WA Gas Consumption Forecast Methodology

Forecasting Reference Group Meeting 7 October 2020

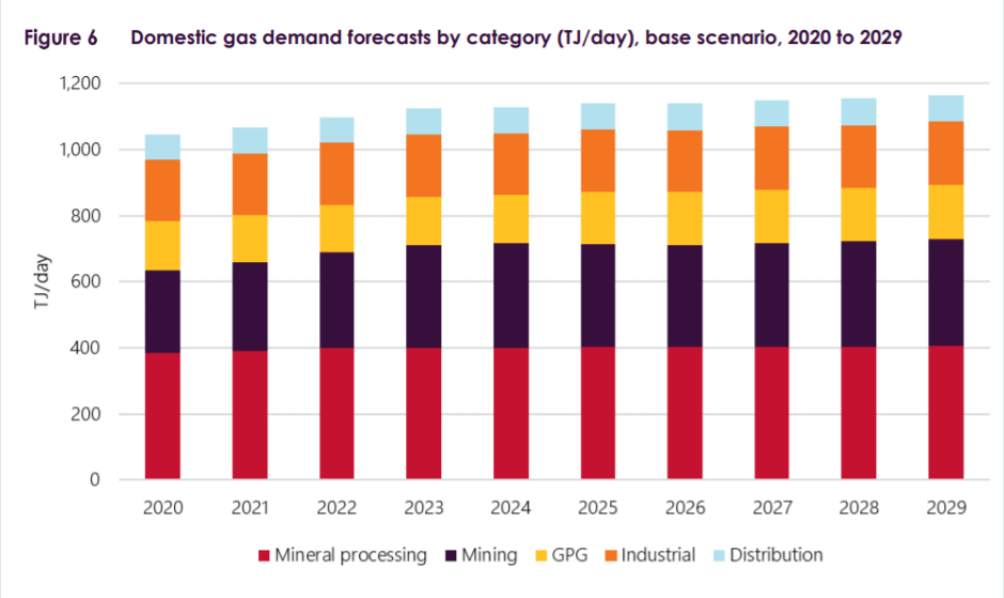
Agenda

1. Overview
2. Methodology
3. COVID-19 impact assessment
4. Discussion

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Overview

	Segment	Component
Tariff V	Distribution	Residential and Small Commercial
	Distribution	Industrial and Large Commercial
	Transmission	Industrial
Tariff D	Minerals Processing	Alumina and Nickel
	Minerals Processing	New and Prospective Projects
	Mining	Gold, Iron Ore, Nickel and Other
	Mining	New and Prospective Projects
	GPG	Non-SWIS
	GPG	SWIS (RBP)
Other	Gas Processing	



Source: 2019 WA GSOO

Overview

- Scenarios: Low, Base and High
- GSOO Regions
  - East: GBB zones Goldfields and Kalgoorlie
  - North: GBB zones Karratha, Dampier, Pilbara and Telfer
  - Metro/ South West: GBB zones Mid-West, Parmelia, Metro, and South West
- GSOO Area
  - SWIS
  - Non-SWIS

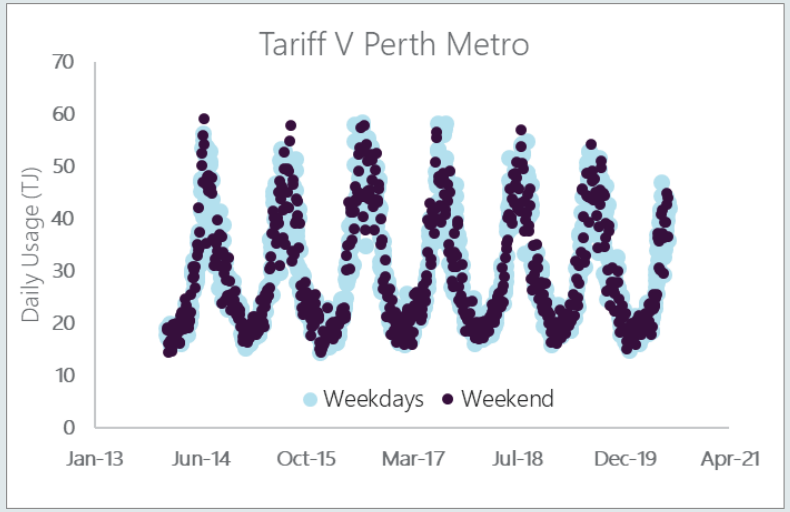
AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

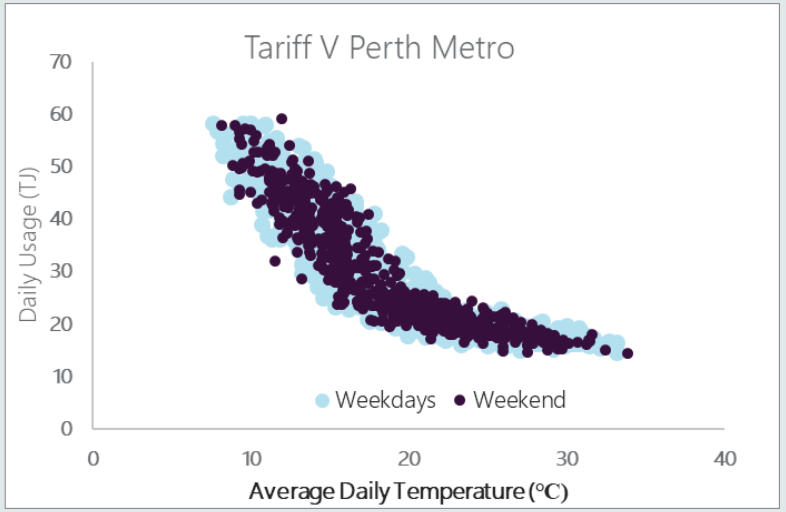
Methodology

Tariff V: Residential and Small Commercial

- Regression model estimates average heating and baseload consumption using heating degree days (HDD) under standard weather conditions over a two-year window leading up to base year.
- Base year value split into Residential and Small Commercial
- Trends and adjustments applied per connection
- Consumption per connection multiplied by MIRN forecast

	Segment
Tariff V	Distribution
	Distribution
Tariff D	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing





TV consumption data for Perth metro shows a strong relationship between seasons and temperature

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Tariff V: Residential and Small Commercial

- Forecast trends and adjustments per connection
  - Energy efficiency savings – National Construction Code (NCC savings) for space conditioning and Greenhouse Energy Minimum Standards (GEMS)
  - Fuel switching – changes in residential appliance and equipment stock from current and planned policy measures, e.g. E3 Zoned Space Heating label
  - Climate change – increased average temperature will reduce loads from gas heaters and hot water systems
  - Price behavioural response – minimal impact on baseload (for e.g. cooking and hot water), and low impact on heating load (for e.g. space conditioning) due to limited substitutability.

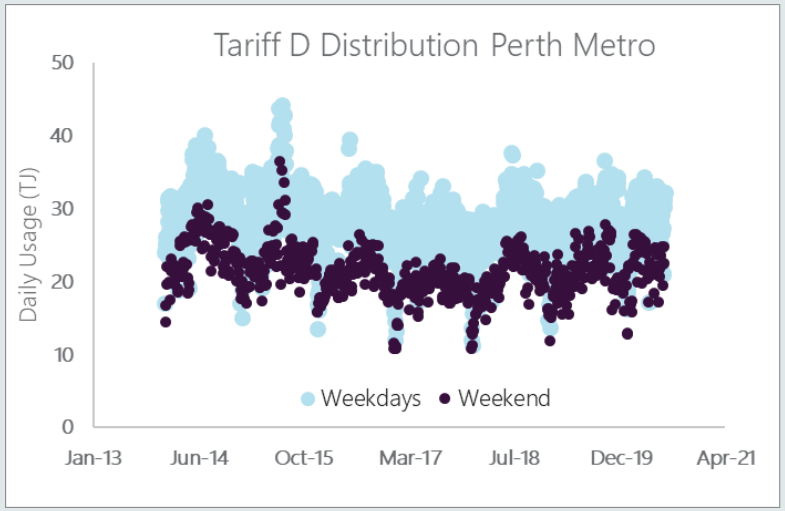
AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

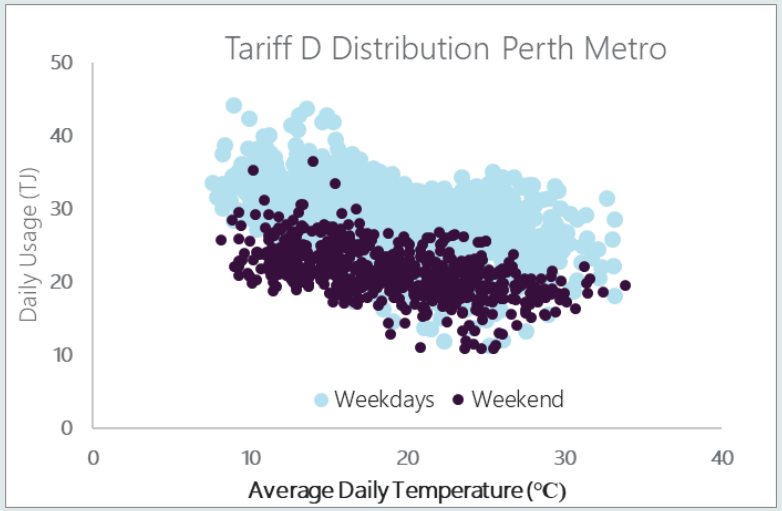
Tariff D Distribution

Industrial and Large Commercial

	Segment
Tariff V	Distribution
	Distribution
Tariff D	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing

- New daily regression model considers macroeconomic drivers
- Key inputs include:
  - Annual GSP growth for each scenario
  - Weekday/ workday split
  - Climate-adjusted weather impact (relatively small due to low weather sensitivity)
- In discussion with distribution network provider





TD Distribution consumption data for Perth metro shows differences in weekday/ weekend usage and lower weather sensitivity compared to TV

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Tariff D Transmission

Industrial

	Segment
Tariff V	Distribution
Tariff D	Distribution
	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing

Data sources

- WA GBB data reviewed for any significant changes
- Industry knowledge and market research used to explain changes
- Formal information request (FIR) data for forecast gas consumption
- Commodity forecast to develop commodity growth index for each scenario

Method

- FIR used first where available
- Median historical gas consumption value **x** commodity growth index used when applicable
- Median historical gas consumption value **x** scenario scaling factor used for remaining sites

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Tariff D Transmission

Mining

Minerals Processing

	Segment
Tariff V	Distribution
	Distribution
Tariff D	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing

AUSTRALIAN ENERGY MARKET OPERATOR

Data sources

- WA GBB data for historical gas consumption
- FIR data for forecast gas consumption
- Company reports for production output
- Industry knowledge and market research on other factors affecting gas consumption, e.g. renewable generation
- Commodity forecast* to develop commodity growth index for each scenario

Method

- FIR data used first where available
- Median historical gas usage per unit output **x** production output **x** commodity growth index for remaining sites

*Provided by NIEIR in 2020

Tariff D Transmission

New & Prospective projects

	Segment
Tariff V	Distribution
	Distribution
Tariff D	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing

AUSTRALIAN ENERGY MARKET OPERATOR

Definition

- New projects
  - Reached Final Investment Decision (FID)
  - Considered in all three scenarios
- Prospective projects
  - Attained environmental approvals
  - Likely to go ahead, however have not yet reached FID
  - Considered in High scenario only

Data sources

- WA GBB data for historical gas consumption
- FIR data for forecast gas consumption
- Company and ASX announcements
- Industry knowledge and market research

Tariff D Transmission

New & Prospective projects

	Segment
Tariff V	Distribution
	Distribution
Tariff D	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing

AUSTRALIAN ENERGY MARKET OPERATOR

Method

- Determine start date of operations and prorate first year if required
- FIR data used first where available
- Where future production output known:
  Gas usage per unit output from similar facilities **x** planned production
- Where project reduces GPG demand, for e.g. due to renewables:
  Depends on available data and could include:
  a) Electricity offset (MWh) using heat rate to convert to gas savings
  b) Emissions factor to convert CO_2-e savings to MWh then a)

Tariff D Transmission

GPG

	Segment
Tariff V	Distribution
Tariff D	Distribution
	Industrial
	Minerals Processing
	Mining
	GPG
Other	Gas Processing

Non-SWIS GPG

- WA GBB for historical gas consumption data
- Forecast electricity consumption and customer growth rates
- Renewable generation removed, for e.g. PV
- Heat rate to convert electricity MWh to gas TJ

SWIS GPG

- Consultant forecast (RBP)

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

COVID-19 impact assessment

- Commodity impacts, for e.g. mining, in the short-term
- Macroeconomic indicators and impact on forecast gas consumption for different components
- Impact on MIRN forecast of residential dwelling starts, building construction activity and population
- Possible structural shifts in residential consumption should some working from home practices continue in the longer term. We are investigating meter data and speaking to distribution businesses across Australia for their own analysis

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Discussion

Discussion

- Is there anything that is unclear?
- Are there other inputs and assumptions that we could consider?
- AEMO intends to present consumption forecasts at the November WA GCF