9th October 2012

Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Submission lodged online at: www.aemc.gov.au

Project Number: EPR0019

Dear Mr Pierce

Submission to: Transmission Frameworks Review
Second Interim Report

Snowy Hydro Limited welcomes the opportunity to make a submission to the AEMC's Transmission Framework Review Second Interim Report.

Our submission can be summarised by the following observations.

Problems not substantiated

We believe the problems that the Optional Firm Access model is supposed to address remains unsubstantiated. As outlined in later in this submission there is already a high level of co-optimisation of generation and transmission investment through the Regulatory Investment Test -Transmission (RIT-T) process. The problems associated with disorderly bidding are not material. The NEM has a well functioning, deep and liquid contracts market. The current NEM is a result of a well-considered design trade-offs which has balanced the benefits of Spot market pricing signals and the need for a deep and liquid Contract market. We believe the current NEM design (status quo) is a much superior model to the alternative Optional Firm Access (OFA) model being considered. Furthermore the current market design could be further improved with some minor improvements.

The OFA is not a solution to the stated problems

Our submission will practically demonstrate that the OFA will create other material and adverse unintended consequences to both the Spot and Contract markets.

The OFA is practically unworkable

It is our strong belief after analysing the complexity of the OFA model that is practically unworkable. In summary the OFA is:

- A well thought out alternative market model only at the purely theoretical level based on the overly simplistic assumption of a single flow gate constraint between two adjacent regions. This simplified assumption is however dangerous to a practical working market. In reality the network is highly meshed, with multiple competing constraint locations with multiple competing constraints (for example thermal, voltage and stability) at each location that will vary depending upon operational decisions

which are made by multiple Market Participants on a 5 minute by 5 minute basis. Each flow gate constraint will need to be allocated and managed separately.

- The OFA is practically unworkable in both the planning domain and in the operational domain.
- Complexity must be resolved in the planning domain by TNSP over an impossibly long time frame. TNSPs for good reasons can't accurately forecast demand reliably for 12 months ahead yet alone forecast a credible baseline plan over multiple decades.
- Complexity must be resolved in the operational domain. Market Participants will have to manage varying rights allocations between hundreds of flowgate constraints and the associated competing incentives on a 5 minute by 5 minute basis. Further, the risk management systems of Market Participants will have to resolve this new found complexity with no historical market data. The inevitable conclusions will be reduced contracting risk appetite for Generator Participants. This will inevitably lead to reduced contracting liquidity (reduced market efficiency and increased contract premiums borne by end users).
- Further the OFA will by design increase the driver for vertical integration and favour 'Portfolio Gentailers' who are best placed to capture risk premiums to the detriment of end users. This is because it will increase basis risk for generators.

Due regulatory process must be followed for such a fundamental market redesign

We remain concerned that the AEMC could even consider this alternative market redesign when there has been immaterial evidence to warrant such a change. The complexity of the OFA model is huge and it will significantly change the incentives for all Market Participants. The implementation cost of moving to this alternative model will be very large. These are all tangible risks which will be factored into the cost of supply electricity to end consumers. What is missing from the AEMC's analysis is the likely benefits from this model. In the absence of this analysis we believe the AEMC cannot make an informed decision to even consider the OFA model as an alternative market re-design.

Snowy Hydro commissioned independent review by Castalia

Snowy Hydro has commissioned an independent review of the public policy aspects of the OFA proposal by Castalia Strategic Advisors.

Their report (attached to this Submission) concludes that the problems that the OFA proposal purports to address, that is co-optimisation of generation and transmission investment, access encroachment and disorderly bidding are not pervasive and endemic problems in the NEM and do not warrant the cost and complexity of the OFA proposal to solve. They also find that it is not clear that the OFA proposal will necessarily solve these problems.

An important and relevant finding was that a study in New Zealand by the Electricity Authority (EA) found the benefits of greater co-optimisation between generation and transmission investment to be negligible, that is almost zero. The EA concluded that most transmission investment was driven by reliability needs and most generation locational decisions driven by access to secure and low cost fuel.

Castalia do find that the proposal, if implemented, will result in a less efficient transmission network. This is because the incentives for generators and TNSPs are to over build the network to reduce their liability to pay compensation. There is no evidence that the current RIT-T process is fatally flawed and hasn't resulted in an efficient constrained optimisation of the transmission system.

Castalia suggest that if the OFA model is implemented, most existing generators will seek firm access, because it will be available at low cost and as a defensive measure to reduce their liability for compensation. They also find that the OFA proposal will have a negative impact on the level of contracts offered. This is because the OFA proposal is neither physically or financially firm and will thus increase and not reduce as claimed basis risk for generators.

Snowy Hydro supports the status quo

In summary Snowy Hydro strongly supports the status quo. The status quo (with minor improvements) is the best market design given the necessary competing trade-offs.

A move to a much more centrally planned arrangement (which is what the OFA is because of the requirement to develop a theoretical baseline transmission plan) will not meet the market objective test.

If the AEMC wishes to test the current design, the appropriate test is a Full Nodal Market with auctioned Financial Transmission Rights (FTRs). This would be a far superior model to the OFA which we characterise as a compromise with the worst of both worlds. Under the Full Nodal Market model complexity is resolved in a fully transparent way without reverting to increased central planning. Of course, moving to a nodal market, unless carefully designed will result in a significant reduction in the liquidity of the contract market and will strengthen incentives to vertical integration.

Finally, we observe that there is considerable consumer and political backlash over the recent dramatically rising retail electricity prices. These have been driven largely by rapidly rising network investment costs. Some commentators have cited “gold plating” by the network companies and have blamed regulatory oversight failures.

Against this background other commentators have noted concern over the ever increasing levels of vertical and horizontal integration/aggregation in the market. It is therefore both ironic and concerning that the Commission appears to be seriously considering fundamental market design changes that will inevitably drive the NEM further in both these two directions. That is, towards the need for greater levels of central planning and the associated requirement for higher levels of regulation oversight, and secondly to strengthen the drivers for increased levels of integration by Market Participants.

Snowy Hydro’s detailed submission attached to this covering letter. We also attach Castalia’s report on the OFA model.

Snowy Hydro appreciates the opportunity to respond to this review. Please contact Kevin Ly, Manager Market Development and Strategy on (02) 9278 1862 if you would like to discuss any issue associated with this submission.

Yours sincerely,

Roger Whitby
Executive Officer, Trading

1.0 Introduction

Snowy Hydro agrees with the Commission that, "The optional firm access model would require fundamental changes to the NEM, and this would represent a very significant implementation task[1]". AEMC stated in the Public Forum that the incentives are hard to model and therefore the AEMC will resort to principles to analyse the merits of market change. We had analysed the incentives under the Optional Firm Access (OFA) model and conclude that these incentives will lead to inefficient market outcomes. The OFA model would introduce disproportionately high complexity to both Spot and Contract trading, would result in high transactions cost, and ultimately lead to lower contract liquidity and lower contracting volumes and hence another driver for vertical integration "Gentailers" to internalise the increased risk Ultimately all these factors will not aid market efficiency.

The OFA potential solution is a disproportionate response to a questionable set of problems and it would be a very brave to recommend such a fundamental change in the absence of due regulatory process.

Snowy Hydro supports retaining the status quo transmission framework arrangements. These existing arrangements have been performing well to date and there is no evidence to suggest that these arrangements won't continue to work in the future. Investors require a stable and predictable period by which to make long term investment decisions. Arguably the succession of reviews on transmission has created more uncertainty for investors.

Previous reviews including the Congestion Management Review (2006), the Transmission Review in Light of Climate Change Policies (2009) concluded that the current transmission arrangements recognise the inherent trade-off in liquid and deep contract markets versus more granular spot pricing. The current Regional market model in the NEM has seen steady increases in contract market liquidity and volume. This in turn has underwritten capital investment in new generation plant.

Our concern with the OFA model is that without wider practical consideration of these proposals on the efficient functioning of the Spot and Contracts markets the AEMC risks in fact increasing the supply chain cost of electricity to end consumers.

To the Commissions credit it has tried to allay concerns we had on the issue of property rights. In our submission to the First Interim Report we stated that issue of the reallocation of transmission property rights warrant much greater debate if the AEMC is to propose new market arrangements. "This includes consideration of complex issues such as the form of the right, the duration of the right, its trade-ability, its impact on new entrants, and its impact on what is currently a liquid and efficient Contract market[2]."

Unfortunately the Second Interim Report does not outline in sufficient detail the issue of transmission property rights. The AEMC analysis is theoretical in nature. Consideration must be given to how the reallocation of these rights through the OFA would change practical market behaviour in both the Spot and Contracts markets and the overall consequence to market efficiency. We have attempted to analyse these practical risks in this submission.

[1] AEMC, Transmission Frameworks Review, Second Interim Report, page 19.
[2] Snowy Hydro, submission to First Interim Report

2.0 A case for fundamental market change has not been made

Snowy Hydro believes the case for fundamental market redesign has still not been made. What is the problem? What is the materiality of this problem? What does the available evidence show? These are some of the fundamental questions which have not been adequately answered by the Commission.

Ultimately the success of the current NEM wholesale market design should be judged by the wholesale price of energy, and the reliability and security of the system. As outlined in the AEMC's draft determination to the MEU Market Power Rule change proposal there is no evidence to suggest wholesale energy prices have been inefficient since the inception of the NEM.
From a system security and reliability perspective it is argued that the NEM has not experienced lack of reserve conditions which would support the notion that the system has been deficient to deliver a reliable and secure system to consumers.

This system security and reliability has been delivered by new generation investment. As outlined in the Castalia report the NEM has delivered over 10,000 MW of new generation since its inception. Castalia has analysed the location of these investments and have conclude that there is no evidence to suggest that these investments were located in the wrong places.

The current end user angst to end use electricity costs is predominantly due to the increased costs from network investments. Network investments are made through a regulated process. The wholesale energy market has demonstrated that it is very competitive. It therefore seems ironic to us the Commission might recommend an OFA model that will only increases the scope of regulation and centralisation of transmission planning and investment.

3.0 The OFA is not a market led approach

The Commission has espoused a view that the OFA is a market led approach to both transmission and generation investment. We strongly disagree with this view. The efficiency of the co-optimisation between generation and transmission investment relieves on the accuracy of the "baseline" transmission plan. The OFA requires a huge amount of centralisation on the part of TNSPs to derive this "baseline" transmission plan. We are highly sceptical that an accurate baseline plan can be derived for the transmission system.

For instance, to date TNSPs have systematically over forecasted demand growth. The baseline transmission plan not only requires demand as a major input but the TNSP would have to make assumptions on:

1. The future location of new generation
2. The timing of new entrant generation
3. The future generation profiles of incumbent generators
4. Assumptions in relation to other forms of non network solutions such as network support and demand side response

All these assumptions have to be made to derive a 30 to 40 year transmission baseline plan for each network element a TNSP's network. We believe such a task would not only be computationally complex but the results would have a very big margin for error.

In contrast under current market arrangements the RIT-T process is a form of co-optimisation of generation and transmission cost. Generators rely on the RIT-T process to ascertain the likihood that new transmission will be build. This becomes a key input into the prospective generators locational decision for new generation. Furthermore the RIT-T is a net benefits approach and ensures any new transmission investment is net beneficial to end consumers. In contrast new transmission build under the OFA model may have private benefits to a Market Participant but would have negative net benefits to the market as a whole. This issue is well articulated by Frontier in its report to the NGF and by Castalia in its report to Snowy Hydro.

The RIT-T and its predecessor the Regulatory Test represents a sound and well proven process for determine transmission investment in the net interest of consumers. If there is a perceived problem that the RIT-T is not appropriately valuing generator access certainty than we suggest that there may be scope to amend the RIT-T to incorporate a generator certainty premium for access to the market.

4.0 Complexity of the OFA model is huge. Out of proportion to the proposed "problem"

Snowy Hydro are analysed the complexity of the OFA model from the perspective of the TNSP's pricing the access rights and the perspective of the generator operating and contracting in the NEM with these access rights.

4.1 Complexity of the OFA model in the Planning Domain (from the TNSPs Perspective)

The AEMC has downplayed the complexity of the OFA model. References to how the OFA would operate have typically involved two nodes in a radial system. In reality the NEM is a meshed network with thousands of flowgates. This would automatically increase the complexity of operating in NEM for all Market Participants.

We have stepped into the TNSP's shoes to analyse how they may go about pricing these Flowgates (constraints). For illustrative purposes this analysis looks at Snowy Hydro acquiring access rights for its Upper Tumut generator to the NSW Region Reference Price (RRP) at Sydney West. The relevant TNSP in this illustrative example is TransGrid.

The only way TransGrid could practically offer Upper Tumut "firm" access is after they have analysed every possible constraint with Upper Tumut on the left hand side of the constraint equation. This is because every constraint represents a potential flowgate. There are at least 648 constraints (flowgates) with Upper Tumut in on the left hand side of the constraint equation.

For each flowgate TransGrid would have to determine a flowgate price which would not only have to reflect the Long Run Incremental Cost of the relevant transmission elements involved in the constraint equation but also have to price in the likihood of the flowgate constraining and therefore affecting TransGrid's ability to meet its Firm Access Standard (FAS). From TransGrid's perspective the flowgate price for each constraint must reflect the risk associated with that constraint binds causing TransGrid to breach its FAS and therefore subjecting TransGrid to compensation.

There are at least 50 generation connection points in NSW[3]. Assuming that Upper Tumut is representative of the number of times a generator would appear on the LHS of a constraint equation, TransGrid would have to determine at least 32,000 flowgate prices for these generators who may be seeking firm access. It is not hard to see that the complexity for each TNSP to undertake similar tasks would be huge.

The incentive on TNSPs is clear in that they are incentivised to price the flowgate price high to compensate for the risk that they will have to make compensation payments. A high flowgate price would also ensure increased likihood of transmission build which mitigates the risk of the constraint binding—transmission build that would not pass the RIT-T.

Now assuming Upper Tumut can secure "firm" access rights for all 648 flowgates (constraints) what operational complexities does the new arrangements present? More importantly, how does this complexity impact the efficiency of both the Spot and Contract markets?

4.2 Complexity of the OFA model in the Operational Domain (From the Generators Perspective)

Any important point to note is that irrespective of whether a Generator is firm (purchased access rights) or non-firm (has no access rights) there will always be an element of pricing risk (basis risk) under the OFA model. This is because a firm generator may still have to make compensation payments to an even firmer generator[4]. These compensation payments would subject the firm generator to receive its Local Marginal Price (LMP) for a proportion of its generation output.

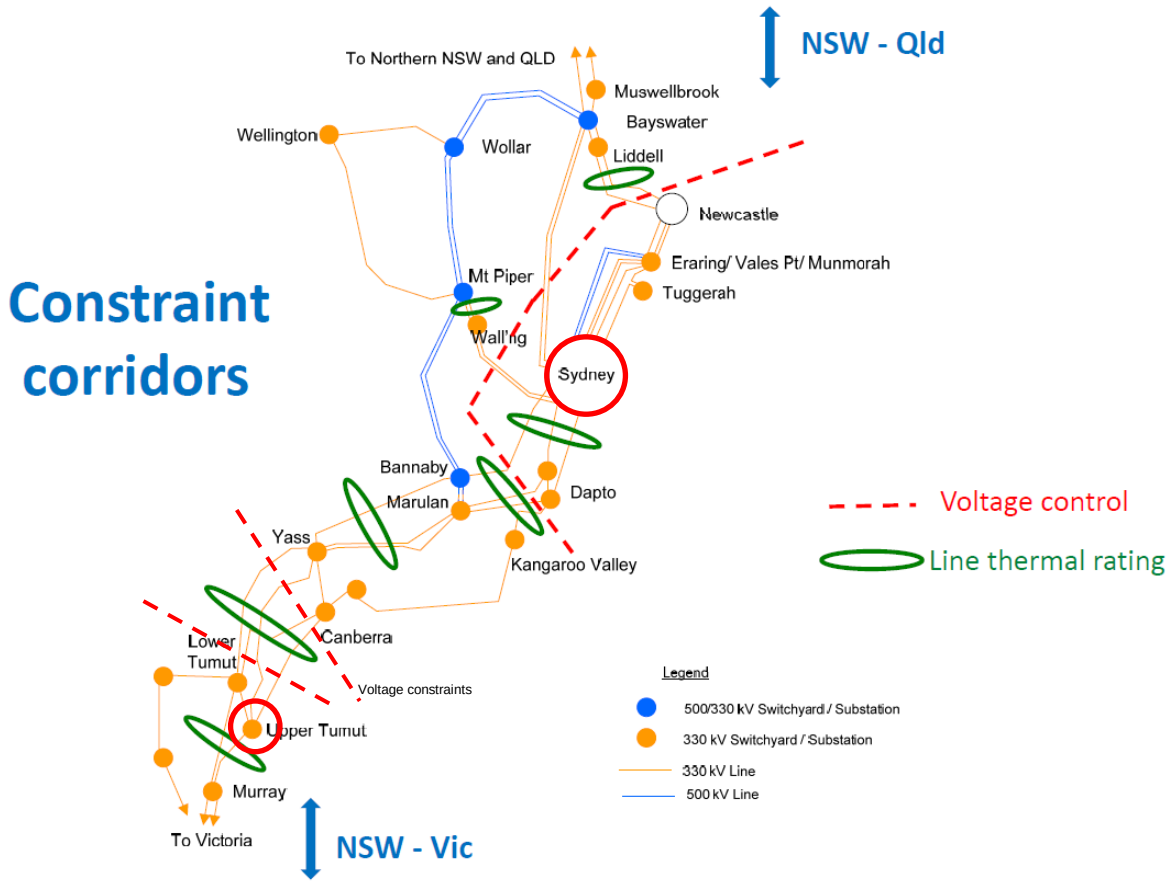
From the previous section we will assume that Upper Tumut has managed to purchase 648 flowgate access prices (constraints) to allow it to contract its generation to the NSW RRP. In this section we highlight the enormous complexity in managing price exposures to Upper Tumut's Locational Market Price (LMP) under the OFA regime.

A diagram below shows the mesh nature of the transmission network.

From the diagram, the location of Upper Tumut and the Sydney load centre with the NSW RRP at Sydney West has been marked with red circles. Notice how there are multiple transmission paths to the Sydney Load centre. Due to a number of reasons such as the large geographic diversity of climatic conditions affecting these transmission lines, the thermal limitations on individual lines, the local voltage limitations, the transient and oscillary stability of the whole system and the load fluctuations in local areas are all factors that can cause binding constraints from Upper Tumut to the NSW RRP.

The effectiveness of access rights relies on the firmness of the network. The network is most firm when the system is operating at "system normal". However the transmission system is never "system normal". Because of the diversity and geographic spread of the interconnected power system there will always be a network element that is taken out for maintenance or derated for some valid reason. Hence by definition the transmission system is never "system normal".

[3] AEMO, List of Regional Boundaries and Marginal Loss Factors 2011/12, page 30-31
[4] AEMC, OFA Technical Report, page 28.



Source: Adapted from TransGrid, Future Main System Constraints – affecting generation, 2012. Two Voltage constraints between Upper Tumut and Yass\Canberra are shown in the figure.

There's potentially at least 648 flowgates (constraints) with Upper Tumut on the LHS of the constraint equation. Any combination of transmission lines from Upper Tumut to Sydney can constrain sporadically thereby subjecting Upper Tumut to the risk of receiving a Local Marginal Price for a proportion of its generation. If in any dispatch period any of these constraints bind then Upper Tumut could have to pay compensation to a firmer generator and therefore potentially be receiving a local marginal price (LMP) for a proportion of its generation. Alternatively, if all relevant generators are firm, the compensation paid by TransGrid may not be adequate to ensure Snowy Hydro receives the RRP for its constrained off capacity.

It is both irrelevant and incorrect that only a few flowgates (constraints) are likely to bind in any dispatch period. From a risk management perspective Snowy Hydro as the owner of the Upper Tumut plant would be forced to monitor all 648 constraint equations with Upper Tumut on the LHS. Each flowgate (constraint) will have a different Participation Factor (constraint coefficient) that can be highly variable from one constraint type to the next. See for instance in the Graph above there are both thermal and voltage constraints. For instance a thermal constraint may have a participation factor of 0.8 compared to a voltage constraint with may have a participation factor of 0.2. Upper Tumut's incentives are varied and would be dependent on whether it would have to pay compensation on the Flowgate price or not. For instance:

- If Upper Tumut is confident that it would be fully firm then it would maximise its generation output and would be indifferent to the Flowgate price (RRP – LMP).

- If Upper Tumut was unsure of its level of firmness it could try and limit its output to reduce the risk that the flowgate (constraint) would bind. This is commonly referred to as maintaining headroom on the flowgate (constraint). This limits the flowgate price but reduces overall competition because less supply is offered to the NSW region.
- If Upper Tumut is non-firm it would withhold generation so as to not constrain the flowgate (maintain headroom) as per dot point 2 above.
- The participation factor for each constraint equation complicates this trade-off that has to be made in real time for each dispatch period.

As outlined above Upper Tumut's generation incentives would be dependent on its perceived level of firmness. These operational decisions have to be made through dispatch offers submitted BEFORE dispatch. The meshed nature of the transmission system means that a generators participation factor could vary significantly from one dispatch period to the next thereby dynamically changing the incentive of Upper Tumut to generate fully without fear of receiving its LMP or conversely to withhold generation to not diverge the LMP from its RRP. What is clear is that basis risk would increase under the OFA model thereby reducing overall market liquidity and volume. Alternatively the Contract prices offered must be increased to compensate for the increased basis risk.

4.3 How is this different to current market arrangements?

In the current market design there is no basis risk when selling Contracts in the generators Region. Generators face dispatch risk in both the current and OFA market designs. Hence, all else being equal the OFA would significantly increase the risk of Contracting (ie. a new dimension of risk) and therefore lead to less efficient outcomes compared to the status quo.

5.0 Will there be net benefits to the Contracts markets in the OFA model?

From the analysis presented in section 3 of this submission we have shown that risks in contracting are increased under the OFA due to:

1. The increased cost from purchasing access rights which are priced higher than fair value to compensate for TNSP incentives to not breach the FAS;

2. The complexity of operating in a regime with exposure to a generators LMP as a result of the potential for hundreds and thousands of different constraints binding will increase the offer prices of contracts; and

3. The increase basis risk if a generator is required to make compensation payments which would increase contract offer prices or reduce lower contract market liquidity and volume as some generators may be forced to take more Spot market exposure than what they currently do under the NEM.

All these factors above would mean a decrease in the aggregate level of contracting and increase the contract prices offered by generators. Snowy Hydro believes that the Contract market is the main market in the NEM where the majority of energy is settled. In Box 1 below we highlight the market efficiency impact on the Contracts market.

Box 1: The Contract Market Impact

NSW energy demand is about 76,000 GWh per annum.

The OFA model increases basis risk and increases complexity of selling forward Contracts in the NEM. This would reduce the supply of contracts and increase contract prices.

Assuming this increases contract prices by $1/MWh, the economic impact is $75 million per annum.

In summary a relatively "small" increase in Contract premiums would have a much bigger impact on the overall market wholesale costs and efficiency.

Further in the following section 5.0 we believe disorderly bidding as is currently characterised now would be replaced by a different form of disorderly bidding. The new disorderly bidding would create the same if not a greater level of uncertainty for generators in the wholesale market and this would also tend to drive Contract offer prices upwards compared to current market design.

6.0 Are there potential benefits to the Spot market under the OFA model?

As outlined in the Castalia report disorderly bidding may still occur in the OFA model. This is inevitable as a new set of market arrangement will in turn induce a new set of behaviours and incentives.

Snowy Hydro has in past submissions outlined the incentive for generators behind the constraint to "disorderly bid" by withholding their generation to align their LMP with the RRP. This will be commercial reality under the OFA. More importantly from a public policy perspective this would clearly be an inefficient outcome as the overall supply of generation effectively seen at the Regional Reference Node is reduced (ie. by definition because there is less competition). Furthermore the incentive for firm generators is to "disorderly" bid to constrain flowgates and receive compensation from non firm generators. This incentive does not exist in the current market design.

We also outline the following issues associated with the OFA model:

1) If there is no firm access and flow gate entitlements are allocated on the basis of offered availability, this will promote the building of new (or more likely, upgrades) of very unreliable, inefficient, high fuel cost, energy limited plant that you wouldn't intend to run. You would just let the lower cost generators generate for you, and possibly run a few MW to keep your local price low.

2) Existing energy limited plant, like hydro, could bid in even if only have enough fuel for 5 minutes, just so they have offered availability.

3) The non-firm generator makes its money by the difference between its fuel cost and the local price. So it is incentivised to bid at the shadow offer price of the next generator, increasing the local price. This will be difficult with multiple generators with different coefficients in constraints. For a non firm hydro generator with no fuel cost, it will be difficult to bid at shadow price of next fuel cost generator as will depend who is in your local area, and there may be multiple "local areas". This increases the complexity of operating in the Spot market and will ensure that energy limited plant is less likely to optimise its finite resource and thereby increase the overall resource cost of meeting demand. In the long run this would increase costs to end consumers.

7.0 Conclusion

The AEMC's case for fundamental market change is unjustified. The AEMC have not articulated the problem or the materiality of the problem with existing market arrangements. The implementation cost of a change to the OFA would be very large compared with unquantified market benefits. It would be poor regulatory practice to advocate the OFA in the absence of a well-reasoned case for change.

Past analysis has demonstrated that dispatch inefficiency is immaterial and is now even less material under the carbon price regime which has narrowed the difference in marginal fuel costs between different generation types. Snowy Hydro believes any attempt to marginally improve dispatch efficiency by more granular pricing will cause much greater efficiency losses in the Contract markets.

The OFA model is practically unworkable. We have shown that the complexity associated with this model will adversely change incentives on all Market Participants.

At the Spot market level it will introduce a new set of incentives to disorderly bid. The impact on the Contracts market would large and adverse. Generators simply won't be able to contract with the same level of confidence due to basis risk. Basis risk is not an issue under the current market arrangements as the Generator receives its Regions price for all its dispatch.

Snowy Hydro sees no justification for fundamentally changing the transmission charging arrangements as a means to achieve more efficient transmission investment. If there's any evidence of inefficient transmission investments then it's a question of whether the RIT-T is doing its intended role.

In the current Open Access regime new entrants will only locate where they have some strategic advantage of incumbent generators. If this entry displaces incumbent generators access to the market than is an efficient outcome. We believe the Southern Generators have being arguing on equity grounds and not on market efficiency perspectives.

We are disappointed that the Commission has invested a disproportionate amount of time of the Optional Firm Access option and not allocate the same amount of time looking at ways the current Open Access regime can be improved. We believe incremental changes as suggested by AEMC in the First Interim report could improve existing arrangements and are therefore worth further investigation.

Our independent consultants report concludes that:

- the benefits of the OFA model—largely greater co-optimisation—are at best small
- the unintended consequences of the OFA model—an over built and less efficient transmission system—are potentially large; and
- the cost and complexity of the OFA model are substantial.

Castalia concludes that the OFA proposal is unlikely to contribute to the achievement of the National Electricity Objective.

In summary Snowy Hydro strongly supports retaining the status quo.