

# **New Seasonal Normal Basis**

Demand Estimation Sub-Committee

22<sup>nd</sup> December 2009

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# Background

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- The seasonal normal weather basis should be a reasonable representation of “normal” weather in each LDZ appropriate for gas demand modelling.
- The current set of SNCWVs were agreed in 2005 and are based on 17 years of historical data (1987/88 to 2003/04).
- Revised SNCWVs are now required for the next defined seasonal normal period, namely from 1<sup>st</sup> October 2010 until 30<sup>th</sup> September 2015
- Following the extra-ordinary DESC meeting held on 2<sup>nd</sup> December 2009, the revised Transporter approach to deriving the new seasonal normal basis has been published on the Joint Office website:
  - [‘Transporters Approach\\_Seasonal Normal Basis.pdf’](#)

# Key Aspects of New Seasonal Normal Basis

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- The new basis combines gas industry daily weather history and forecast climatology temperature increments (originally at an hourly level) from the EP2-WP8 project.
- No increments are available for wind speeds.
- The new basis uses the forecast increments for the target future year of 2012/13 (the mid year of the next 5 year basis period).
- The fixed increments comprising the original EP2-WP8 outputs have been refined to derive linearly varying increments applicable to the years 1971 to 2006. The approach taken is that suggested by the Met. Office (see next two slides for schematic illustration).
- The approach derives 36 different daily CWV values and takes the mean of each such set for each day of the target gas year (2012/13).
- These values are then smoothed using the “loess” method to give an annual seasonal normal profile.

# Application of Linearly Varying Increments

(extracted from page 9 of the Met Office review report)

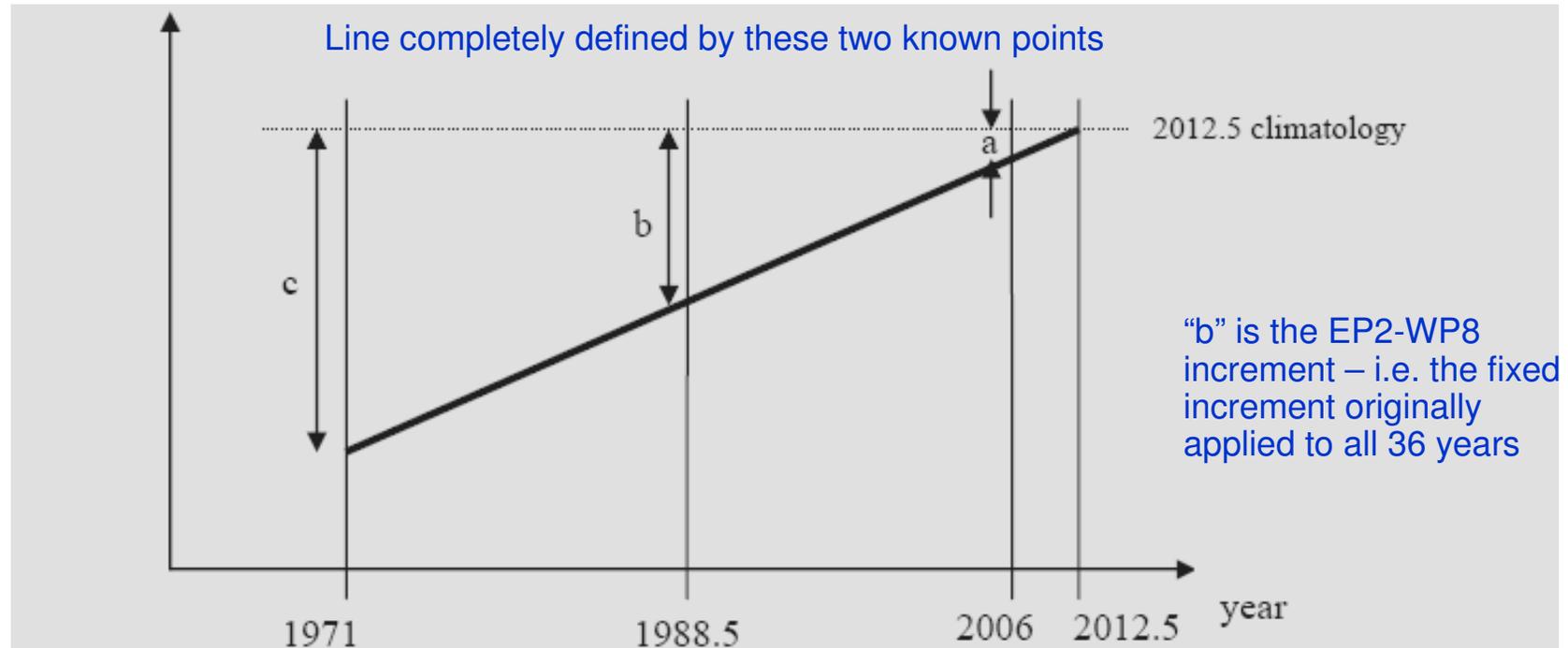


Fig. 2: Schematic illustration of a potential method for applying EP2-WP8 corrections to adjust temperature climatology in individual years 1971-2006 to values appropriate for 2012.5. The bold line shows the assumed linear warming over the 1971-2012.5 period. To adjust climatology in any year to 2012.5 climatology, progressively larger corrections are required for years further back in time (as illustrated by distances a, b and c). 1988.5 is the central point of the 1971-2006 period used in the EP2-WP8 climatologies: under the linear assumption, the correction applied at this point (b) will be equal to the EP2-WP8 correction.

# Application of Linearly Varying Increments

(extracted from page 10 of the Met Office review report)

With the linear assumption, corrections for other years (e.g. 'a' and 'c' in Fig. 2) may be calculated using the following formula.

$$C(Y) = C_{EP2} \times \frac{(2012.5 - Y)}{(2012.5 - 1988.5)} , \quad (1)$$

where  $C(Y)$  is the correction for year  $Y$  and  $C_{EP2}$  is the EP2-WP8 correction for 2012.5.

From equation (1) the multiplication factor on  $C_{EP2}$  for 1988.5 is 1.0, and no change is made to the EP2-WP8 correction. The multiplication factor is greater than 1.0 for years earlier than 1988.5 and smaller than 1.0 for years after 1988.5. As desired, no correction [ $C(Y)=0$ ] is made to the trend line at 2012.5.

# Results Set

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- All data has been derived using the newly revised definitions of CWV.
- Degree day values are based on the threshold value appropriate for aggregate NDM demand in each LDZ
- Charts are provided for each LDZ showing the old and new annual degree day levels and the annual degree days for each year since 1987/88 (the start of the old basis period).
- Graphs are provided for each LDZ showing the old 17-year based seasonal normal profile and the new seasonal normal profile.
- Files of data (for all LDZs) available on xoserve website:
  - Historical daily CWVs for each LDZ: 01/04/1928 to 30/09/2009
  - New basis SNCWV profile values (expressed for 2010/11 dates)
  - New SNET profile values (expressed for 2010/11 dates)

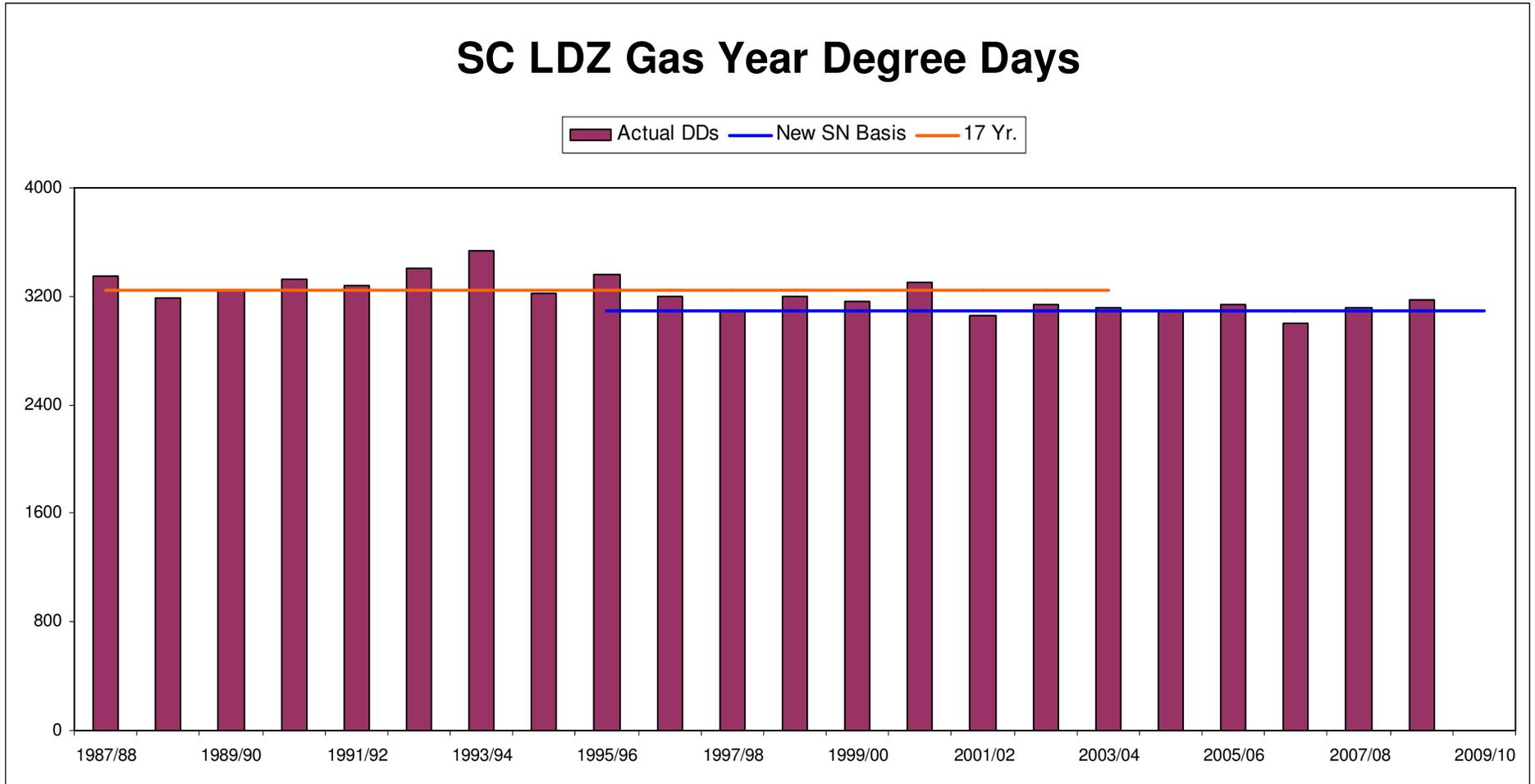
# Charts of Annual Degree Days

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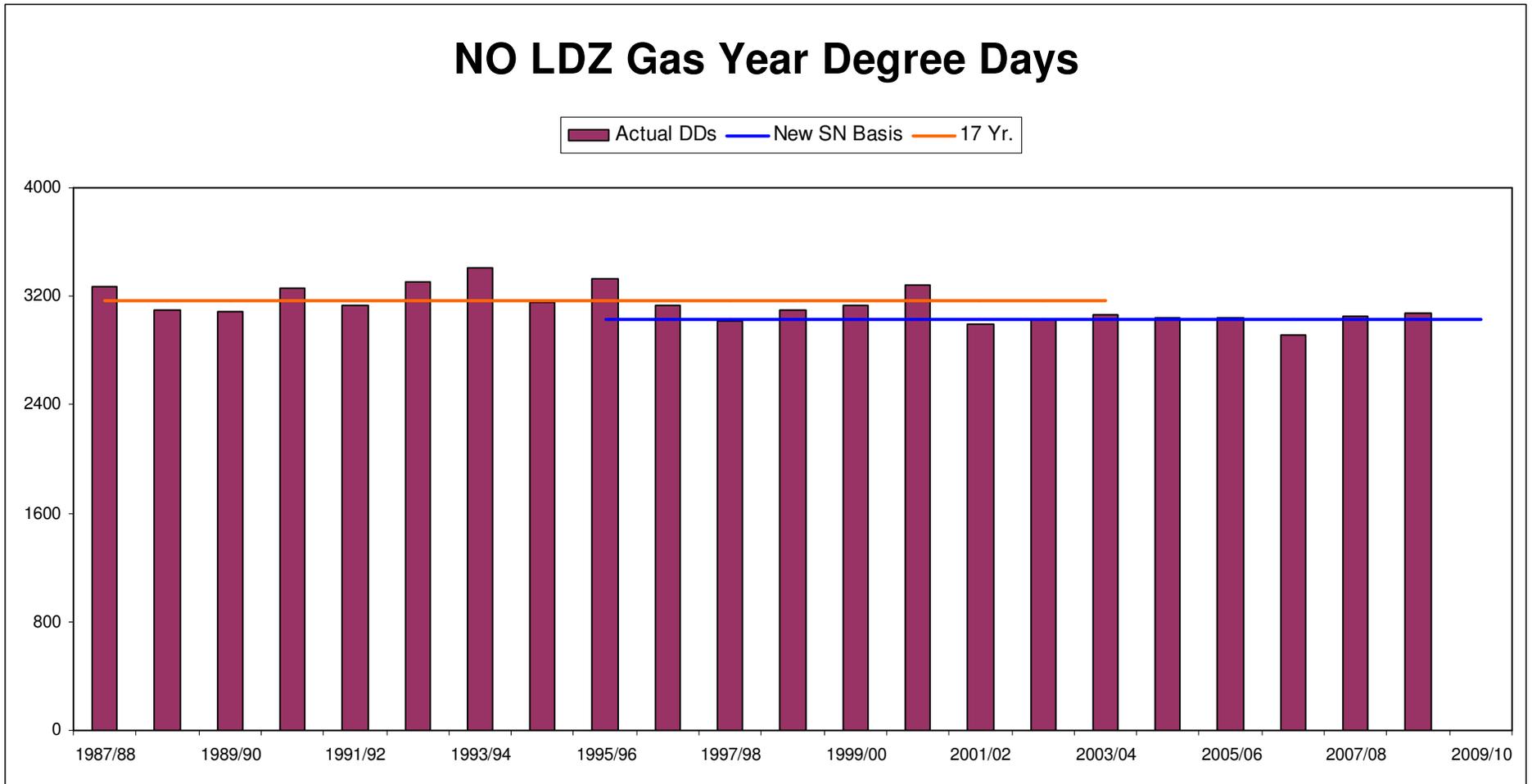
- Annual degree day charts show new seasonal normal basis level and 17-year basis level.
- Globally, the past decade has been the warmest on record.
- In most LDZs, over the 10 years 1999/00 to 2008/09 two gas years (2001/02 and 2006/07) have been warmer than the new seasonal normal basis.
- Over 10 years, in WS LDZ one year (2006/07) was warmer than the new basis and in NW & WN LDZs three years (2002/03 as well) were warmer.
- Over the most recent 5 and 6 years in every LDZ one gas year (2006/07) has been warmer than the new basis.
- The new basis is warmer than recently experienced actual annual weather in every LDZ.

# Results

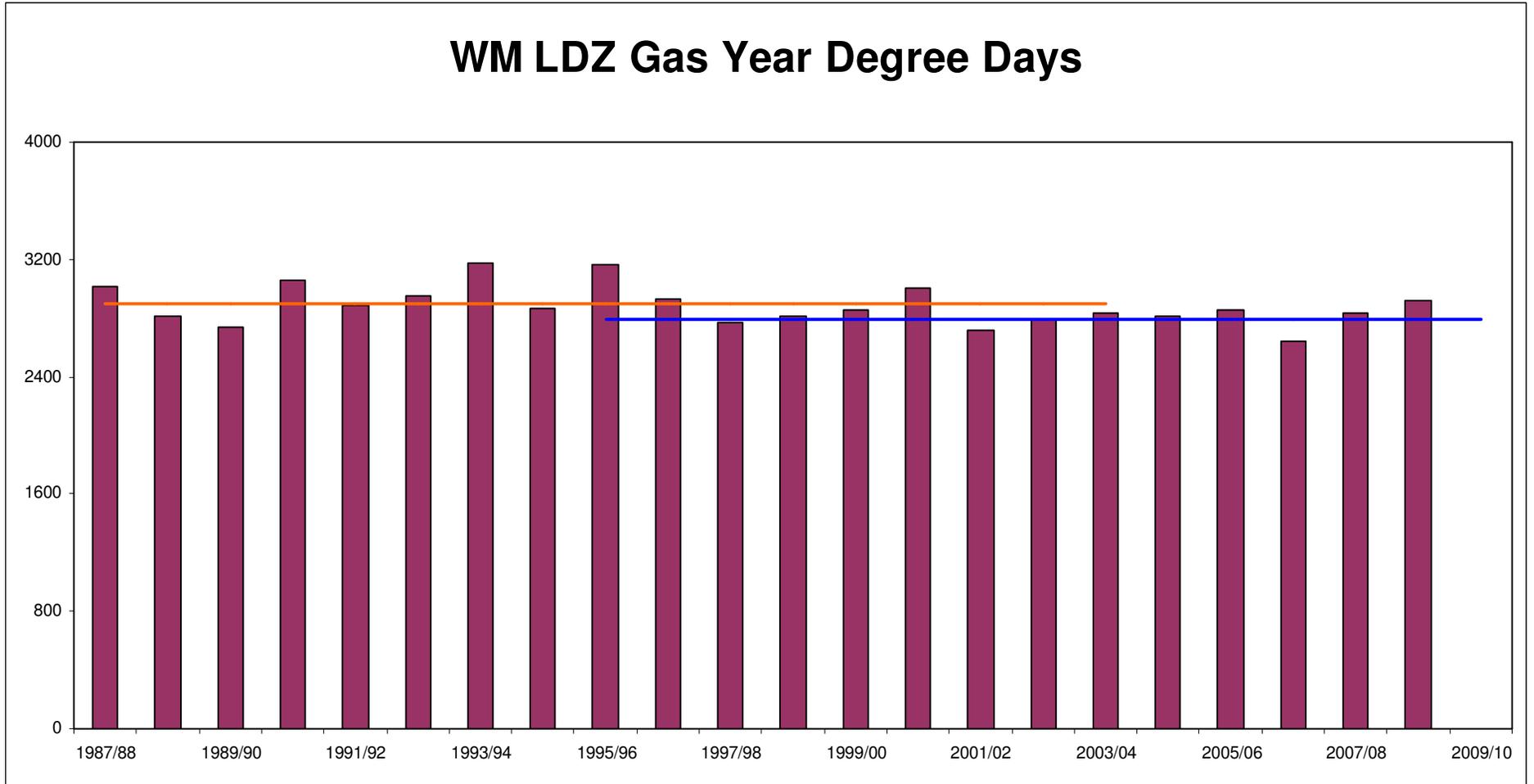
# SC LDZ



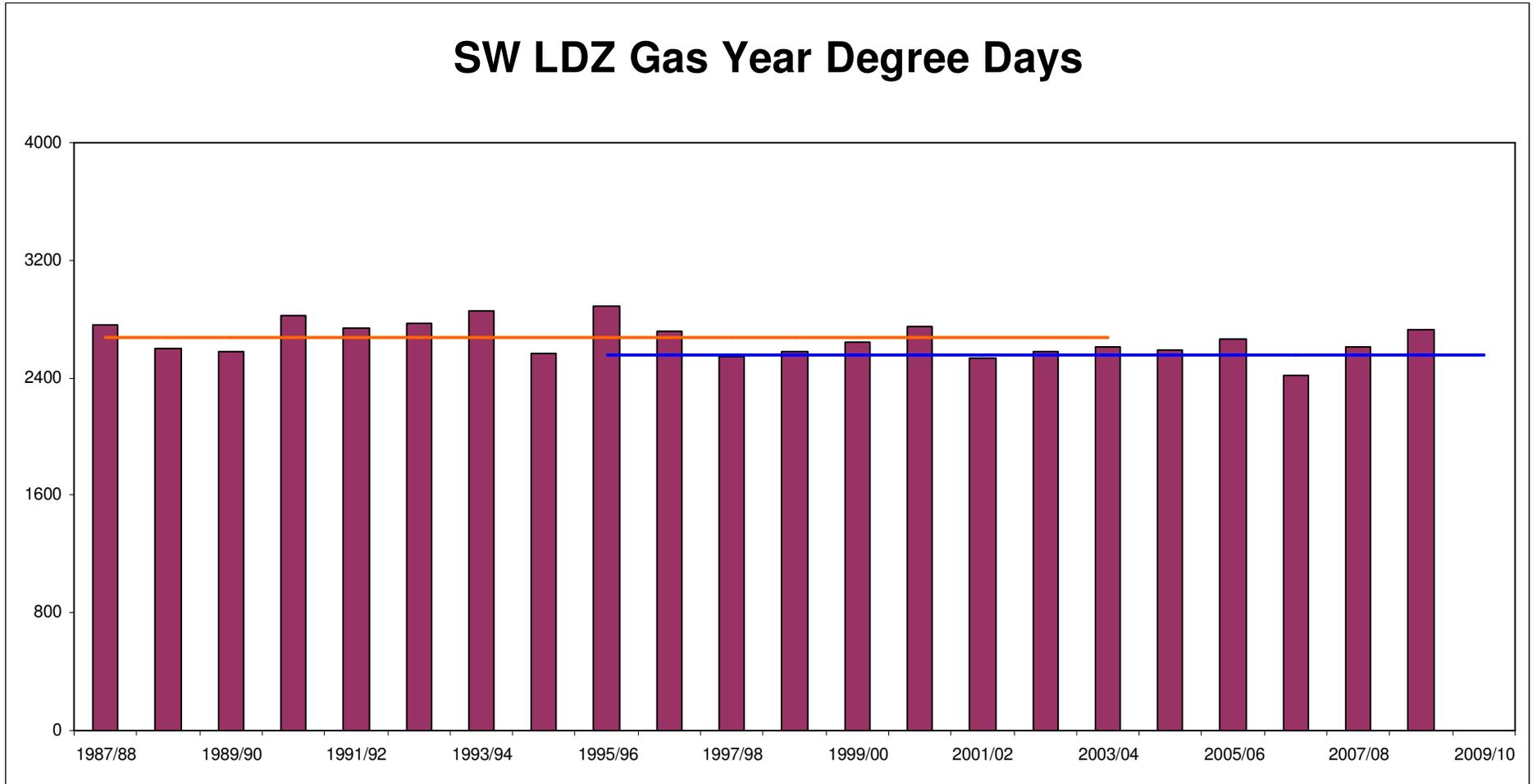
# NO LDZ



# WM LDZ



# SW LDZ



# Degree Day thresholds and Overall % Change

LDZ	Agg. NDM Threshold	% Warming (from 17-yr. basis)
SC	17.4	4.5%
NO	16.6	4.3%
NW & WN	18.9	4.6%
NE	18.5	4.4%
EM	17.6	4.5%
WM	17.5	3.9%
WS	18.4	4.4%
EA	18.7	3.6%
NT	19.0	3.5%
SE	18.6	3.7%
SO	18.1	4.3%
SW	17.6	4.4%

# Extent of Change in Seasonal Normal Basis

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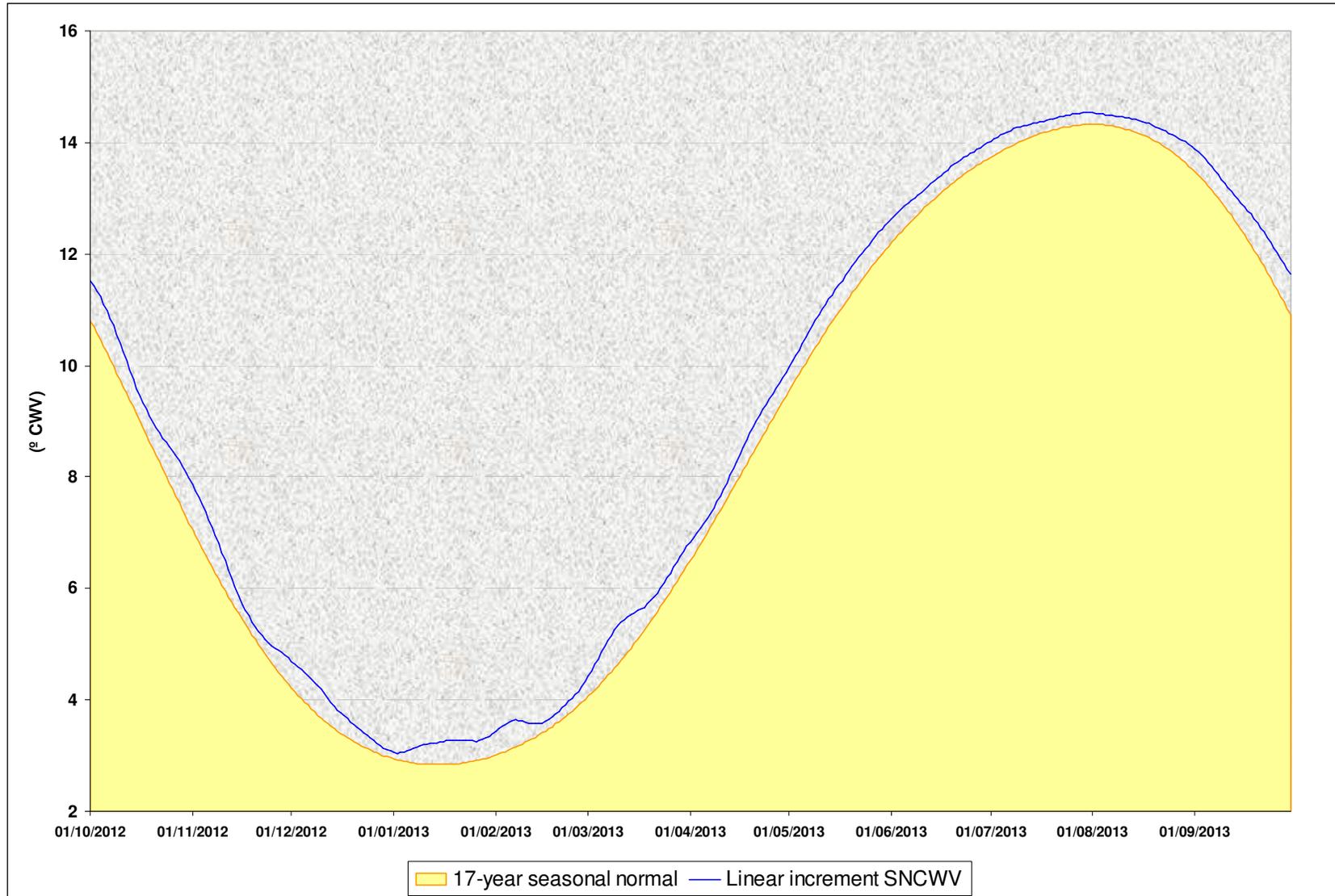
- Overall % warming is a little over 4% nationally.
- Annual aggregate NDM AQ changes have been:
  - 4.4% (reduction) in 2009/10
  - 3.4% (reduction) in 2008/09
  - 4.0% (reduction) in 2007/08
- Not unreasonable to expect a similar AQ reduction in 2010/11 (e.g. ~4%) irrespective of the seasonal normal basis change (e.g. general demand reduction).
- Overall change could be of the order of 8%.

# New Seasonal Normal Basis Profiles

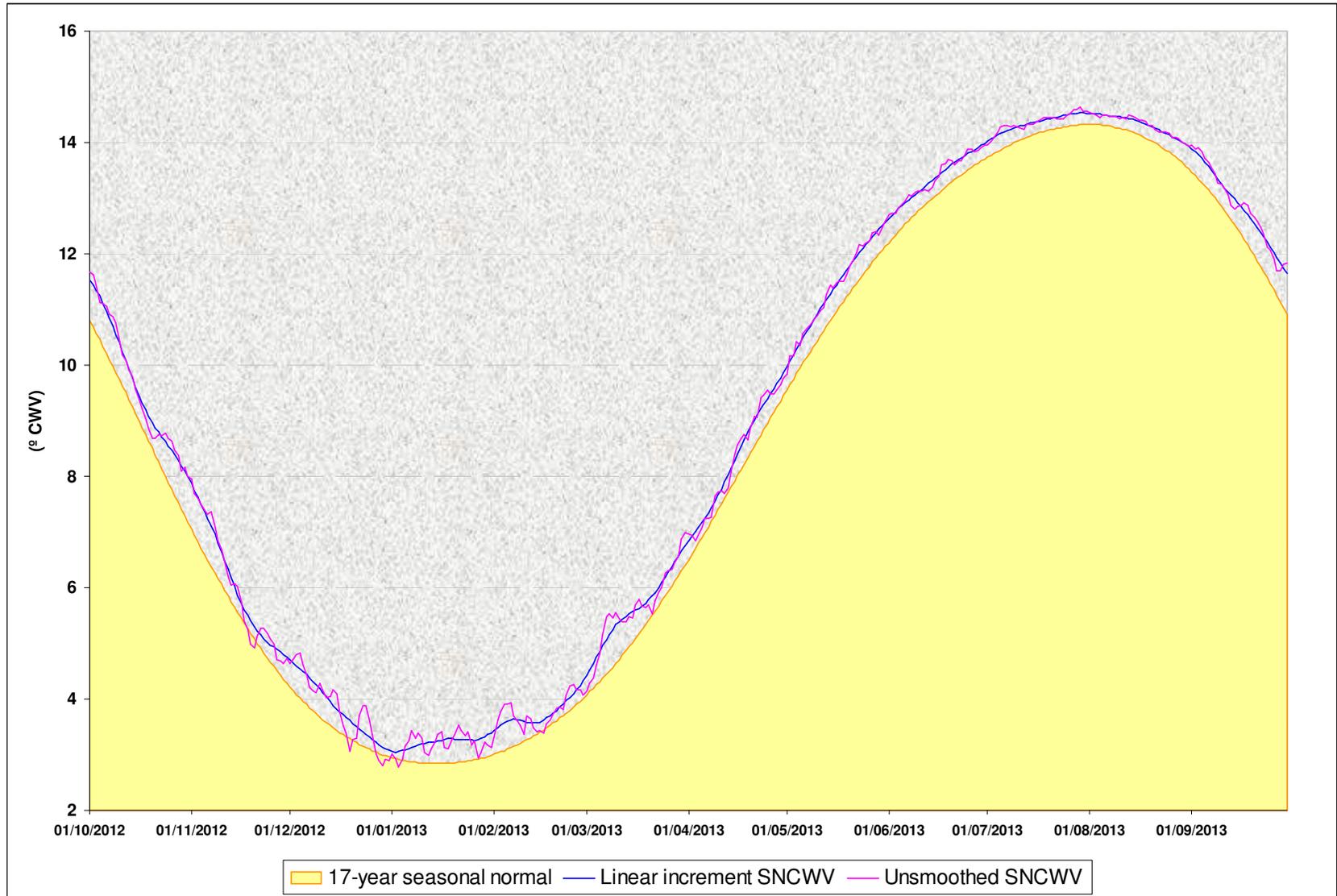
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- New profiles have been smoothed using the “loess” method.
- The new profiles clearly show meteorological phenomena such as the Buchan spell in (mainly) February.
- February Buchan spell is longer in more southerly LDZs (e.g. EA, NT, SE, SO, SW)
- Days making up February Buchan spell colder than 17-year basis in most LDZs (only SC LDZ excepted).
- Profiles all generally warmer than 17-year basis outside of February Buchan spell.
- Coldest days of profiles now in early January in all LDZs.
- Shape of EUC ALP profiles will be different especially over February Buchan spell; for example: weekday/weekend relative ALP values will show changes through the year.

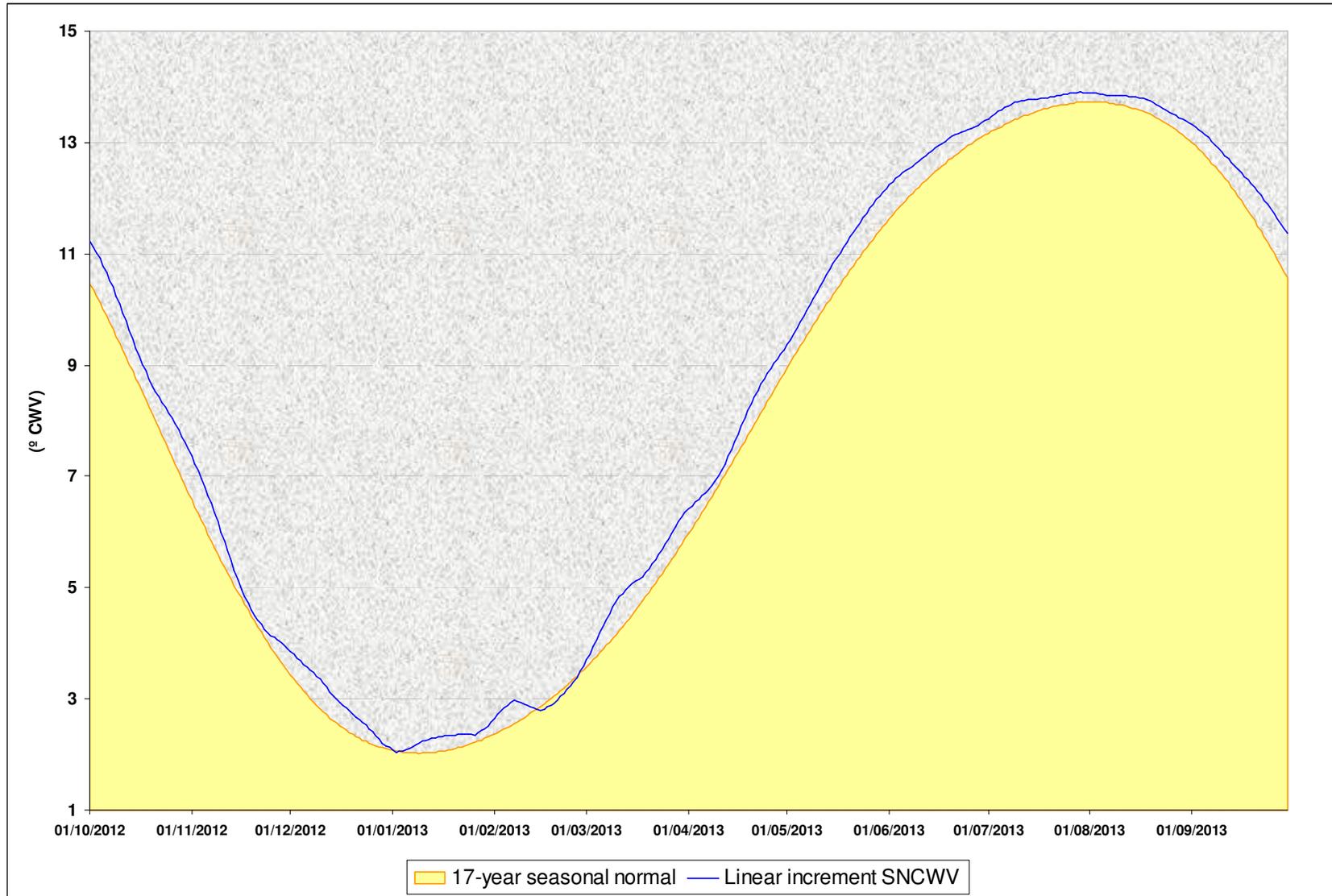
# SC LDZ



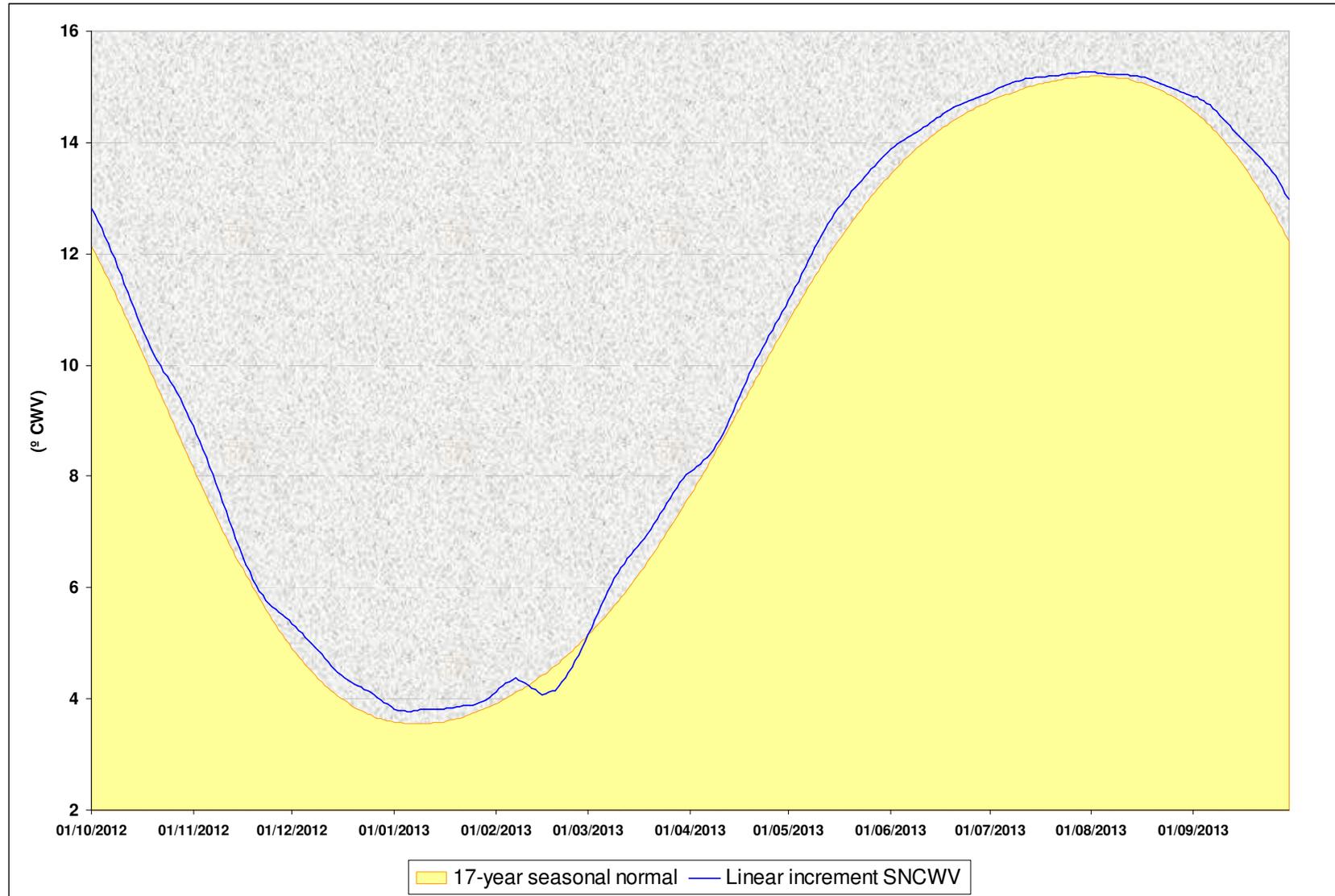
# SC LDZ



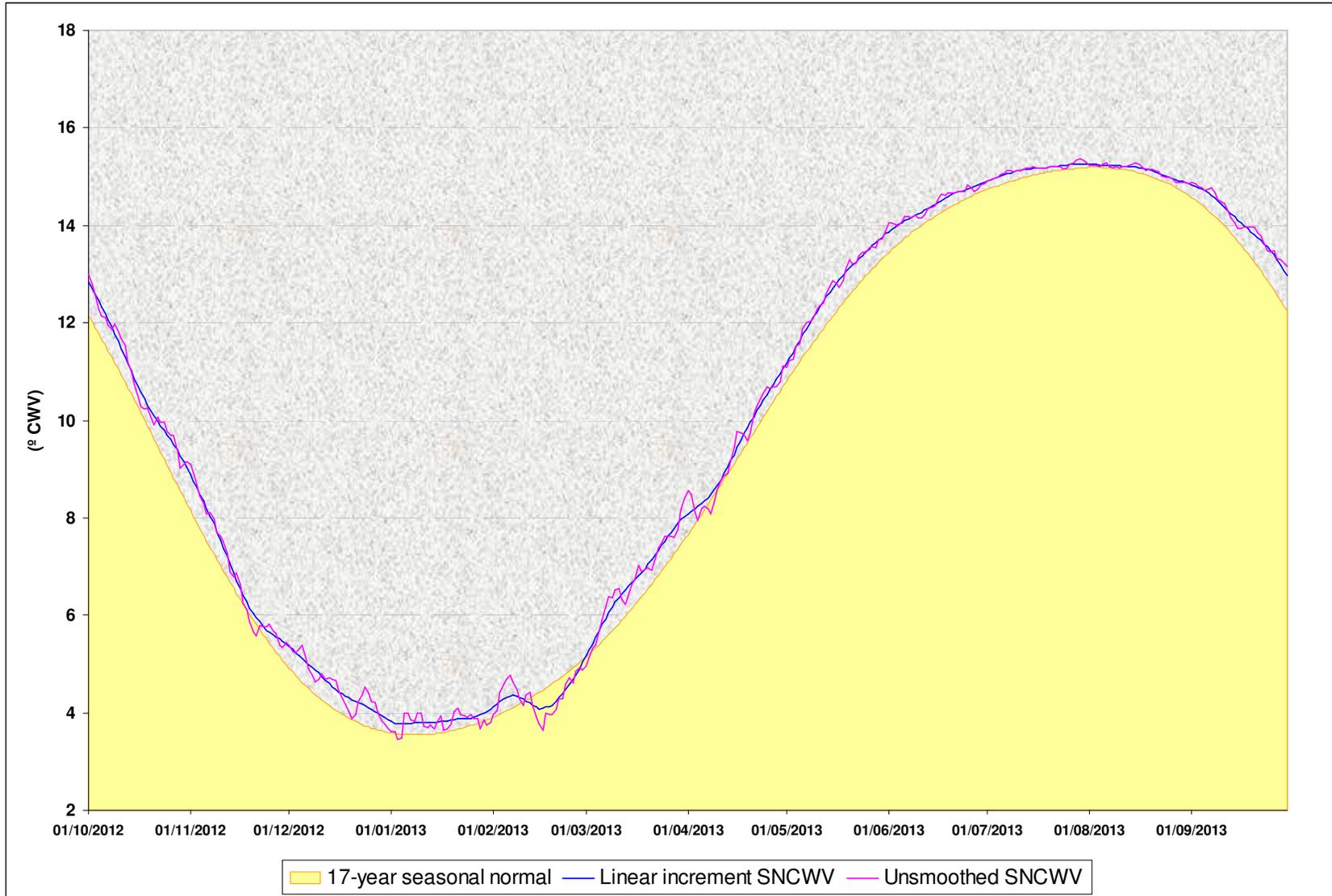
# NO LDZ



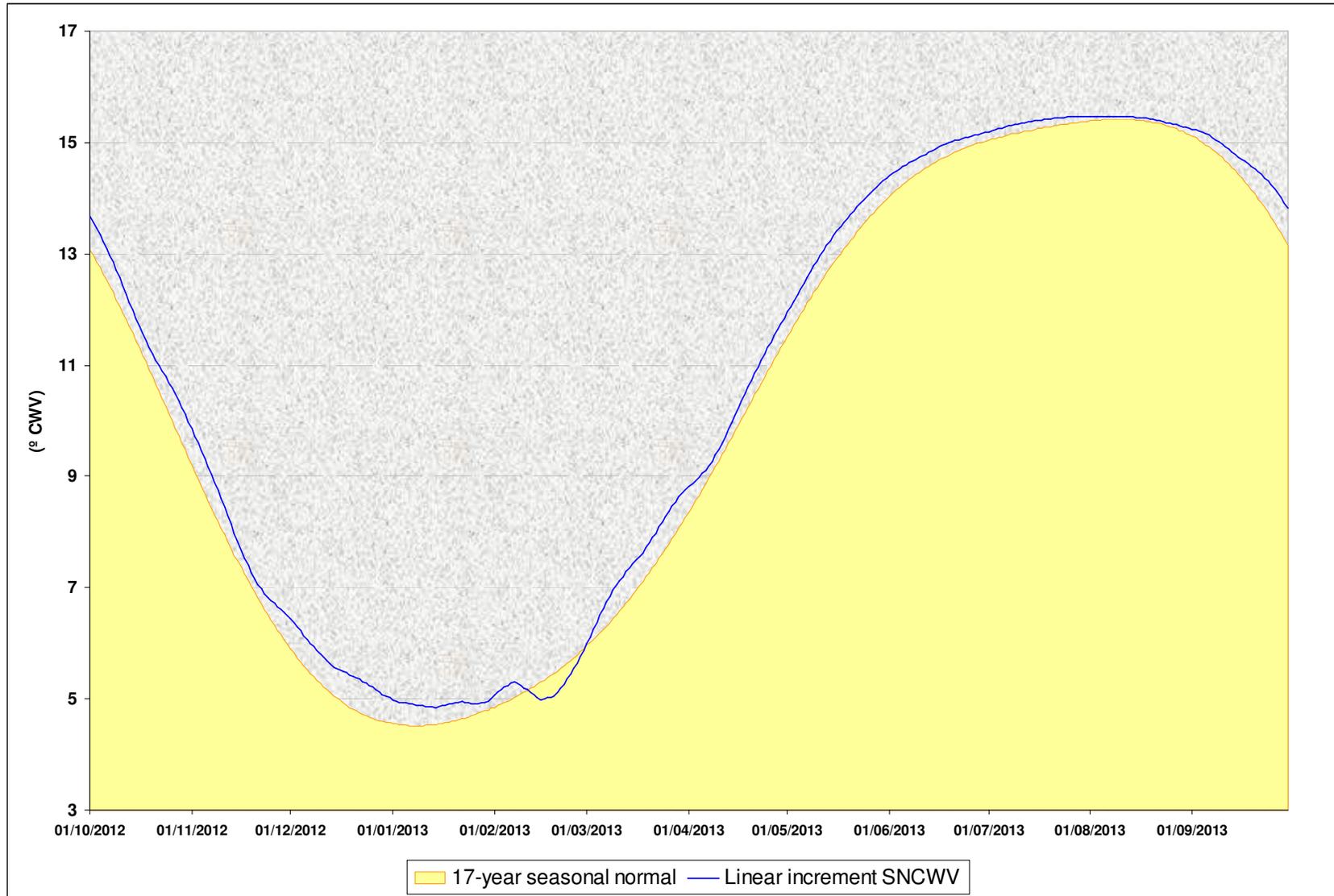
# WM LDZ



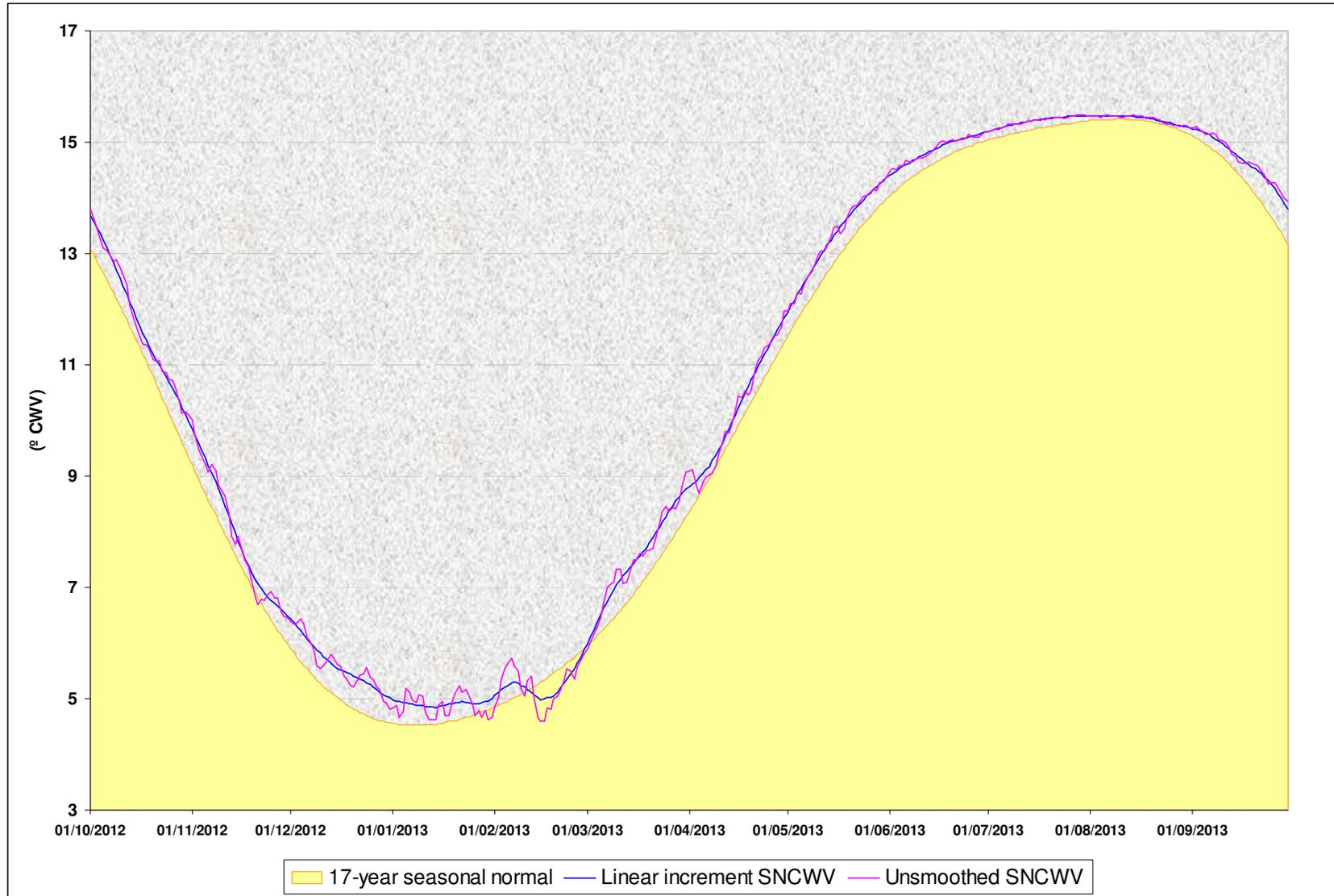
# WM LDZ



# SW LDZ



# SW LDZ



# Application of New SNCWVs and CWVs

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## Work to be done in Jan/Feb/Mar 2010:

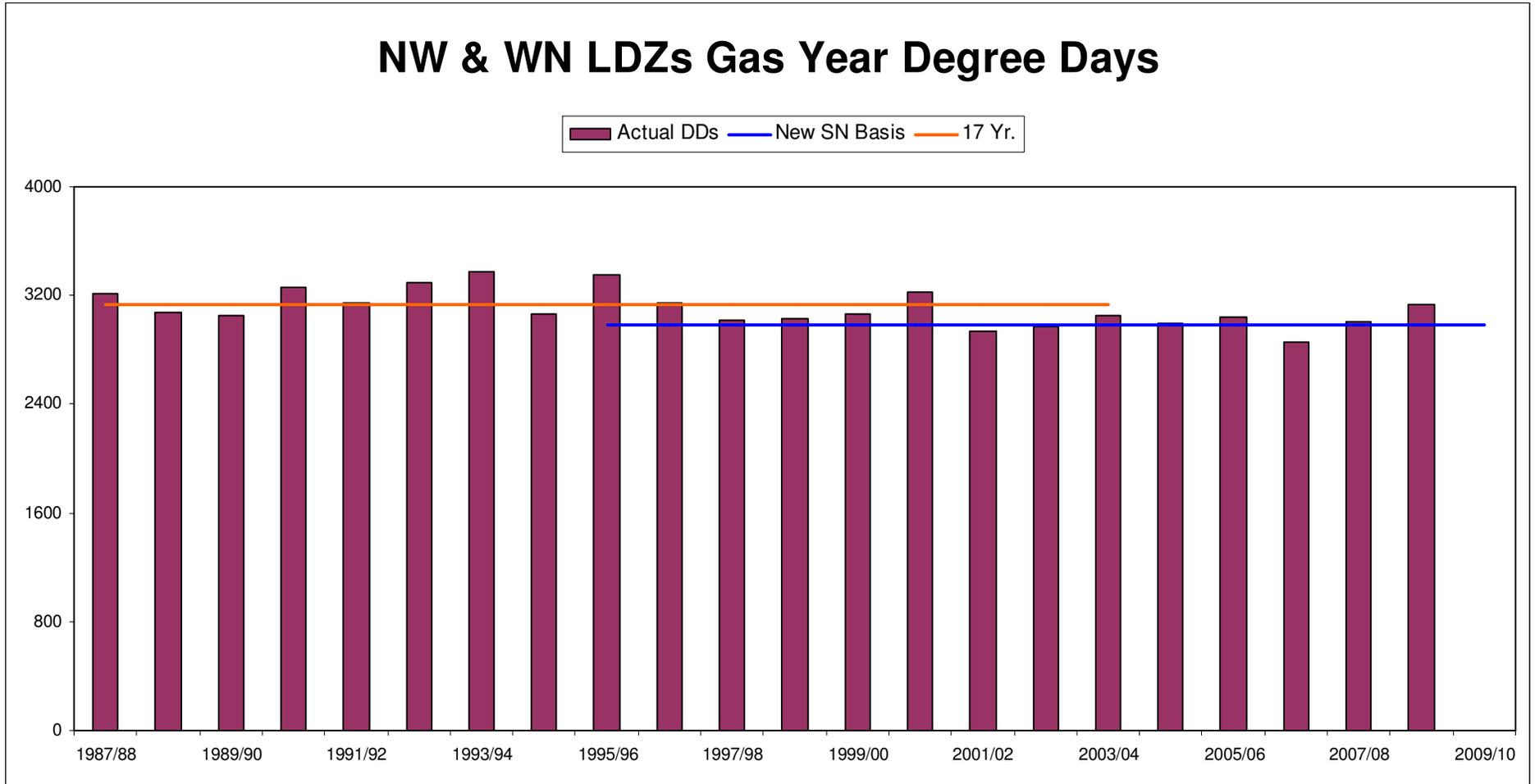
- Spring 2009 NDM analysis reworked using new CWVs and SNCWVs.
- Additionally do back-runs of individual years' EUC models using new CWVs and SNCWVs required for spring 2010 NDM analysis.
- Produce revised WAALPs for all EUCs from 01/10/2006 onwards using new CWVs and SNCWVs – required for 2010 AQ review.
- Produce AQ factors for each EUC (to be applied when meter reads are not available).

## Work to be done in Apr/May/June 2010:

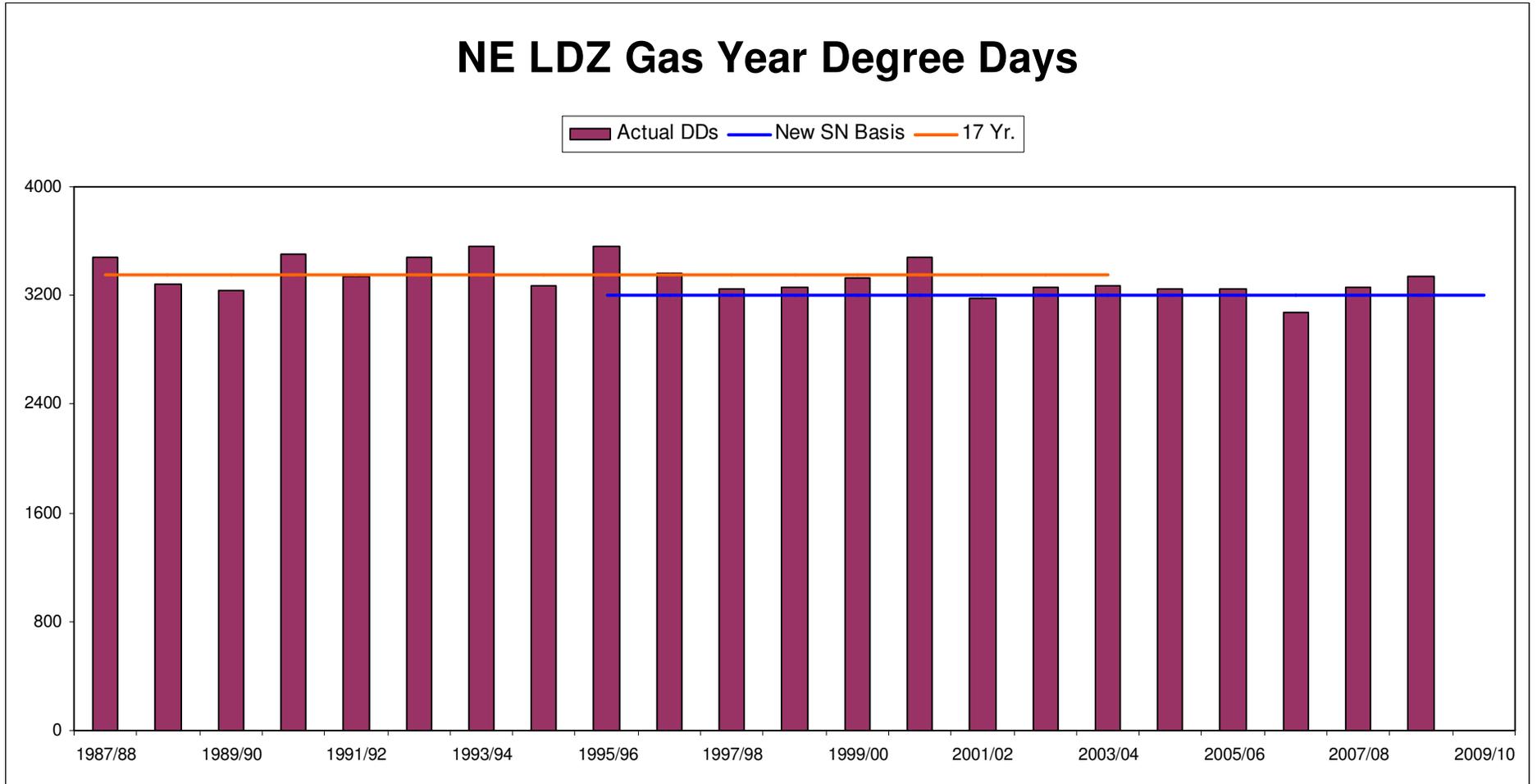
- Spring 2010 NDM analysis (using new CWVs and SNCWVs)

# Appendices

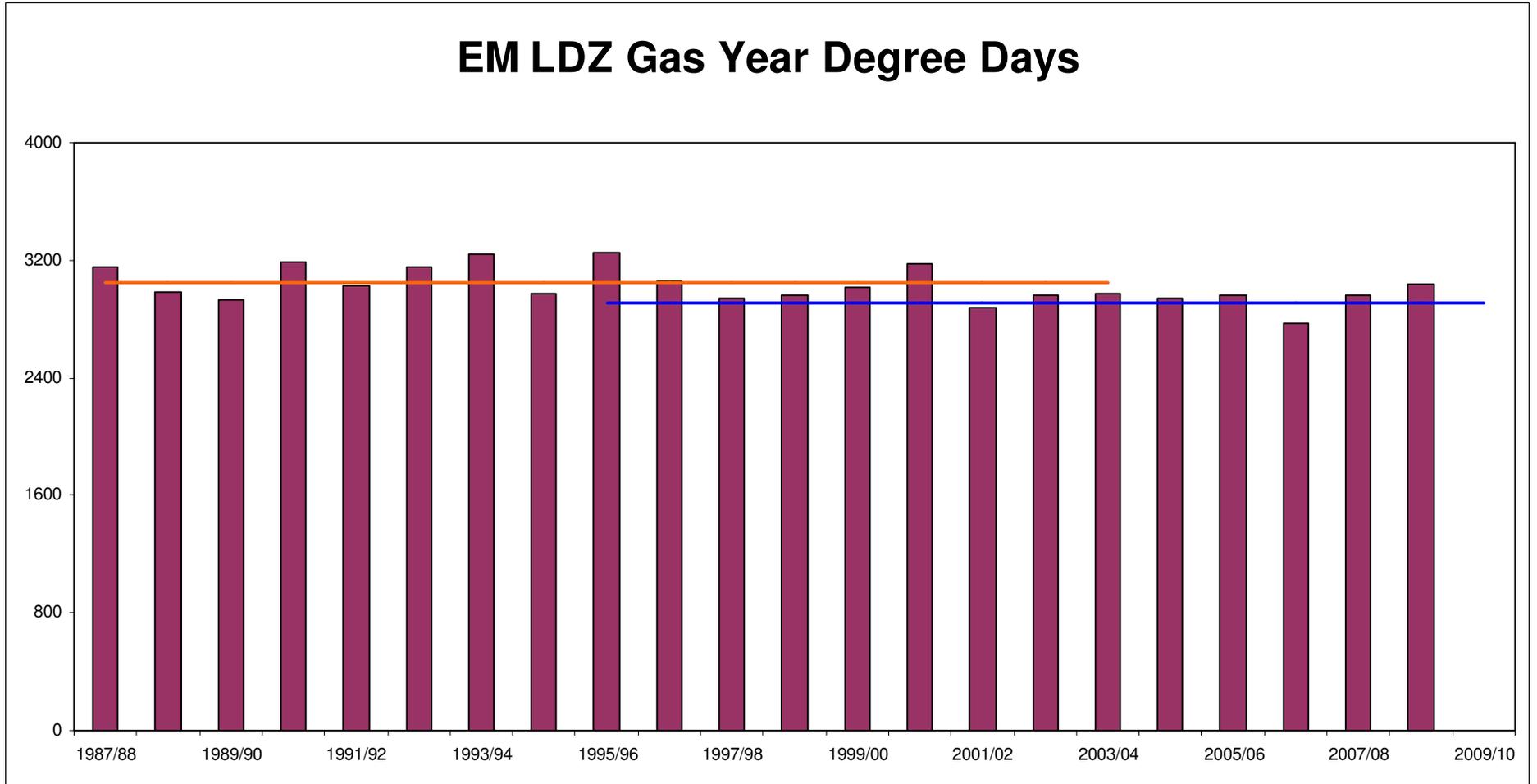
# NW & WN LDZs



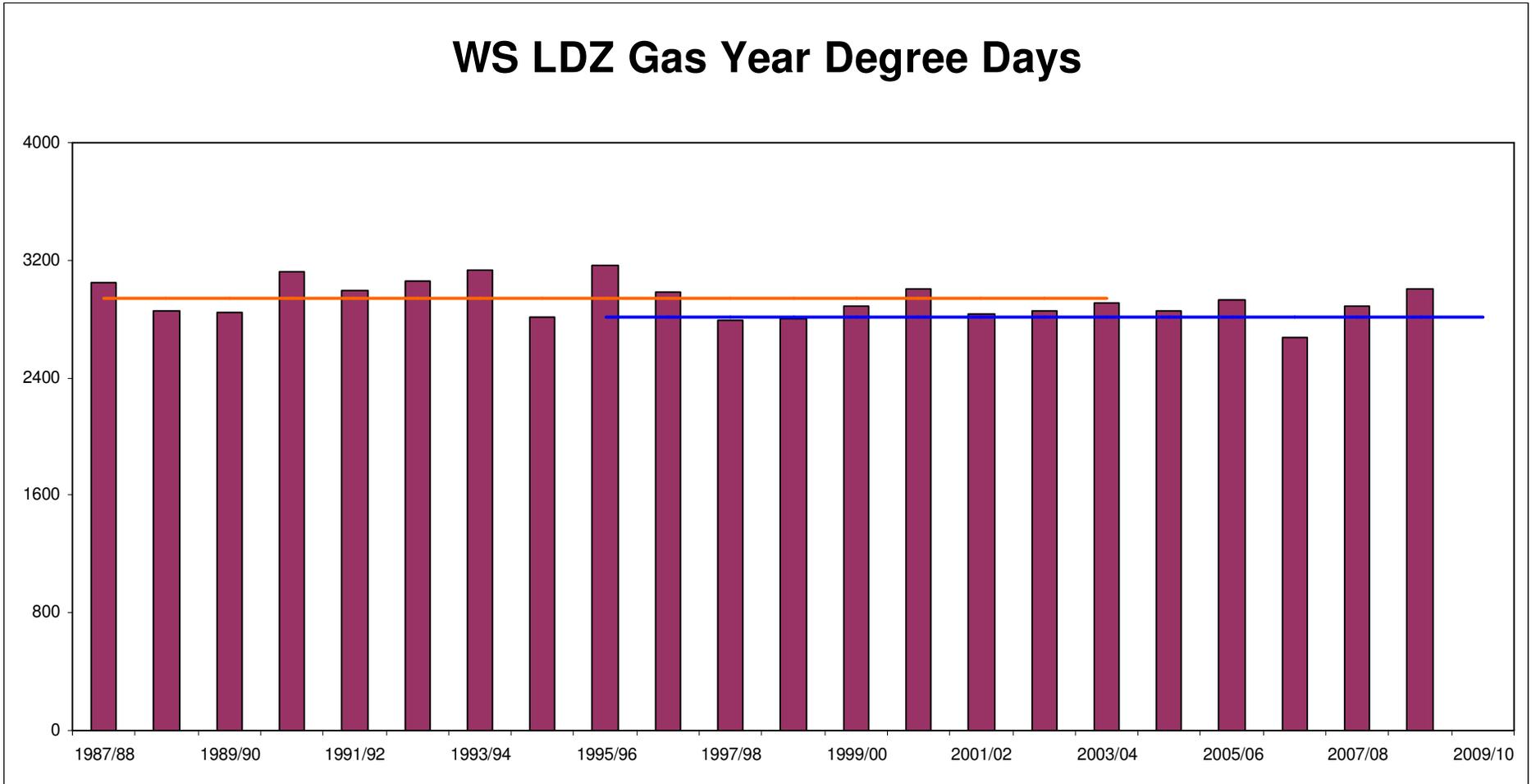
# NE LDZ



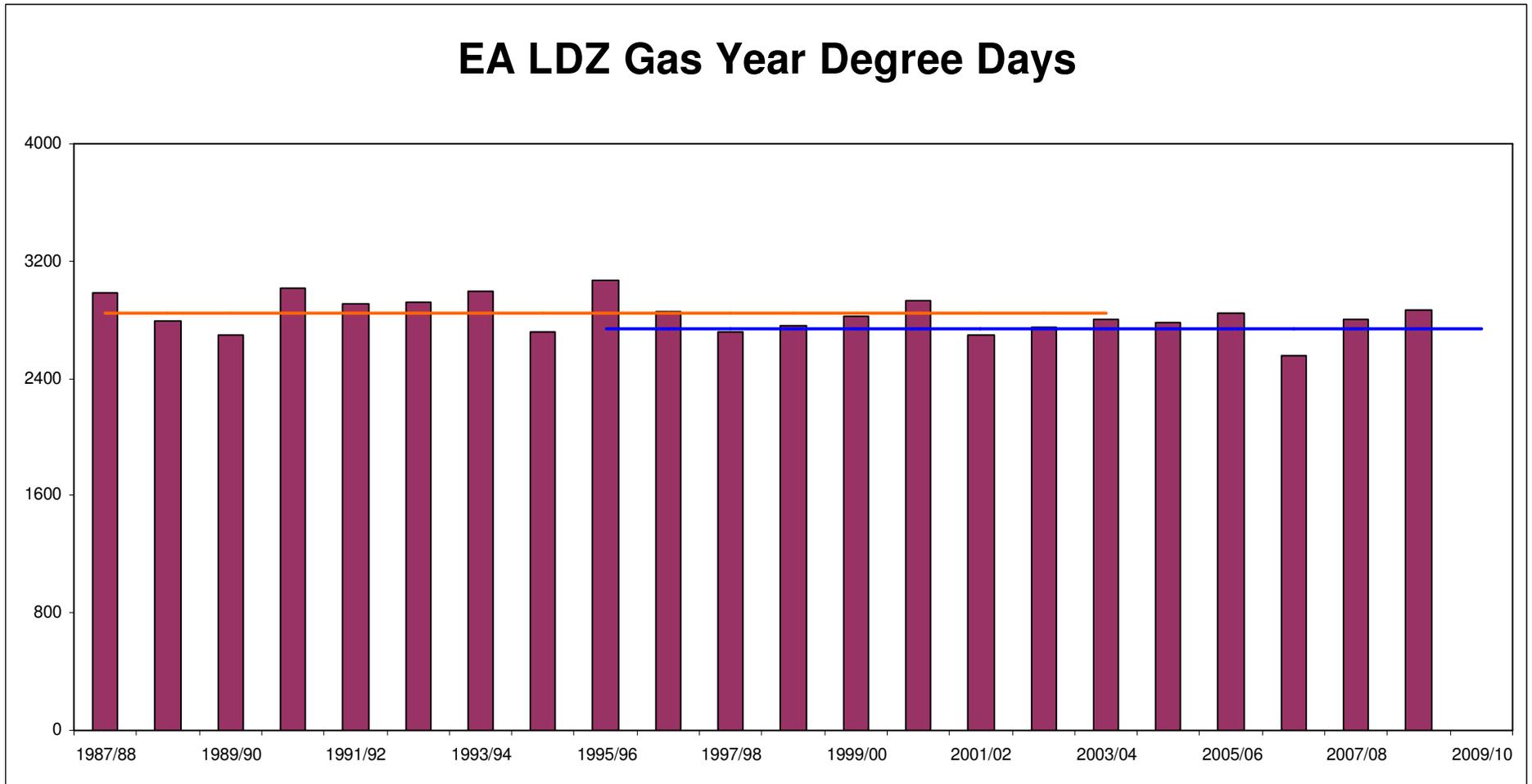
# EM LDZ



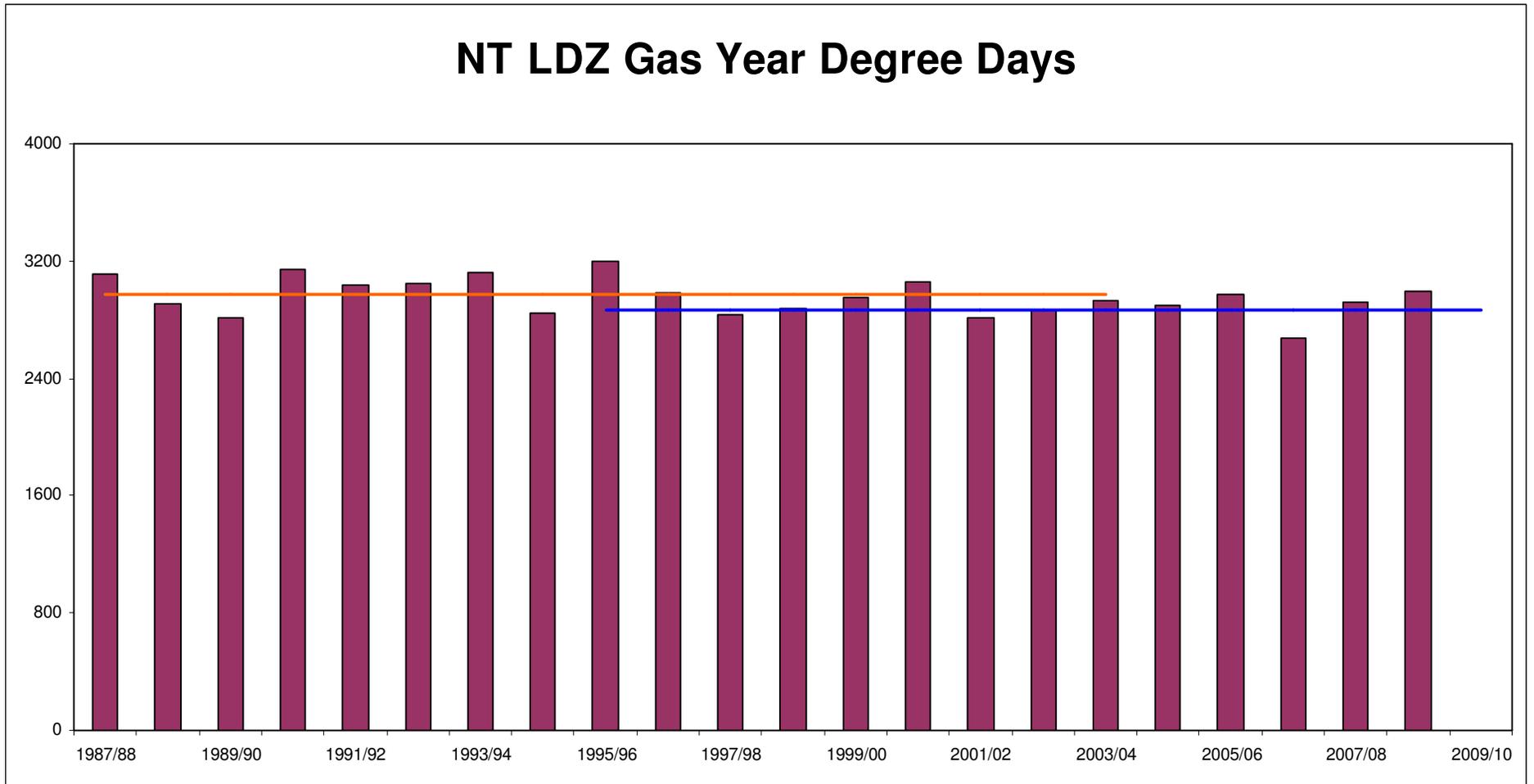
# WS LDZ



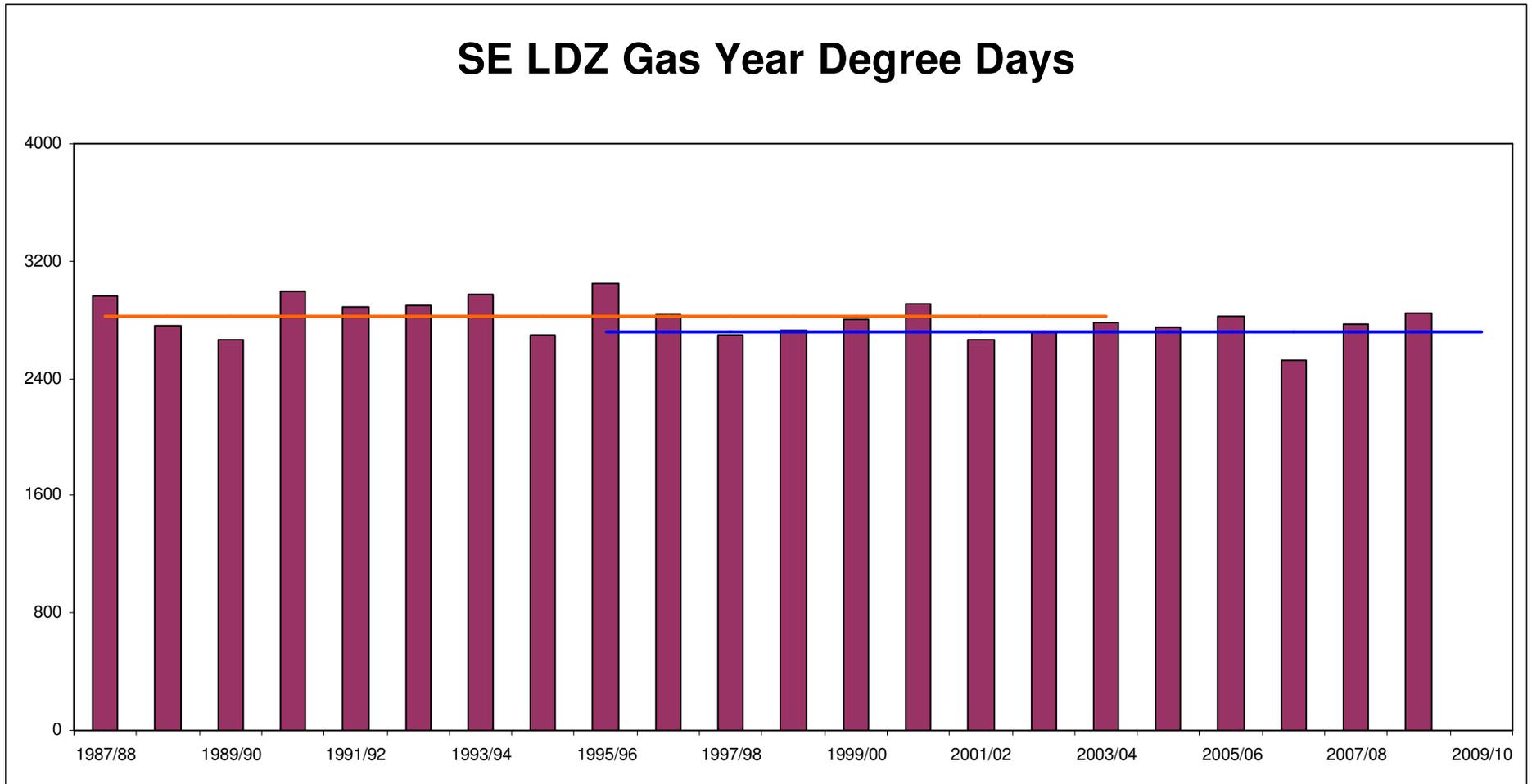
# EA LDZ



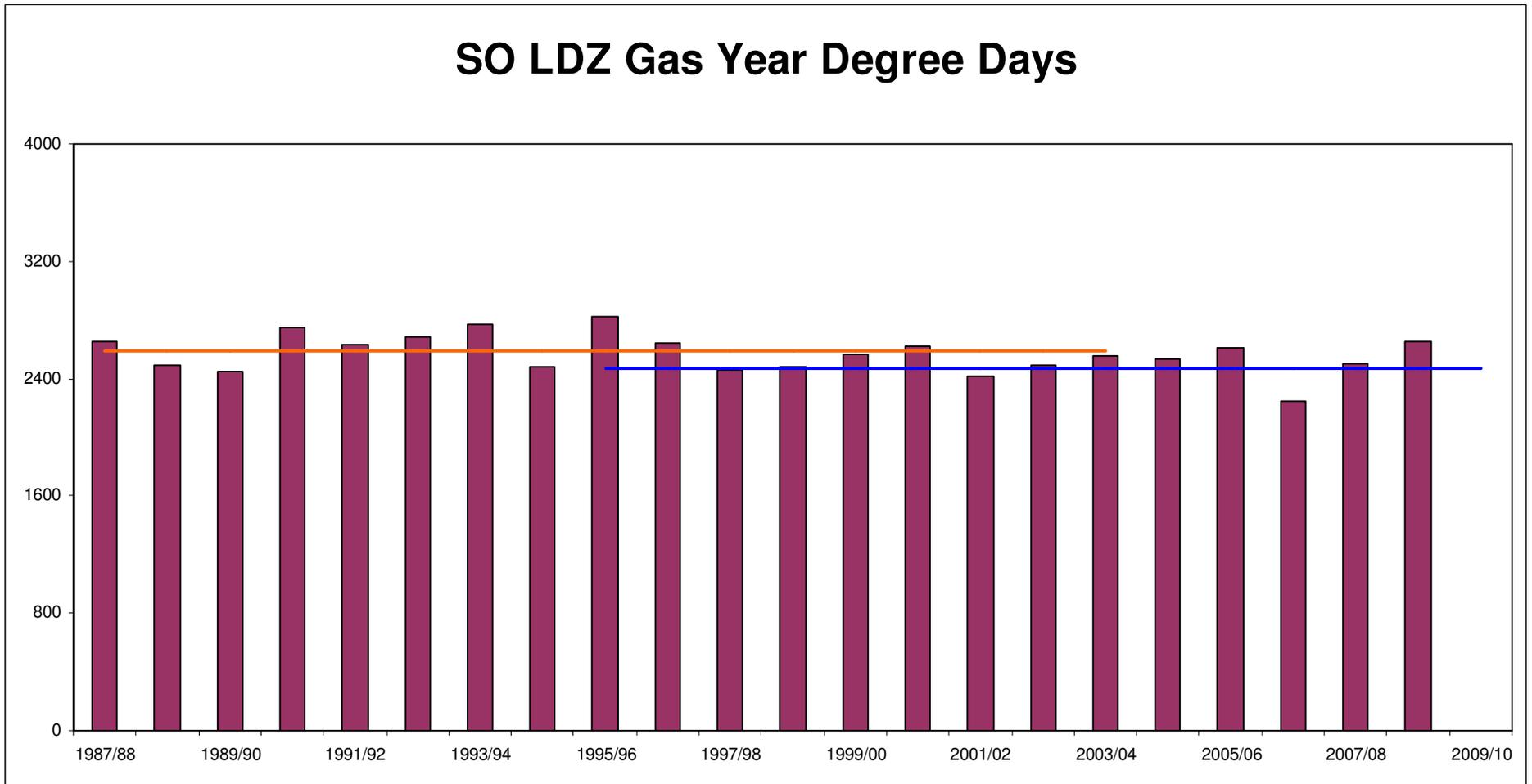
# NT LDZ



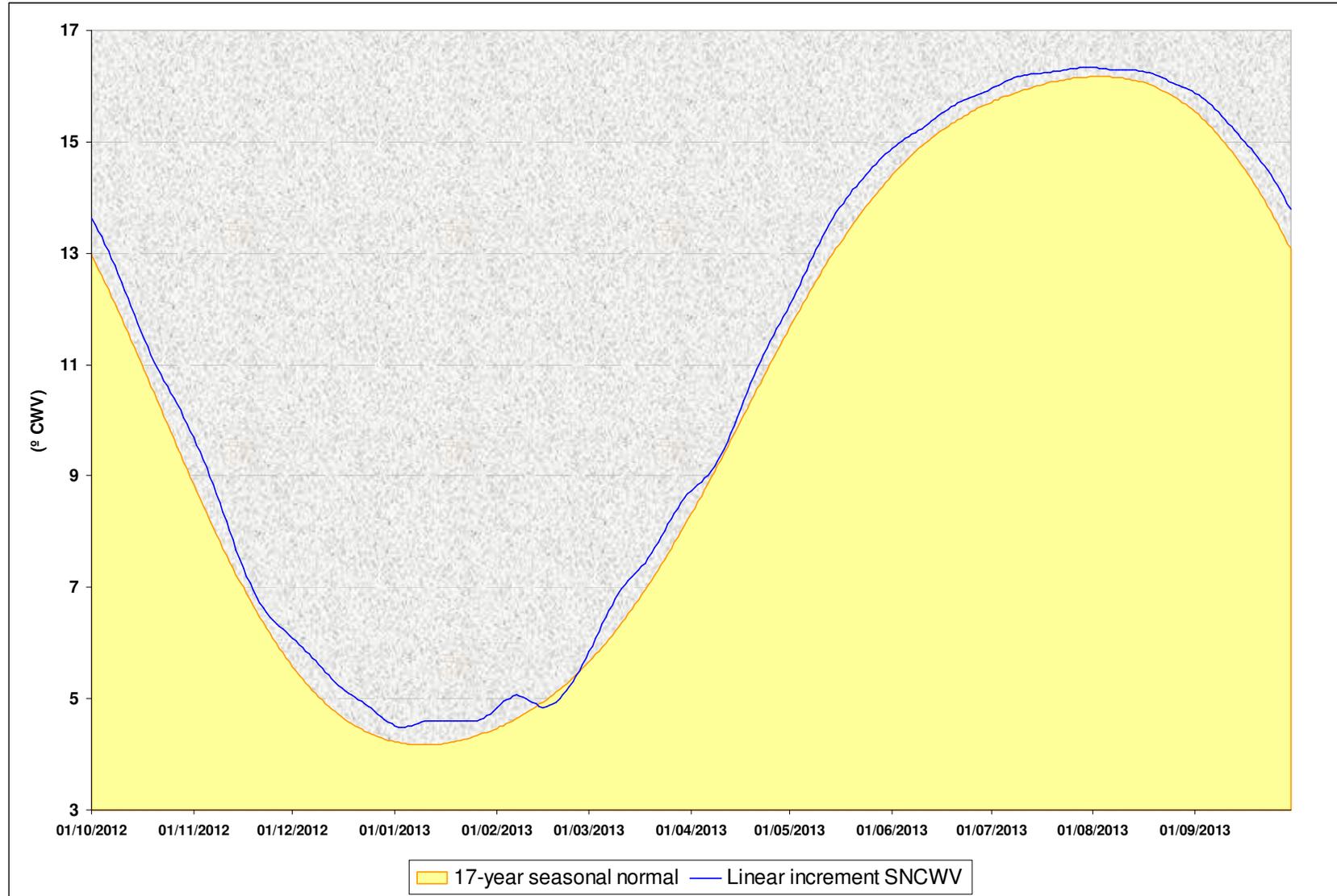
# SE LDZ



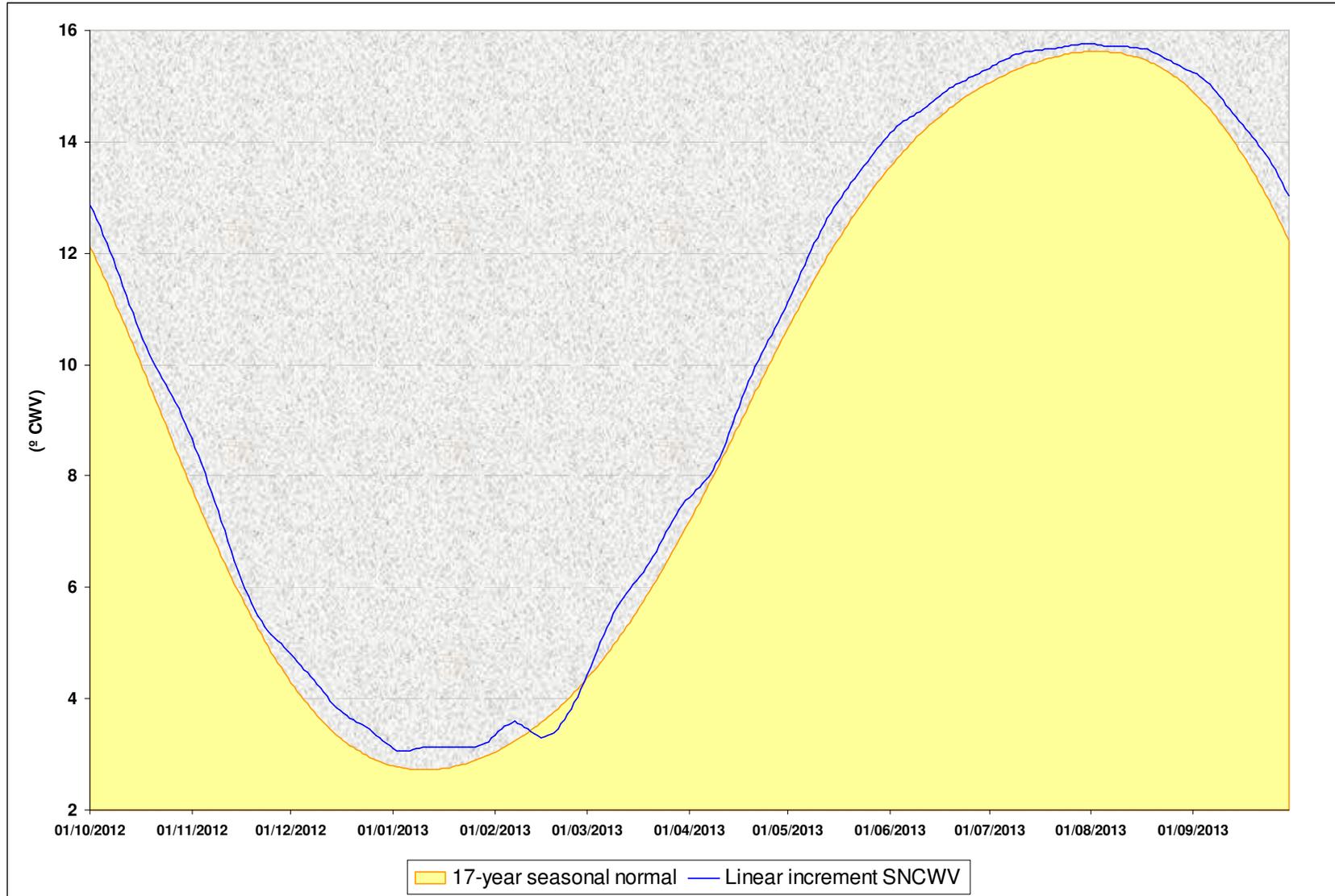
# SO LDZ



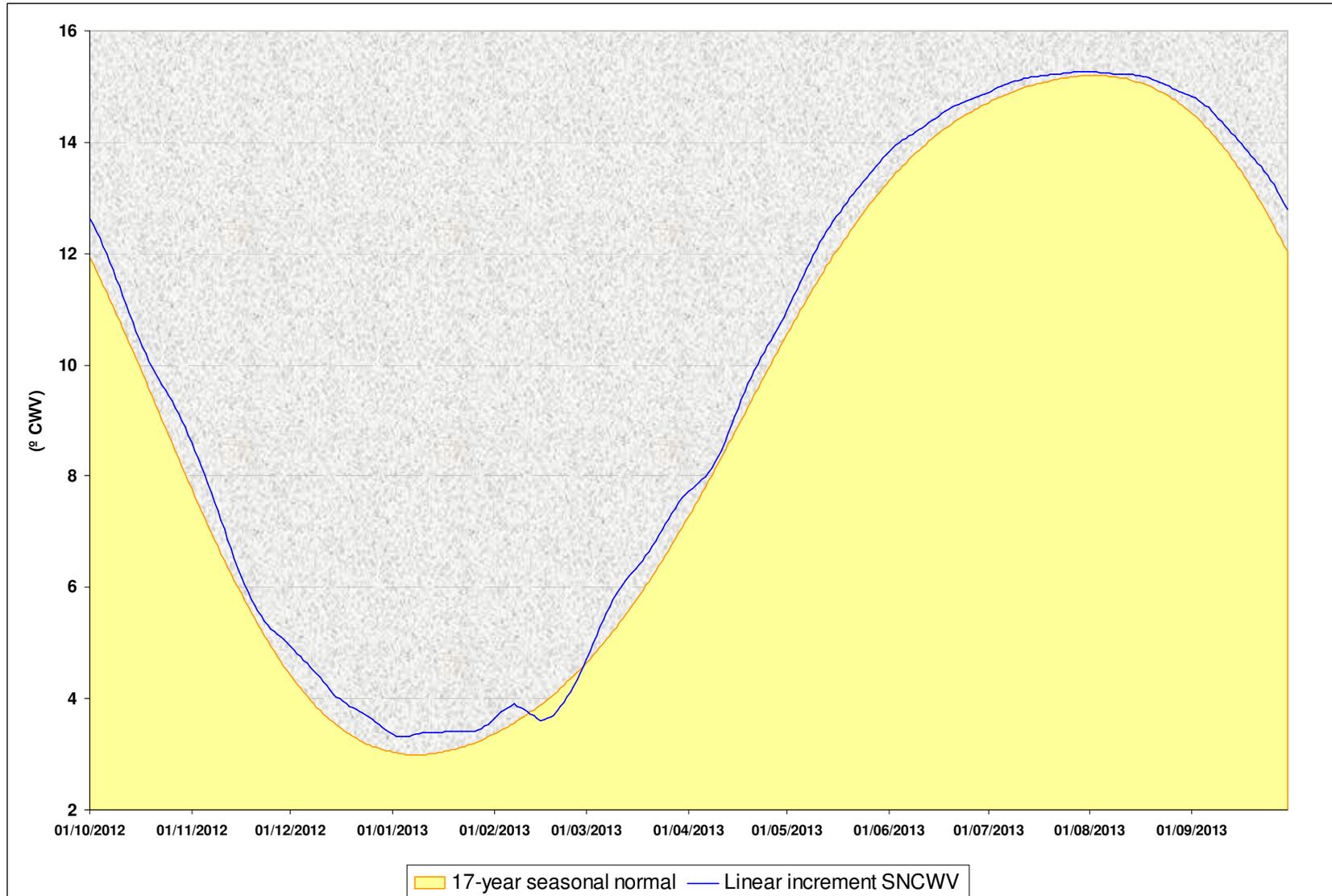
# NW & WN LDZs



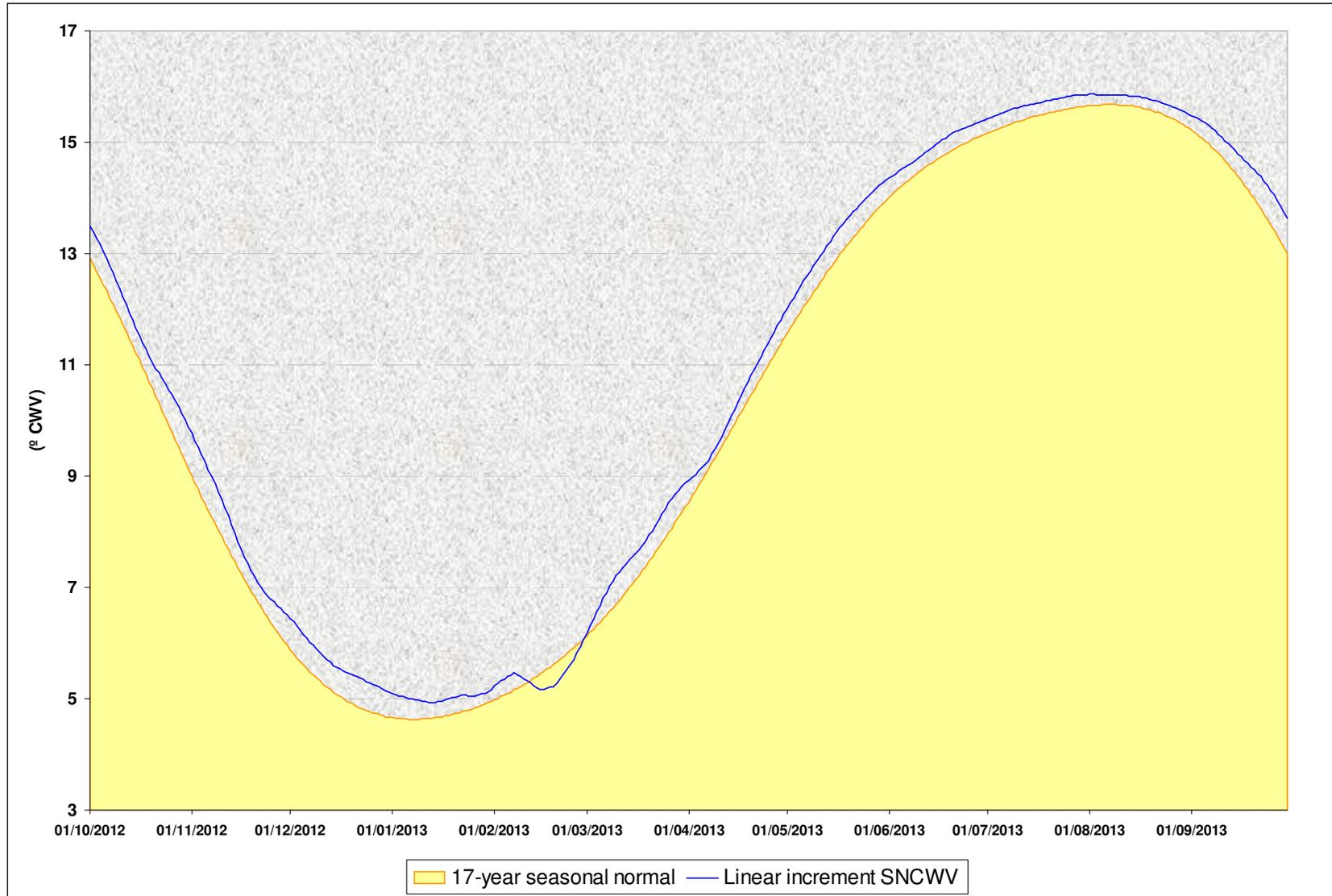
# NE LDZ



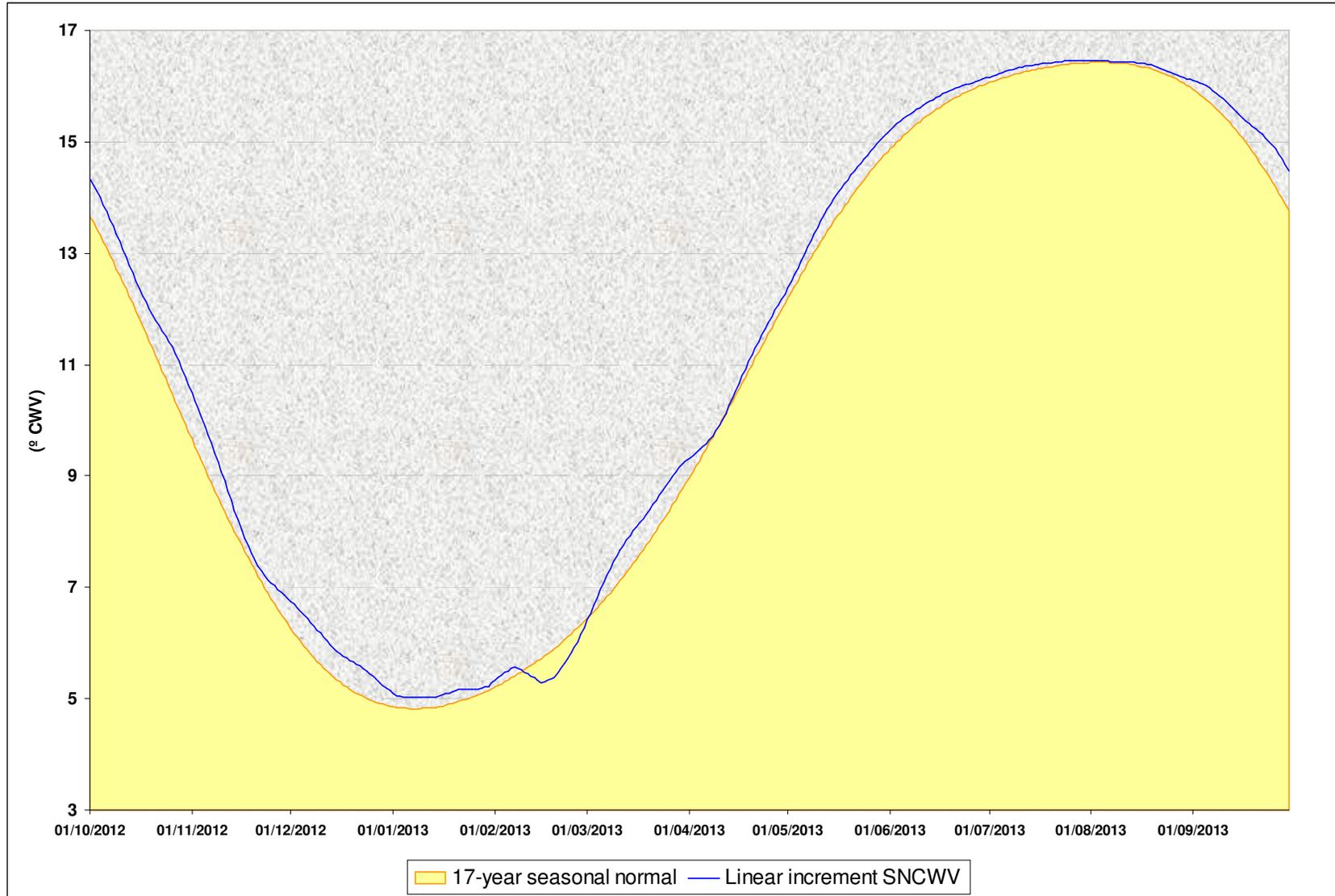
# EM LDZ



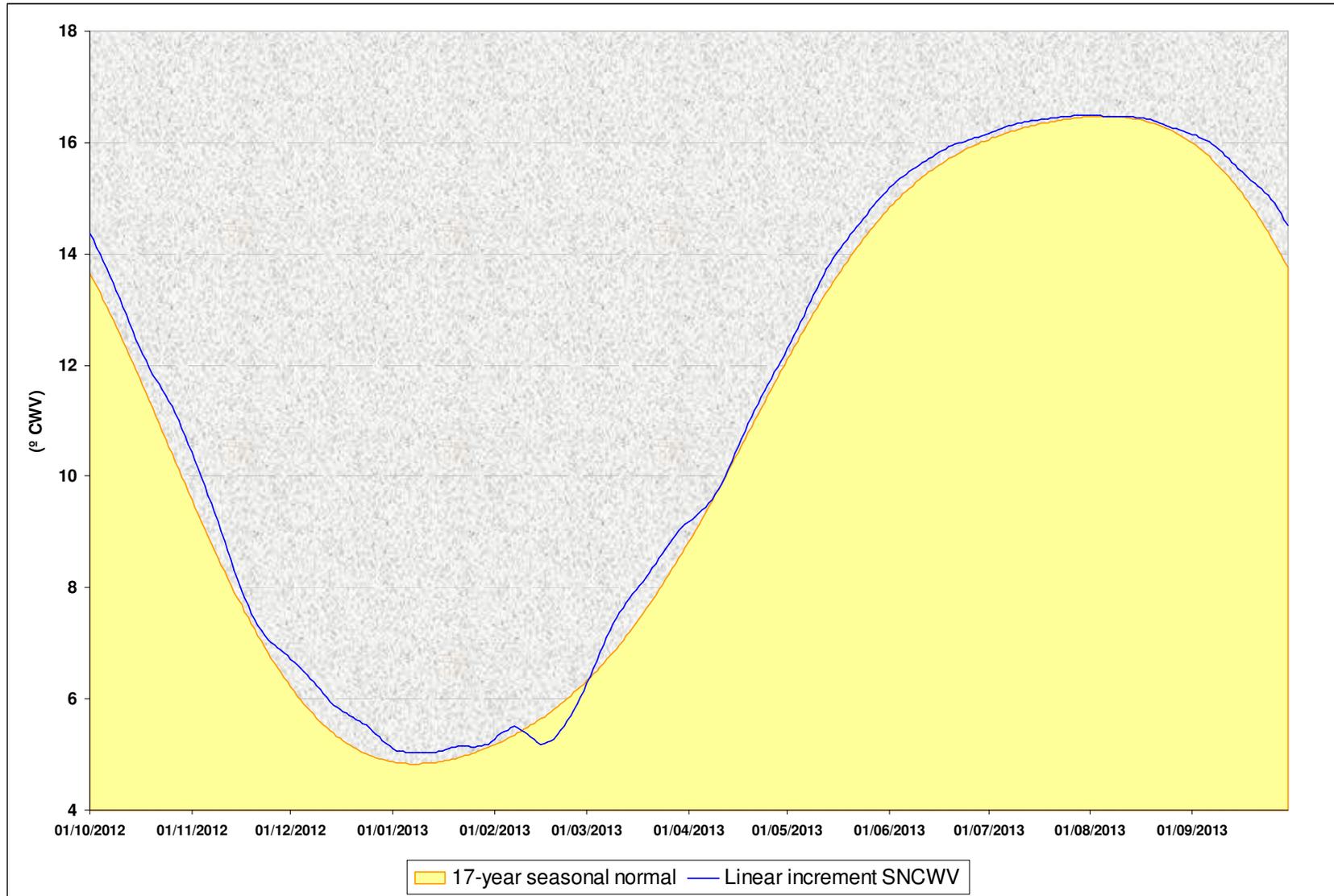
# WS LDZ



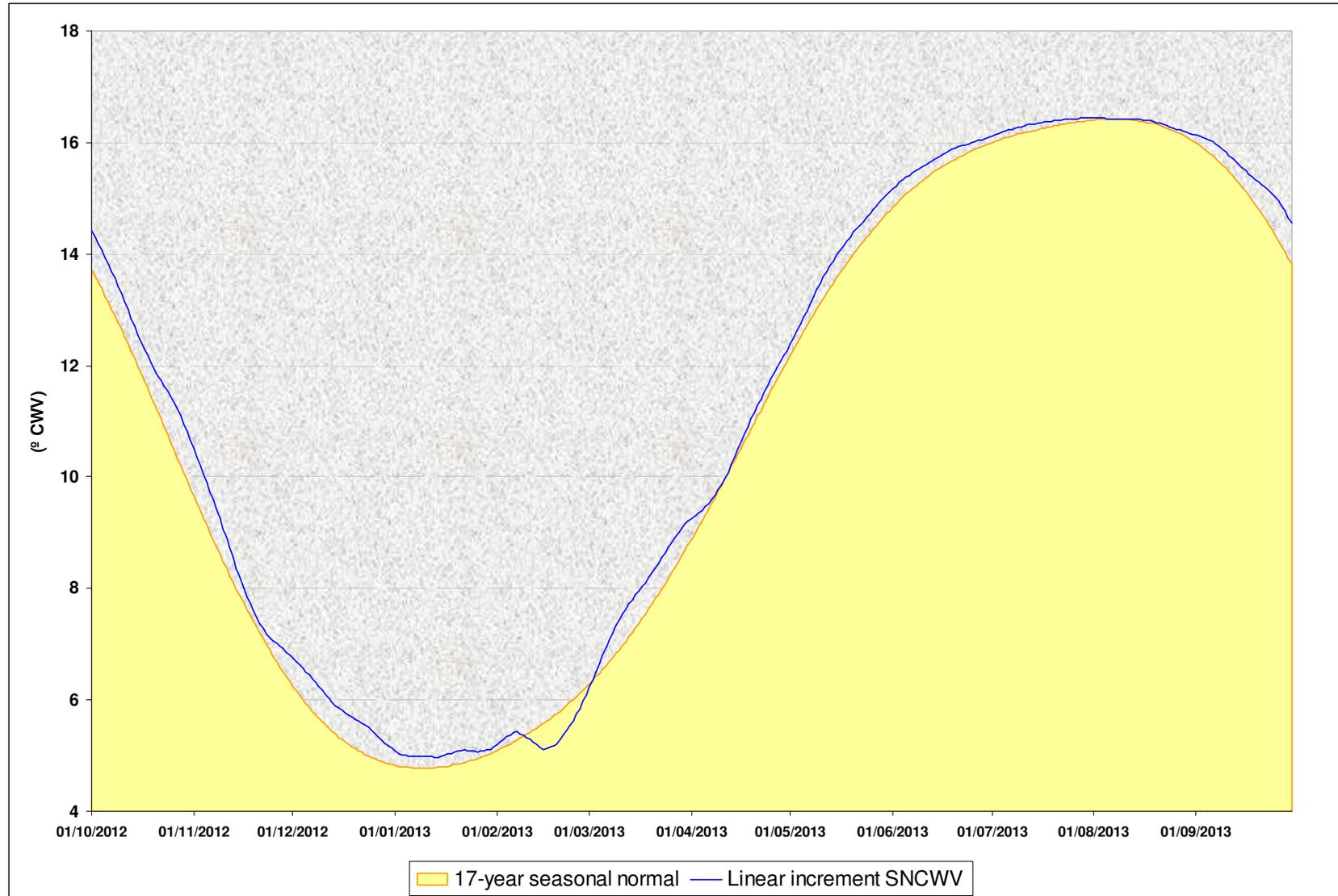
# EA LDZ



# NT LDZ



# SE LDZ



# SO LDZ

