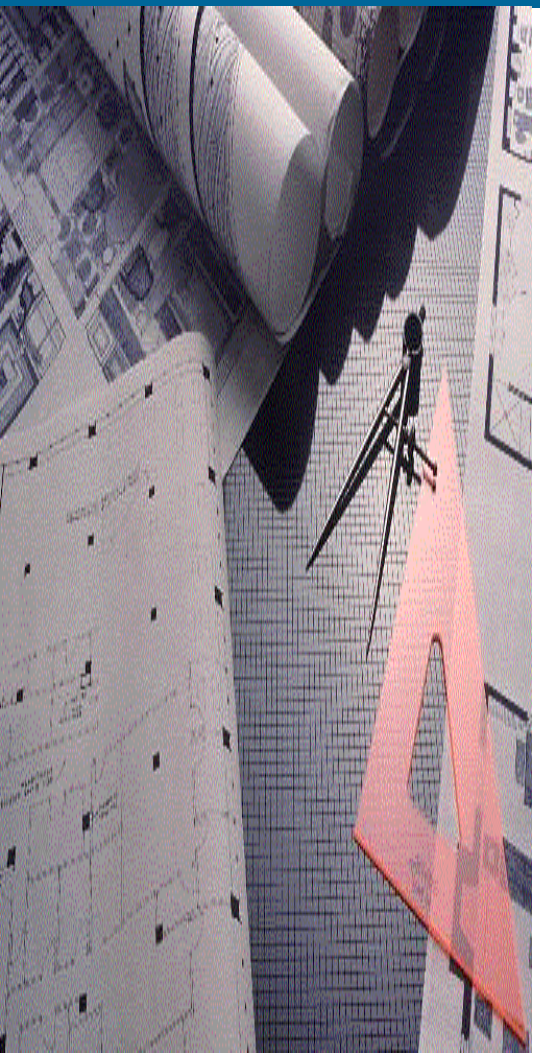
MARKET REFORM

Gas Market Parameters Review 2022: Draft Recommendations

Market Reform

6 December 2022

Outline



- Introduction and background
- Draft findings and recommendations
- Markets and trends
- Approach
- Results
- Conclusions

Please note that the draft determination to which this presentation relates is published on the AEMO website: AEMO | Gas Market Parameter Review 2022

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Introduction

- AEMO has engaged Market Reform to perform the Gas Market Parameter Review.
- This is part of a mandatory review required to be performed for the Short Term Trading Market (STTM) within 6 months of a NEM parameter review.
- No similar mandate exists for the Declared Wholesale Gas Market (DWGM) but AEMO has combined this with the STTM review.
- Any change in the current parameters will normally apply from July 2025. The study period extends through to June 2028, as the next NEM parameter review will apply from then.
- If an urgent requirement for change is found, then the new parameters could apply from July 2024.
- In response to the events of winter 2022, we explored the performance of parameters for the year from July 2023. While not part of the formal review, the information will be available if there is seen to be any need for earlier change.

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Role of Parameters

- Role of MPC/VoLL.
  - Set maximum market price.
  - Provide economic price signalling by allowing the market maximum opportunity to clear.
  - Not a risk management tool, although does influence participant risk.
- Bounds on MPC and VoLL.
  - Greater than the maximum short-term price expected to arise.
  - High enough to support an investment response to shortages.
  - Common across all schedules (STTM and separately DWGM) and hubs (STTM).
- Role of APC/CPT.
  - APC/CPT limit unmanageable market risks.
- Bounds on APC/CPT.
  - APC should not undermine participant incentive to manage risk or distort investment decisions.
  - CPT should be set to allow for normal market clearing while limiting exposure to unmanageable risks.

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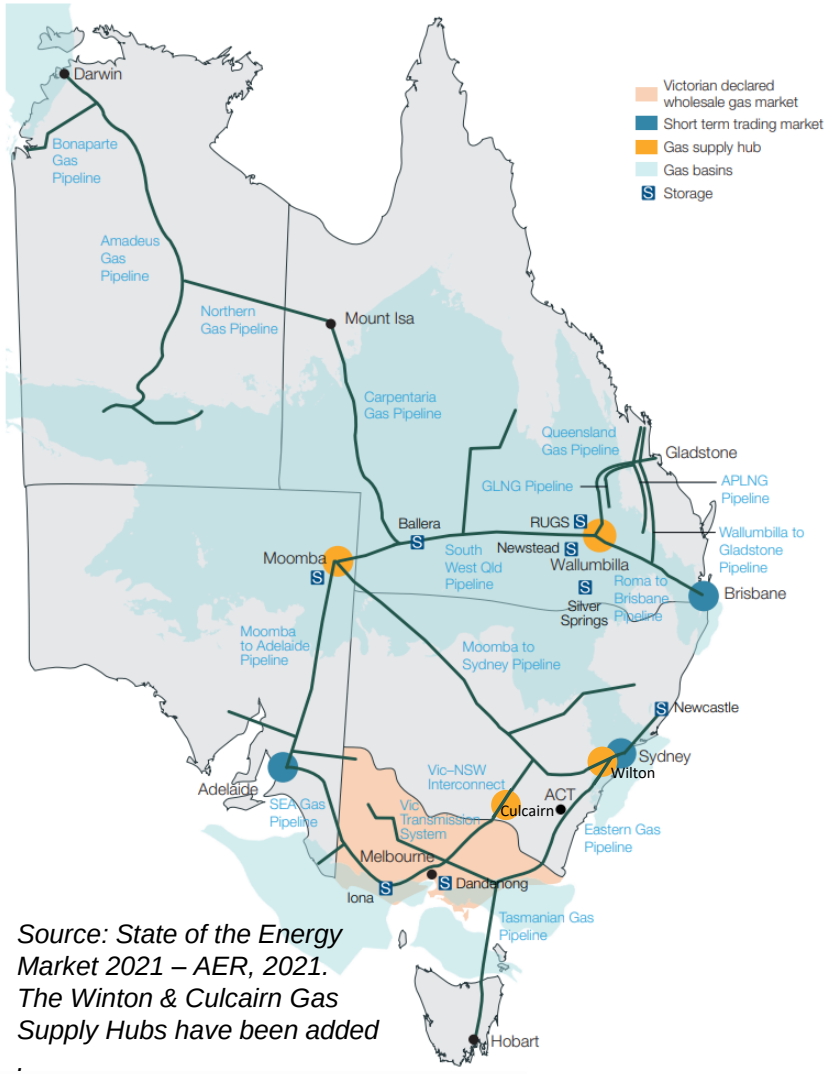
The Current Parameter Settings: We Are Proposing No Change

STTM		
Parameter	**Documented in**	**Current Setting***
Market Price Cap (MPC)	National Gas Rules	$400/GJ
Administered Price Cap (APC)	National Gas Rules	$40/GJ
Cumulative Price Threshold (CPT)	National Gas Rules	$440 over 7 days (110% of MPC)
DWGM		
Parameter	**Documented in**	**Current Setting**
Value of Lost Load (VoLL)	National Gas Rules	$800/GJ
Administered Price Cap (APC)	Wholesale Market Administered Pricing Procedures (Vic)	$40/GJ
Cumulative Price Threshold (CPT)	Wholesale Market Administered Pricing Procedures (Vic)	$1,400 over 35 periods

** The appropriateness of different level of price caps in the STTM and DWGM was raised in the previous reviews Feedback then was that the different natures and context of the markets makes this appropriate.*

The Advice AEMO Has Sought



Source: State of the Energy Market 2021 – AER, 2021. The Winton & Culcairn Gas Supply Hubs have been added .

Review is to:

- Consider links between markets.
  - STTM Hubs (ADL, SYD, BRI) & Victoria's DWGM.
  - Linkage with NEM.
  - Gas contracts and international gas markets.
  - Participants operating across markets.
- Reflect industry structure and future development.
  - Current and foreseeable future structure.
  - Should not focus on real participants but should look at range of participant sizes types and their contract / spot positions.
- Use public data or reasonable estimates.
- The four Gas Supply Hubs are not in scope.

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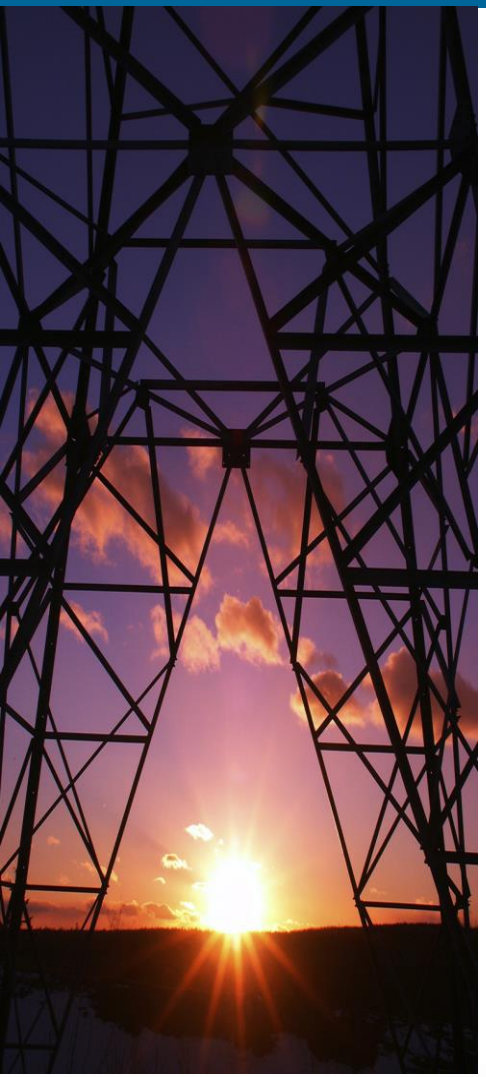
The NEM APC Value



- The Reliability Panel published its final report on the 2022 Review of the Reliability Standard and Settings on September 1st.
  - Recommended that the NEM's administered price cap be increased from $300/MWh to $500/MWh for the period 1 July 2025 – 30 June 2028.
  - Also proposed a review to consider, among other things, linking NEM APC to a gas reference price or gas APC value.

- Separately, in response to an Alinta energy rule change proposal, the AEMC has increased the NEM APC to $600/MWh for the period 1 December 2022 to 30 June 2025.
  - This change was in response to events of Winter 2022 where the existing cap of $300/MWh is was found to be too low relative to the gas price cap.

- The NEM's administered price cap is relevant to the review:
  - The level of NEM APC influences the level of gas demand in our scenarios. We used $600/MWh as the NEM APC in our studies. Its only impact was a on gas demand and there was no material difference between $500/MWh and $600/MWh.
  - The NEM APC values have been informed by the current gas APC values of $40/GJ. This is particularly important as an increase in the gas APC could conflict with the NEM APC.

Findings and Recommendations

- The current parameters are still acceptable, though close to the limits of what is acceptable.
- For the DWGM there are no options for adjusting CPT that both support investment and participant risk management. There is scope for increasing VoLL to $1000/GJ but there is no clear benefit to doing so.
- For the STTM, the analysis revealed no suitable alternatives for either MPC or CPT.
- We favour no change to the current APC values in both the STTM and DWGM.
  - The AEMC's new settings of the NEM APC were based on the current gas APC values and raising the gas APC values would conflict with the NEM settings, potentially recreating some of the detrimental issues encountered in Winter 2022.
  - While our analysis indicates lower APC values could be supported, we do not propose it as it would significantly reduce market efficiency
- Preserving the current parameters minimizes the impacts on current contractual arrangements.

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Findings and Recommendations

- Interest has been expressed in aligning parameters between the DWGM and STTM
  - Reduces risk of distortions in flow between markets when one is administered, and one is not.

- No single set of parameters exists that could be applied across both the DWGM and STTM.
  - The STTM is primarily a day-ahead market with one opportunity to trade through an auction process. All subsequent process are less advanced. The cumulative price is only updated once per day.
  - The DWGM is an on-the-day market with five opportunities to trade each day through auction processes. The cumulative price is updated five times per day.
  - These differences create a very different risk profile for participants in these markets.

- We recommend consideration of an additional trigger that could administer multiple markets.
  - Applied to avoid distortions in flows between markets.
  - The specific markets impacted would need to be determined in response to the event.
  - The trigger would have to be a measure that reflects (a) reduced supply to those markets and (b) a better outcome if the relevant markets are administered.

- It would be beneficial to align the reviews of NEM parameters and the Gas Market Parameters. At minimum, the reviews should be run concurrently with interactions between them.

Current Global Gas Market Conditions

- An assumption of the analysis is that the market is in equilibrium, such that supply and demand are aligned with the prevailing typical level of gas prices.
  - We used GSOO supply and demand data and corresponding price forecasts.
  - These price forecasts (≈$9-11/GJ) are less than current levels of gas price.

- Current levels of gas price are primarily driven by the Ukraine war.
  - This may be resolved in six months (or not).
  - Equally, future events, such as an economic downturn, could reduce gas prices.
  - The best read on a potential future equilibrium is probably recent history prior to covid, and the GSOO price forecasts seem broadly consistent with that.

- Determining Gas Market Parameters over the long term based on prices that may reflect transient effects can be very problematic. The market is not in equilibrium during transient events meaning that participants may be inadequately contracted, and gas supply and demand will differ from GSOO forecasts.

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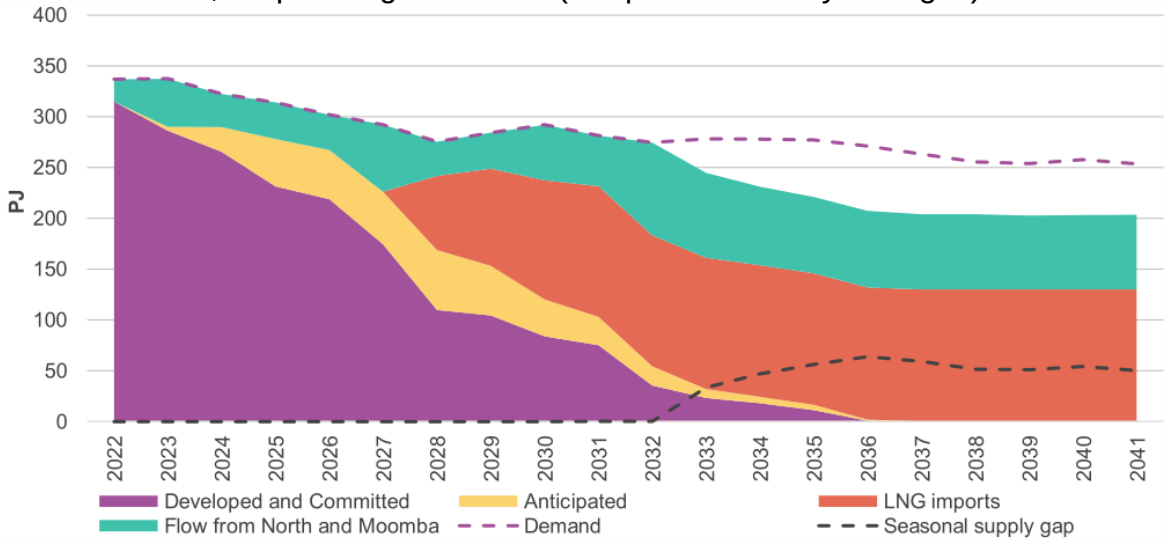
Implications of Different Scenarios

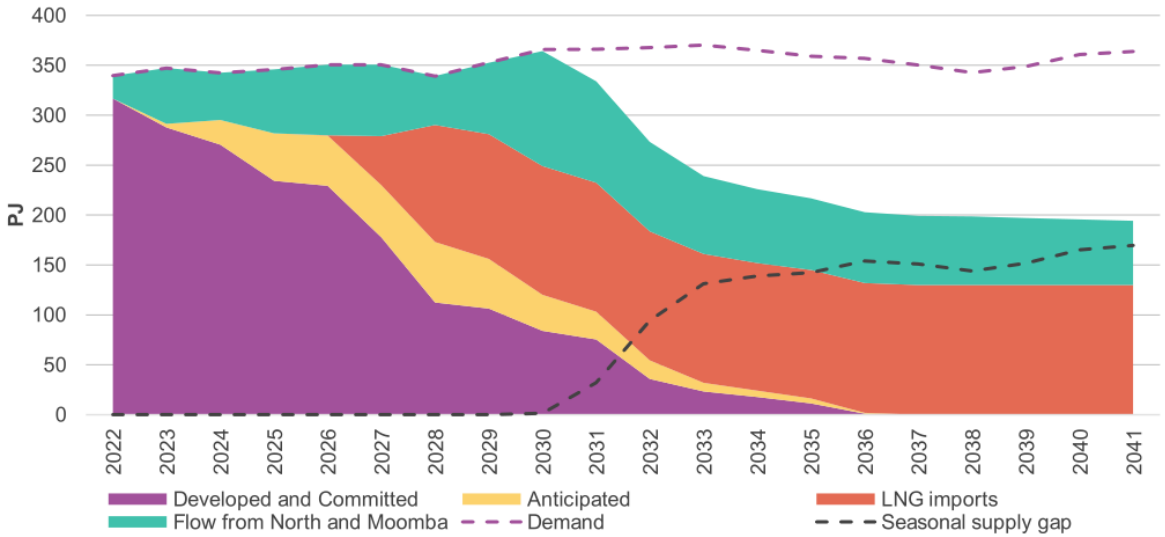
- Sustained high gas prices with the market equilibrated
  - Suppose gas prices were to rise to $20/GJ permanently and the contract market re-equilibrated to this level.
  - Key impacts with our proposed Gas Market Parameters are:
    - Lower participant risk in terms of days profit lost due to tighter CPT limits relative to price levels.
      - Our measure for acceptability of Gas Market Parameters is no more than 500 days of lost profit during an event.
    - Investment would be less tenable.
      - Higher average prices would mean that the markets would not even be exposed to one pricing period at VoLL/MPC before an administered state was applied.
    - Efficiency would be relatively worse as more transactions would be curbed.
    - To avoid this, the DWGM might require a CPT of $1600 while the STTM might require a CPT of $600/GJ.
      - There may be reasonable scope to go higher with CPT if participant risk is roughly halved.
    - There would be more options if both the gas APC and NEM APC were modified.
- Transitional high gas prices without the market equilibrated
  - Suppose the $20/GJ price applied temporarily, before reverting to the levels predicted in the GSOO.
  - While prices are at $20/GJ, participants are likely to face days of lost profit even without a CPT event. This means that they will have less tolerance to CPT events.
    - A participant that can absorb 500 days of lost profit for an event may also be faced with, for example, 100 more days of lost profit because of base prices being high.
    - It follows that the risk of participant failures is higher.
  - There is no parameter set that will protect fundamentally unprofitable/low profitability businesses while supporting investment.
  - The process of re-equilibrating to new market conditions would likely see some participants exit the market.
- If we incorrectly treated this transitional price as permanent and ran our study as if $20/GJ was the equilibrium price (ignoring that GSOO data would be inconsistent with this forecast) then this would produce more extreme parameters that would further increase participant risk.

Our Study Was Built Around the GSOO Step Change and Progressive Change Scenarios

2022 GSOO, Step Change Scenario (A rapid move away from gas)



2022 GSOO, Progressive Change Scenario (a slower move away from gas)



2022 GSOO, Table 10: Maximum magnitude and timing of forecast daily shortfalls, Step Change and Progressive Change, 2023-26 (TJ/d).

Scenario	2023	2024	2025	2026
Step Change, existing and committed supply	0 - 0	0 - 0	0 - 0	0 - 0
Step Change, existing, committed and anticipated supply	0 - 0	0 - 0	0 - 0	0 - 0
Progressive Change, existing and committed supply	0 - 36	0 - 50	0 - 35	157 - 614
Progressive Change, existing, committed and anticipated supply	0 - 36	0 - 0	0 - 0	0 - 0

We generally used this data, though also considered a late delivery of Port Kembla.

Higher demand means tighter conditions so 2023 was the tightest year. After that, demand declines under the step change scenario make it less extreme than the progressive change. New projects coming on-stream later in the horizon produce fewer extreme conditions.

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Summary of Trends

DWGM

Predicted increase in commercial & industrial gas demand, due to uptake in steam methane reforming used in hydrogen production

Demand uncertainty is being reflected in a relative hesitancy of the market to contract for future supply.

Victorian gas production declining, with existing and committed supply forecast to decline from 360 PJ (2022) to 243 PJ (2026)

Risk of shortfalls

- No peak shortfalls forecast prior to 2026 though risk of issues on high demand days due to tight supply and demand balance.
- For 2026 unless anticipated (but not yet confirmed) projects eventuate peak day shortfalls could range from 23 TJ (1-in-2-year peak) to 130 TJ (1-in-20-year peak).

Note: A current proposed rule change by the Victorian government would, if adopted, have AEMO managing a reserve of gas in the Dandenong LNG storage facility with gas priced at VoLL.

STTM

Adelaide and Sydney share in the potential overall shortfalls for south-eastern region.

- Under higher progressive change demand, infrequent gas shortages are forecast from 2023, but these become more severe by 2026 with the reduction in south-eastern production.
- The delivery of anticipated projects would alleviate all forecast supply gaps, except in 2023.

The ACCC's Gas Enquiry 2017-2025 indicates that Queensland could face a small shortfall of 2 PJ in 2023 if LNG exporters decide to export all of their excess gas.

The DWGM and STTM - Features

DWGM 2022

- Market carriage with bids and offers used in a market run on the day of delivery.
- Network funded separately.
- Gas supply contracts used to hedge market exposure.
- Demand dominated by heating load.
- GPG's participate as price takers and can be curtailed.
- Interconnected with SA, NSW and Tasmania.
- Winter peak consumption typically exceeds 1100 TJ/day with 1-in-20 year-peak of around 1250 TJ/day.
- During summer 1-in-20-year peak consumption can be as low as 440 TJ/day.
- Available supply within and for Victoria is split between Gippsland (~972 TJ/day), Port Campbell (~719 TJ/day) and LNG (87 TJ/day).

Data based on 2022 forecast in Victorian Gas Planning Report

STTM 2022

- Three hubs – Adelaide, Sydney, and Brisbane.
- Participants trade gas in a day-ahead market then nominate on a relevant facility
- Pipeline shipping costs must be built into price.
- On the day schedules can be adjusted bilaterally, or (very rarely) a contingency gas market can be run.
- Market operator service used to balance markets.
- Deviation pricing to settle deviations from modified market schedule.
- Indicative Demand.
  - Adelaide Typically 35-80 TJ/day, Extremes 25-90 TJ/day.
  - Brisbane Typically 60-100 TJ/day, Extremes 40-140TJ/day.
  - Sydney Typically 210-350 TJ/Day Extremes 185-490 TJ/day.

Data derived from daily STTM reports from Jan 2019 to July 2022.

Events of Winter 2022

Drivers:

- Extreme international coal & gas prices.
- Domestic gas prices reached (and exceeded). international LNG netback gas prices.
- Reduced coal generation availability in the NEM.
- Particularly cold weather increasing gas consumption.

Impacts:

- High gas and electricity prices.
  - Retail failure and ROLR events.
- Price caps created issues across markets.
  - APC in STTM and DWGM at $40/GJ.
  - APC in NEM applied at $300/MWh .
  - Challenging ratio given GPG heat rates.
  - APC applied at different times in different gas markets, impacting flows between them.
- AEMO invoked Gas Supply Guarantee.
- AEMO suspended NEM.

Observations

- Gas and NEM price caps may have been appropriate for short term supply interruptions at otherwise historic levels of gas prices, but in the context of gas prices aligning with world gas prices they were challenging.
- Gas sold outside of the STTM and DWGM is not at a capped price, meaning there can be incentives to sell out of these markets. Overtime this can reduce the supply certainty for consumers in markets with price caps.
- Price caps are suited for short events which the market cannot mitigate but are not the solution when high prices reflect long term supply and demand. Prices need to rise to allow supply and demand to re-equilibrate.

These highlight trade-offs between risks to consumers, system security, and the operability of markets.

Market Linkages

- Links between DWGM and STTM and broader gas market
  - Markets are sharing the same pool of gas.
  - Long delivery times limit inter-market responses to short term issues.
  - Multiple day issues are possible given market tightness.
  - Gas supply disruptions in one market increase demand for gas in other markets.
  - Different market price caps may impact willingness to trade (but only when prices are very high).
  - Market price caps are triggered independently between the DWMG and each STTM hub, even if an event is common to the DWGM and some STTM hubs.
  - Links to the LNG export market. As at the start of this work, spot LNG net back prices were forecast to be $70/GJ+ during the European winter, but the current forecast peaks are now below $45/GJ.

- Links between gas markets and the NEM
  - Gas powered generation links the gas and electricity markets.
  - If there is an urgent need for GPG in the electricity market but gas is limited, then an electricity issues becomes a gas issues.
  - Sustained high electricity prices incentivise long-term running of gas powered generation.
  - Coincident and cascading linked events across markets are possible (and happened this year).

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Potential Unmanageable Risk Events

DWGM

- Production failure on high demand day.
- Pipeline compressor failure limiting ability to move gas.
- Very high demand, e.g. due to:
  - Extreme cold weather.
  - High rate of gas export to support other markets.
  - High GPG demand (e.g. surprise event during day).
  - Context of different events may impact administered outcomes and market risks for participants differently.
- Low reserves of stored gas (e.g. LNG to support Melbourne).
- VoLL triggered by price taker bidding behaviour at a system withdrawal point (e.g. failure to schedule supply to hedge that position which drives price to VoLL).

STTM

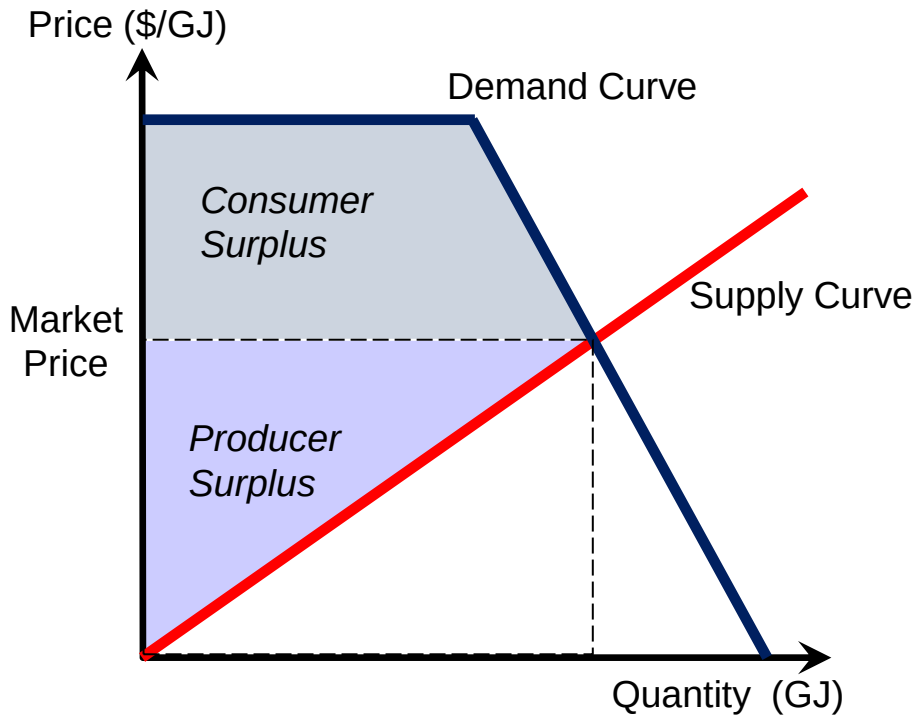
- Production failure limits supply to the hub.
- Pipeline compressor failure limits ability to move gas to the hub.
- High GPG demand outside the hub reducing capacity to deliver to the hub.
- Very high demand (including in broader gas market).
- Contingency gas scenarios resulting from the above risks.

Maximising Market Efficiency

while

Keeping Participant Risk Acceptable

Market Efficiency



- Consumer Surplus is the difference between the value of a product and the price paid for it.
- Producer surplus is the difference between the price paid for a product and its cost of production.
- We can measure Market Efficiency as the sum of Consumer Surplus and Producer Surplus.
- If the market clears where the supply and demand curves cross then market efficiency is maximised.
- But if this implies high prices then this creates risk for the market.

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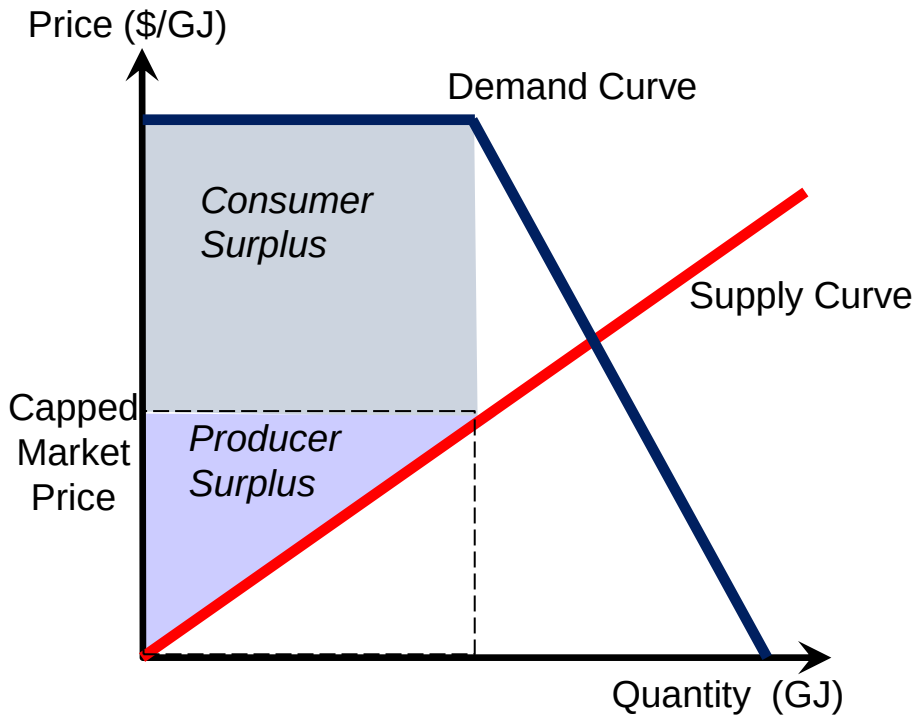
Administered Price Caps Can Reduce Market Efficiency



- If we impose price caps to limit prices, we can also limit trade.
- With a lower price cap supply is truncated and less quantity clears in the market.
- The sum of the Consumer Surplus and Producer Surplus is reduced.
- Suppliers who would willingly sell to willing consumers at prices above the price cap cannot do so.
- The market outcome is less efficient.

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Keeping Participant Risk Acceptable

- On a high-priced day, participants can be forced to buy gas at a loss if they are to operate.
- Based on annual profits, a participant will have a typical average daily profit.
- The ratio of these is the Days of Lost Profit due to an event.

$$Days\ Lost\ Profit = \frac{Profit\ Lost}{Average\ Daily\ Profit}$$

- The measure used in past reviews is that an Acceptable Participant Risk is no more than 500 days lost profit.
- Participants come in all shapes and sizes and with different degrees of hedge. Using a hypothetical example of each size and type of participant we can use simulation with different gas market parameters to determine which parameters maintain risk at acceptable levels for across all participants in the modelled scenarios.

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The Scenarios

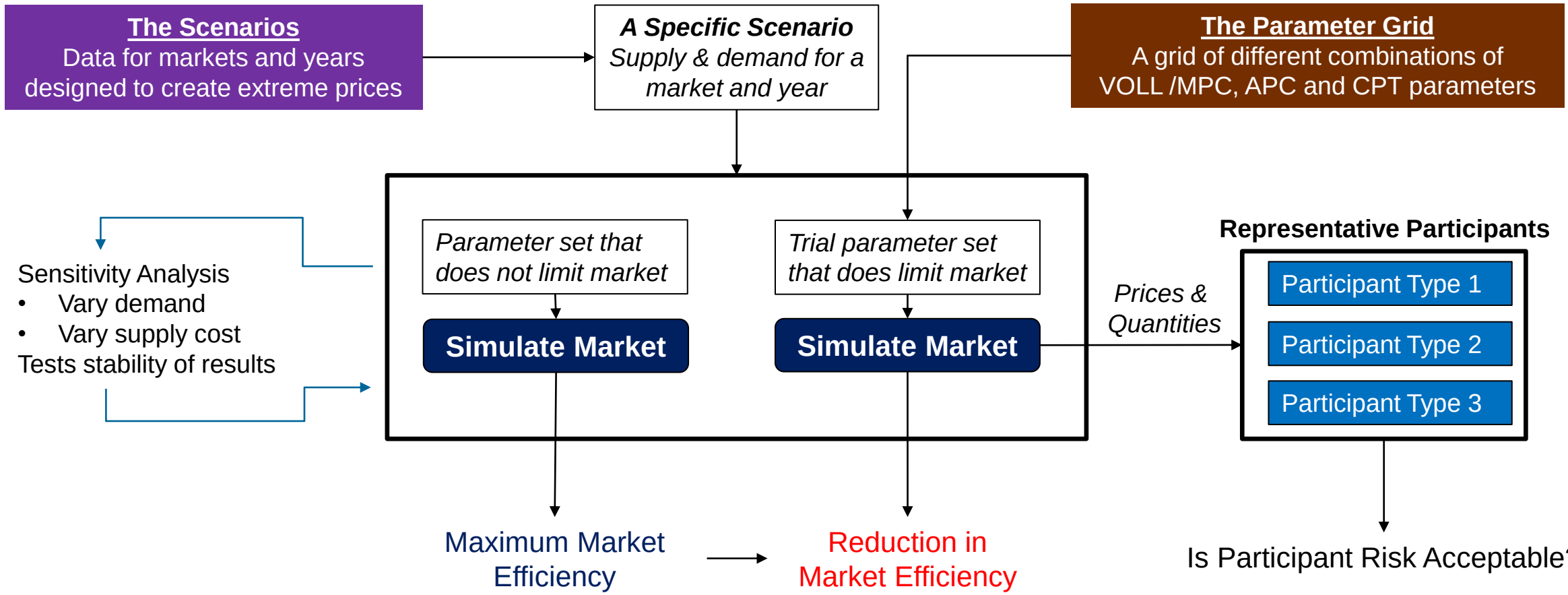
The scenarios are described in more detail in the report. They are a mix of scenarios used in our last review (with updated data) and new scenarios. PC and SC refer to the GSOO Progressive Change and Step Change supply and demand scenarios. The years shown are periods of 12 months from 1st July of that year.

DWGM Scenarios		STTM Scenarios		Linked Market Scenarios	
1	A full Longford outage during part of a high demand day in winter. 2024, 2026. *PC*	7	MSP capacity to supply SYD reduced by 50% for 3 days during winter. 2024 (without Port Kembla), 2026, 2027. *SC*	11	Extreme VIC winter demand and low storage links markets for 3 days. DWGM, SYD, ADL, 2026, SYD, ADL 2023. *PC*
2	A 2-day VNI compressor outage limiting supply from NSW, high demand days. 2026, 2027. *PC*	8	High GPG backhaul limiting supply to ADL ex ante market. 2025, 2027. *PG*	12	High NEM GPG demand for 3 days. APC in NEM. DWGM, SYD, ADL, 2026. *PC*
3	Moomba supply issue for 3 days has high exports from Victoria, NEM prices are high. 2026. *SC*	9	High GPG backhaul for BRI for 3 days. GPG demand triggers contingency gas during first gas day. 2025, 2027. *PG*	13	High world oil, gas and coal price scenario. NEM not capped. DWGM, SYD, ADL, 2026. *SC*
4	High GPG demand & coal outages during winter. Flow to SA. APC in NEM. 2023, 2025, 2026. *PC*	10	Supply interruption at SYD hub triggers contingency gas. 2024, 2026. *SC*		
5	Extreme winter demand (> 1-in-20-years) for 3 days. APC in NEM. 2023, 2025, 2026. *SC*				
6	High demand, 2-days of LNG but storage low. High NEM prices. 2026, 2027. *SC*				

The Parameter Grid We Explored

Parameter	Current Value	Grid Points Explored in Study
Market Price Cap (MPC) **Value of Lost Load (VoLL)**	STTM $400/GJ DWGM $800/GJ	Both markets: $400/GJ, $600/GJ, $800/GJ, $1000/GJ
Administered Price Cap (APC)	STTM $40/GJ DWGM $40/GJ	Both markets: $30/GJ, $35/GJ, $40/GJ, $60/GJ, $80/GJ
Cumulative Price Threshold (CPT)	STTM $440 DWGM $1400	Both markets: $440, $600, $800, $1000, $1200, $1400, $1600, $2000, $2500 Subject to CPT exceeding VoLL/MPC.

Model Components



Goal: Across all scenarios, find the parameters that maximise market efficiency without participants facing unacceptable risk.

The Risk Assessment Considers Different Types of Participants

- We do not simulate individual participants within the market simulation. Instead,
  - We focus on the settlement outcomes for generic representative market participants
  - We use parameter settings to represent the context of different participant types.

- The participant parameters adopted represented the following participant types:
  - A small market customer;
  - Gas retailers with varying contract positions, retail margins and customer portfolios;
  - Gas and electricity retailer who could be impacted by events in both the NEM and the gas industry;
  - Industrial users, covering a representative spectrum of gas intensity; and
  - Gas powered generators;

- For each of those participant types we consider a range of:
  - Basic structure (as applicable by participant type):
    - Retail margins;
    - Residential and Industrial customer profiles; and
    - Gas intensity as share of cost structure;
  - Contracting behaviour:
    - Differing premium levels relative to spot; and
    - Hedging levels, both as a fraction of total demand and as a fraction of peak demand.

- We found that in the current market context new entrant retailers would face low contract availability, high contract margins and low retail margins. Protecting them would require more restrictive Gas Market Parameters that would not incentivize investment. We excluded these participants in setting parameters.

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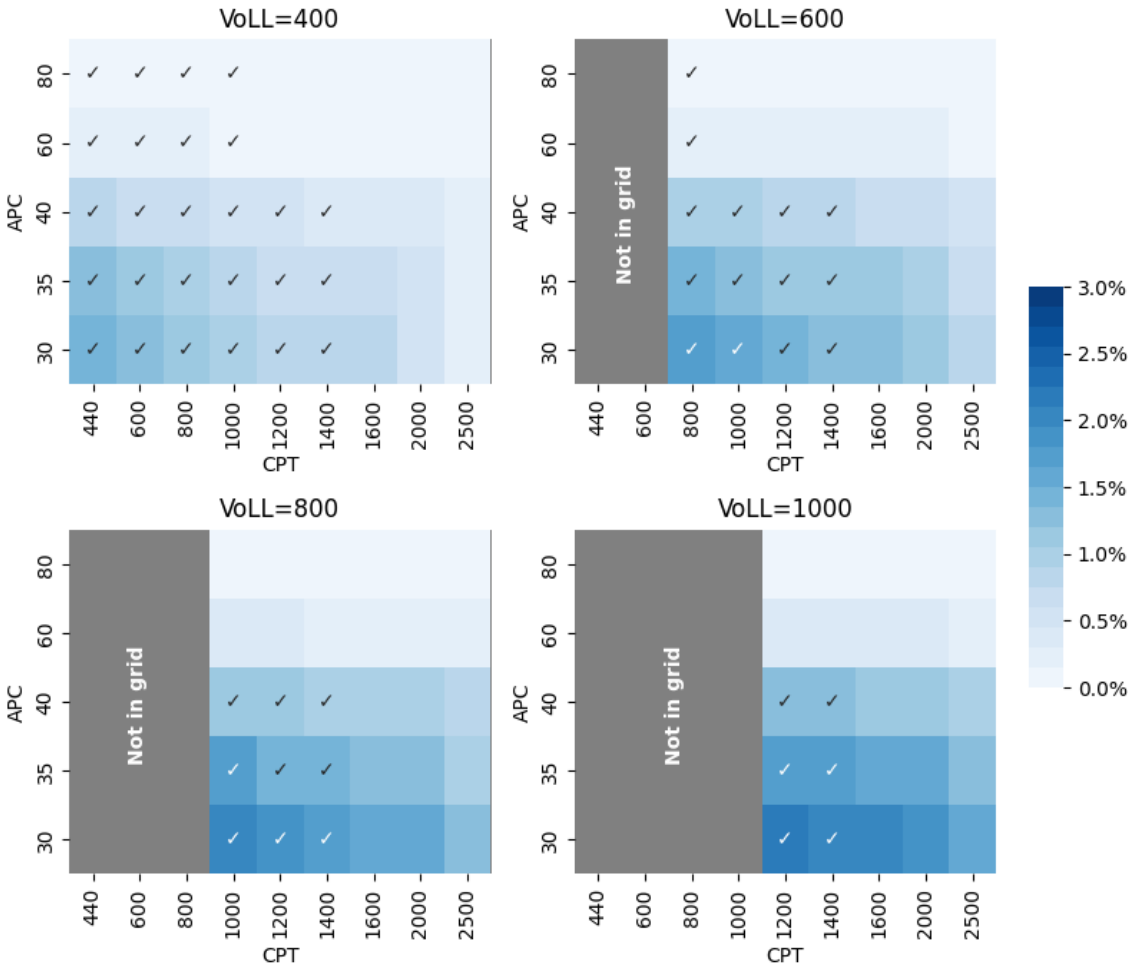
DWGM Parameters that Provide Acceptable Participant Risk Exposure



- The ticked regions represents the parameter combinations that are acceptable from the perspective of participant risk based on the parameter grid used.
- Note the actual efficiency loss recorded in each scenario varies significantly between them. .
- The areas show as “not in grid” would imply VoLL in excess of CPT which is not a viable setting.

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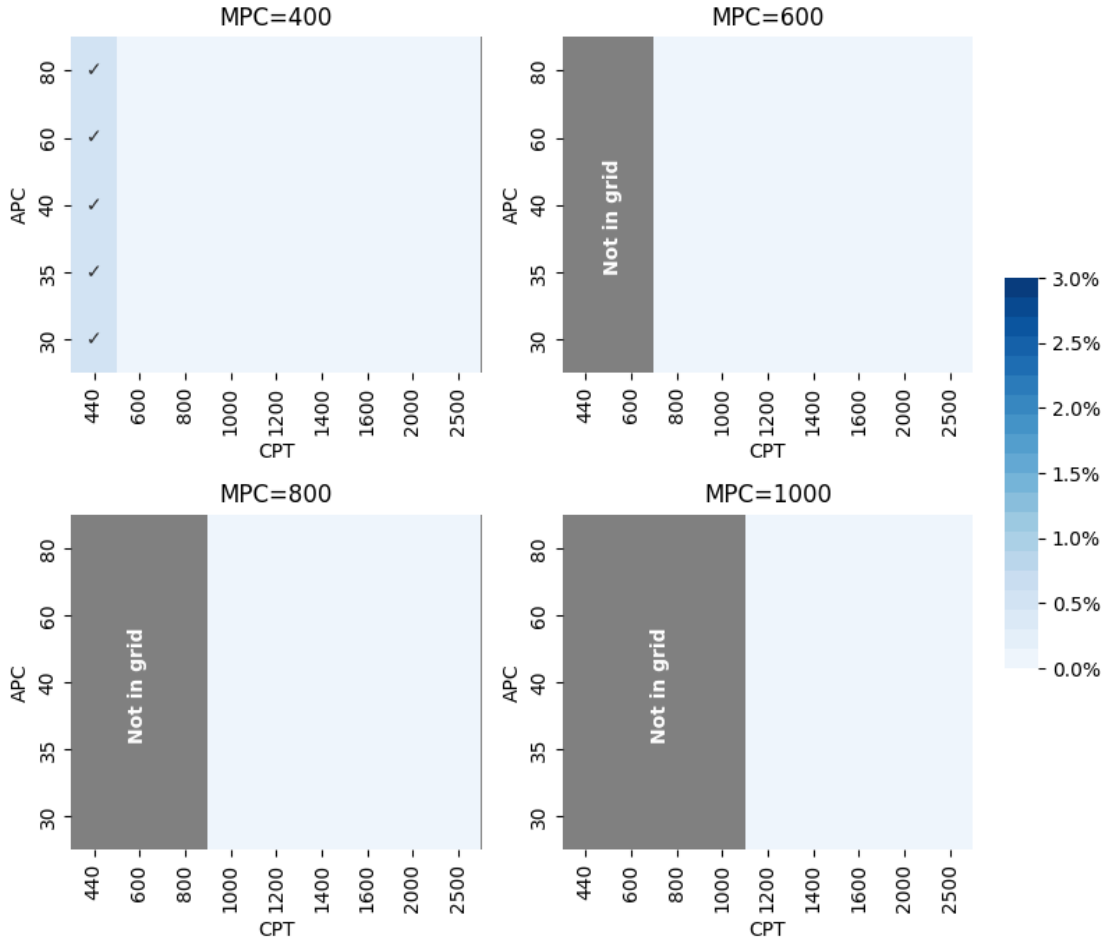
STTM Parameters that Provide Acceptable Participant Risk Exposure



- The ticked regions represents the parameter combinations that are acceptable from the perspective of participant risk based on the parameter grid used.

- Less variation in efficiency than for the DWGM as:
  - the steps between the parameters have bigger impacts for the STTM than for the DWGM.
    - A CPT of $1400 in the DWGM is less than 2 periods at VoLL of $800/GJ
    - A CPT of $1400 in the STTM is over 3 periods of MPC at $400/GJ. Events need to last longer to cause this an administered pricing period at all.
  - The bid and offer curves have different structures
    - DWGM bids and offers are built around a participants (ideally) matched supply and demand position with greater change in price further away.
    - In the STTM there is longer tail of offers at lower prices, so relative to the DWGM there is a reduce impact on efficiency of different price caps.

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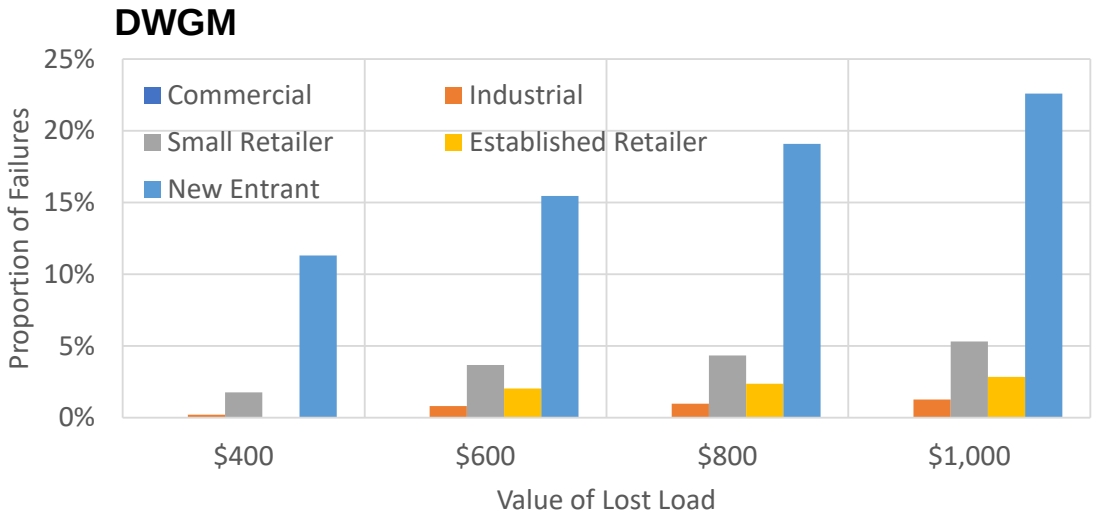
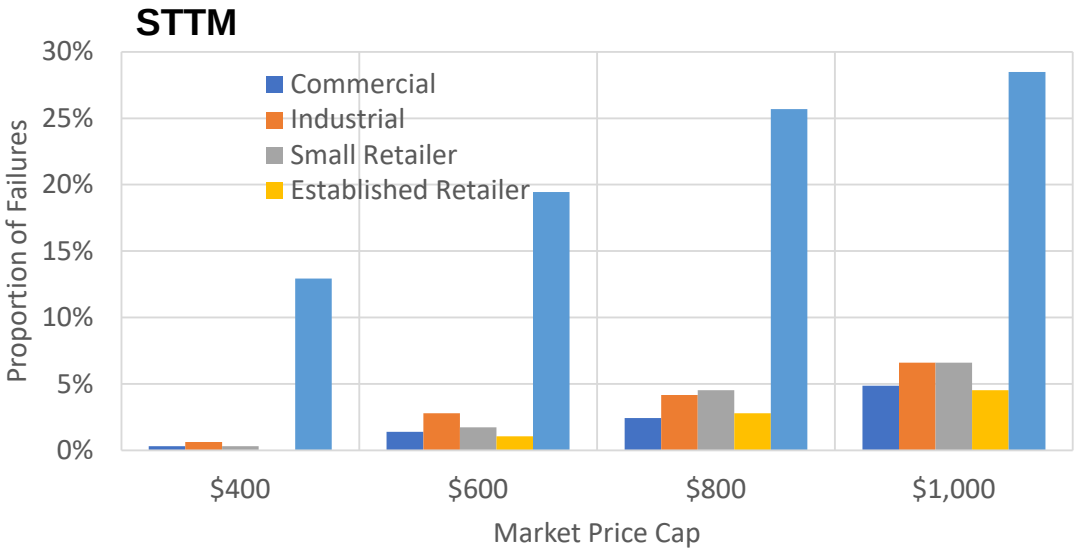
Participant Failures





- The proportion of participants with greater than 500 days lost profit is shown for different VoLL/MPC settings.
  - These participants are assumed to fail.
- The proportion reflects performance across all possible parameter sets given the VoLL/MPC setting
- Participant risk is naturally increasing in VoLL however in individual cases, increases in VoLL do result in earlier CPT trigger
- New entrants into the current market context are especially vulnerable across all levels of VoLL
- It is not possible to derive parameter sets to protect these participant type and preserve investment incentives because their underlying profitability is insufficient.

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Investment

- Investment decisions require consideration of at least:
  - Cost of constructing capacity, noting alternative or additional use cases for a particular project.
  - Required rate of return (of similar investments) based on inflation and risk-free rates.
  - Event frequency and severity
  - Cost recovery opportunities available during the event
- We consider a generic LNG receipt facility similar to Port Kembla.
  - Port Kembla data informed investment costs
  - We used mid-rate rate of return requirements that are non-specific to investor type/motivation
- Investment analysis is heavily dependent on assumptions:
  - Rather than considering a single set of data we considered a range of sensitivities around a base case.
    - This also included assessing how parameters performed with a Dandenong type LNG facility.
    - Out of 15 sensitivities around a base scenario, a Dandenong type facility is investable in 13, while a Port Kembla type facility is investable in 14.
  - We assessed suitability of the Gas Market Parameter sets based on the number of different sensitivities a particular parameter set could accommodate.
  - Further, we erred on the side of caution as:
    - the sensitivities we study are not exhaustive or combinatorial and
    - the lead time for correction is significant if investment stalls.

Investment

- Investment cost recovery requires the parameter set delivers at least one VoLL/MPC per event

- Higher CPT levels assist investment cost recovery
  - Without one VoLL/MPC per CPT period investment cost recovery is significantly lower
  - Two or more VoLL per CPT period strengthens the feasibility of investment but has implications for participant risk

- Higher VoLL/MPC levels assist investment cost recovery provided the rule above is observed
  - VoLL/MPC pricing periods typically provide 70-80% of total returns during an event
  - For a given CPT the payoff is saw-toothed due to interaction with the level of CPT

- Higher APC levels also contribute to investment cost recovery
  - Sensitive to assumptions about ingoing storage and delivery capability relative to storage.
  - More modest influence on the investment case but at the margin can still be significant.

Investment Sensitivities

- Given a set of market parameters the most consequential sensitivities were:
  - Inflation in construction costs. Investment feasibility should be protected throughout the whole study period during which parameters, in this case to 2028, in which time cost increases will likely occur while the parameters remain fixed
  - Discount rates. We adopted a standard WACC approach, but the results are sensitive to higher rates which increase cost recovery requirements. This could be due to changing circumstances that would move the WACC, or to factors this approach does not consider explicitly.
  - Event frequency. A base of 1:10 years was considered. 1:20 years is difficult from an investment cost recovery perspective, but we do not consider that this is a planning/investment standard that would be used as a basis for investment in this market (at least on a standalone basis with the level of WACC under consideration)

- Combinations of sensitivities are generally problematic for investment cost recovery; hence we recommend the exercise of caution when adjusting parameter sets to levels that are inferior for investment cost recovery.

Options for the DWGM Gas Market Parameters

DWGM GAS MARKET PARAMETERS					
VOLL ($/GJ)	CPT ($)	APC ($/GJ)	SUPPORTS INVESTMENT?	SUPPORTS EXTERNAL MARKETS?	SUPPORTS EFFICIENCY?
400	440	ALL	No	-	-
400	600	ALL	No	-	-
400	800	ALL	No	-	-
400	1000	ALL	No	-	-
400	1200	<= $40	No	-	-
400	1400	<= $40	No	-	-
600	1000	<= $40	No	-	-
600	1200	<= $40	No	-	-
600	1400	<= $40	No	-	-
800	1000	<= $40	No	-	-
800	1200	<= $40	No	-	-
800	1400	<= $40	Yes	<= $40	>= $40
1000	1200	<= $40	No	-	-
1000	1400	<= $40	Yes	<= $40	>= $40

- The parameter sets shown keep participant risk below the 500 days lost profit standard.
- Only two parameter sets support investment. Investment support declines for two reasons:
  - The VoLL/CPT ratio prevents VoLL pricing arising before CPT is breached
  - The level of VoLL and/or APC are such that a single VoLL period in an event does not support investment.
- To support the NEM APC requires a gas APC less than or equal to $40/GJ.
- Given the feasible set the efficiency maximizing option is to choose the current parameter set
- VoLL=$1000/GJ is also an option but
  - Efficiency benefits are limited and
  - Not a large difference between CPT and VoLL, so CPT easier to trigger without prices ever reaching VoLL.

MARKET REFORM

Options for the STTM Gas Market Parameters

STTM GAS MARKET PARAMETERS					
MPC ($/GJ)	CPT ($)	APC ($/GJ)	SUPPORTS INVESTMENT?	SUPPORTS EXTERNAL MARKETS?	SUPPORTS EFFICIENCY?
400	440	ALL	Yes	<= $40	>= $40

- In the STTM the parameter sets that support the participant risk constraint all involve MPC=$400/GJ and CPT=$440
- As for the DWGM, support of the NEM APC requires a gas APC less than or equal to $40/GJ.
- Given the feasible set the efficiency maximizing option is to choose the current parameter set
- The reduced opportunities for trade in the STTM mean that the change in outcomes are more pronounced between two adjacent grid of points than in the DWGM, reducing the number of feasible options.

MARKET REFORM

Sensitivity Analysis of 500 Days Lost Profit Setting

- Overall, the parameter sets are robust to the days lost profit assumption.
  - Lowering the lost days profit standard could not be accommodated while simultaneously protecting investment incentives
  - In the DWGM there is some tolerance for increasing both VoLL and CPT if the standard was increased to 700 days.
  - In the STTM, this change would create the possibility to consider higher CPT levels.

DAYS LOST PROFIT SENSITIVITY		
DAYS LOST PROFIT	DWGM (VOLL/CPT/APC)	STTM (MPC/CPT/APC)
300	800/1400/40	400/440/40
400	800/1400/40	400/440/40
500	800/1400/40	400/440/40
600	800/1400/40	400/600/40
700	1000/2000/40	400/600/40

Conclusions

- We recommend no changes to the gas market parameters.
  - The current parameters are still acceptable while still being close to the limits of what is acceptable.
  - In the DWGM there are no options for adjusting CPT that both support investment and participant risk management. There is scope for increasing VoLL to $1000/GJ but it is no clear benefit to doing so.
  - In the STTM, the analysis revealed no suitable alternatives for either MPC or CPT.
  - We favour no change to the current APC values in both the STTM and DWGM.
    - The AEMC's new settings of the NEM APC provide no scope for increased gas APC values.
    - Lower APC values could be supported but this would significantly reduce market efficiency
  - Preserving the current parameters minimises the impacts on current contractual arrangements.
- Additional recommendations
  - There have been suggestions of aligning parameters between the DWGM and STTM.
    - No set of all three parameters was found that could be applied to both DWGM and the STTM.
    - We recommend consideration of a new administered state trigger mechanism that would allow simultaneous administering or two or more of the DWGM / STTM supply and demand hubs.
  - It would be beneficial to align the reviews of NEM paraments and the Gas Market Parameters.
    - At minimum the reviews should be run concurrently with interactions between them. This would largely mitigate the risk of misalignment between parameters.

Data Sources - Processing

- Sources
  - AEMO Public Market History (AEMO website: www.aemo.com.au)
    - Daily injection and withdrawal.
    - Daily Prices.
    - Daily total injections and withdrawals.
    - End-of-day linepack
  - Gas Statement of Opportunities for Eastern and South-Eastern Australia, AEMO, March 2022, including LGA Gas Price Projections.
  - Victorian Gas Planning Report Update 2022.
  - State of the Energy Market 2021, Australian Energy Regulator, 2nd July 2021.
  - Gas Inquiry, 2017-2025, Interim Report, ACCC, July 2022.
  - ABS, Australian Bureau of Statistics.
  - DWGM - CPT Review Final Report (DCPTR), AEMO, September 2013.
  - Previous Reviews
    - Investment parameter estimates.
    - Participant profitability.
- Processing
  - Bid and offers curves to be modified to suit the context of future conditions.

MARKET REFORM

Questions