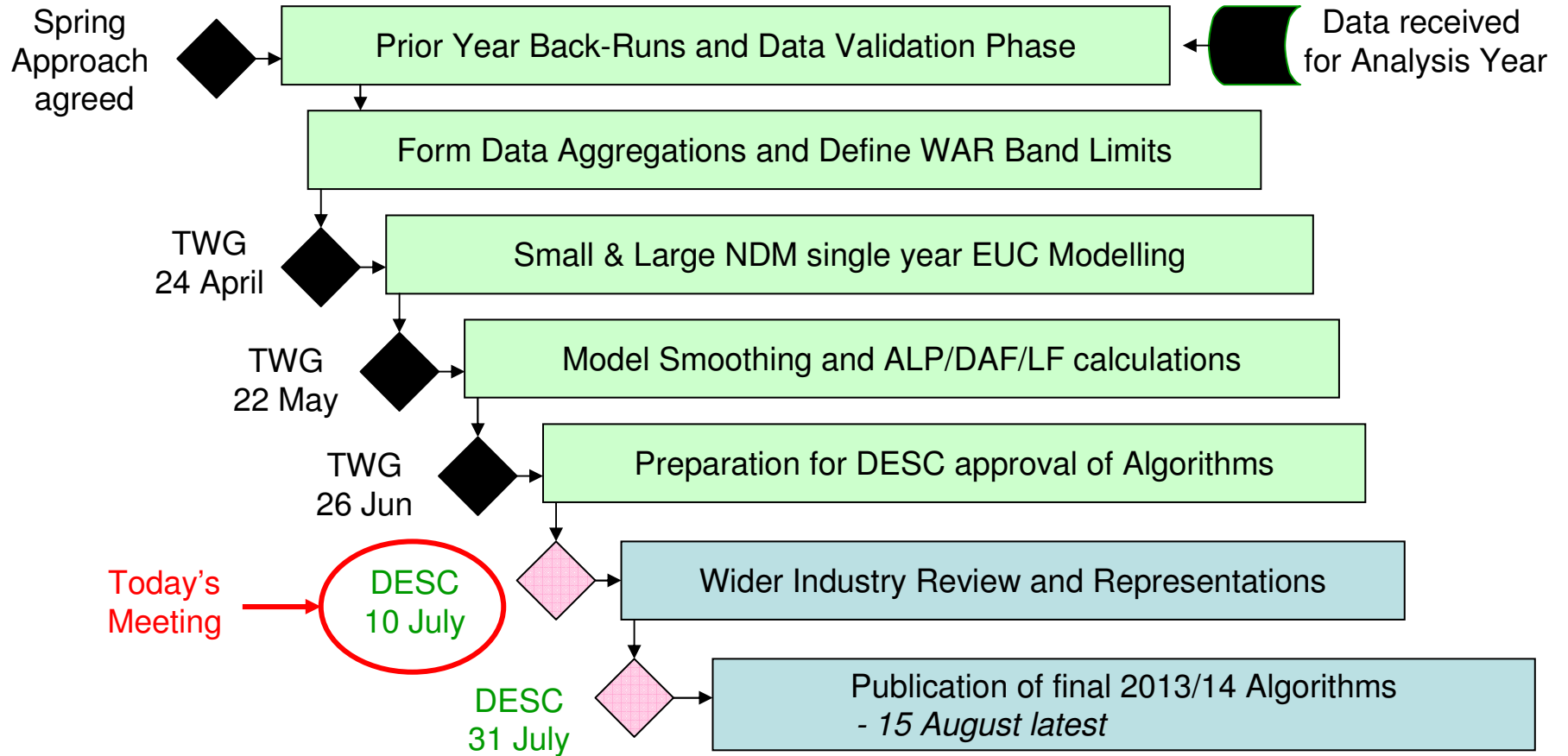
Changes to UNC Section H

- Responsibilities for Demand Estimation changed following implementation of UNC Modification 331 on 3rd January 2012
- DESC collectively required by UNC to:
 - Submit proposals to Transporters and Users for each Gas Year comprising:
 - EUC Definitions
 - NDM Profiling Parameters
 - Capacity Estimation Parameters
 - In addition:
 - Analysis of accuracy of the allocation process
 - Derivation of CWV and Seasonal Normal
 - Consultation with Industry
- Xoserve acts as the common NDM Demand Estimation service provider

Agreed 2013 Modelling Workplan

- Workplan for 2013 Modelling agreed at February 2013 DESC meeting
- Workplan aims to provide more transparency of process and introduce checkpoints for DESC/TWG review
 - 3 TWG meetings to date – April, May and June
 - Further interaction via email

Agreed 2013 Timetable



DESC/TWG checkpoints



Summary of overall process

- Series of slides to summarise the data collection, modelling, outcomes and TWG involvement / decisions made

Basis of 2013 Modelling

- Described in “Spring Approach” document, reviewed at February 2013 meeting
- Key aspects of EUC demand modelling basis for Spring 2013 analysis:
 - 12 month analysis for datalogger data sets (2012/13)
 - Data sets cover April to March (as in 2011/12)
 - 12 month analysis for AMR data sets (2012/13)
 - Data sets cover April to March (as in 2011/12)
 - Data validation rules unchanged
 - CWV definitions and SN basis as Spring 2012

TWG Involvement: 24th April 2013

Objectives of Meeting

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- First check point meeting of Technical Workgroup
- Key objectives of April Meeting
 - Inform TWG of numbers of validated data sets collected
 - Consider the most appropriate data sets and aggregations to apply to the most recently available sample data - i.e. 2012/13
- Outcome – TWG finalised sample sizes, aggregations and WAR Band Limits
- TWG raised question relating to aggregations which was added to potential work areas log
- Next phase was then able to commence:
Single Year modelling – 2012/13 data

Total NDM Population Counts: Supply Point & AQ

Consumption Range	% of Total NDM	
	Total AQ	Total Count
0 – 73.2 MWh pa	72.5%	98.78%
0 – 293 MWh pa	78.5%	99.67%
0 – 2,196 MWh pa	88.8%	99.96%
>2,196 MWh pa	11.2%	0.04%

- On an AQ basis:
 - Small NDM is by far the main component of the overall NDM sector
 - The range 0-73.2 MWh pa constitutes nearly 3/4 of overall NDM
 - The range 0-293 MWh pa constitutes nearly 4/5 of overall NDM
 - The range 0-2196 MWh pa constitutes nearly 9/10 of overall NDM
 - Large NDM is very much a minority component of overall NDM

Summary of Validated Data

- Both AMRs & Dataloggers used in Small NDM Analysis (<2,196 MWh pa)
- NDM Sample Counts:

<i>Sample Counts</i>	<i>2012/13 data</i>	<i>2011/12 data</i>
0 to 73.2 MWh pa Range – AMR	3,036 Domestic	2,996 Domestic
73.2 to 2,196 MWh pa Range – AMR & Dataloggers	5,445	5,469
> 2,196 MWh pa Range – Dataloggers	3,412	3,632

Small NDM Supply Points (<2,196 MWh pa) Consumption Band Aggregations

	Consumption Band Analysis – 2012/13 data
Band 01 0 to 73.2 MWh pa	Individual LDZ
Band 02 73.2 to 293 MWh pa	Individual LDZ
Band 03 293 to 732 MWh pa	Individual LDZ WS/SW Combined
Band 04 732 to 2,196 MWh pa	Individual LDZ

- Aggregations to model agreed at April TWG
- In the main sufficient data available to allow individual LDZ analysis (usual combination of NW/WN excepted)

Small NDM Supply Points (<2,196 MWh pa) WAR Band Aggregations

<i>Consumption Range</i>	<i>Comments on 2012/13 data</i>
0 to 73.2 MWh pa (EUC Band 1)	Not generally Monthly read – no WAR Bands
73.2 to 293 MWh pa (EUC Band 2)	Not generally Monthly read – no WAR Bands
293 to 732 MWh pa (EUC Band 3)	Modelled all LDZs separately except: NW/WN combined & WS/SW combined. Merged Band 3 & 4 data for WAR Band Analysis
732 to 2,196 MWh pa (EUC Band 4)	

- Aggregation of sample data to allow sufficient sample analysis
- Groupings to model agreed at April TWG meeting

Large NDM Supply Points (>2,196 MWh pa) Consumption Band Aggregations

<i>Consumption Range</i>	<i>2012/13 Analysis</i>	<i>2011/12 Analysis</i>
Band 05 2,196 to 5,860 MWh pa	Individual LDZ	Individual LDZ
Band 06 5,860 to 14,650 MWh pa	Individual LDZ	Individual LDZ
Band 07 14,650 to 29,300 MWh pa	By 5 or 4 Groups of LDZs	By 5 Groups of LDZs
Band 08 29,300 to 58,600 MWh pa	By 4 or 3 Groups of LDZs	By 4 Groups of LDZs
Band 09 >58,600 MWh pa	National	National

- Aggregation of sample data to allow sufficient sample analysis
- Groupings to model agreed at April TWG meeting

Large NDM Supply Points (>2,196 MWh pa) WAR Band Aggregations

<i>Consumption Range</i>	<i>2012/13 Analysis</i>	<i>2011/12 Analysis</i>
Band 05 2,196 to 5,860 MWh pa	By 5 Groups of LDZs	By 5 Groups of LDZs
Band 06 5,860 to 14,650 MWh pa	By 3 Groups of LDZs	By 3 Groups of LDZs
Band 07 14,650 to 29,300 MWh pa	National	National
Band 08 29,300 to 58,600 MWh pa	National	National
Band 09 >58,600 MWh pa	N/A - No WAR Bands	N/A - No WAR Bands

- Aggregation of sample data to allow sufficient sample analysis
- Groupings agreed at April TWG meeting

Single Year Modelling – 2012/13 data

- Analysis carried out...
 - Aims to assist in the creation of profiles based on the relationship between demand to weather
 - Identify the best fit model based on available data samples
 - View of results so far and highlight any issues raised
- Tools used to identify best model :
 - R^2 Multiple Correlation Coefficient – statistical tool for identifying ‘goodness of fit’ (100% = perfect fit / direct relationship)
 - Variations in Indicative Load Factors.....

Small NDM Modelling Results

EUC Band 1: 0 – 73.2 MWh pa Domestic Sites

	Indicative Load Factor	R ² Multiple Correlation Coefficient	Sample Size
SC	40%	98%	236
NO	33%	98%	238
NW / WN	36%	98%	245
NE	37%	97%	266
EM	35%	99%	255
WM	32%	99%	257
WS	34%	97%	244
EA	33%	99%	281
NT	32%	99%	247
SE	31%	99%	243
SO	29%	99%	263
SW	31%	99%	261

- **Indicative Load Factor** : **R² Multiple Correlation Coefficient** : **Sample Size**

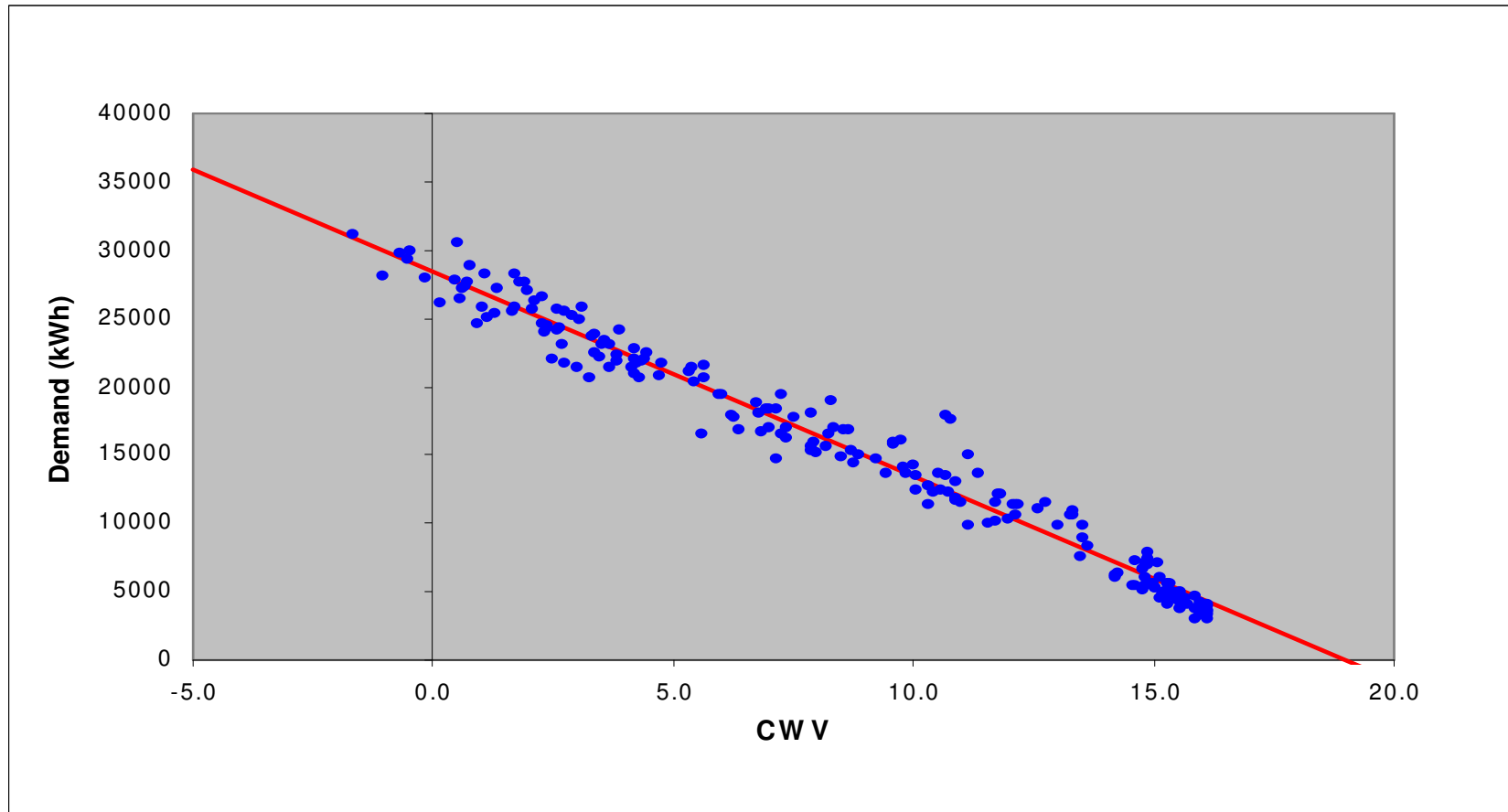
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Small NDM Modelling Results

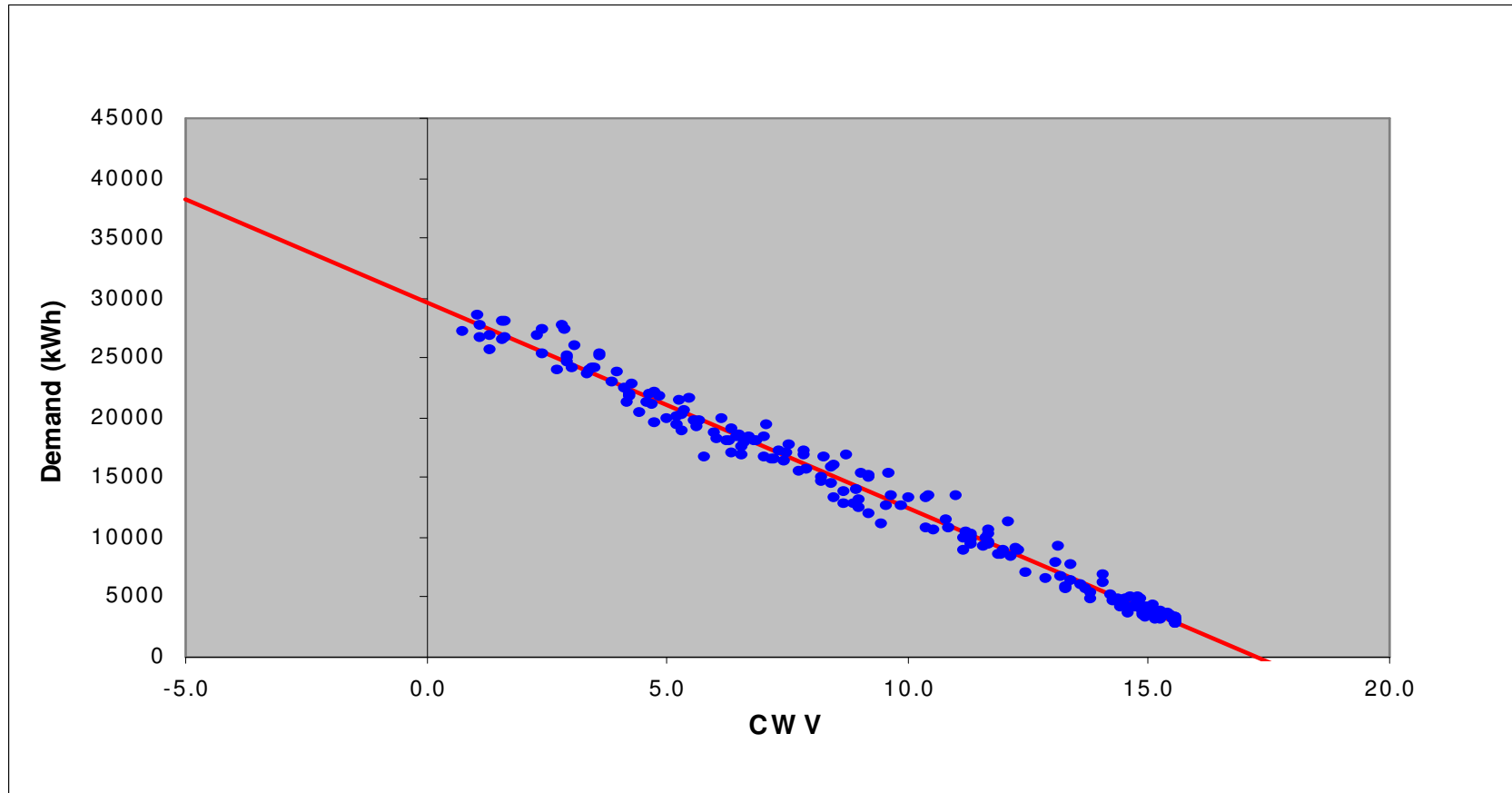
NE LDZ, EUC Band 1: 0 - 73.2 MWh pa



Demand against NE CWV – Monday to Thursday - Holidays included

Small NDM Modelling Results

SW LDZ, EUC Band 1: 0 - 73.2 MWh pa



Demand against SW CWV – Monday to Thursday - Holidays included

TWG Involvement: 22nd May 2013

Objectives of Meeting

- Second check point meeting of Technical Workgroup (old Technical Forum)
- Key objectives of May meeting
 - Review and confirm results of single year EUC Modelling
- Outcome – TWG discussed and agreed single year models to be used including aggregations to take forward for all NDM consumption bands
 - e.g. TWG agreed to use four groups of LDZs in 14650-29300 MWh consumption band (previously 5 groups)
- Next phase was then able to commence:
Model Smoothing and derivation of draft NDM proposals

Model Smoothing and Derivation of Parameters

- Model Smoothing process carried out on 3 years of sample data (2010/11, 2011/12 and 2012/13)
- Smoothed EUC model parameter values created represent the average value from across the 3 years (in place to address year on year volatility)
- Smoothed model parameter values were then used to derive the various NDM proposals such as the ALPs
- During this phase there was further TWG interaction where details of amendments to weekend factor results were shared

TWG Involvement: 7th June to 25th June 2013

Review of draft NDM proposals

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- Draft NDM proposals were published and available for review on 7th June
- Note issued to TWG inviting feedback and comments
- One response received from E.On representative on TWG covering:
 - Request to understand reasons for differences in specific ALP and DAF patterns compared with previous years
 - Importance of achieving new SN basis
 - Weekend Scaling Factor behaviour
- Next phase was then able to commence: Investigate TWG comments and provide feedback at meeting on 26th June

TWG Involvement: 26th June 2013

Objectives of Meeting

- Third check point meeting of Technical Work Group
- Key objectives of this meeting:
 - Review TWG comments and agree any actions
 - Agree approach to presentation of proposals to DESC
- Outcome: Following discussion about representation TWG provided support for proposals and recommended they be presented to DESC
- Further detail on representation to follow

E.On Response to Algorithms (1 of 2)

- There were 3 queries specific to the draft proposals
 - Query 1: Can we provide views on the drivers behind change in DAF profiles for a number of EUCs
 - Query 2: What is the driver behind change in ALP profile for 2013 for specified EUCs
 - Query 3: What is the driver for the change in the early May Bank Holiday ALP shape for selected EUCs
- The changes to models highlighted in queries 1 to 3 were as a result of the underlying characteristic of the ‘smoothed’ models changing, whether that was related to warm weather cut-offs or holiday factors
- TWG accepted the explanation, although a further item relating to warm weather performance was added to potential work areas log

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E.On Response to Algorithms (2 of 2)

- Query 4: Reiteration of the desire to undertake a full Seasonal Review was made:
 - An update was provided on the current position of the tender process for procuring the climate change methodology
- Query 5: Request for an update on the analysis of the day of the week shape seen in Scaling Factor:
 - Analysis so far has not identified any modelling issues that could be contributing to a day of the week effect
- Full details of the representation and response can be viewed on Joint Office website under meeting material for 26th June

NDM Algorithm Performance

- In addition to production of demand models and derived factors DESC also has the responsibility to provide a summary of the algorithm performance in the preceding year
- Xoserve performs this role as the common demand estimation service provider
- The main algorithm performance analysis for the gas year is completed in Autumn however historically a review has also been undertaken during Spring using the recently collected data and published in Appendix 13 of the NDM report
- DESC agreed at the November 2012 meeting to only refresh the analysis once a year and to provide a repeat of the Autumn analysis in the annual NDM report
- The NDM report including Appendix 13 has also now been completed and published in the UK Link Docs area

Recommendations to DESC

- Objective: Obtain DESC approval to submit NDM proposals to Transporters and Users as per UNC requirement
- Draft NDM proposals are ready to be submitted to wider industry for review
- TWG have been involved throughout the process and provided their recommendation to proceed
- Appendix 13 summarising NDM algorithm performance has been published
- DESC majority now required to proceed to next phase

Next Steps

- w/c 15th July
 - Prepare documentation and apply any final revisions
 - Xoserve publish DESC's proposals by 19th July for industry to review
- w/c 22nd July
 - Users and Transporters have 5 b.ds to review and submit representations to DESC
- w/c 29th July
 - DESC meeting to review representations and consider response
 - Proposed meeting date – Wed 31st July
- w/c 5th August
 - DESC provide formal response to representations (via Xoserve)
- w/c 12th August
 - Xoserve on behalf of Transporters publish final proposals to industry (no later than 15th August) and submit interface files to key systems