

# The gas-fired recovery - new supply v. fuel switching with reservation

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*"Over half of Australians still rely on gas as a source of energy, but few realise that there's a more cost-effective, energy-efficient option – heat pumps" AGL*

*... and so, if gas is critical for industrial recovery, why waste it heating houses?*

With traditional east coast gas reserves in decline<sup>1</sup>, industry and government argue new gas supply from the likes of Narrabri<sup>2</sup> or import terminals is *essential* for post-COVID industrial recovery. Lead-times on new production mean addressing allocation is likely to secure more supply in the short-term. As much is recognized in the federal government's ADGSM<sup>3</sup>, which delivers about ~200 TJ/day each year. Here we address the broader issue of allocation by asking to what extent can non-critical fuel switching - *gas to electricity* - help alleviate supply issues? Despite the ADGSM, LNG exports have seen a substantial diversion of Queensland CSG production away from domestic markets. We argue that fuel switching together with reservation of a small fraction of CSG production, in line with pre-2015 levels, can substantially alleviate *critical industrial gas supply* issues with significant additional benefits. We provide two policy prescriptions

**PP 1. Switch ~50% of the current Victorian domestic and commercial gas heating demand to electricity delivering an additional ~180 TJ/day above 2019 levels to domestic markets**

**PP 2. Reserve a minimum 550 TJ/day from Queensland CSG production delivering an additional 170 TJ/day above 2019 levels to domestic markets**

Together, PP1 and PP2 more than compensate the looming 330 TJ/day Victorian committed supply deficit<sup>1</sup> with each contributing almost as much as Narrabri. We note that fuel switching is implicit in our *Paris commitments*, and is an obligation.

## how is east coast gas currently allocated?

In 2019, total east coast gas production averaged ~5180 TJ/day of which 3320 TJ/day was allocated to LNG exports (64%) and about 310 TJ/day (6%) to LNG processing at Curtis Island, leaving a balance of about 1550 TJ/day (30%) for the domestic market. CSG production in Queensland accounted for 77% of total production (~4010 TJ/day), of which 9% (~380 TJ/day) was allocated to the domestic market. This compares to the average of 550 TJ/day from CSG in the period 2010-2013, prior to the first LNG exports in 2015. In effect, notwithstanding the impact of the ADGSM, some 180 TJ/day has been diverted from Queensland domestic supply to LNG export. Of the domestic allocation industry uses ~45%, domestic and commercial heating ~32%, power generation ~23%. In Victoria, 55% of demand is for domestic and commercial heating, 30% for industry and 15% for power.

## alternatives to new supply?

We consider two alternatives to new supply: *fuel-switching* of domestic heating loads and *reservation*. With *efficient electrical heat-pump* alternatives such as

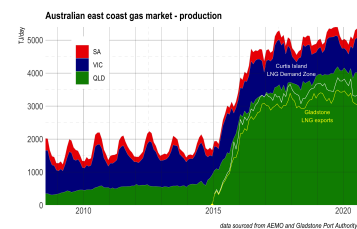


Figure 1: East Coast gas production by region

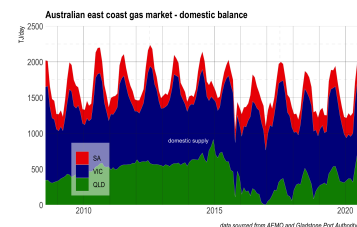


Figure 2: East Coast gas production by region less allocations to the Curtis Island Demand zone used for LNG export.

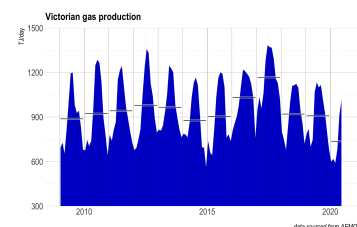


Figure 3: Victorian gas production showing strong seasonality averaging about 910 TJ/day.

reverse cycle air-conditioners now widely available, fuel switching of heating loads is now plausible. Fuel switching of ~50% of Victorian gas heating demand saves about 180 TJ/day. Reserving CSG production at the 2010-2013 average delivers an additional 170 TJ/day to domestic markets equivalent to an additional 5% of export demand. Gas use in LNG processing can be substantially electrified and therefore contribute materially to the domestic market supply balance. At ~80 TJ/day, electrifying 25% of LNG processing demand would contribute about half the additional required PP2 CSG reservation.

## where would the additional energy come from?

Switching 50% of the Victorian gas heating load to heat pumps, adds about 2.0 GW to Victorian peak winter power demand<sup>5</sup>, with the total annual demand requirement equivalent to the output of about 1.5 GW of installed wind power assuming a capacity factor of 35%.

## with added benefits

- for households, the possibility of just one connection fee instead of two saving around \$350/year
- for gas transmission, mitigation of looming winter *peak day adequacy* issues<sup>6</sup>
- for electricity consumers, a more productive power grid (~6% higher utilisation) with reduced unit costs, and reduced incentives for gaming by market participants through practices such as *shadowing gas prices*<sup>7</sup>
- for investors, further incentives for renewable power generation
- for Australians, time for the hydrogen/alternative economy to arrive without costly supply-side investments and their associated risks

## 2019 gas allocation and supply data

- total east coast gas demand, excluding LNG ~1550 TJ/day
- Queensland CSG production ~4010 TJ/day
- Victorian gas production ~910 TJ/day
- total east coast industrial gas demand, excluding LNG ~720 TJ/day
- Victorian domestic and commercial gas heating ~360 TJ/day
- LNG exports ~3320 TJ/day
- LNG processing ~310 TJ/day

1. For example, the currently committed supply from Victoria's Gippsland Basin declines by 37% or about 330 TJ/day by 2024.
2. The SANTOS Narrabri project will deliver about 190 TJ/day in new supply.
3. The [ADGSM](#) is a government scheme to ensure uncontracted gas from LNG exporters is made available to domestic markets - in effect a *veiled domestic reservation scheme*, delivering about ~200 TJ/day in 2019.
4. LNG processing demand is measured as the total Curtis Island demand, less LNG exports assuming an energy content of LNG of 54.8 GJ/tonne, and amounts to ~9% of LNG export volume.
5. assuming a gas heat efficiency of 75% and a heat pump COP~3
6. *Peak day adequacy* issues are forecast in AEMO's March 2020 [Victorian Gas Planning Report Update](#)
7. the exercise of market power through *shadowing the gas price* impacted the wholesale electricity price in 2017 by as much as ~\$14 billion.

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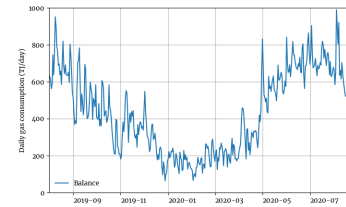


Figure 4: Victorian gas allocation to domestic and commercial sectors mainly for heating.

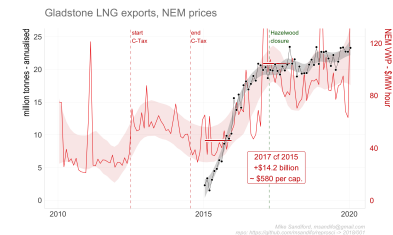


Figure 5: Wholesale electricity prices doubled as LNG exports increased across 2016, adding 14 billion to the traded value substantially due to the practice of shadowing the gas price.