



Demand Estimation Sub Committee

Seasonal Normal Review 2020:

Overview and Background Information

Overview

- During 2019 DESC are reviewing / revising the Composite Weather Variable (CWV) formula **AND** the basis for deriving the Seasonal Normal Composite Weather Variable (SNCWV)
- Why ? - Reminder of DESC's UNC Section H obligations:
 - “1.4.3 The Committee will, at appropriate frequencies determined by it, **review** and where appropriate **revise** (with effect from the start of a Gas Year) the **formula** by which the **Composite Weather Variable** for an LDZ will be determined.”
 - “1.5.3 The Committee will, at appropriate frequencies determined by it, after consultation with the Uniform Network Code Committee, **review** and where appropriate **revise** (with effect from the start of a Gas Year) the **seasonal normal value** (for each Day in a year) of the **Composite Weather Variable** for an LDZ.”

Overview cont.

- The last review of the CWV formula and Seasonal Normal basis was completed by DESC in 2014. The revised values took effect from 1st October 2015 and remain in place today
- The CWV and SNCWV are key building blocks in the production of demand models, profiles, peak load factors and the NDM allocation formula
- For stability across the many industry processes impacted, DESC review the CWV and SNCWV, as a minimum, every 5 years. The current basis 'expires' on 30th September 2020
- The review of CWV and SNCWV needs to be completed during 2019 in order that the Spring modelling in 2020 can be performed using the new arrangements, when profiles for Gas Year 2020/21 will be produced

Overview - Timeline

High Level Timeline of CWV / SNCWV Review

2019												2020											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Complete review of CWV Formula and Seasonal Normal Basis, Define methodology and calculate values for next period (2020-2025)																							
										New CWVs and SNCWVs approved by DESC													
Develop Profiles for GY 2019/20 using existing CWVs and SNCWVs						Profiles in place for Gas Year 2019/20, using existing CWVs and SNCWVs																	
												Preparation for Modelling for GY 2020/21											
																		Develop Profiles for GY 2020/21 using new CWVs and SNCWVs					
												Profiles go LIVE using new CWVs and SNCWVs											
SYSTEM CHANGE - CWV Formula and Receipt of Additional Weather Data Items																							

Prep. for New CWVs and SNCWVs

Current CWVs and SNCWVs

Assumptions

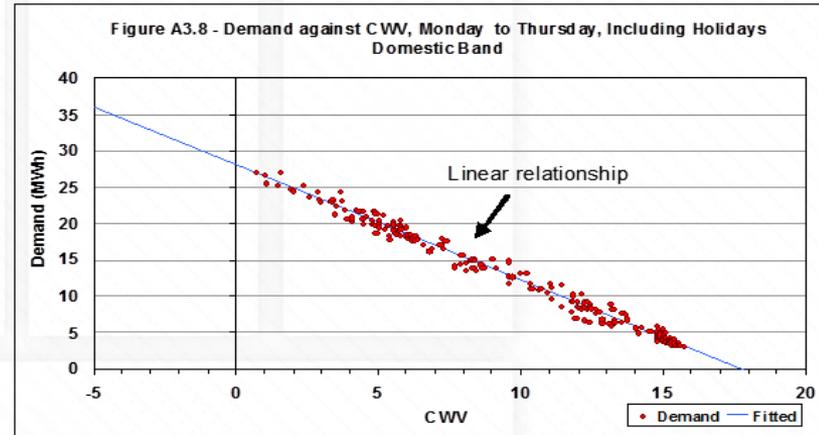
- The following assumptions have been made in relation to the whole Seasonal Normal Review work this year
- The algorithm defined in UNC and used in Gemini to estimate daily NDM demand (Nominations and Allocation) will for the foreseeable future continue to require a **single** view of weather (the CWV) for each **gas day** for each **LDZ**
- The CWV formula will therefore continue to be a single measure of daily weather in an LDZ, and defined in a manner to provide a linear relationship between the daily aggregate LDZ NDM demand* in the LDZ and the CWV
 - * From 1st June 2017 the daily aggregate NDM demand is a pseudo value of NDM demand + UIG

Background

Composite Weather Variable (CWV) Formula

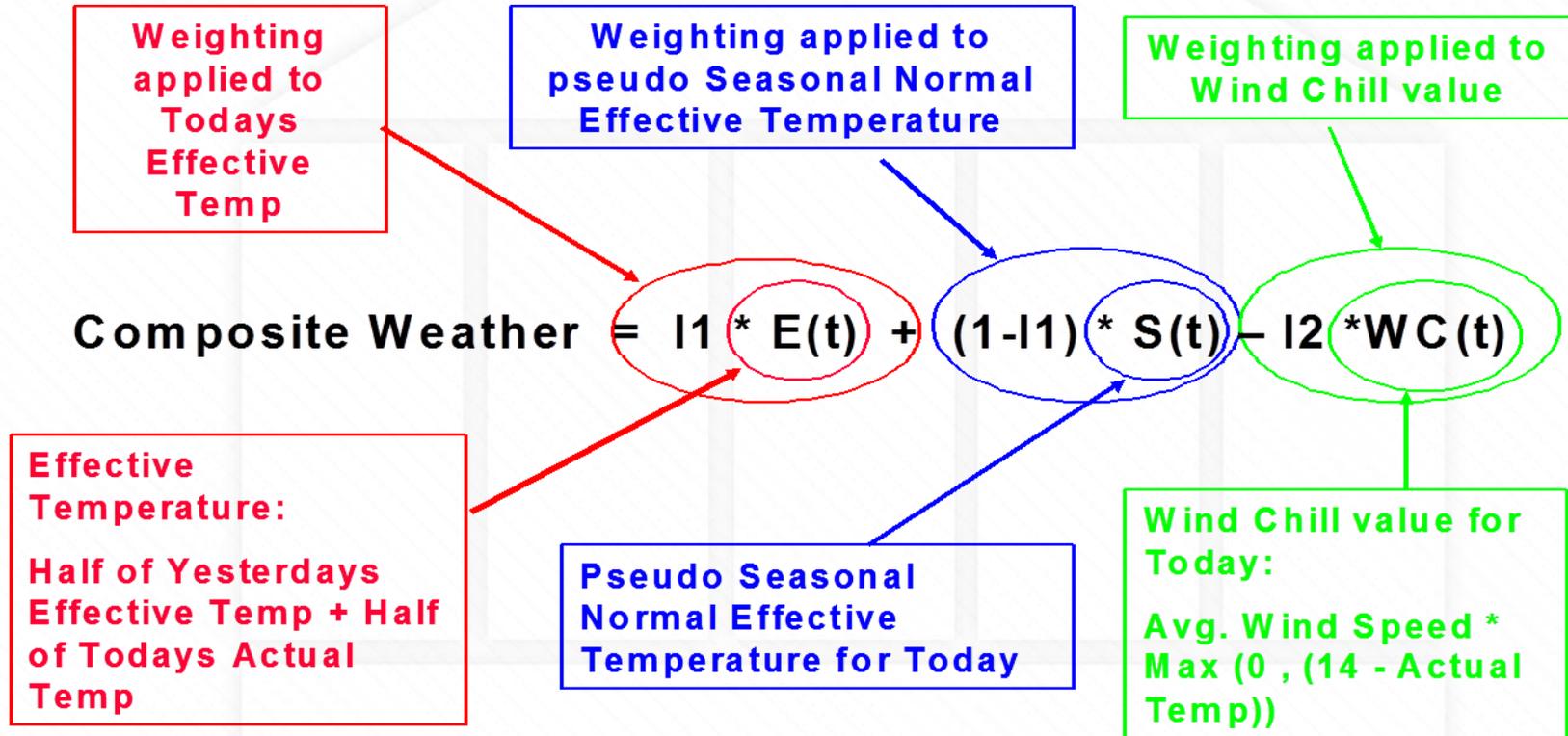
Background – CWV Formula Principles

- The CWV is a single measure of daily weather in each LDZ and is a function of effective temperature, wind speed and pseudo Seasonal Normal Effective Temperature (SNET)
- It is defined to give a linear relationship between **Monday to Thursday non holiday** daily aggregate NDM demand in the LDZ and the CWV
- It is important to produce a weather variable that provides the strongest possible ‘fit’ for the weather and demand models
- This relationship is key to providing the Demand Estimation parameters:
 - Annual Load Profile (ALP)
 - Daily Adjustment Factor (DAF)
 - Peak Load Factor (PLF)



Background – Current CWV Formula (Part 1- CW)

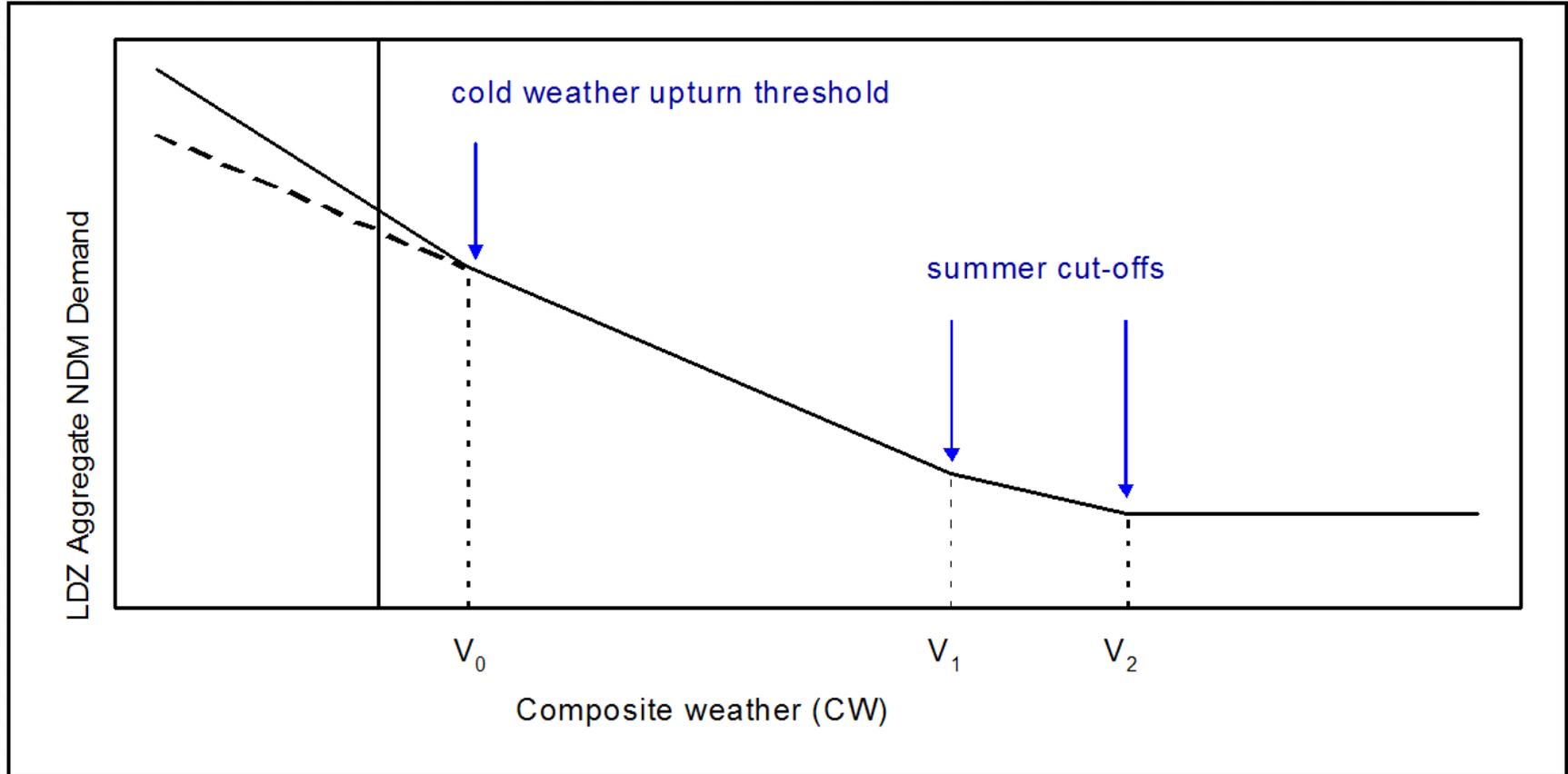
- The formula is effectively split into 2 parts – part 1 below:



Background – Current CWV Formula (Part 2 - CWV)

- The formula is effectively split into 2 parts – part 2 below:
- Series of tests applied to the CW value (using parameters below) to determine if changes need to be made. Parameters to consider:
 - V0 – Cold Weather Upturn Threshold
 - V1 – Lower Warm Weather Cut-Off
 - V2 – Upper Warm Weather Cut-Off
 - Q – Slope relating to Warm Weather Cut-off
- **‘Normal’**: If CW is > cold weather threshold and < lower warm weather cut off: $CWV = CW$.
- **‘Summer Transition’**: If CW is > lower warm weather cut-off but < upper warm weather cut-off:
 $CWV = \text{Lower Cut-Off} + \text{Slope} * (CW - \text{Lower Cut-Off})$
- **‘Summer Cut-Off’**: If CW is > upper warm weather cut off:
 $CWV = \text{Lower Cut-Off} + \text{Slope} * (\text{Upper Cut-Off} - \text{Lower Cut-Off})$
- **‘Cold Weather Upturn’**: If CW is < cold weather upturn threshold:
 $CWV = CW + \text{Cold Weather sensitivity} * (CW - \text{Cold Weather Upturn Threshold})$

Background – Current CWV Formula Schematic

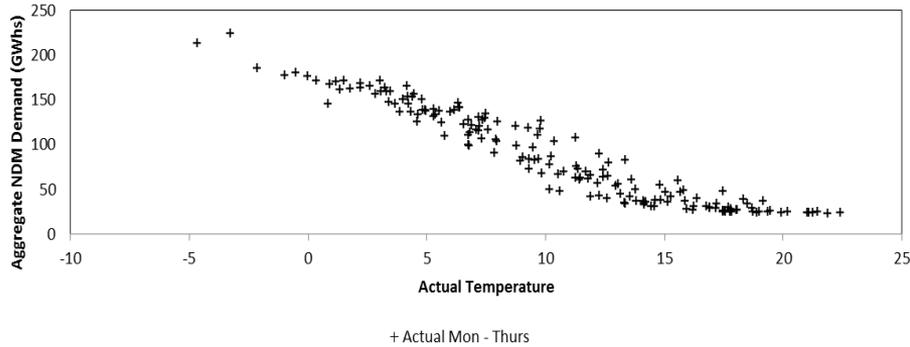


Background – Example of CWV Formula

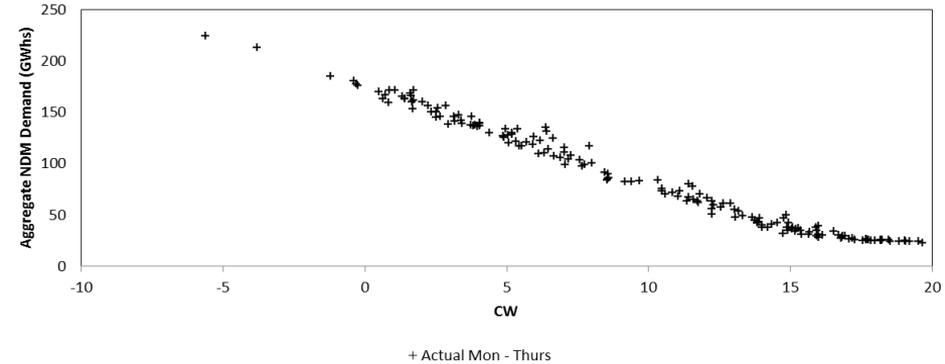
- To bring the formula to 'life' we have used the aggregate NDM demand for LDZ NE for Gas Year 2017/18 and compared it with the component parts of the CWV formula to show how the various elements 'work' to produce a linear fit
- The charts on slide 14 show the same demand (y-axis) matched with the progressive states of the CWV formula (x-axis):
 - Actual Temperature (AT)
 - Effective Temperature (ET)
 - Composite Weather (CW)
 - Composite Weather Variable (CWV)
- The charts provide a useful visual representation of what the current CWV formula components are designed to achieve i.e. a linear relationship to demand

Background – Formula breakdown

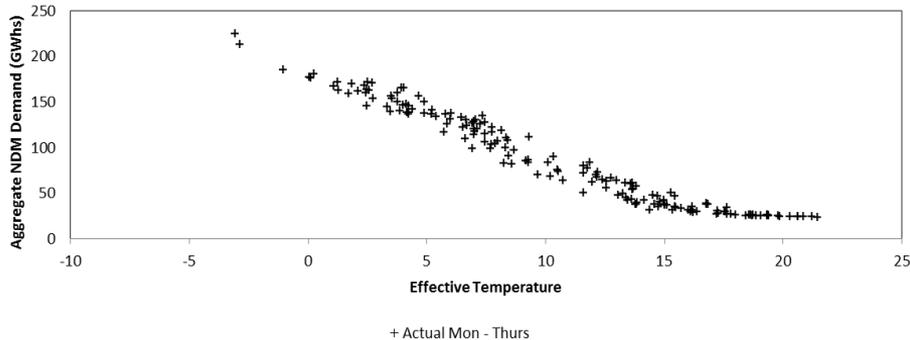
LDZ: NE Gas Year 2017 Mon to Thurs non-holiday Demand against **Actual Temperature** (Weighted observations)



LDZ: NE Gas Year 2017 Mon to Thurs non-holiday Demand against **CW**



LDZ: NE Gas Year 2017 Mon to Thurs non-holiday Demand against **Effective Temperature**



LDZ: NE Gas Year 2017 Mon to Thurs non-holiday Demand against **CWV**

