Tutorial on Generic Stacking Order Preparation Based on AESO Rules

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Background

- AESO is preparing the building blocks for the development of the 2007 Loss Factors, including the following main items:
  - the Generic Stacking Order (GSO) (today's focus)
  - Base cases (load forecast, topology, etc)
  - Project selection
  - Annual energy volume calculation
- Loss Factor Methodology via the AESO Rules requires seasonal base cases for determining the loss factor of each generator.

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Background (2)

- Twelve cases of data (four seasons with a High, Medium and Low level per season) are developed to evaluate loss factors.
  - Twelve cases (Summer, Winter, Spring and Fall) (H,M,L) have been evaluated and sent to owners of generation.
- 12 seasonal base cases are prepared from Net-To-Grid (NTG) amount at the Point of Supply (POS). Industrial Systems Designation's (ISD's) included.
- NTG amount are obtained from AESO metering database and processed.

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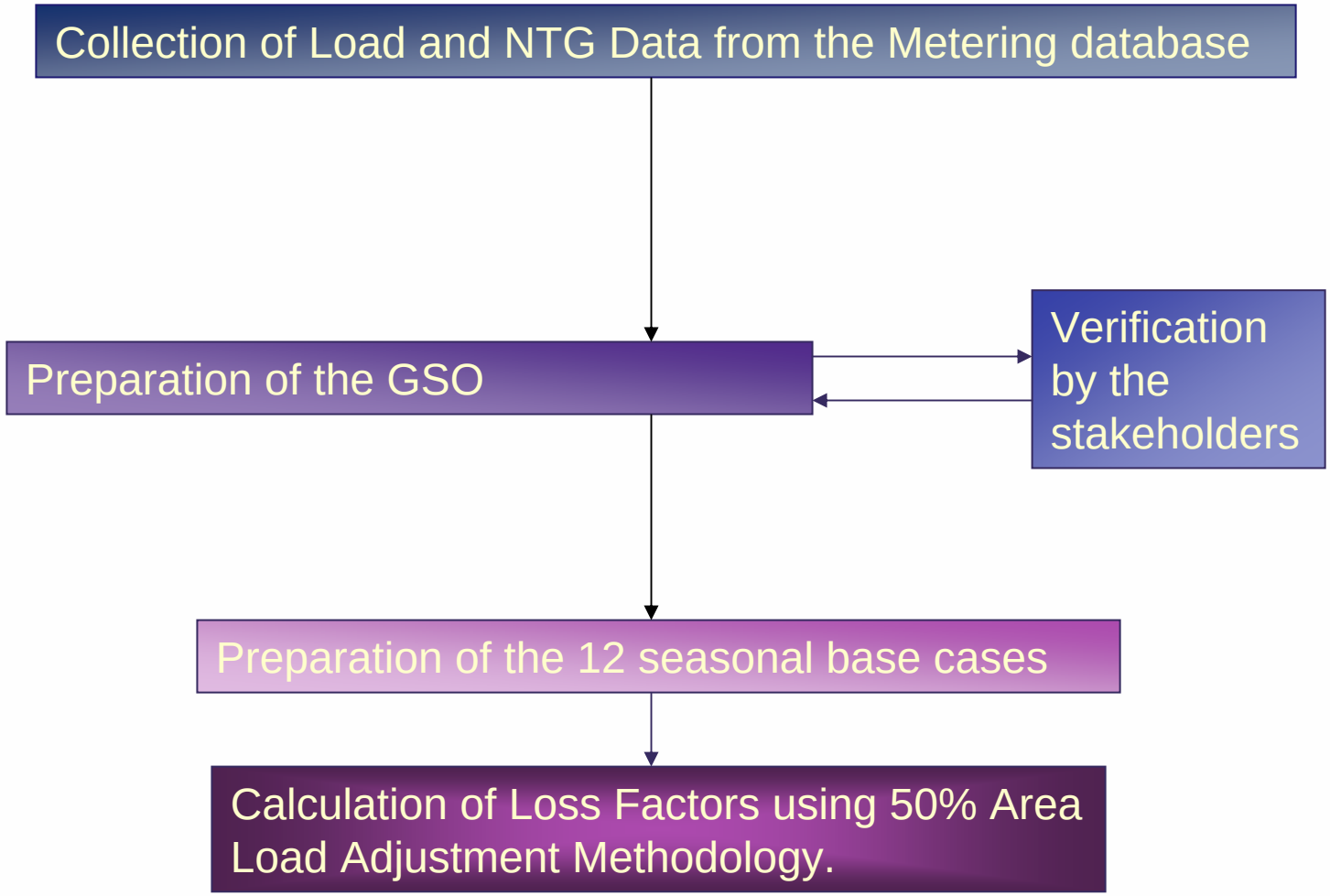
Background



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Preparation of GSO
Step 1

- Based on AESO Rules.
- Obtain AIES load data for the most recent 12 months.
- Organize the load data according to seasons.
- Seasons are defines as –
  - Winter (December 1 – February 28/29)
  - Spring (March 1 – May 31)
  - Summer (June 1 – August 31)
  - Fall (September 1 – November 30)
- Create Load Duration Curve (LDC) for each season.
- Obtain High, Medium and Low segments from LDC.

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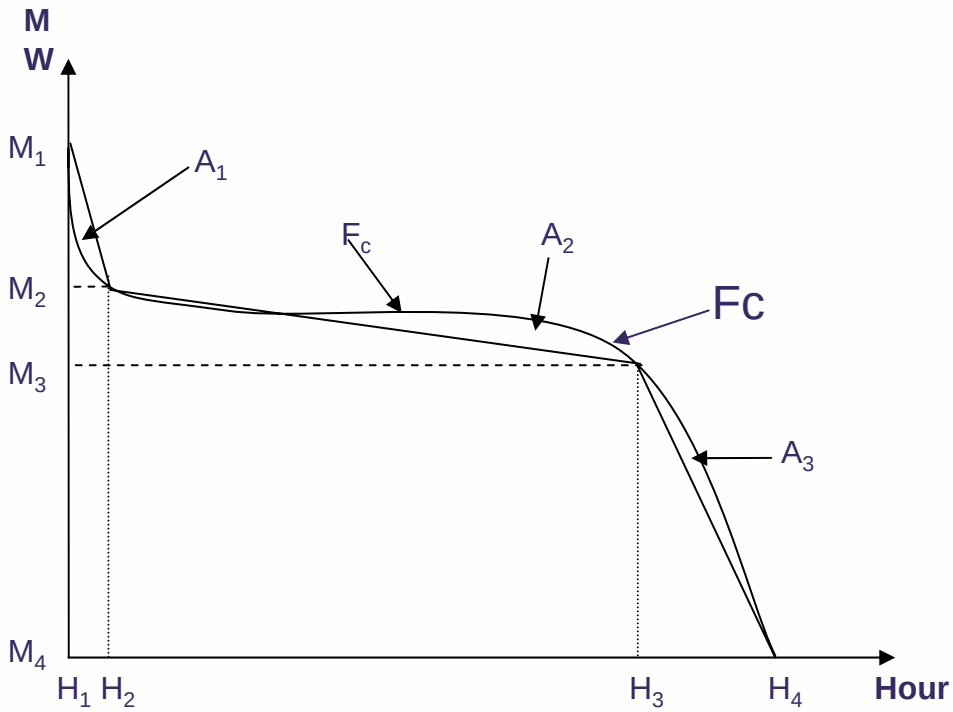
Preparation of GSO
Step 2

- High, Medium and Low segments from LDC.



- Load Duration Curve and Determination of H_2 and H_3
- M_4 is a non-zero value

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Preparation of GSO
Step 2

- Why 3 segments only –
  - In Alberta, the three segments results in an optimized and efficient result. Rules set accordingly
- 3 segments represents linearized simulated LDC
- For each of the segment obtain the area under the straight line and duration curve Fc.
- Find the difference between these two areas (A_x).
- Find all three A_xs and add their squares ($A_1^2 + A_2^2 + A_3^2$).
- Find H_2 and H_3 so that the sum of the squares of A_xs becomes minimum ,i.e. Minimize ($A_1^2 + A_2^2 + A_3^2$).

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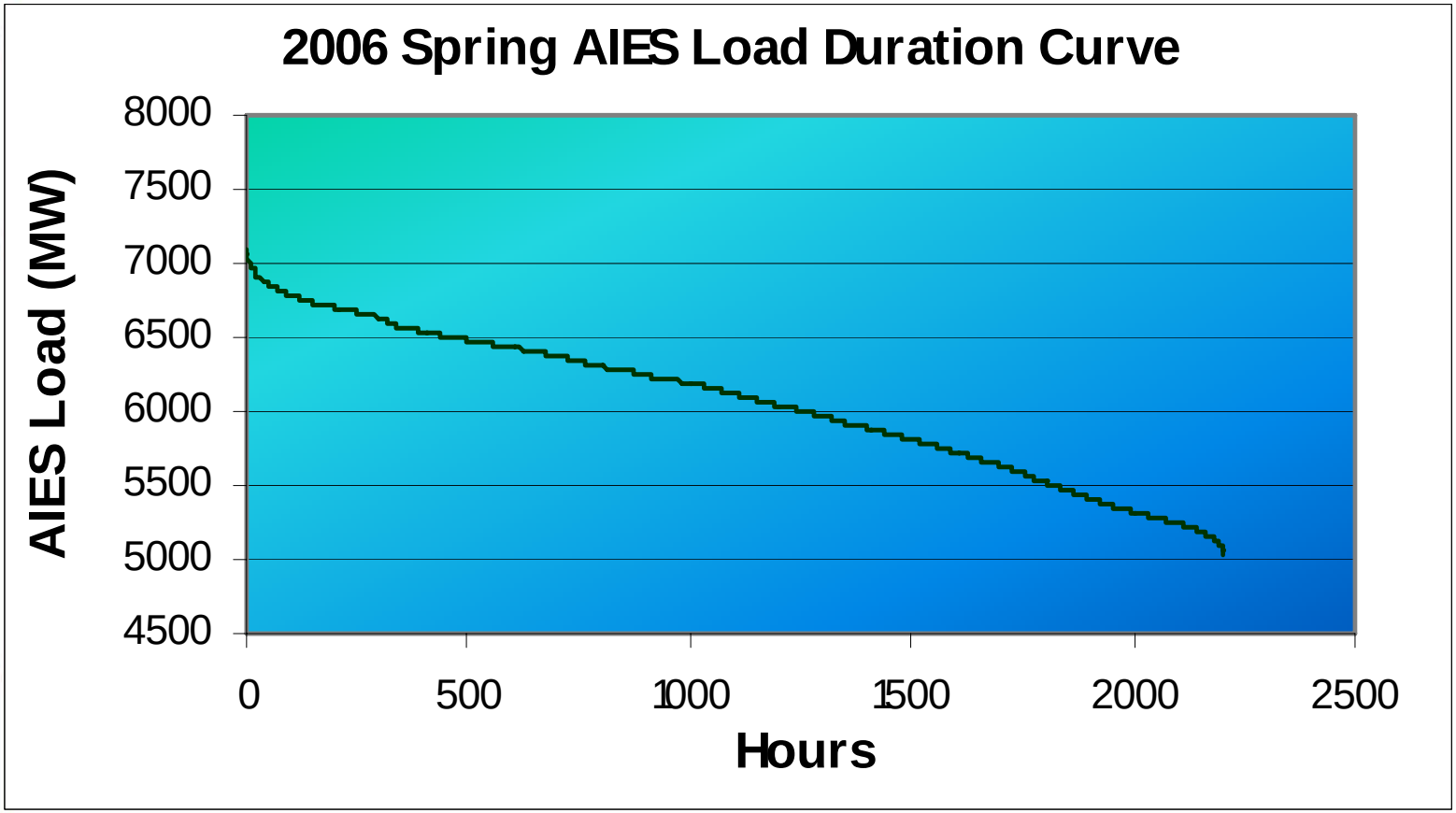
Preparation of GSO
Step 2 – Seasonal Hourly Load Duration Curve



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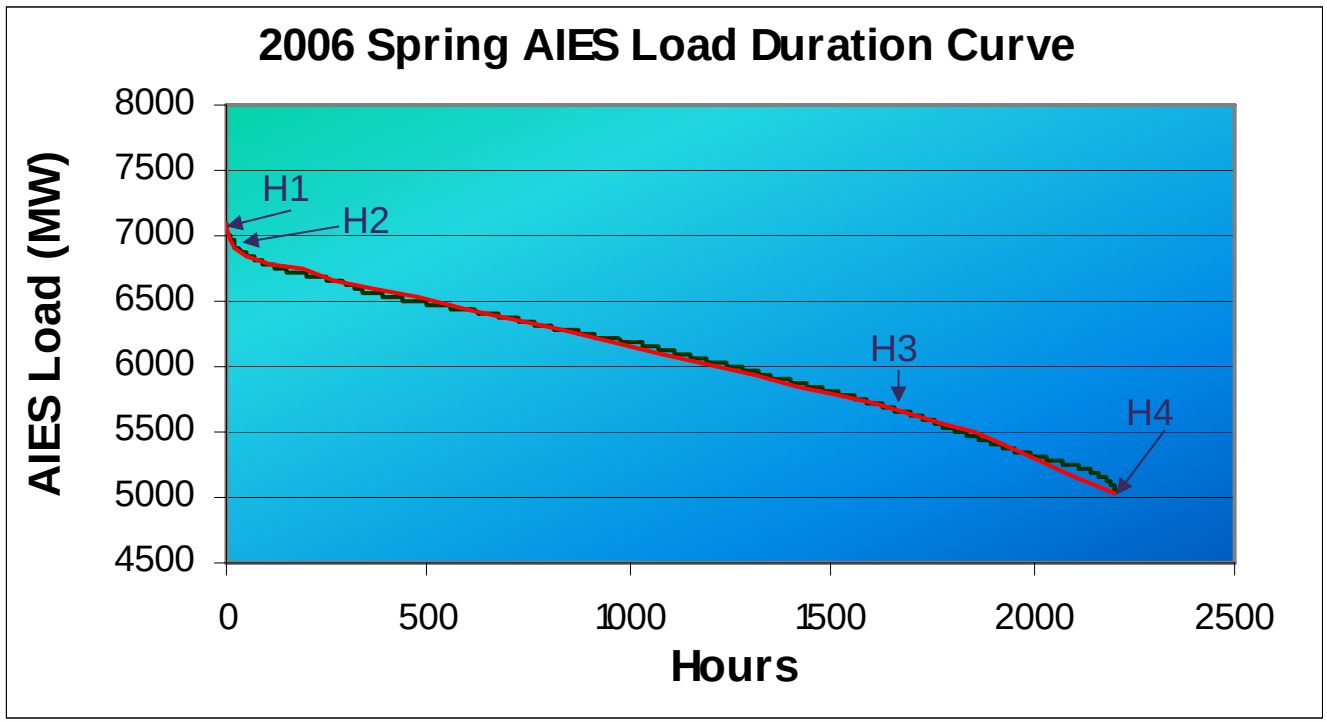
Preparation of GSO
Step 2 – H, M, and L breakdown

Spring							
		MW					
	Hr	Actual	Avg	Percentile	Season	Duraion	Weight
H1	1	7099.4		100.0%			
H2	50	6855.2	6925.1	97.8%	High	50	2.3%
H3	1675	5662.7	6255.2	24.2%	Medium	1625	73.6%
H4	2207	5035.4	5386.8	0.0%	Low	532	24.1%



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Preparation of GSO
Step 3

- LDC is used to obtain the sequence of hours in a season according to load sorted in descending hours.
- NTG data of each generator for each season are stored chronologically.
- NTG data of each generator for each season are sorted according to the sequence of hours obtained from LDC.
- Segments obtained from LDC analysis is used to find average NTG for each MPID for the High, Medium and Low segments.

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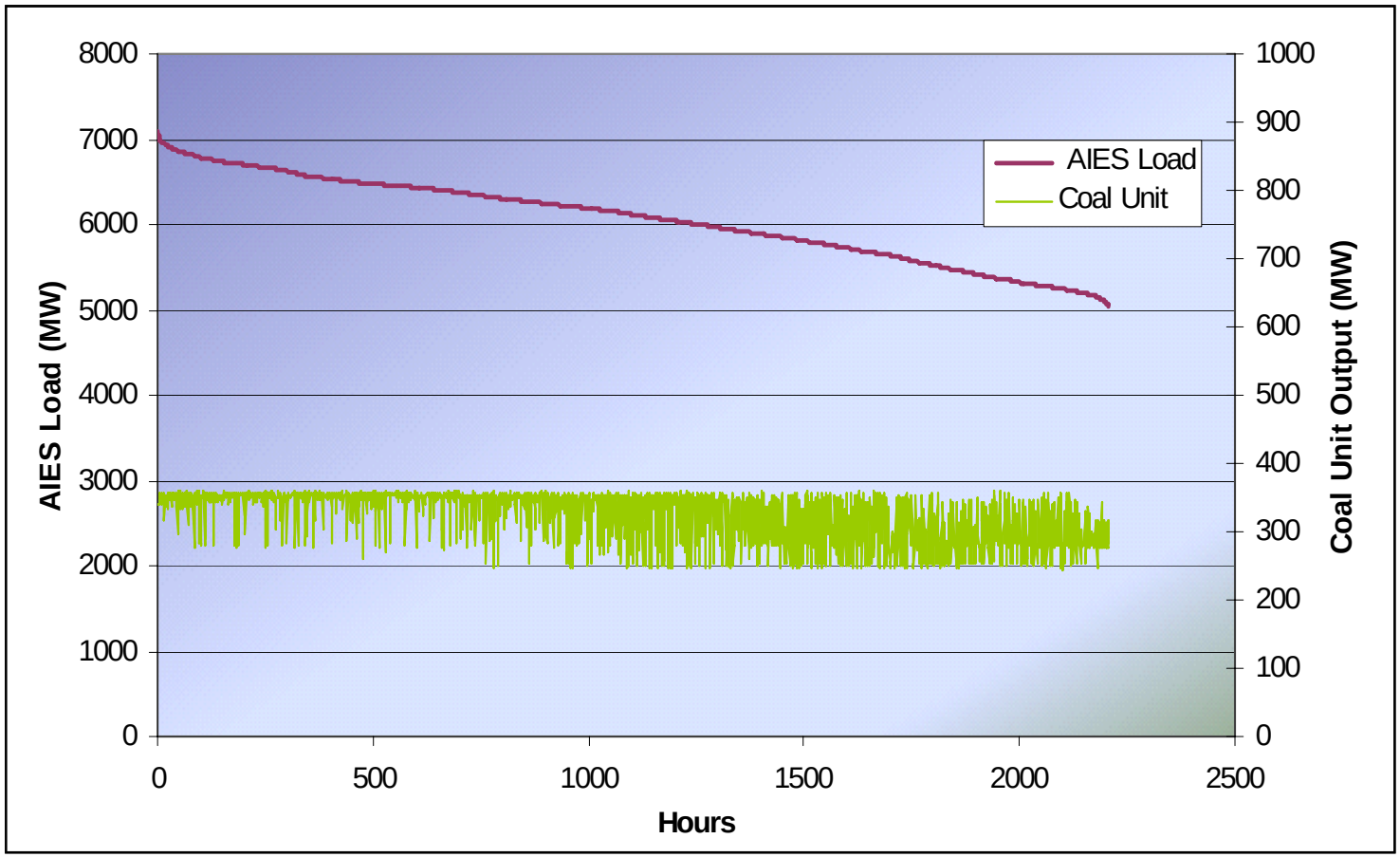
Preparation of GSO
Step 3

- Coal Unit - LDC and corresponding NTG from Analysis.
- Co-incidental peak.



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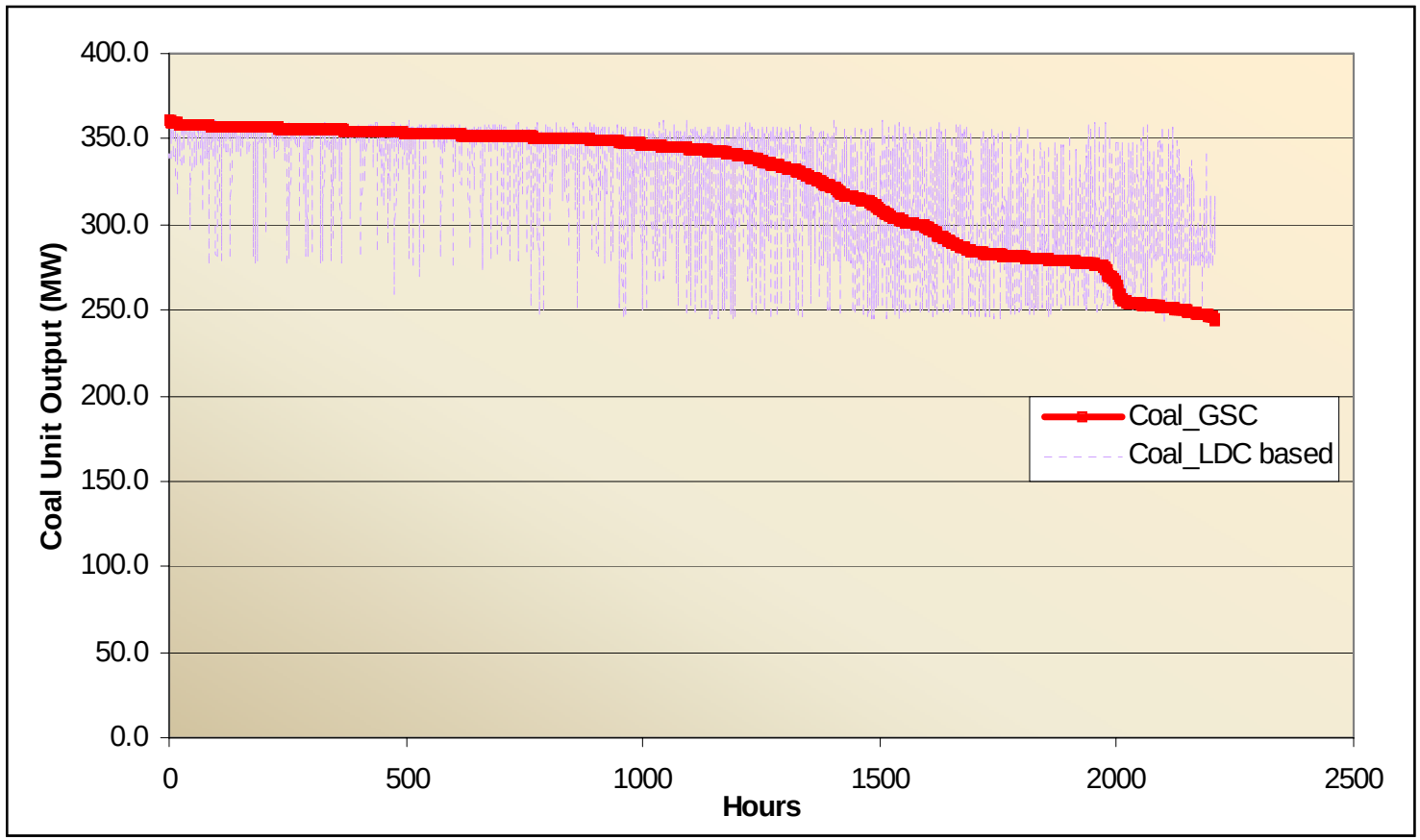
Preparation of GSO
Step 3

- Coal Unit - NTG from Analysis and Supply Curve.



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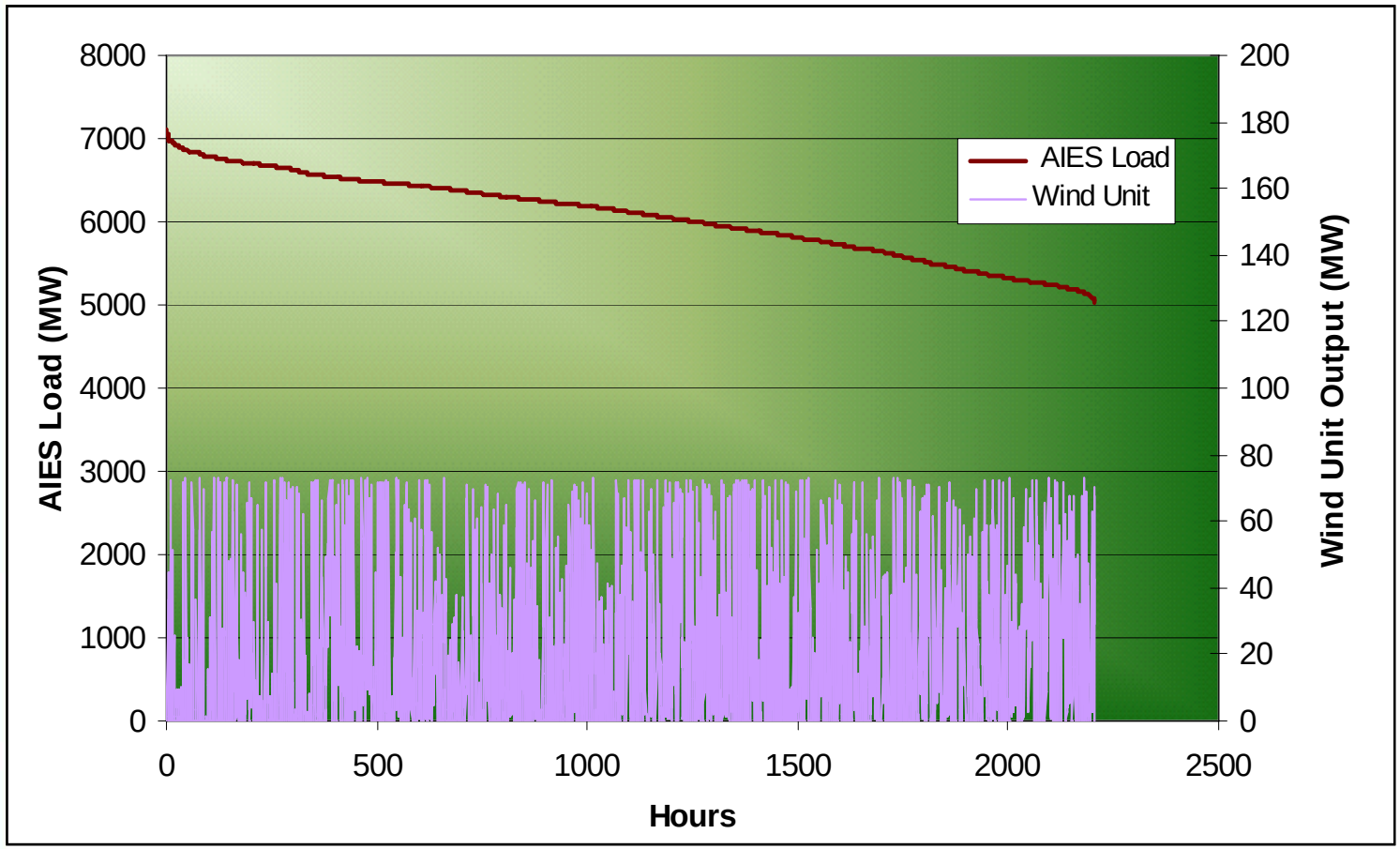
Preparation of GSO
Step 3

- Wind Unit - LDC and corresponding NTG from Analysis.
- Non-coincidental peak.



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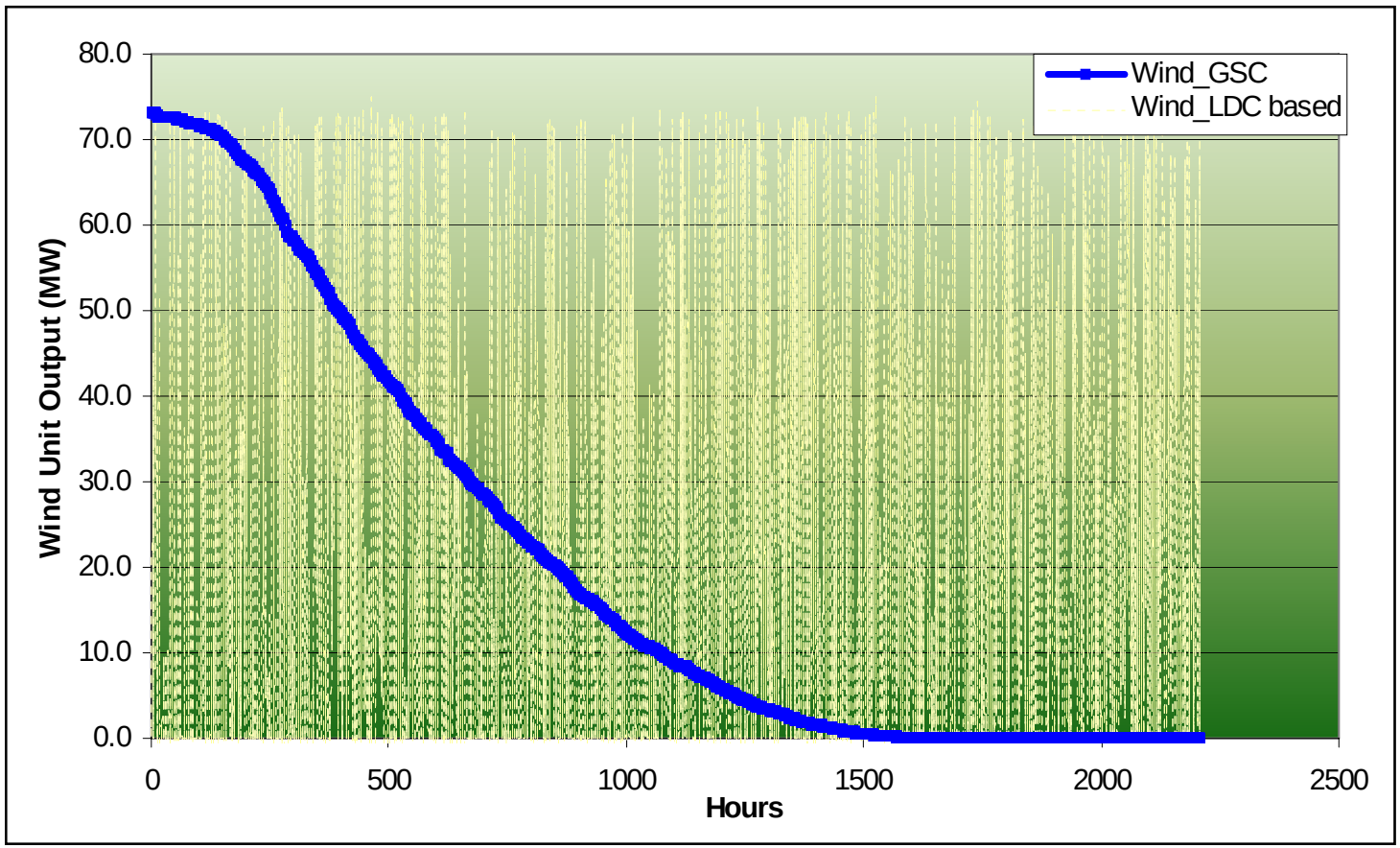
Preparation of GSO
Step 3

- Wind Unit - NTG from Analysis and Supply Curve.



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Conclusion

- Analysis consistent with Rule to obtain capacity values for base cases
- It is possible to have output values less than the minimum generator output
- Capacity values calculated are truly historic with no forward maintenance embedded
- AESO has sent 12 values of 4 seasonal cases to owners for sign-off

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Further Actions

- Confirm with companies we are contacting the right people and they understand the intent of the request
- Sign-off confirms best information to build base cases and calculate loss factors
- Sign off ensures new confidential units are not public unless they are expected to be in service in 2007

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