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# Demand Estimation Sub Committee

## 2.0 Review DESC Representations of 2023/24 NDM Algorithms

### 5 July 2023

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2.0 Review DESC Representations

# **BACKGROUND, TIMETABLE AND OBJECTIVES**

# Overview



- An overview of the Demand Estimation process and output can be found [here](#)
- Annual modelling cycle of activities are represented in diagram opposite
- This presentation relates to the Industry Consultation phase of the Demand Model cycle

# CDSP / DESC Obligations and Timetable: October 2022 to September 2023

Milestone	UNC H Ref	2022			2023									
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
DESC Membership confirmed	1.12	✓												
NDM Sampling: Data Collection and Validation	1.6	✓						✓						
NDM Algorithm Performance for Gas Year 2021/22	1.8			✓									✓	
DESC Adhoc Workplan	1.7	✓		✓			✓							
DESC Modelling Approach – EUCs and Demand Models	1.7			✓			✓							
Single Year EUC Demand Modelling	1.7								✓					
Model Smoothing and Draft Gas Demand Profiles	1.7									✓				
Industry Consultation	1.8									✓	✓			
Gas Demand Profiles finalised and Core systems updated	1.9												✓	
Climate Change Methodology progressed (SN Review 2025)	1.4			✓			✓		✓		✓		✓	

# Objectives

- For DESC members to consider and review all DESC representations received and observations noted by Demand Estimation Team

- To gain DESC support for proposals prior to submitting for wider industry review

Vote  
Required

2.0 Review DESC Representations

## **MODELLING APPROACH**

# Modelling Approach – Basis of 2023 Modelling (1 of 2)

Key aspects of DESC's [Modelling Approach 2023](#) are summarised below:

- Demand modelling runs and any necessary aggregations (following validation and selection) were agreed by DESC in April
- The Composite Weather Variable (CWV) definitions and Seasonal Normal basis (SNCWV), effective from 1st October 2020, will be used
- All gas demand modelling is data driven – where identified in the modelling results, Holiday & Weekend Factors, Summer Reductions & Cut-Offs will be applied
- Holiday Factors are determined using the rules agreed by DESC on 2<sup>nd</sup> March 2022, following a review of the Holiday Code Rule definitions in the Autumn/Winter 21/22 Adhoc Workplan
- In line with recent years, holidays have been excluded from the regression models for Domestic EUCs



# Modelling Approach – Basis of 2023 Modelling (2 of 2)

- Warm-weather cut-offs:
  - Not applied to EUC models < 293 MWh pa, meaning no cut-off is placed on warm weather demand reduction in EUC models representing nearly 80% of NDM load
  - Any cut-offs are based on modelling results from 3 years
- Summer Reductions:
  - Summer reductions can apply to EUC models over the period from the Sunday before Spring Bank Holiday Monday to last Sunday in September – i.e. 26<sup>th</sup> May 2024 to 29<sup>th</sup> September 2024
  - Above applies along with the more general summer holiday period in July and August
  - Any summer reductions are based on modelling results over 3 years
- Modelling methodology in NDM Algorithms Booklet (Sections 3 & 4)

2.0 Review DESC Representations

# **SUMMARY OF MODELLING PROGRESS TO DATE**

# Summary of Modelling Progress to Date

- Data Aggregations and WAR Band Thresholds for latest Single year models agreed at April DESC Meeting (26<sup>th</sup>)
  - Amendment to Band 03 WAR Band Thresholds agreed at May DESC (24<sup>th</sup>)
- Single year Modelling approved at May DESC Meeting (24<sup>th</sup>)
- 3-year Model Smoothing process completed followed by production of Gas Demand Profiles (i.e. ALPs, DAFs and PLFs)
  - Published for review 12<sup>th</sup> June
  - Smoothed Model outcomes on following slides

# Smoothed Model Outcomes: Description

The following slides show a summary count of models by modelling results

- Straight Models
  - Are models with no cut-off and no summer reduction (see below)
- Cut-Off Only
  - These are models which either require a cut off before the CWV reaches it's maximum to avoid forecasting very low or negative volumes or where demand levels off during the warmest days
- Summer Reductions Only
  - These are models where the demand does not flatten off at warm temperatures but rather falls away to lower than expected values
- No Slope
  - These models have no weather sensitivity and therefore no seasonality
- Cut-Off and Reductions
  - Applies where models have both a cut-off and a summer reduction
- Details of the criteria used for determining Cut-offs and Summer Reductions is in Section 3 of the NDM Algorithms Booklet, parts 2.2 and 2.3

# Smoothed Model Outcomes: Small NDM

Smoothed Model Outcome	2023	2022
Straight Models	27	30
Cut-Off Only	17	14
Summer Reductions Only	181	178
No Slope	0	0
Cut-Off and Reductions	9	12
Total Number of EUCs	234	234

- Small NDM meters are 0 to 2,196 MWh p.a. and represent approx. 87% of current NDM AQ

# Smoothed Model Outcomes: Large NDM

Smoothed Model Outcome	2023	2022
Straight Models	158	152
Cut-Off Only	12	14
Summer Reductions Only	63	69
No Slope	33	33
Cut-Off and Reductions	7	5
Total Number of EUCs	273	273

- Large NDM meters are > 2,196 MWh p.a. and represent approx. 13% of current NDM AQ

2.0 Review DESC Representations

**DESC RESPONSES AND DEMAND  
ESTIMATION TEAM OBSERVATIONS**

# Analysis

- Email sent on 13th June asked DESC members for feedback by no later than close of play 28th June in order to prepare for today's meeting
- No feedback has been received at time of publication
- Summary of Representation topics to be covered
  - Topic 1: Domestic Weekend Factors – Demand Estimation Team



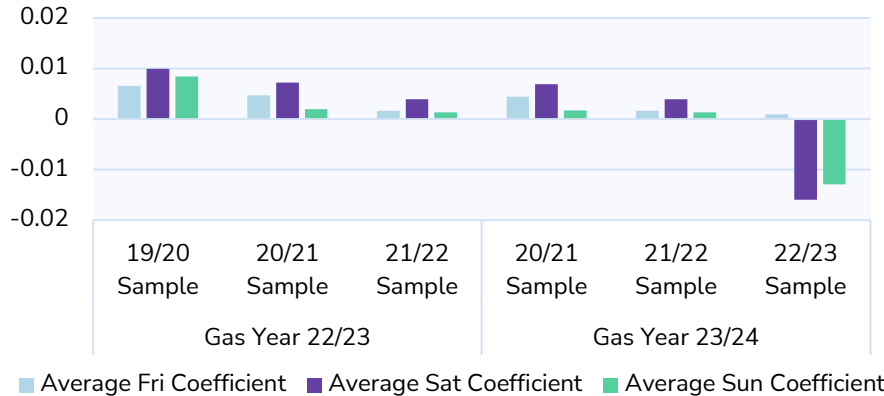
# Topic 1: Domestic Weekend Factors

- Historically, Domestic weekend factors have been greater than 1, i.e., Domestic Gas user's consumption increases on weekends when compared to the core 'Monday to Thursday' model
- Last year we pointed out that we had observed “a less prominent weekend effect in the Band 1 Domestic demand models”
- This year we have seen this trend continue for the latest analysis period (Apr'22 to Mar'23), with the majority of LDZs displaying a decrease in demand at weekends in the Domestic Non-prepayment EUC (“01BND”)
- The impact of the oldest analysis period (2019/20) being replaced with the latest analysis year (2022/23), combined with the previous two analysis years (20/21 and 21/22), has resulted in several of the 3-year smoothed ALPs for this EUC exhibiting a decrease in demand at weekends

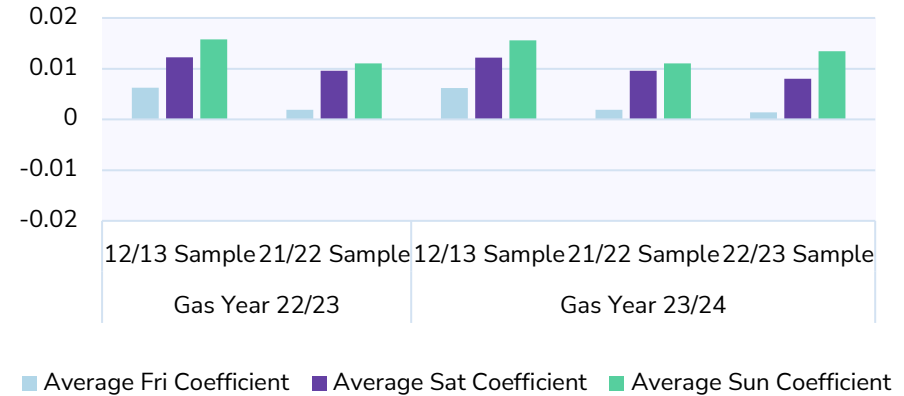
# Topic 1: Domestic Weekend Factors - Trends

The charts below show the average weekend factors used in the smoothed models for Band 1 Domestic meters

01BND



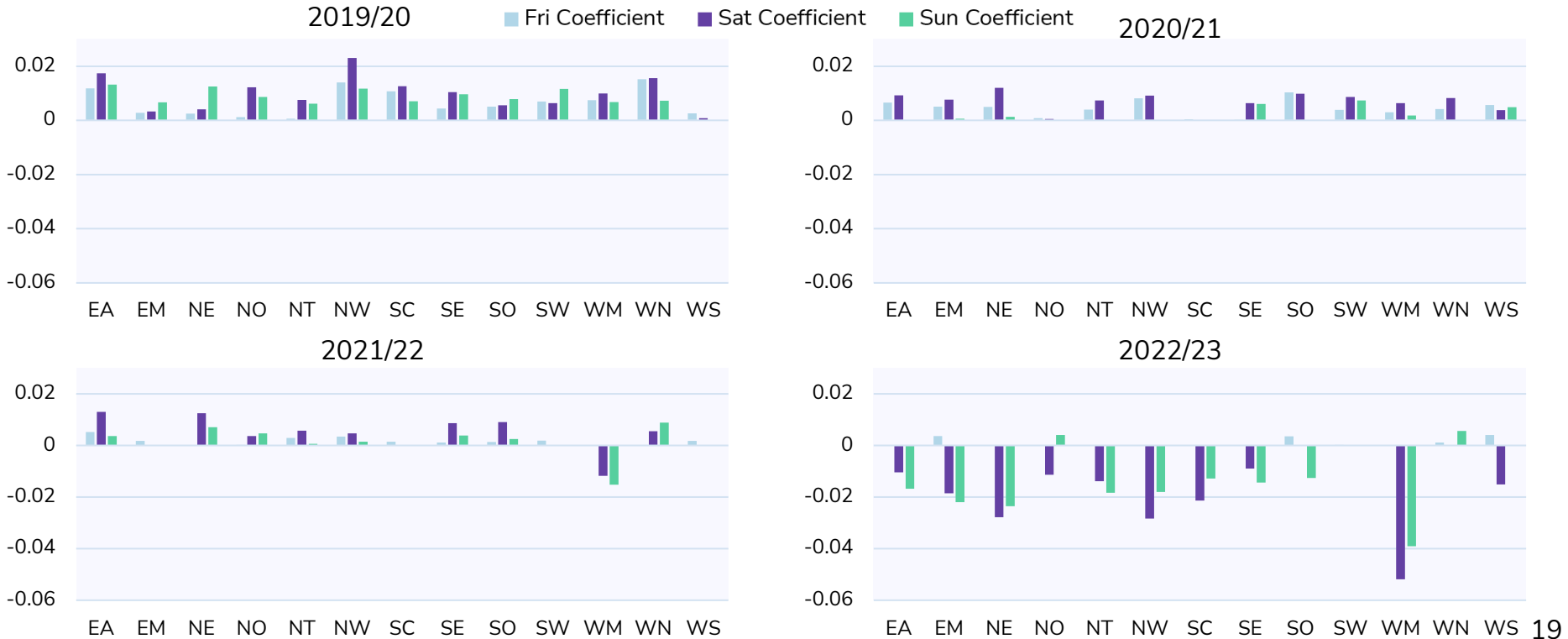
01BPD



- Non-prepayment EUC (“01BND”) has seen a clear trend towards negative weekend factors particularly in 22/23
  - This could be as a result of more home working on weekdays, pushing up the core ‘Monday to Thursday’ rather than a reduction of weekend consumption
- This is also seen in some of the Prepayment meter factors but to a lesser degree

# Topic 1: Domestic Weekend Factors - Trends

- The trend towards zero/negative Weekend Factors is apparent across all LDZs
- In the smoothing for Gas Year 23/24, the 2022/23 data has replaced 2019/20



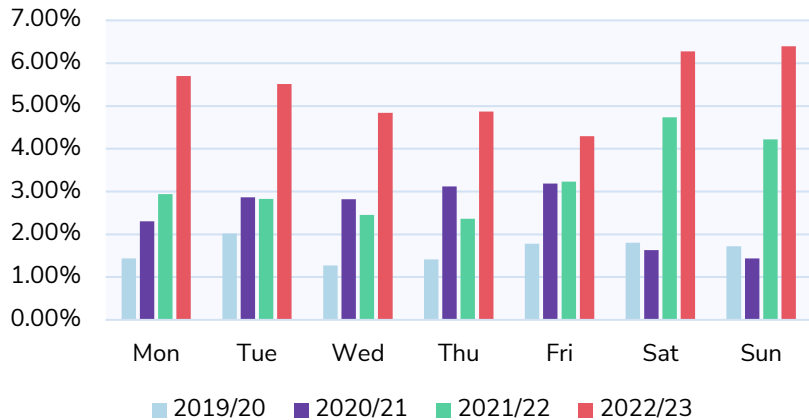
# Topic 1: Domestic Weekend Factors - UIG Trends

- The models are derived from a sample of the population and there is a chance that unusual modelling results are reflective of the sample rather than the whole population
- The behaviour observed in the 01BND model is similar for all LDZs and over a number of years, each with different samples so this is unlikely
- If this observed behaviour is reflective of the population, then we might expect to see this within UIG. UIG is the balancing figure and includes modelling error. In Gas Year 2022/23 we know the profiles used in the NDM Algorithm will be adding demand at weekends for 01BND
- We would therefore expect this to show in the UIG result as an overallocation on weekend days (a lower or more negative UIG for weekends when compared to weekdays)
- Analysis of UIG for Gas Year 2022/23 by 'day of week' is covered on the following slide

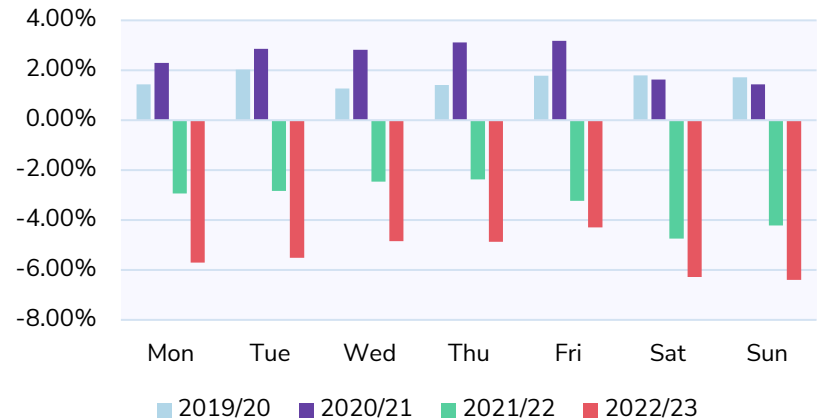
# Topic 1: Domestic Weekend Factors - UIG Trends

The charts below show the absolute and average UIG for recent Gas Years by day of week

Absolute UIG



Average UIG



- Friday, Saturday and Sunday UIG values have been creeping up relative to the core Monday to Thursday over recent years
- This suggests an over allocation of NDM consumption, reflecting the trends seen in the modelling results

# Topic 1: Domestic Weekend Factors - Summary

- Historically, Domestic weekend factors have added demand to the weekend days (when compared to the core Monday to Thursday)
- Recent behaviour trends have resulted in the weekend factors removing demand from the weekend days
- UIG figures support the view that this is likely to be due to a change in behaviour and not an error
- The recommendation of the Demand Estimation team is to accept the calculated profiles with the negative Domestic weekend factors

# Conclusions

- Topic 1: Domestic Weekend Factors
  - Now trending negative when previously observed behaviour was positive
- Are DESC happy to approve the smoothed EUC Demand Models and Gas Demand Profiles for wider industry review (ahead of finalising the profiles)?
  - If not, need to confirm actions required to progress ahead of wider industry consultation (5-day window)

# Next Steps

Gas Demand Profile Update Timeline



Industry review of  
Gas Demand  
Profiles

5<sup>th</sup> to 19<sup>th</sup> July

DESC consider any  
further comments  
received prior to  
finalisation of  
profiles

19<sup>th</sup> July

Systems updated  
with new profiles for  
Gas Year 23/24

August

New Profiles live

1<sup>st</sup> October



# Reminder: Where to find Demand Estimation Data

Folder Structure on Secure Website, links to secured area and access request form can be found by following this [link](#)

## 18. NDM Profiling and Capacity Algorithms

### 2023-24 Gas Year

#### 1 Modelling Approach

#### 2 Demand Estimation Sample Data

#### 3 Demand Estimation Parameters

##### a End User Categories and Derived Factors

##### b Demand Model Supporting Files

#### 4 NDM Algorithms Booklet

- Folders highlighted in green contain the draft NDM proposals for Gas Year 2023/24
- The NDM Algorithms Booklet (summary of the end-to-end modelling process) will be available in Folder 4 once published