Technical Work Group

EUC Modelling 2012/13 –
Warm weather cut-offs examples

23rd May 2012

Background

- As mentioned in the main modelling results presentation Xoserve invited DESC members to request specific information to discuss at the May meeting

- One of the areas E.On asked to be included related to providing examples of models with warm weather cut-offs

- Warm weather cut-offs are only considered for EUCs above 293 MWh pa (i.e. Bands 3 and above)

- The modelling system identifies two different types of cut-offs – 'Imposed' and 'Best Fit'.

- The Imposed cut-off is necessary for those models which otherwise would lead to negative or near zero fitted demands

Spring Methodology document

- The Best Fit cut-off is incorporated for those models which show an improvement of >20% in the 'fit at the warm end' (warmest 4 degrees CWV)

- The modelling system includes a parameter called the 'Critical F value' which is used to identify the Best Fit warm weather cut offs

- This is defined as: $\dfrac{\text{Mean square residual without a cut-off}}{\text{Mean square residual with the cut-off}}$

- The methodology discussed in the Spring stated that models must show an improvement of 20% which is the equivalent of 1.2 when using the Critical F value.

- E. On's request also included running additional analysis with a different tolerance for the Critical F value of 1.1 (instead of 1.2)

- The detail of how warm weather cut-offs are identified are explained in detail in Appendix 4 of the NDM profiling booklet and the Spring approach methodology document

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Small NDM Modelling Results

- The main Spring analysis has all been performed using the 20% improvement criteria.

- The table below summarises the number of models with warm weather cut offs with example charts to follow

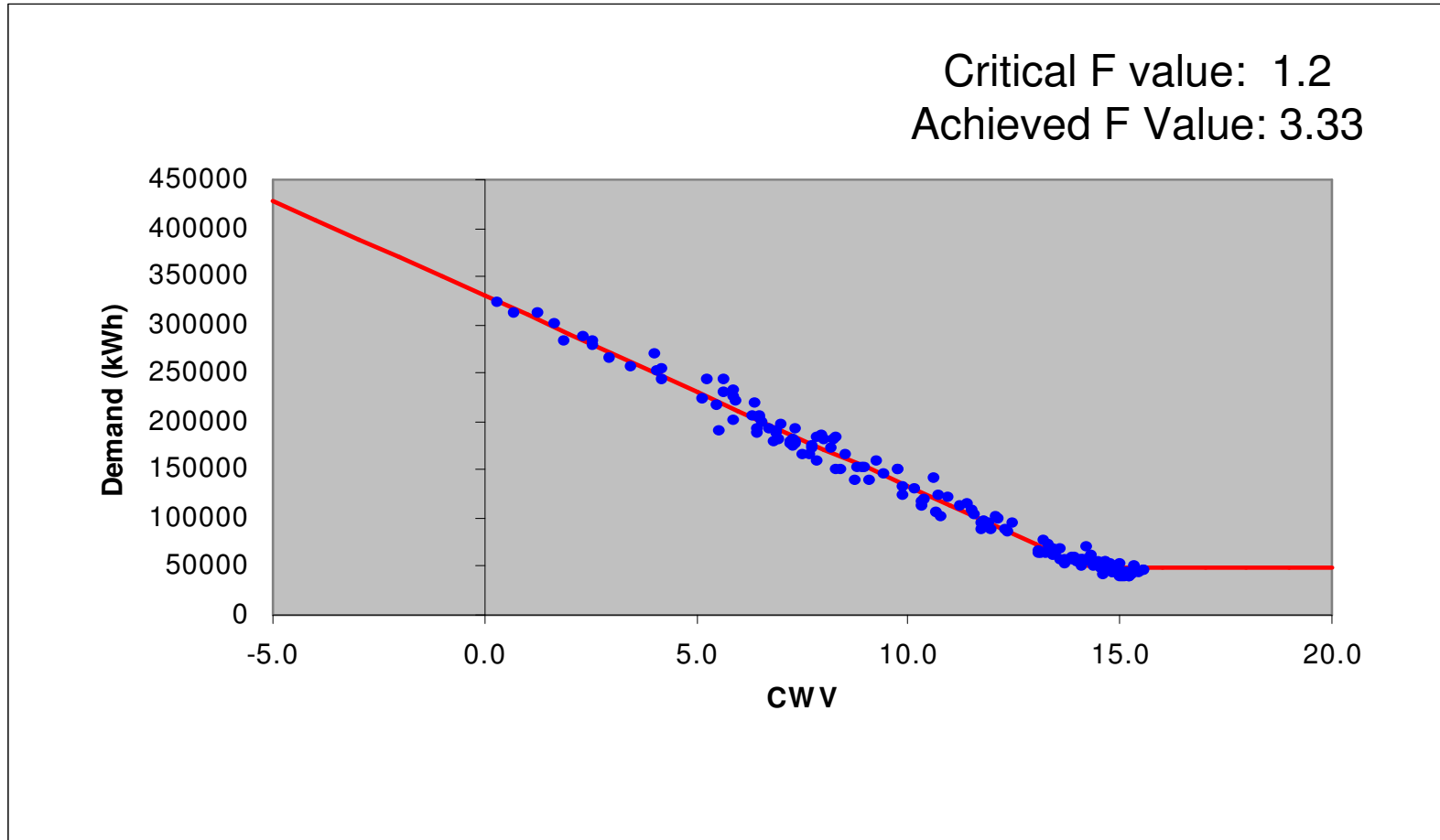| Consumption Range	No. of EUC models from 2011/12 data	
	With Cut-Offs	Without Cut-Offs
0 – 73.2 MWh pa	N/A	
73.2 – 293 MWh pa	N/A	
CB 293 – 732 MWh pa	9	4
CB 732 – 2196 MWh pa	7	6
293 – 2196 MWh pa WAR Band 1	0	13
293 – 2196 MWh pa WAR Band 2	0	13
293 – 2196 MWh pa WAR Band 3	6	7
293 – 2196 MWh pa WAR Band 4	13	0

- In total 35 of 78 models resulted in a cut-off (45%)

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Example of clear Best–Fit cut-off model
SW LDZ, EUC Band 3: 293 - 732 MWh pa

Critical F value: 1.2
Achieved F Value: 3.33

Demand against SW CWV – Non Holiday Monday to Thursday
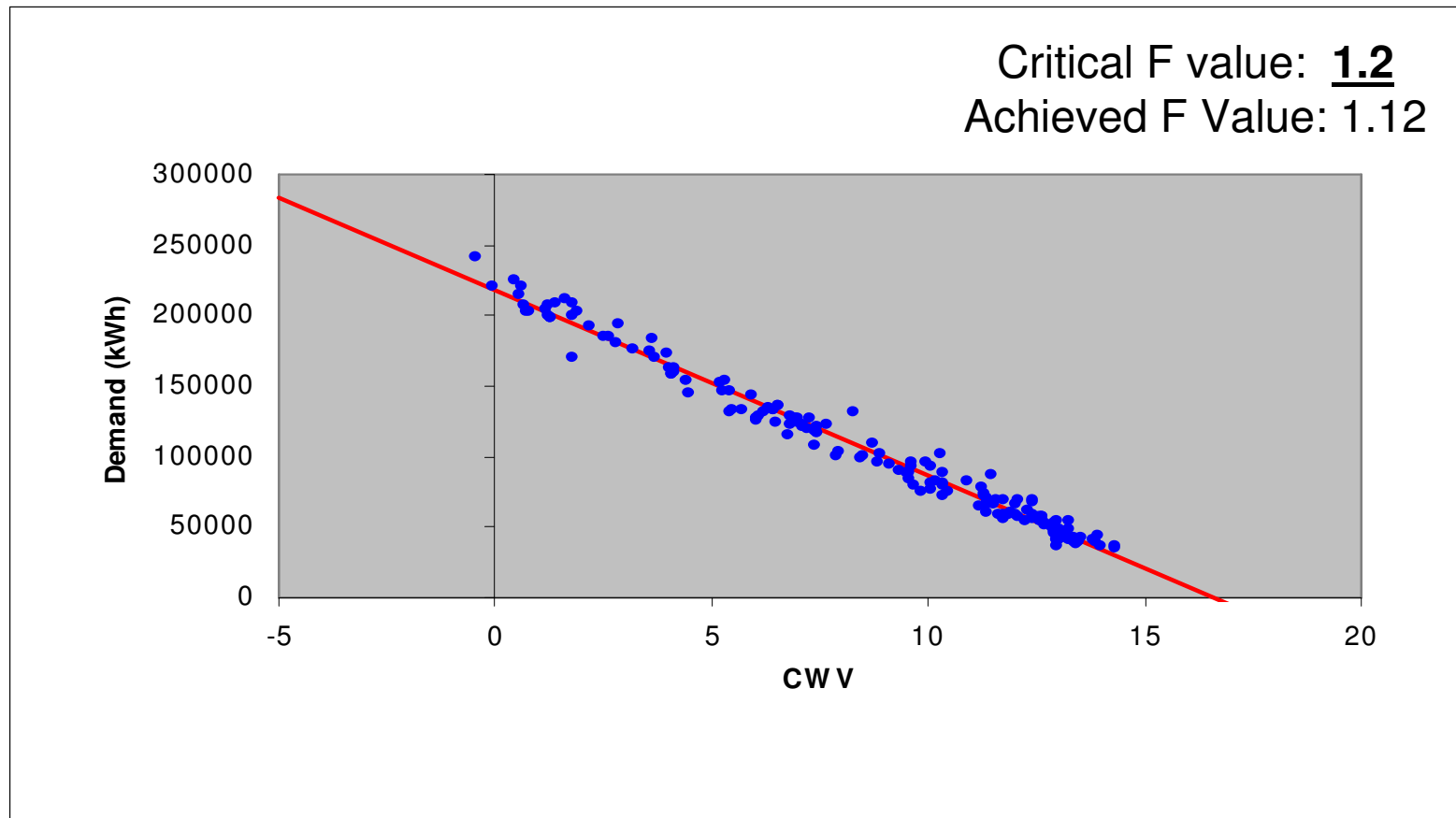
Small NDM Modelling Results

- Additional analysis has also been performed using a <u>10%</u> improvement criteria.

- The table below summarises the revised number of models with warm weather cut offs with example charts to follow

Consumption Range	No. of EUC models from 2011/12 data	
	With Cut-Offs	Without Cut-Offs
0 – 73.2 MWh pa	N/A	
73.2 – 293 MWh pa	N/A	
CB 293 – 732 MWh pa	10 (+1)	3 (-1)
CB 732 – 2196 MWh pa	9 (+2)	4 (-2)
293 – 2196 MWh pa WAR Band 1	0	13
293 – 2196 MWh pa WAR Band 2	0	13
293 – 2196 MWh pa WAR Band 3	8 (+2)	5 (-2)
293 – 2196 MWh pa WAR Band 4	13	0

- In total an additional 5 models resulted in a cut-off by reducing the improvement criteria to 10%
- Example charts for some of these 'new' cut-off models to follow to allow comparison
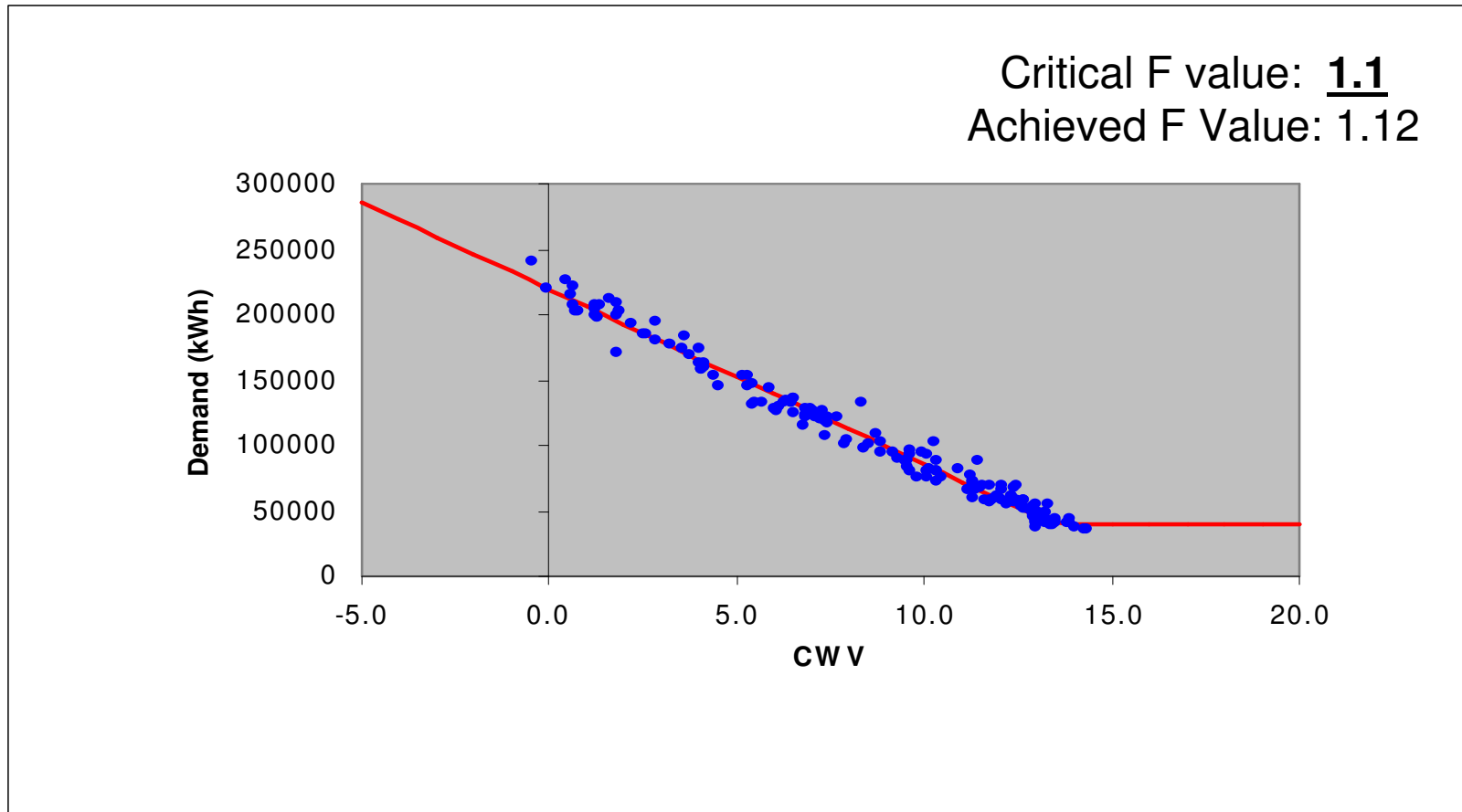
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Example of 'No cut-off applied model'
NO LDZ, EUC Band 3: 293 - 732 MWh pa

Critical F value: **1.2**
Achieved F Value: 1.12

Demand against NO CWV – Non Holiday Monday to Thursday

Same model with criteria changed to **10%** improvement
NO LDZ, EUC Band 3: 293 - 732 MWh pa

Critical F value: **1.1**
Achieved F Value: 1.12

Demand against NO CWV – Non Holiday Monday to Thursday

Example of 'No cut-off applied model'
SW LDZ, WAR Band 1: 293 - 2196 MWh pa
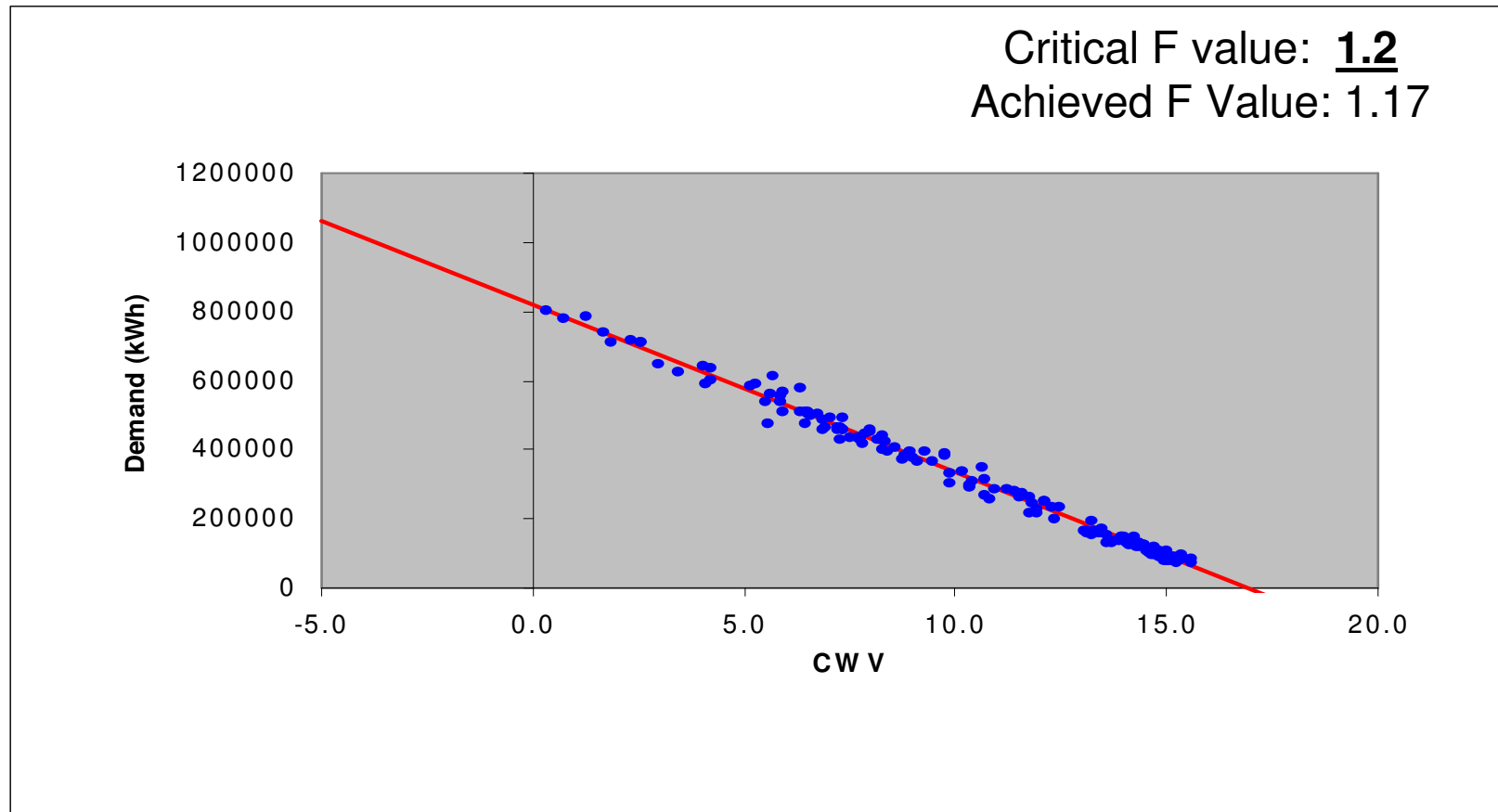
Critical F value: **1.2**
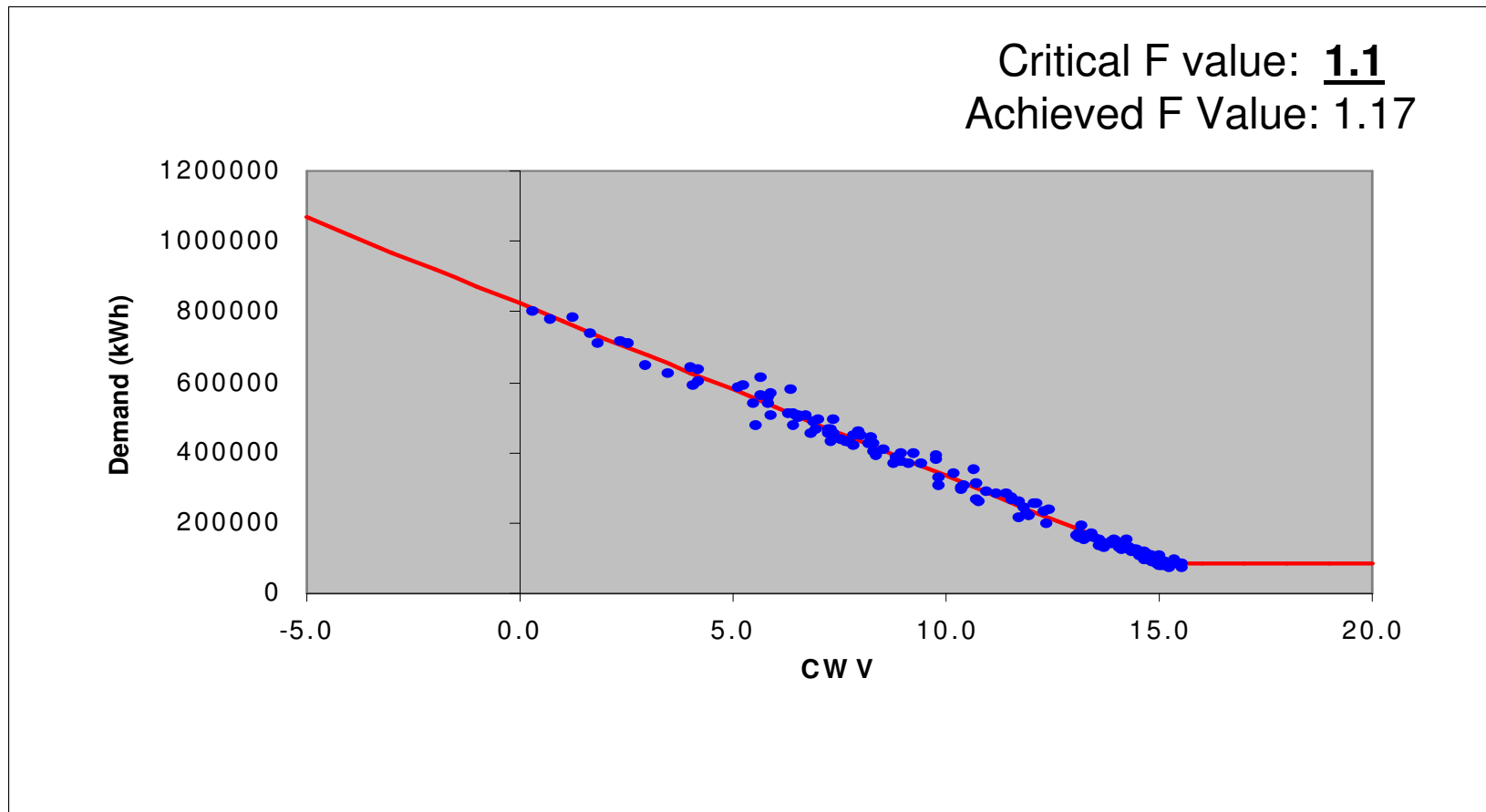Achieved F Value: 1.17

Demand against SW CWV – Non Holiday Monday to Thursday

Same model with criteria changed to **10%** improvement
SW LDZ, WAR Band 1: 293 - 2196 MWh pa

Critical F value: **1.1**
Achieved F Value: 1.17

Demand against SW CWV – Non Holiday Monday to Thursday

Small NDM Modelling Results

- Additional analysis has also been performed using a <u>30%</u> improvement criteria.

- The table below summarises the number of models with warm weather cut offs with example charts to follow

Consumption Range	No. of EUC models from 2011/12 data	
	With Cut-Offs	Without Cut-Offs
0 – 73.2 MWh pa	N/A	
73.2 – 293 MWh pa	N/A	
CB 293 – 732 MWh pa	9	4
CB 732 – 2196 MWh pa	6 (-1)	7 (+1)
293 – 2196 MWh pa WAR Band 1	0	13
293 – 2196 MWh pa WAR Band 2	0	13
293 – 2196 MWh pa WAR Band 3	6	7
293 – 2196 MWh pa WAR Band 4	13	0

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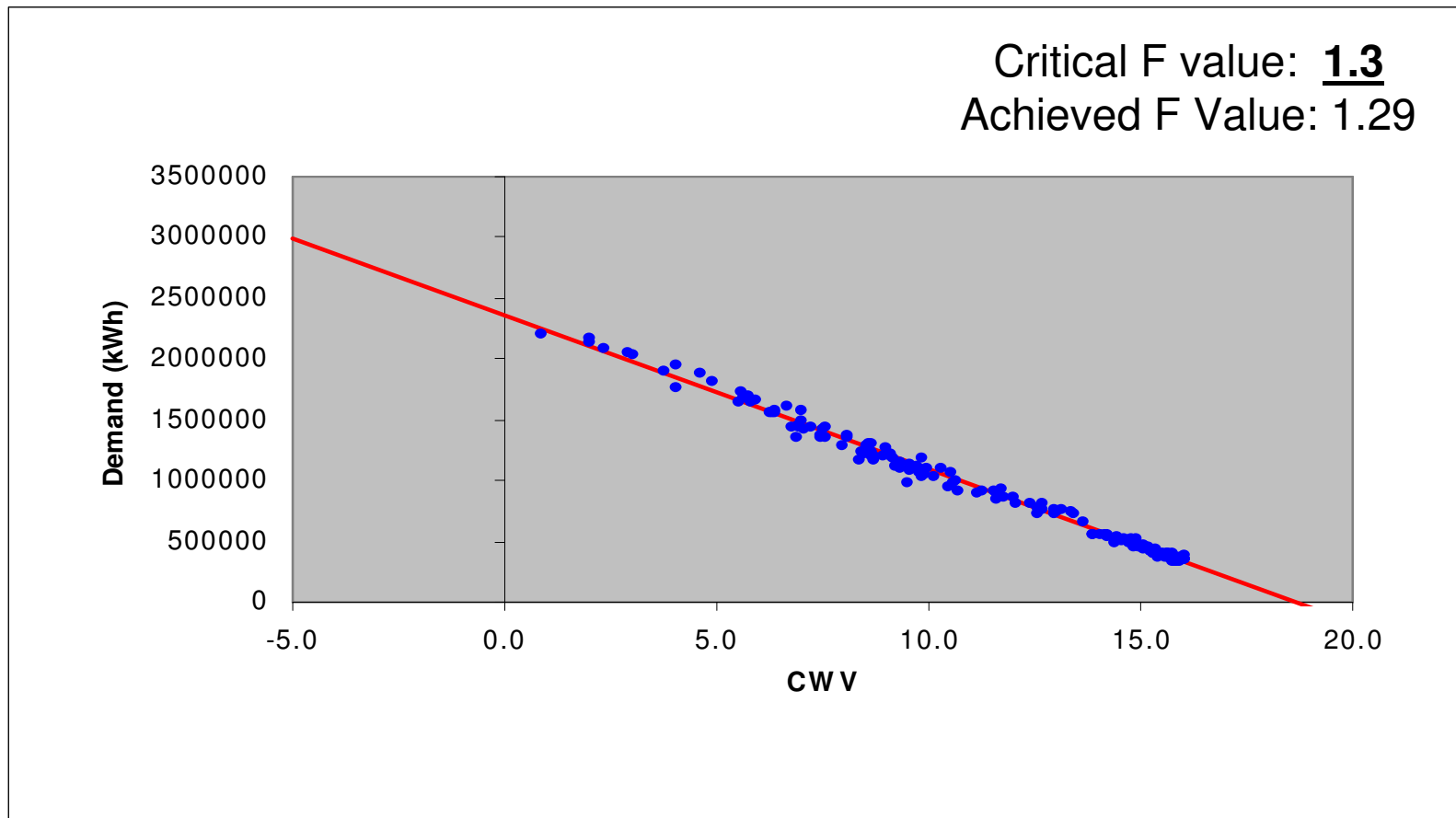
Example of current cut-off applied model
SO LDZ, Band 4: 732 - 2196 MWh pa

Critical F value: **1.2**
Achieved F Value: 1.29
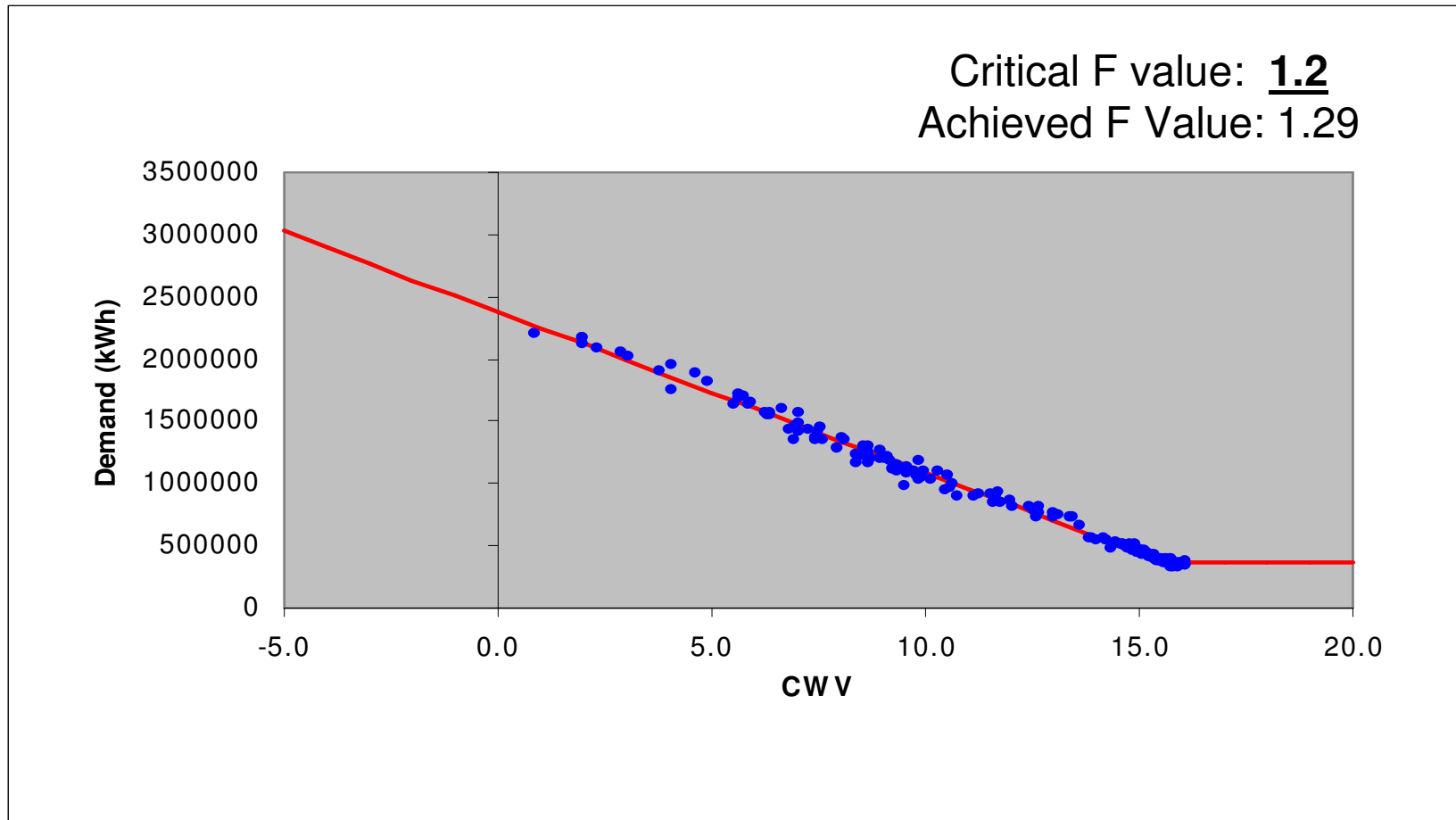
Demand against SO CWV – Non Holiday Monday to Thursday

Same model with criteria changed to **30%** improvement
SO LDZ, Band 4: 732 - 2196 MWh pa

Critical F value: **1.3**
Achieved F Value: 1.29

Demand against SO CWV – Non Holiday Monday to Thursday

Next Steps

- Analysis was possible for Small NDM although completed in tight timescales

- Ideal time for adhoc analysis is outside of 'modelling window'

- TWG to decide if they wish to investigate this area in more detail and add to 'TWG wish list log'?

- Exercise with TWG to review and prioritise the adhoc analysis areas will be necessary after the completion of this years modelling analysis

Potential TWG adhoc work areas

Ref No.	Source	Description	Status
1	TWG 20/04/12	Review of 'spike' validation rules applied to sample data during Spring (and Autumn) analysis	Raised
2	TWG 20/04/12	Review of appropriateness of current EUC definitions for Small and Large NDM	Raised
3	TWG 20/04/12	Investigate possibility of providing TWG with data during the Spring analysis WAR Band definitions review	Raised