

COVID-19 impacts on demand

Medium to long term forecasting

Agenda

1. Forecasting medium to longer term
2. Easter/April 2020 outlook for SA
3. Medium term scenarios for COVID-19 impacts
4. Questions

Short term vs. longer term forecasting

Operational forecasting:

- Forecasts from 5 minute to 14 days out
- Weather driven
- Demand, wind and solar
- Frequent and automated publication of forecasts

Forecasting:

- 2 weeks to 30 years outlook
- Climate driven
- Consumption, max/min demand (by season)
- Annual publication of forecasts, with additional event driven updates



Risk vs. uncertainty

When forecasting medium to longer term, the inputs driving the forecast are increasingly uncertain the further out you forecast.

- Risk – distribution known (or can be assessed)
 - Example: weather, certain types of customer behaviour
 - Probabilistic methods, sampling/simulation
- Uncertainty – inputs not known
 - Example: Policy, future economic growth, battery storage uptake
 - Scenarios/sensitivities



Probabilistic outlook for minimum demand 2020 Easter

A case study for South Australia

Easter 2020 minimum demand forecast for South Australia

- Analysis has been done on most recent demand data (approximately two weeks of COVID-19 measures in place) and then simulated.

South Australia forecast operational minimum demand (MW, as generated)

POE*	April – no COVID-19	April – with COVID-19	Easter – with COVID-19
10% POE	790	760	611
50% POE	658	612	463
90% POE	584	557	406

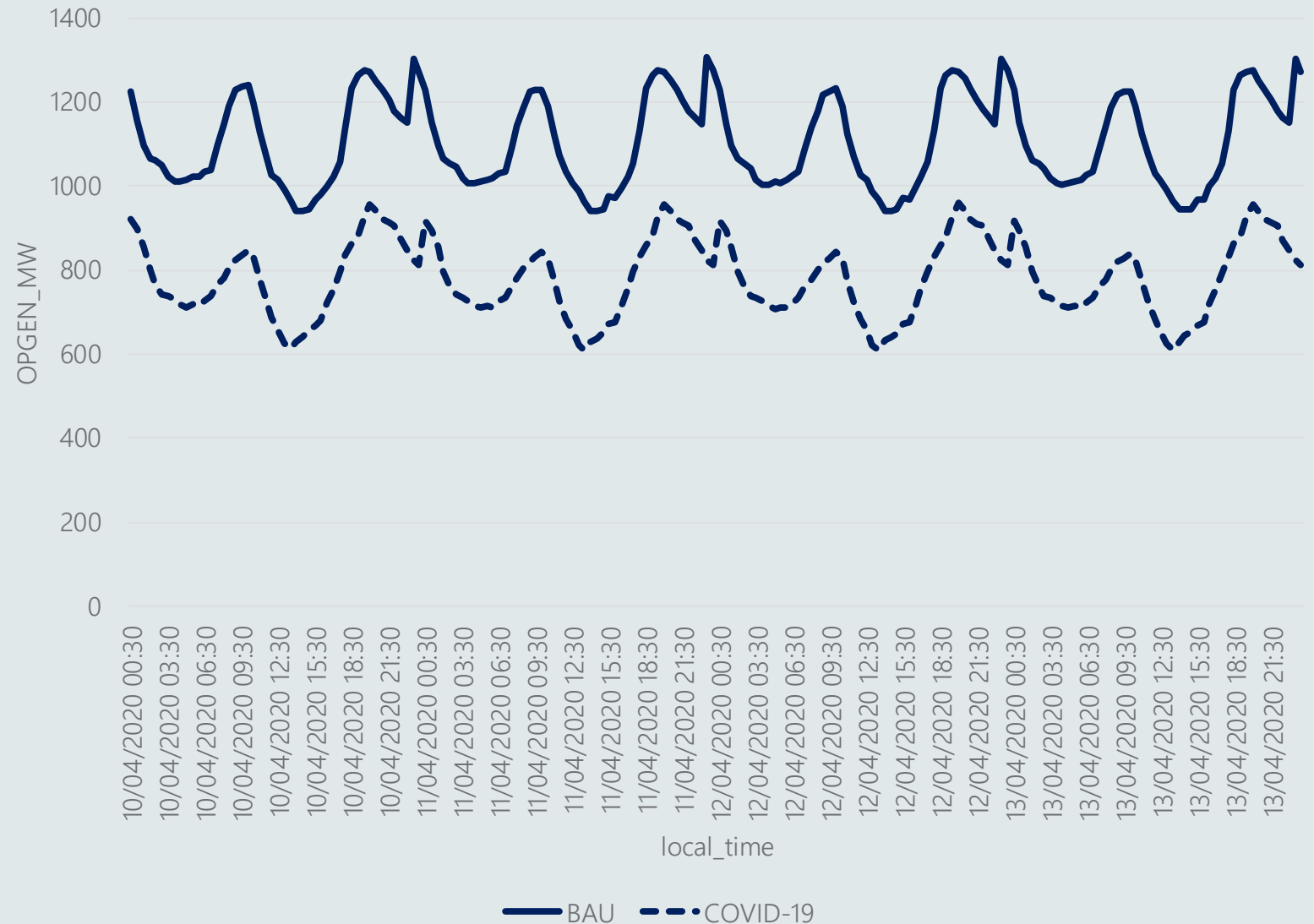
*Probability of Exceedance

(results based on climate alone – not accounting for actual weather forecast)

Operational Demand

Operational demand over Easter is forecast to be lower due to COVID-19 compared to BAU operation.

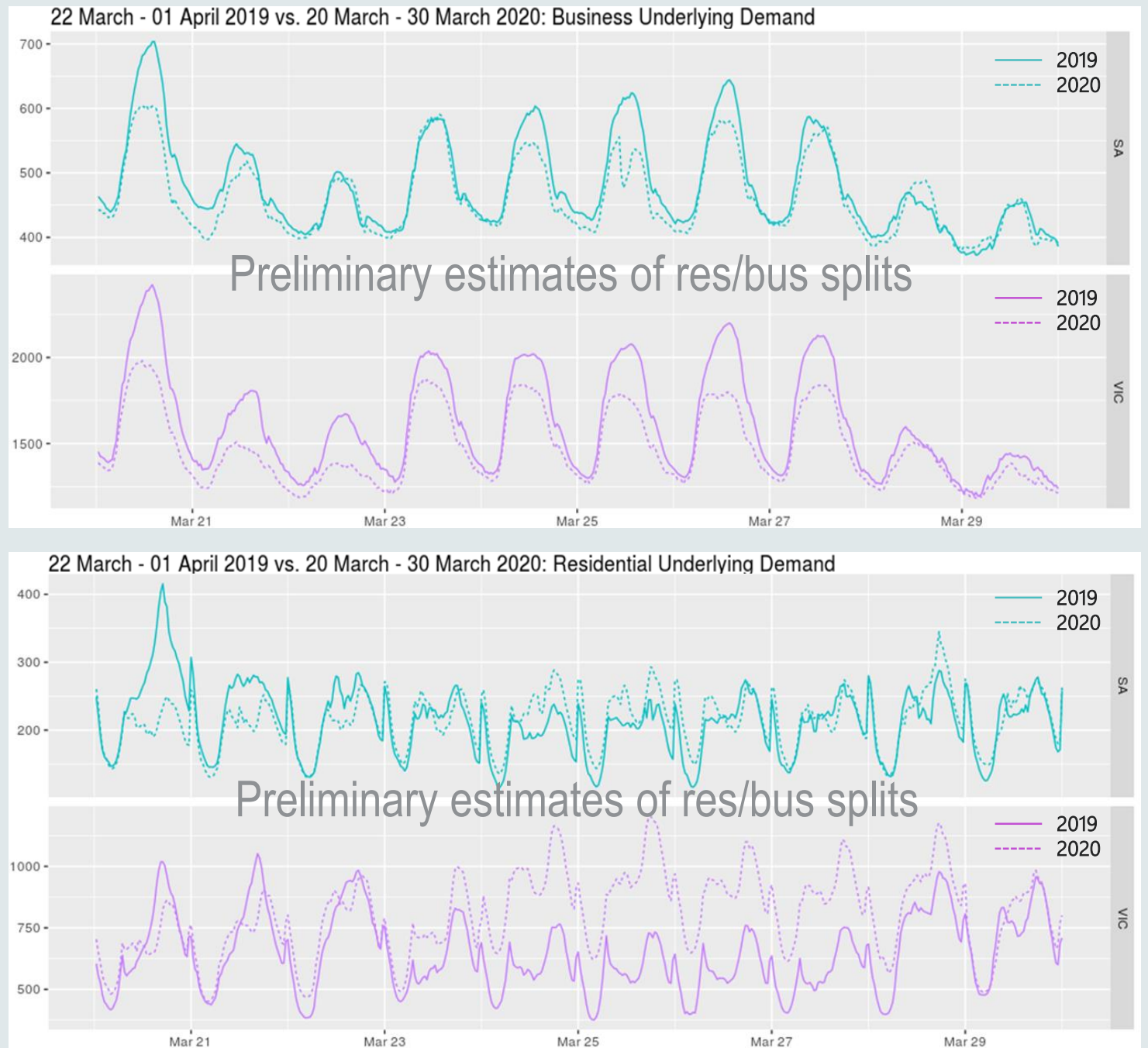
This is due to lower business demand slightly offset by higher residential demand.



Business vs residential consumption

Business demand during the day, where minimum demand is expected to occur, is estimated to be lower over the 2020 Easter period

Residential demand is expected to be higher in general due to reduced holiday activities, increased time spent at home from preventative measures (social distancing).



Large industrial load sensitivities

- Base results on the previous slide assumes current large industrial loads in South Australia continues at their current levels.
- AEMO has been in contact with all the largest ones and there are currently no plans for their operation to be reduced.
- However, there could be risks from sickness of key staff and restriction of movement of staff and potential access to essential spare parts from overseas that poses a downward risk. AEMO has therefore defined sensitivities of various levels of reduction from these loads as shown below.

Sensitivities:
Base scenario – no reduction
10% LIL reduction scenario
20% LIL reduction scenario
Largest load reduction scenario

Outlook for minimum demand in the medium term

Scenarios for COVID-19 impacts on demand

Approach

For its longer term forecasting, AEMO uses an ensemble model approach, combining the half-hourly model with a Generalized Extreme Value (GEV) model. This will allow AEMO to cross check each model to assess performance and trade off between the strengths and weaknesses of each model.

- Half-hourly model is better at forecasting the transition in timing of demand due to disruptive technology (PV, Battery and EV) but higher resolution models have greater variability
- GEV is better for forecasting short-term maximum demand (1-3 years ahead) but cannot account for structural shifts in demand drivers.

To analyse the impact in the medium term, including Spring 2020, the results will be driven by the GEV model outlook, though currently this will not pick up any impacts of COVID-19.

- AEMO is working on updated GEV results with latest PV, large industrial, etc.
- To this adjustment scenarios of COVID-19 impacts will have to be applied.

COVID-19 restrictions – International trends

By observing the impacts in a number of international jurisdictions, AEMO has found:

- Generally increasing impact (in percentage) on demand week by week (so far).
- Generally same impact on energy and max demand.
- Less impact on minimum demand, though these minimums are generally occurring overnight.
- Impact on demand at the time for a typical minimum for South Australia (weekend, 1pm) is generally similar to the percentage change observed for energy and max demand.

To ensure robust conclusions can be drawn, careful considerations on weather impacts and for example installed PV generation is required. This is still ongoing.

COVID-19 restrictions – how long?

COVID Impact on Demand – Guangdong, China

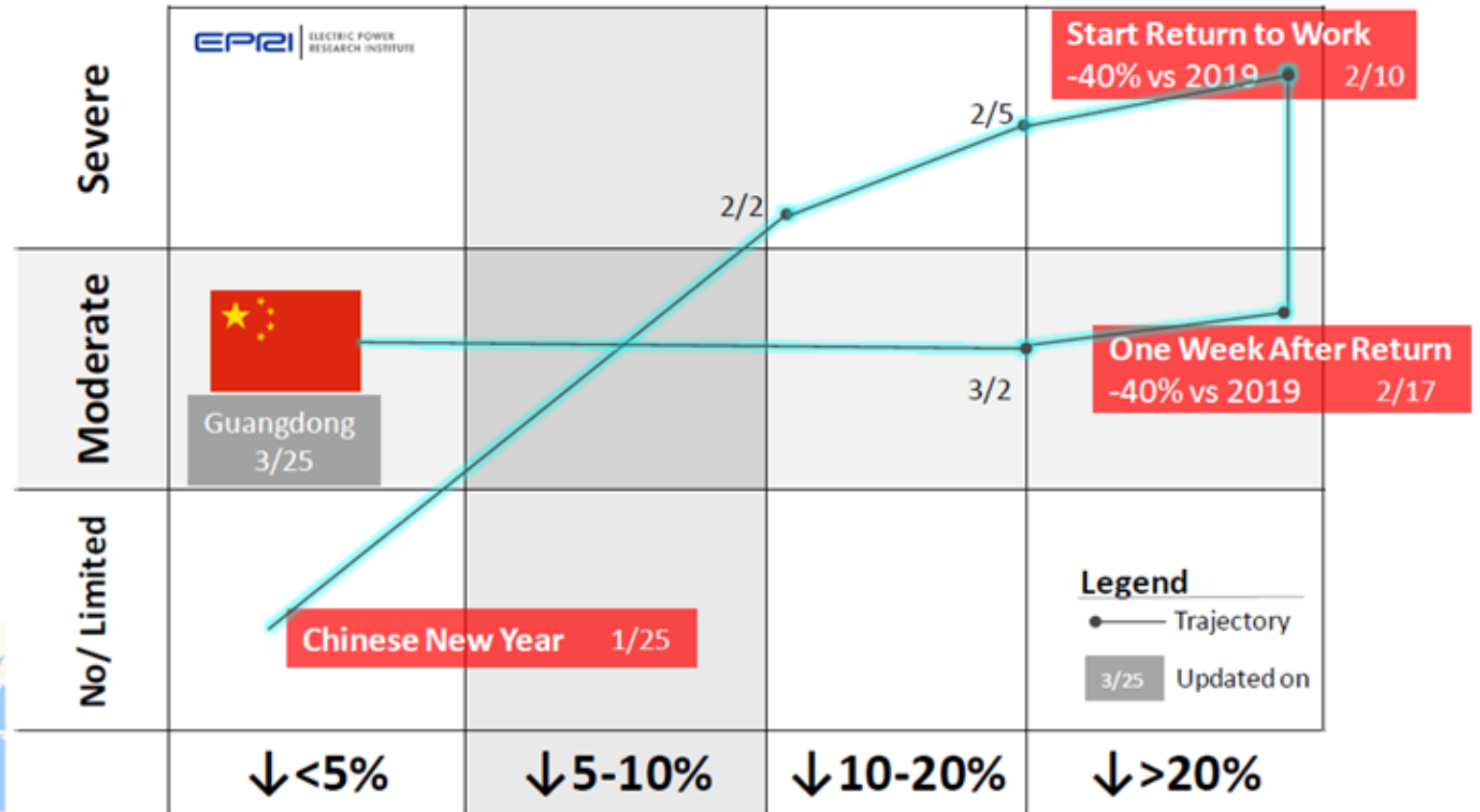
Prime minister Scott Morrison stresses Australia will live with coronavirus restrictions for at least six months

By Bella Peacock | 3 days ago



Source: A Current Affair, 9 News

Restriction Severity*



Data Sources:
<http://m.bjx.com.cn/mnews/20200304/1050387.shtml>
http://m.cnr.cn/news/20200326/20200326_525031627.html

Daily Energy Impact

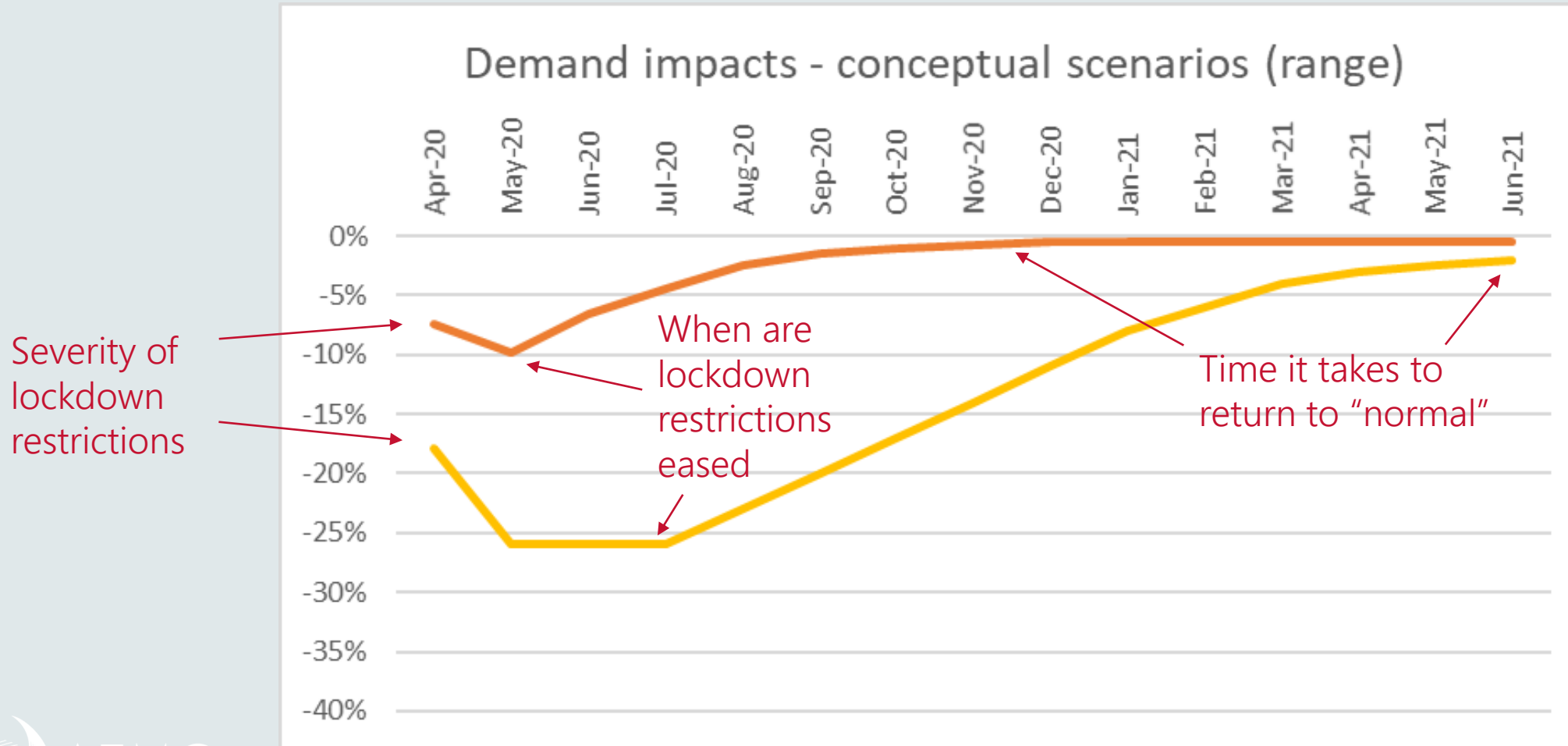
*Restriction severity varies substantially from region to region. Classification based on media reported restrictions

Scenarios for COVID-19 impacts

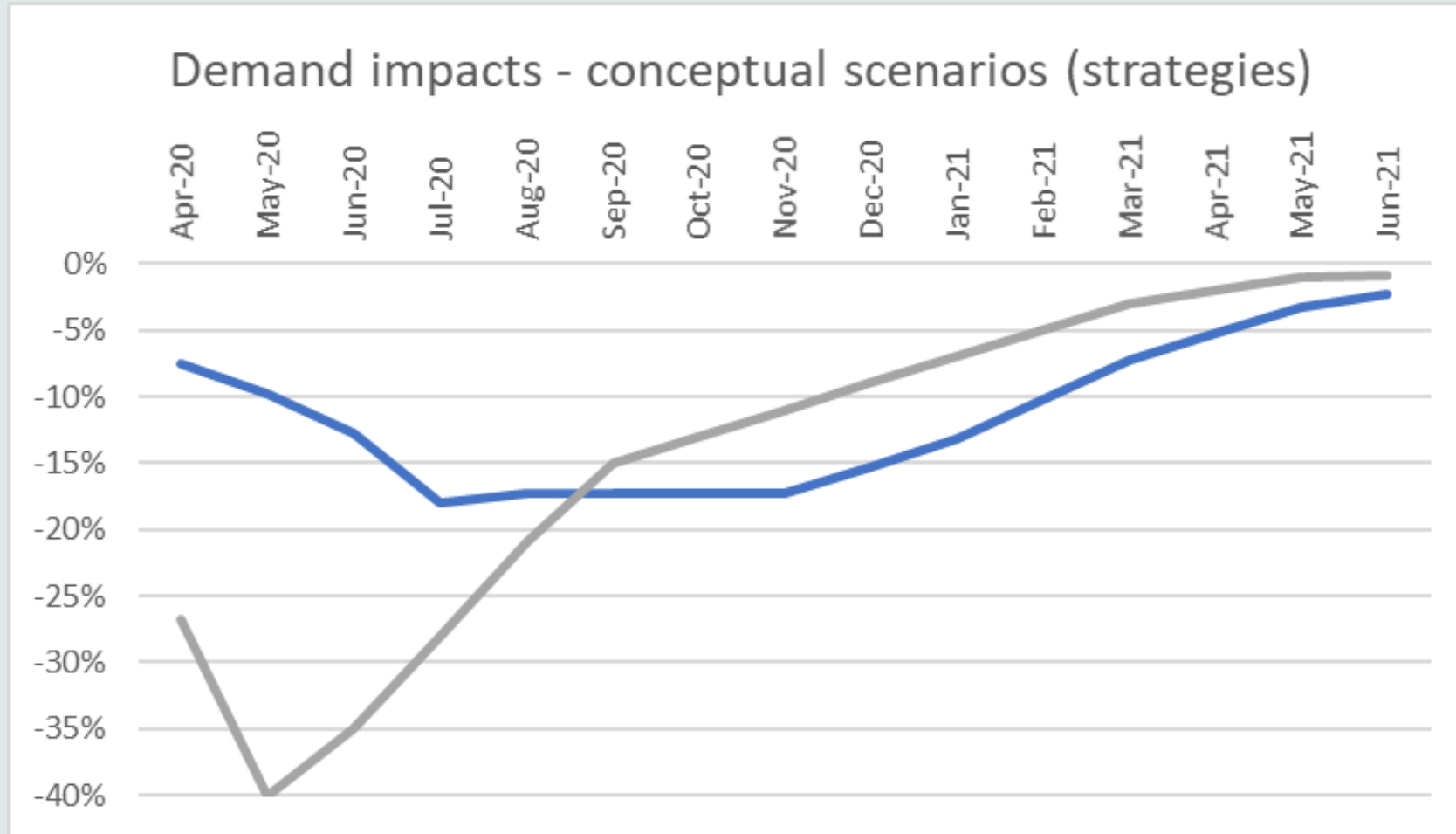
What are the impacts on electricity consumption and max/min demand?

- Severity of lockdown restrictions in place
- Time before lockdown restrictions are eased and over time removed
- Future economic and demographic impacts:
 - AEMO getting updated economic and population forecast from its consultant
 - What policy measures to lower the impact on the economy?
 - Potential impacts on large industrial loads?
 - Other?

Scenarios for COVID-19 impacts



Scenarios for COVID-19 impacts



Questions

- In terms of current trends, are you currently seeing the same:
 - Industrial approximately the same?
 - Business consumption down?
 - Residential consumption up?
- What are the major risks in the medium term to residential, business and industrial consumption?
 - Impact on load shape?
 - Any extreme risks AEMO should consider?
- Impact on electricity supply?

