# Demand Estimation Sub Committee

An Introduction

# Background – Demand Estimation

- Key industry processes require various types of gas demand estimation at NDM Supply Points. These processes include:
    - Determining Supply Point Capacity
    - Daily Nominations and Allocations i.e. NDM Supply Meter Point Demand Formula
    - Determining Annual Quantities (AQs)

- To achieve this estimation, each NDM Supply Point belongs to an End User Category (EUC)

- EUCs are used to categorise NDM Supply Points in an LDZ and are defined by reference to variables which are maintained in the Supply Point Register

- Each EUC requires an associated Demand Model which represents its gas usage characteristics e.g. weather sensitivity, consumption profile etc

- Demand Models are mathematical models which provides an estimate of gas demand for each EUC by reference to variables determined by DESC
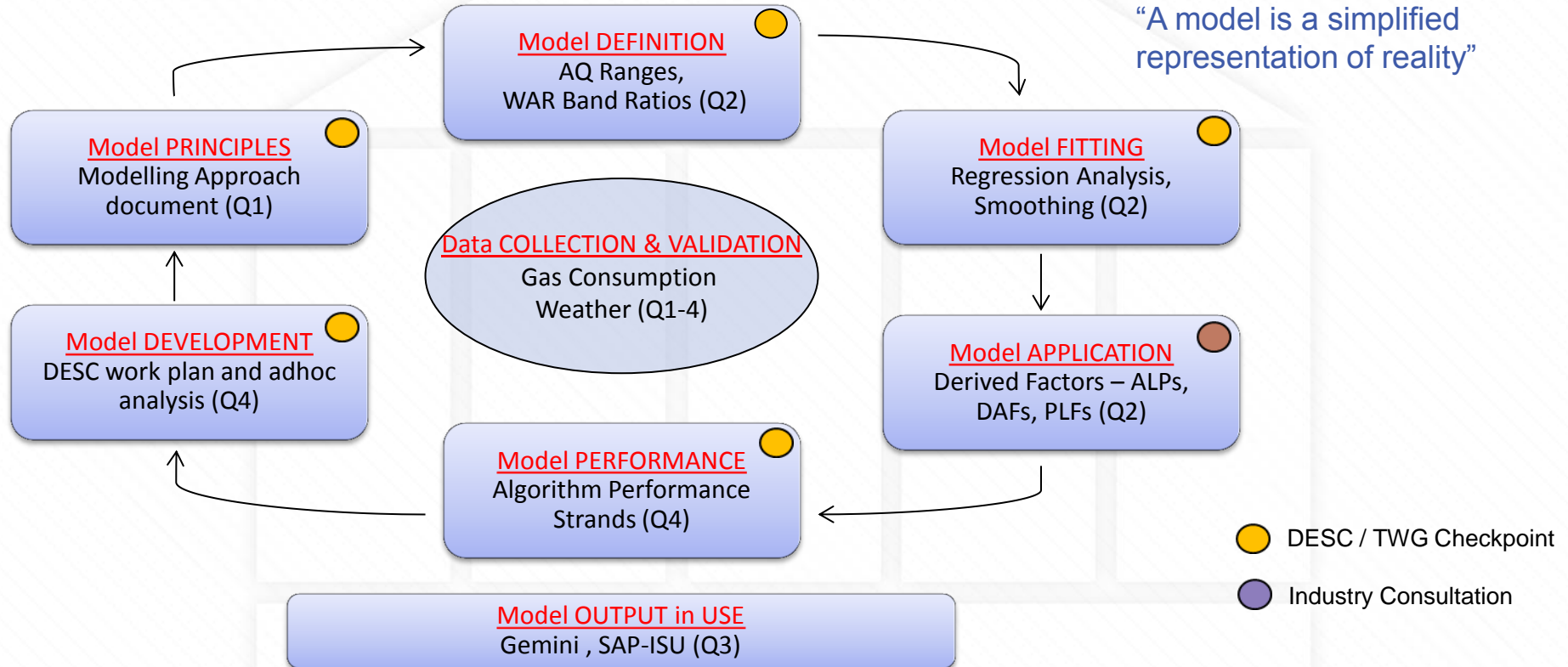
# Background – Demand Estimation cont.

- For each Gas Year, DESC will develop or revise the definitions of the EUCs for the LDZ <u>and</u> the Demand Models for each EUC. The CDSP will then implement these decisions

- The annual process for determining the EUCs and Demand Models for the following gas year begins with the production of a Modelling Approach document

- The Modelling Approach provides an overview of the EUC definitions and how the modelling shall be performed, which DESC is asked to formally approve at its meeting in February each year

- Prior to this, DESC's Technical Workgroup (TWG) are sent a draft of the document to review and comment on

- Section H of UNC and the NDM Demand Estimation Methodology document provides more detail of the Demand Estimation process

# Overview: EUC & Demand Model Lifecycle

The purpose of the EUC Demand Model is to represent the behaviour and reactions of the EUC Population

"A model is a simplified representation of reality"

**Model DEFINITION**
AQ Ranges,
WAR Band Ratios (Q2)

**Model PRINCIPLES**
Modelling Approach
document (Q1)

**Model FITTING**
Regression Analysis,
Smoothing (Q2)

**Data COLLECTION & VALIDATION**
Gas Consumption
Weather (Q1-4)

**Model DEVELOPMENT**
DESC work plan and adhoc
analysis (Q4)

**Model APPLICATION**
Derived Factors – ALPs,
DAFs, PLFs (Q2)

**Model PERFORMANCE**
Algorithm Performance
Strands (Q4)

**Model OUTPUT in USE**
Gemini , SAP-ISU (Q3)

DESC / TWG Checkpoint

Industry Consultation

# Demand Modelling Framework

- DESC's obligation of producing a set of End User Categories and Demand Models for the next gas year have to be delivered within certain timescales:

  – The sample data collected for analysis must include the most recent Winter period (December to March), meaning the sample data collation and validation cannot start until **early April**

  – The Final EUCs and Demand Models must be approved and submitted to the Authority and loaded to CDSP's systems **by 15th August**

  – In between April and August is when the sample data validation results are reviewed, WAR Band ratios are set, single year models are developed and reviewed, model smoothing is applied, draft Derived Factors are produced and reviewed, followed by an industry consultation **commencing early June**

- The above explains why it is necessary to agree modelling principles and methodologies in February, as there is not time in the Spring/Summer to make fundamental modelling decisions and gain agreement from all DESC members

# Demand Estimation Typical Timetable

| High Level View of Demand Estimation Meeting Timetable and Key Checkpoints | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PHASE** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** |
| 1. MODEL PRINCIPLES | ░ | ░ | | | | | | | | | | |
| Modelling Approach Approved (DESC) | | DESC | | | | | | | | | | |
| 2. Data COLLECTION & VALIDATION | | ░ | ░ | ░ | | | | | | | | |
| Sample data validated (CDSP) | | | | ■ | | | | | | | | |
| 3. MODEL DEFINITION | | | | ░ | | | | | | | | |
| Agree Data Aggregations / WAR Band Limits (TWG) | | | | TWG | | | | | | | | |
| 4. MODEL FITTING | | | | ░ | ░ | | | | | | | |
| Small & Large NDM Single Year modelling review (TWG) | | | | | TWG | | | | | | | |
| 5. MODEL APPLICATION | | | | | ░ | ░ | ░ | | | | | |
| Publication of Draft Derived Factors (CDSP) | | | | | | ■ | | | | | | |
| Derived Factors Approved for wider industry (TWG/DESC) | | | | | | | DESC | | | | | |
| Final Approval of Derived Factors (DESC) | | | | | | | DESC | | | | | |
| 6. MODEL OUTPUT IN USE | | | | | | | ░ | ░ | | | | |
| SAP-ISU and Gemini updated (CDSP) | | | | | | | | ■ | | | | |
| 7. MODEL DEVELOPMENT | | | | | | | ░ | ░ | ░ | ░ | ░ | ░ |
| Adhoc Work-plan approved (DESC) | | | | | | | DESC | | | DESC | | |
| 8. MODEL PERFORMANCE | | | | | | | | | | ░ | ░ | ░ |
| Strands 1 to 4 reviewed (DESC) | | | | | | | | | | | | DESC |

# DESC Deliverables – High Level View

| What we do… | In order to… | Represented by… | For use in… |
|---|---|---|---|
| Estimate how consumers typically use their gas during a year | Develop consumer consumption profiles | The Annual Load Profile (ALP) | Demand Attribution, AQ and opening read estimation |
| Estimate how gas consumers usage reacts to changes in weather | Understand and define weather sensitivity profiles | The Daily Adjustment Factor (DAF) | Demand Attribution, AQ and opening read estimation |
| Understand how gas consumers will react in the event of extremely cold weather | Understand and estimate peak day demand | The Peak Load Factor (PLF) | Capacity Invoicing |
| Categorise gas consumers by their different usage patterns | Ensure profiles are available for a wide range of consumer types | The End User Category (EUC) | Demand Attribution, AQ, Capacity invoicing and opening read estimation |
| Understand and explain the relationship between weather and gas consumption | Produce a variable which we can depend upon as a 'building block' for modelling | The Composite Weather Variable (CWV) | Demand Attribution, AQ and opening read estimation |
| Define a basis for 'seasonal normal' weather | Enable profiles to be represented at 'average' conditions which creates stability for industry | The Seasonal Normal Composite Weather Variable (SNCWV) | Demand Attribution, AQ and opening read estimation |

# Want to know more ?

- The Demand Estimation Team at Xoserve can be contacted via our regularly reviewed box account – email address below:

  xoserve.demand.estimation@xoserve.com

- All DESC meetings are co-ordinated by the Joint Office and the meeting material can be viewed on the DESC page [here](here)

- Further information, including FAQs can also be viewed on Xoserve's website [here](here)