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DESC Technical Work group

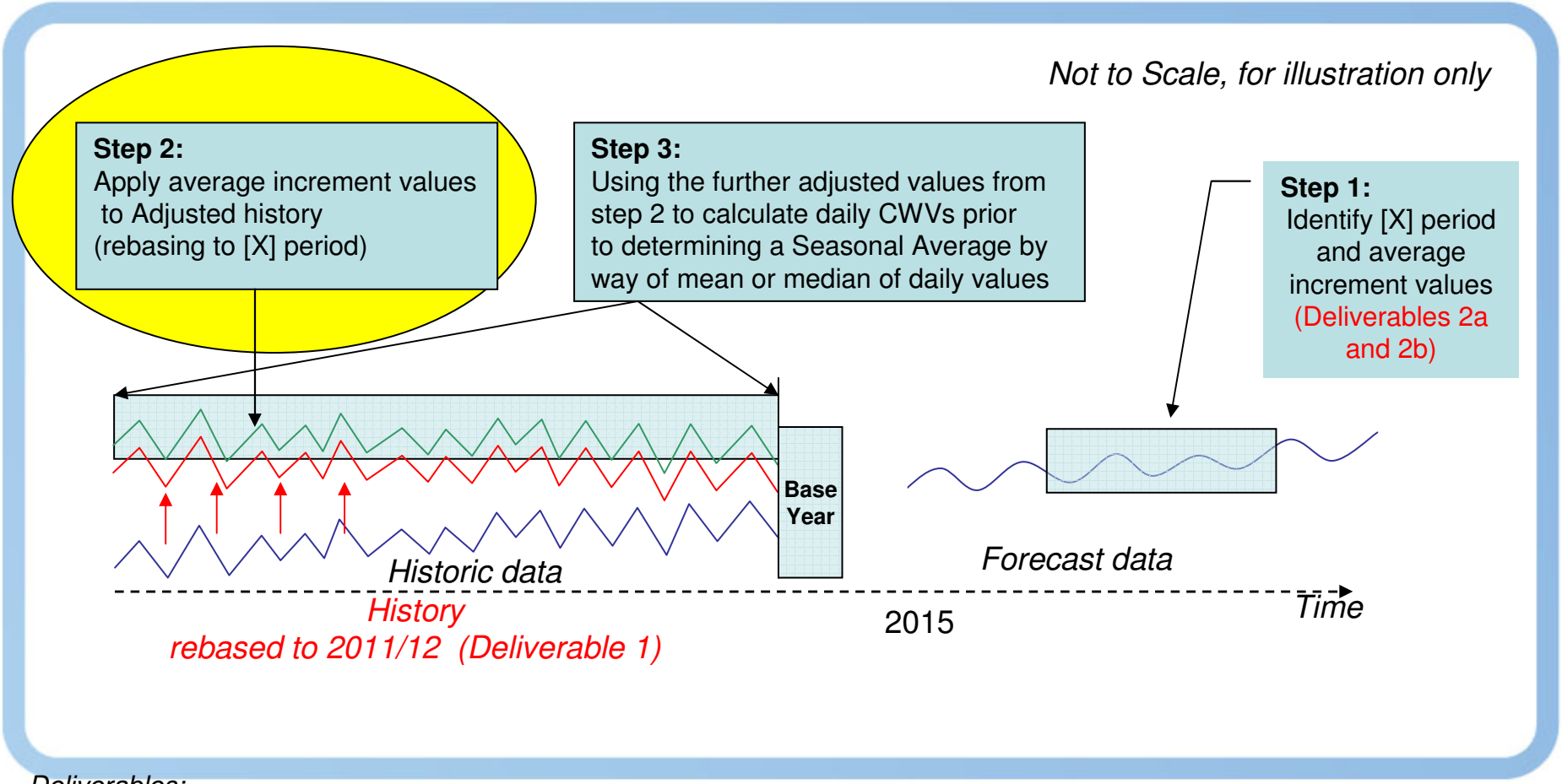
Seasonal Normal Review: Applying CCM Increments and Calculate CWV History

18 August 2014

Summary of Updates

- Since material relating to choice of period for increments has been published, attention has turned to Steps 2 and 3 in the diagram reflecting agreement on how the CCM data should be used
- Xoserve have attempted to interpret the diagram into several steps in order to calculate a draft SNCWV for NE LDZ – one of the trial LDZs with minimal requirements for gap filling
- Ultimately an approach document for calculating the SNCWV needs to be produced and signed off by DESC by the end of Q3 2014

Use of Project Deliverables



Deliverables:

1) *An adjusted view of historic hourly weather datasets (derived from WSSM) reflecting estimated impacts of climate change based on results from base year 2011/12*
2) *a) Predicted hourly climatological average values for period 1st October 2012 to 30th September 2025 based on predicted impact of climate change trends for future period*
   b) Predicted hourly increments values – difference between predicted hourly climatological average values (i.e. from 2a) and base year (2011/12) averages

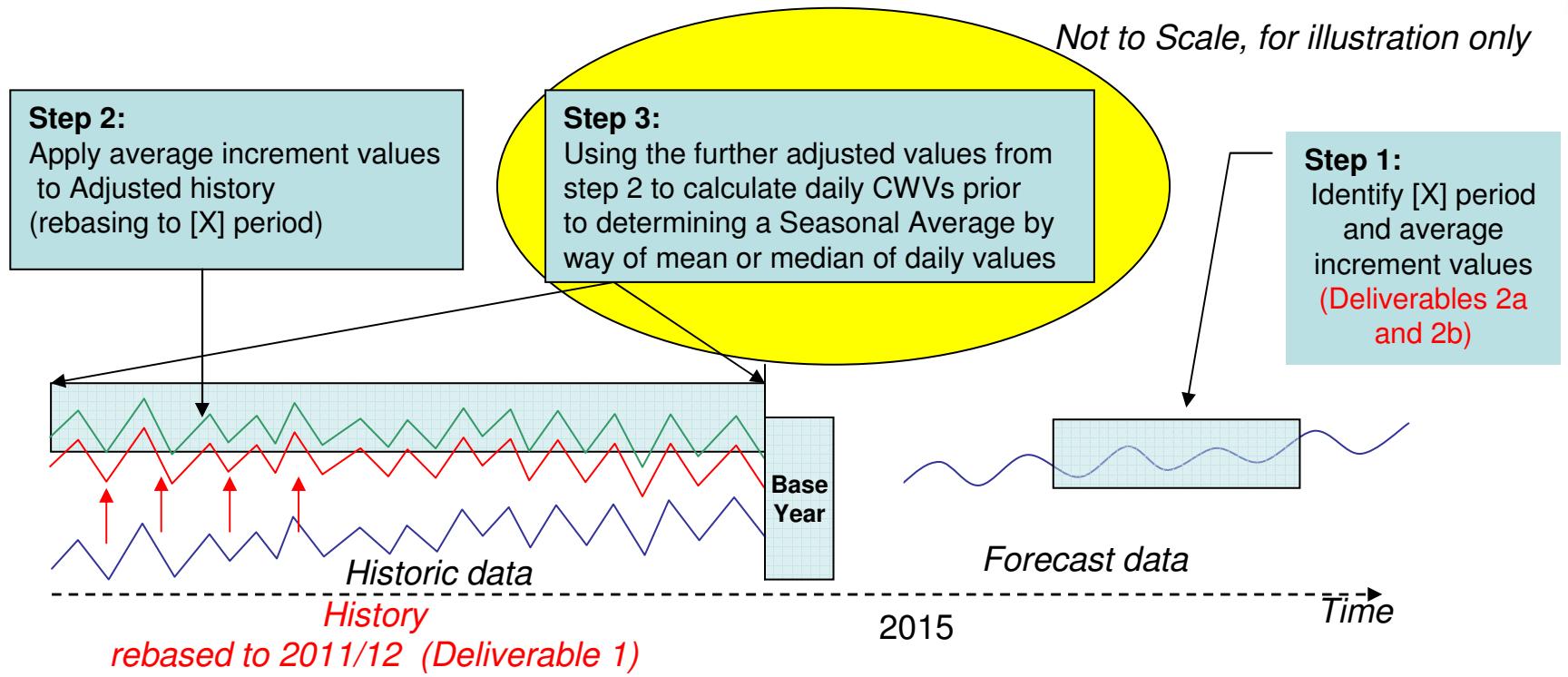
Step 2 "Apply Average Increment values to Adjusted history (rebasing to [X] period)"

- For testing purposes it is assumed that '[X] period' is 5 years
- Step2.1: Take CCM data file for increments – 'Temperature – weather station ID_increments_2012_2025' (Met Office file provided in GMT)
- Step 2.2: Convert data into Local Time and select increments from period 01/10/2015 to 01/10/2020 (5 year period)
- Step 2.3: Calculate the average hourly increment value for each calendar day
  - Rounded to 1 dcp - 29th Feb not included
- Step 2.4: Take CCM data file for adjusted WSSM history – 'Temperature – weather station ID_adjhist' (Met Office file provided in GMT)

Step 2 "Apply Average Increment values to Adjusted history (rebasing to [X] period)"

- Step 2.5: For records in adjhist where there are missing values (-32768) apply E.On fill-in methodology
  - Note the WSSM 'filled-in' values from the equivalent missing timeslots cannot be used as they have not been adjusted for Climate Change
- Step 2.6: Convert data into Local Time and select all records – 01/01/1960 to 30/09/2012
- Step 2.7: Add the average hourly increment value (Step 2.3) for each calendar day to all applicable records in adjhist thereby rebasing to [X] period
  - Rounded to 1 dcp
  - Calendar day 29th Feb records in history use the combined average hourly increment value from 28th Feb and 1st March
- Step 2.8: Adjusted values from Step 2.7 are now ready to be used in Step 3 of overall approach

Use of Project Deliverables



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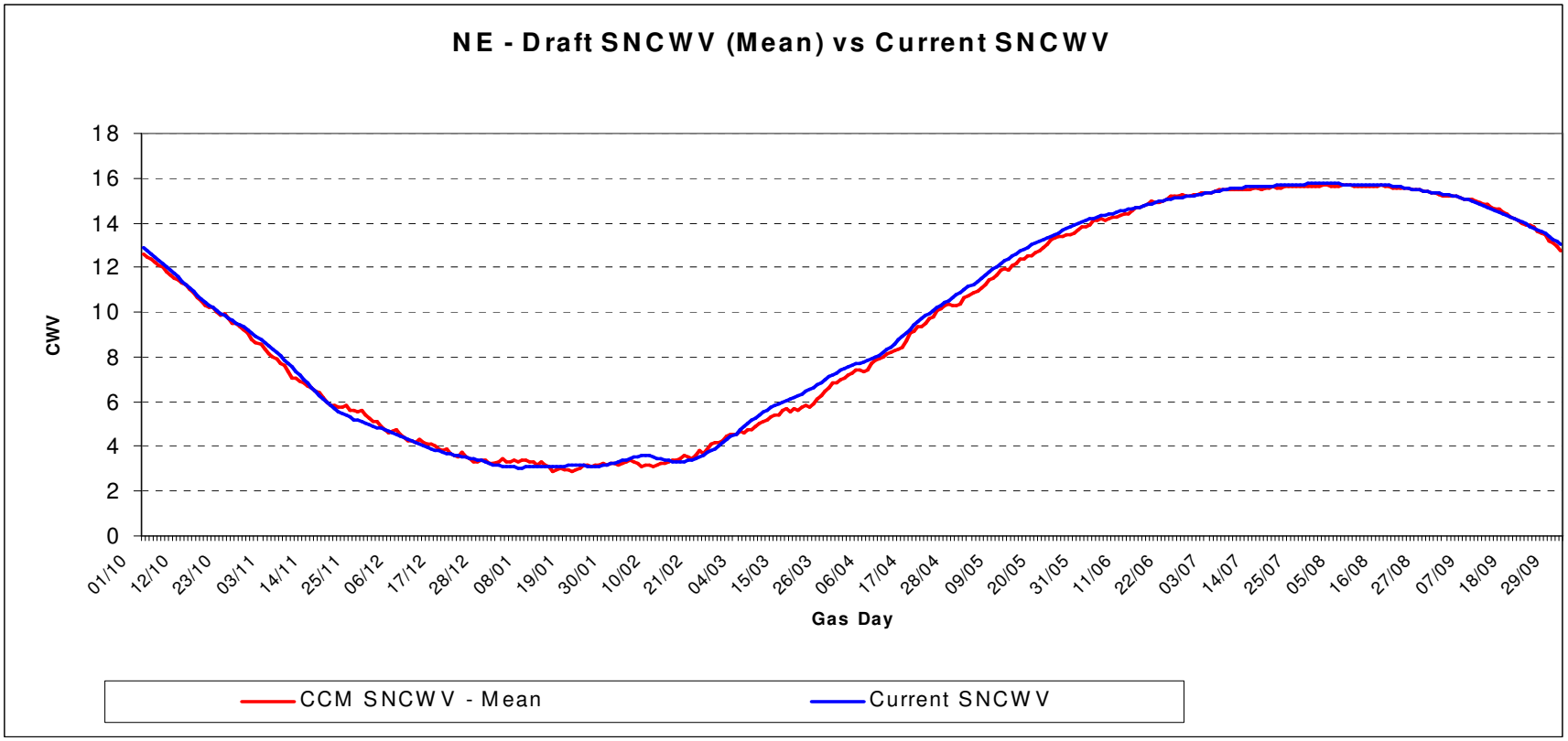
Step 3 "Using the further adjusted values from Step 2 to calculate the daily CWVs"

- Step 3.1 Take the CCM data for Wind Speed. 'Windspeed – weather station ID_adjhist' (Met Office file provided in GMT)
- Step 3.2 For records where there are missing values (-32768) apply E.On fill-in methodology
  - Note the WSSM values from the equivalent missing timeslots can be used as there is no adjustment for Climate Change
- Step 3.3 Convert wind speed data into Local Time and select all records 01/10/1960 to 30/09/2012
- Step 3.4 Convert wind speed data from m/s into knotts using conversion of 1.943844
  - Rounded to whole numbers

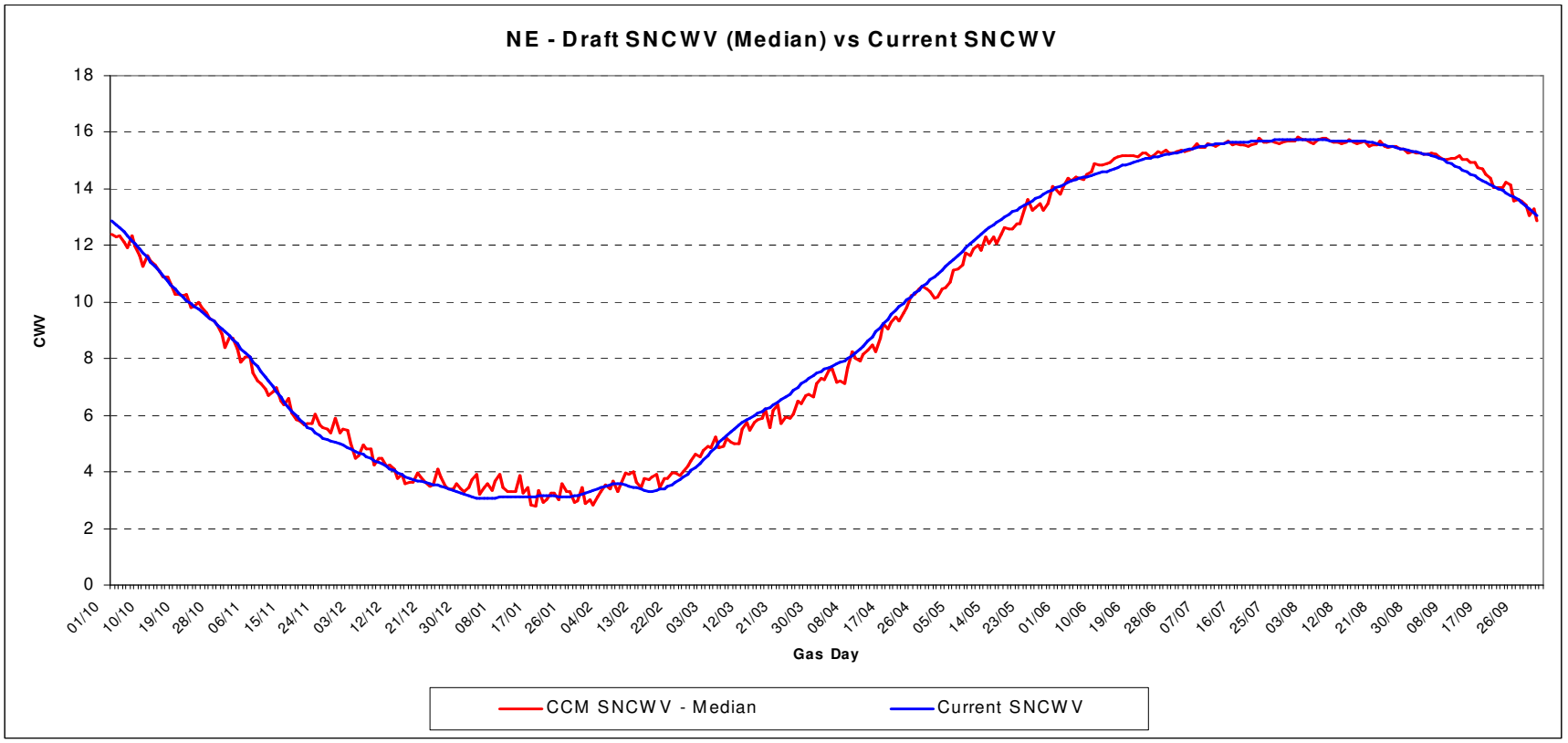
Step 3 "Using the further adjusted values from Step 2 to calculate the daily CWVs"

- Step 3.5 Convert temperature and wind speed data into daily average values by gas day
  - Using 5am to 3am timeslots for Temperature and existing timeslots for Wind speed
- Step 3.6 Using the data from Step 3.5 calculate a set of daily CWVs using optimised parameters (for the purposes of this 'walk through' exercise the current parameters have been used)
  - CWVs calculated to 2 dcps
  - Daily CWV data series generated from 01/10/1960 to 30/09/2012
- Remaining part of Step 3: "determine a Seasonal Average by way of mean or median of daily values"
- Step 3.7 Using the data series generated in Step 3.6 calculate the mean (or median) of each gas day to form an SNCWV profile
  - Note: There has been no smoothing applied to these values

Draft SNCWV – Using MEAN of daily CWVs



Draft SNCWV – Using MEDIAN of daily CWVs



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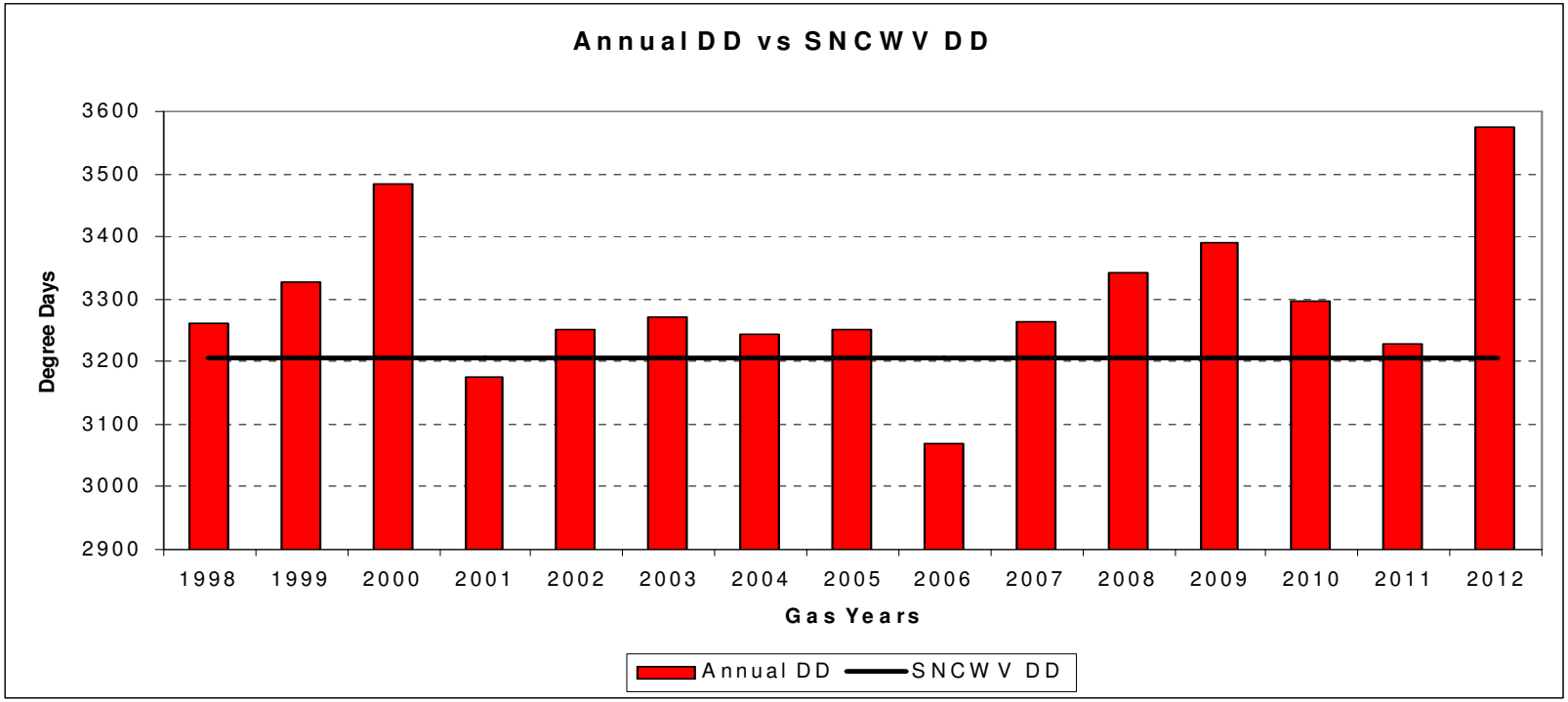
Degree Day Analysis

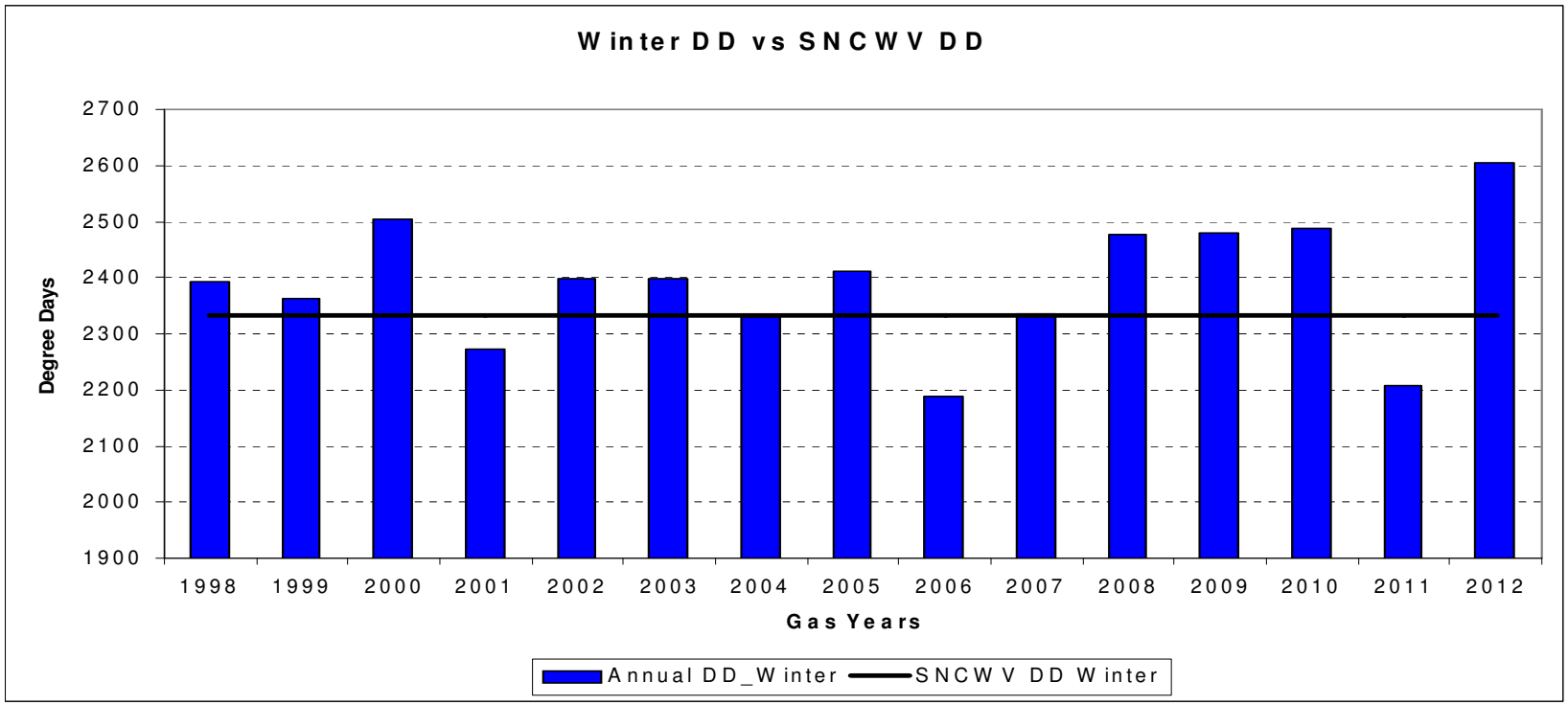
- One measure which is often used in the gas industry to summarise the weather experienced is Degree Day (DD) analysis
- This can also be used to assess how the Seasonal Normal basis has performed against recent years
- A Degree Day is calculated as the difference between a threshold value and the actual CWV
  - Lower figure = warmer weather / Higher figure = colder weather
- The Degree Day (DD) can then be used as a single figure which represents weather trends for any given period
- Xoserve has used this approach to assess recent gas years for NE at an annual level and by Winter (Oct to Mar) and Summer (Apr to Oct)
  - Calculated by summing the daily differences for relevant period

Degree Day Analysis – NE – Annual Results



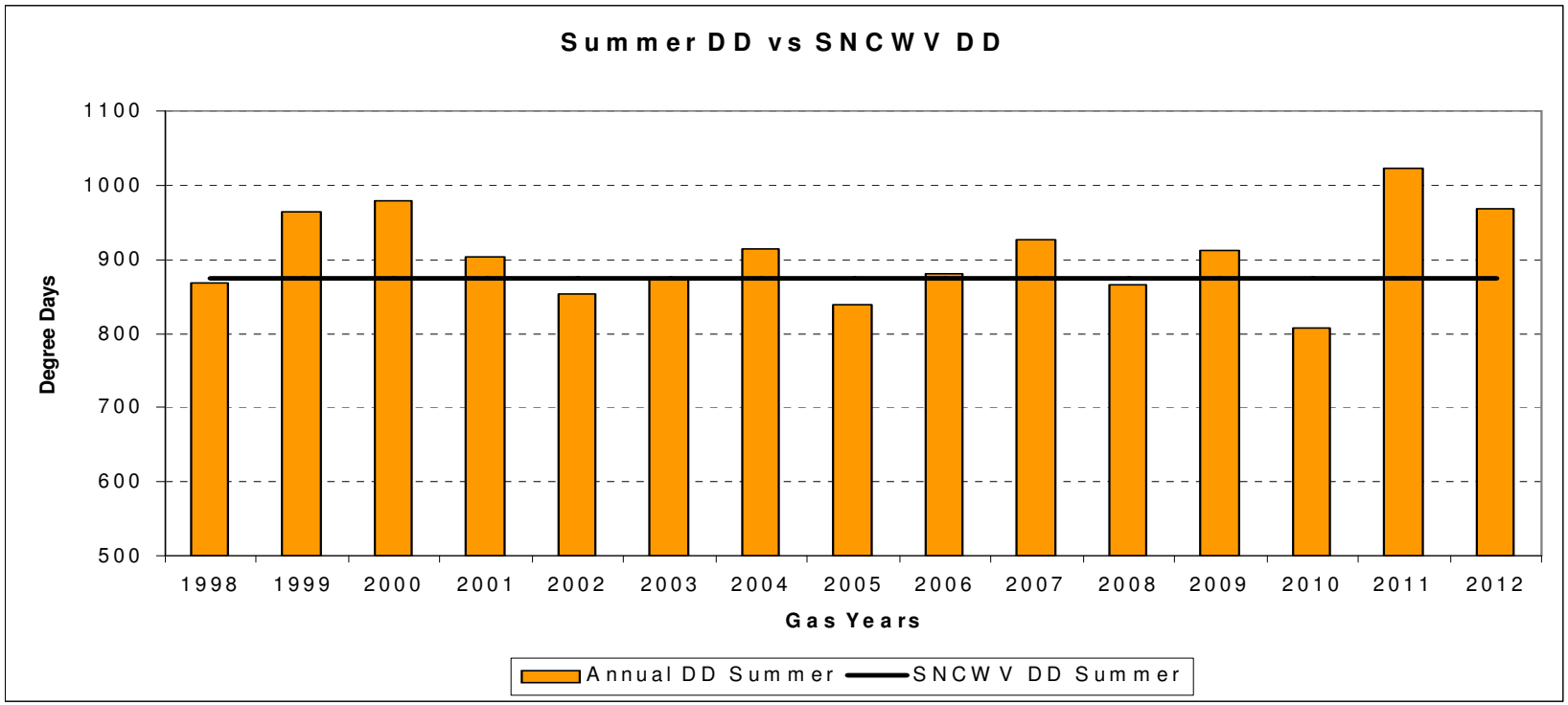
- SNCWV based on current Seasonal Normal

Degree Day Analysis – NE – Winter Results



- SNCWV based on current Seasonal Normal

Degree Day Analysis – NE – Summer Results



- SNCWV based on current Seasonal Normal

Options & Next Steps

- Decision on [X] period for increments needs to be finalised
- TWG comments welcome on Xoserve's interpretation of DESC high level agreement on use of CCM data files