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26 May 2011

The Chairman
Australian Energy Market Commission
Level 16, 1 Margaret Street
SYDNEY NSW 2000

By email to submissions@aemc.gov.au

Dear Chairman,

Transmission Frameworks Review – Directions Paper

AGL Energy welcomes the opportunity to comment on the Australian Energy Market Commission's (AEMC) *Transmission Frameworks Review – Directions Paper.*

As the leading investor in renewable energy in Australia, AGL Energy (AGL) is well placed to comment on transmission policy. AGL operates across the supply chain and has investments in coal-fired, gas-fired, renewable and embedded electricity generation and electricity retailing. AGL is Australia's largest private owner, operator and developer of renewable generation and has invested well over $2 billion in renewable energy and has much more in its portfolio of development opportunities. AGL has over 3 million retail customers and operational control of some 3,000MW of generation capacity in the National Electricity Market.

The Commission has sought stakeholder views as to the inclusion or omissions of issues in the scope of the review and the materiality of the issues included. As a vertically integrated utility, asset owner and investor in generation in the NEM AGL is concerned that the current transmission frameworks for delivering transmission services to the competitive sector create significant barriers to entry for new generation investment.

AGL is of the view that priority should be given to reforms that are required to increase supply side investor certainty and decrease investment cost. This means reform of generator access[1] rights, and changes to support timely transmission augmentation and funding. From that perspective AGL provides the following comments on the four work streams described in the Transmission Frameworks Review Directions Paper [2](TFR DP), repeated below.

[1] In this submission "access" means access to the RRN, ie in the Commissions terminology "access" to the network and "transfer" rights or capability through the network.

[2] Transmission Framework Review Directions Paper (TFR DP) Figure 2.1 page 10

- **Transmission investment**
  - Transmission planning
  - Efficient investment
- **Network charging access and connection**
  - Network charging for generation & Load
  - Nature of access
  - Connection arrangements
- **Network congestion**
  - Dispatch of the market and management of network congestion
- **Network operation**
  - Dispatch of the market and management of network congestion

From AGL's perspective, the most material work stream is "Network access connection and charging". We note also that changes in this work stream to facilitate generator connections and provide access rights can have positive flow on effects to the other work streams in particular transmission investment and congestion. Because there are strong linkages across work streams it is important to ensure that solutions are considered in a holistic manner through a co-ordinated approach, i.e. the impact of a proposed solution in one stream is tested in the other work streams. For example network access and charging arrangements can facilitate efficient generation and transmission investment and assist in mitigating network congestion. The lack of clarity surrounding connection arrangements and the services to be provided by NSPs' cannot be resolved in the absence of ensuring that connection arrangements support efficient outcomes

AGL supports the Commissions view that including "economic regulation" in the scope would make the review unworkable. However we note that the generator access provisions which include the provisions for "negotiated services" should be included in the scope. AGL has identified the Rules clauses that are relevant to generator access. (Refer Appendix 4).

AGL does not place a high priority on establishing a "financial access rights regime"[3], for the same reasons that the Commission excluded 'economic regulation'. Further in AGL's view reducing barriers to entry for new generation investment and ensuring efficient generation and transmission investment, (i.e. the lowest delivered cost of energy to consumers) as well as congestion management, can be achieved in the absence a "financial access rights regime".

The Commission has included in the scope of the review an alternative to the Commissions interpretation of the generator access provisions, which the Commission has described as "physical"[4] access. The so called "physical" access proposal has been proposed by privately owned generators (generally Victorian based generators) some with significant retail interests. The prime motivation in proposing this model to support new investment by increasing revenue certainty, reducing the current barriers to entry to reduce investment risk

The "physical" access model also promotes the optimisation of generation and the transmission costs, consistent with the Commissions objective for efficient generation and transmission investment. The proposal also prevents congestion i.e. promotes an efficient

[3] (TFR DP)- Section 4.3.5 page 4

[4] The term "physical" does not imply access is restricted to certain physical assets rather that in the planning process the NSP will ensure that the network (at the specified planning conditions) will support the payment of the RRP at the capacity specified in the connection agreement.

level of congestion. We have made a distinction here between congestion prevention and congestion management which is discussed in the attached submission.

In general AGL agrees with the scope of the review of the planning arrangements. To achieve efficient investment, network planning and expansion requires the coordination of two separate processes;

- expansion to meet customer reliability requirements and projects justified on a cost benefit basis through the RIT-T and funded by customers, and
- expansion to meet new connecting generator requirements funded by new generator entrants.

The Commission has acknowledged the benefits that might be given by transmission rights in terms of providing additional information for transmission planning. The sale of these rights would provide certainty over the usage of the transmission system, and could therefore reduce the risk of transmission assets being under utilised. AGL notes that the "physical" access model will provide this information for the planning process through the definition of a defined level of access.

With respect to the connection arrangements the Commission has identified a wide range of issues to be addressed and clarified. In AGLs' view at the highest level the lack of clarity results from the interpretation of the NEM as an "open access" regime where generators have "non firm" access i.e. the "no agreed service" model. NSPs are supposed to be "service" providers, i.e. providers of, for example, "prescribed services" or "negotiated services". The "no agreed service" model when combined with a monopoly service provider essentially prevents generators from negotiating any level of service even after paying for network expansion. Before any progress can be made with connection issues for example the nature of the access service provided to generators must be established. The nature of access for generators is also key to addressing the issues raised in other work streams.

AGL is of the view however that a properly co-ordinated review both within and across the five work streams as outlined by the Commission should appropriately address the important issues.

Should you have any questions in relation to this submission, please contact Roger Oakley, Manager Wholesale Markets Regulation, at roakley@agl.com.au or on (03) 8633 7665.

Yours sincerely,

Alex Cruickshank
Head of Energy Regulation

The Role of transmission

Application of the NEO objective[5]

Commission's current views

"The Commission continues to believe that the objective for transmission frameworks should be to ensure that investment and operational decisions across generation and transmission are optimised in a manner that minimises the total system costs faced by consumers."

With respect to transmission investment decisions AGL supports this objective and notes that transmission investment occurs in two paradigms;

- Centrally planned transmission investment to meet reliability targets for consumers where achieving economies of scale can minimise transmission costs, and
- Decentralised decision making by generation investors supported where necessary by transmission investment where total system costs or total delivered costs are minimised on a project by project basis.

In developing transmission frameworks to achieve the above objective there is an interaction between these investment streams which must be considered to achieve a balance to ensure that;

- the decentralised decision making process is facilitated to support competition in the NEM, and
- centrally planned investment decisions do not create barriers to entry for supply side investment or distort supply side investment through subsidised transmission funded by consumers.

In AGL's view the recent SENE decision strikes an appropriate balance between these two paradigms. This decision forms a model for the wider transmission framework.

Shaping and defining the role of transmission[6]

Commission's current views.

The Commission has stated that*;*

"in order to facilitate its further consideration under this work program, the Commission's initial view of the role of transmission is that it should be: "To provide services to competitive and regulated sectors of the electricity market in a manner that is in the long term interests of consumers of electricity."

With respect to the transmission investment decisions AGL supports this description of the role of transmission and suggests that the comments provided above are relevant to this role.

Further AGL supports the view that the role of transmission is to provide "services" to both sectors. As discussed in this submission our view is that the current framework is failing to provide the range of services required to support efficient decentralised investment decision making.

[5] TFR DPSection 3.1, page 15

[6] TFR DP, Section 3.2, page 18

Nature of access[7]

Level of service to generators and load

The Commission has described some of the adverse features of the current access arrangements or "services" provided for generators that can lead to congestion and dispatch uncertainty, such as;

- no functioning obligation on NSP's to provide access to the deeper network,
- generators can fund augmentations to the deeper network however receive no exclusive right to the use of that network.

This dispatch uncertainty can lead to reduction in the volume of contracts offered, reducing liquidity in the contract market and creating barriers to entry for new investment.

The Commission has noted some concepts associated with alternative levels of transmission service proposed by some participants such as "physical access", and "financial access", which can provide the means to reduce congestion and dispatch uncertainty for generators.

As there are differing interpretations as to what these terms mean and because there are differing interpretations of the current access arrangements as described in the Rules, AGL has identified 3 levels of "open access", which are described below, these three models provide an increasing level of certainty of access for generators, and move the risk of insufficient transmission capacity to the party best able to manage that risk, i.e. the NSP.

The term "access" used in this submission means access and transfer capability through the network that will support the payment of the RRP at the capacity specified in the connection agreement.

AGL proposes that the Commission users the following models as the starting point for establishing efficient access arrangements for generators.

Selective negotiated or enhanced rights for generators[8]

<u>"non firm" access model aka "base level of service", or "no agreed service" model</u>

The Commissions describes the current NEM "open access" arrangement as a regime where generators have "non firm" access which AGL understands to mean that a generators access to the RRN can be reduced in

- an operational time frame due to NSP operation and maintenance activities and transmission line failures, and in
- a planning time frame due to the failure of the NSP to plan and develop the network and due to other generators connecting to the network and causing constraints and congestion.

Generators can pay to have the network augmented to avoid constraints but receive no priority access to the expanded network. Given that NSP's are service providers this model is more accurately described as the "no agreed service" model. The Commission has called this a "base level" of service.

As the Commission is aware AGL does not agree that this is a correct interpretation of the Rules. (Ref all previous submissions.)

<u>The first level of enhanced service or "physical access"</u>

[7] TFR DP, Section 4.0, page 23

[8] TFR DP, Section 4.3.4, page 32

AGL has provided an alternative "open access" model that provides an enhanced level of service to generators when compared to a regime described above. This proposal provides all generators with a defined level of service in planning timescales but not with respect to NSP operational and maintenance activates. In this model generators also have "non firm" access but only in an operational time frame. This proposal does not expose NSP's to any market risk, it also provides a source of revenue to NSP's to fund the network expansions, if requested and paid for by the participant, to avoid congestion. It places the risk of network development with the party best able to mange it, the NSP, with that risk being minimal because there are no penalties for late delivery of network assets, although incentives could be applied to encourage timely investment.

The Commission has described this model as providing "physical" access.

The second level of enhanced service or "firm financial" access.

The second level of enhanced service provides in addition to a defined level of access in planning time frames, a defined level of access in operational time frames. This could be achieved by financially compensating generators faced with constraints that result from a NSP's operation and maintenance activities. This is an "open access" model with "firm financial" access. Provision of this service would probably require the implementation of a financial transmission rights regime. As the Commission and other participants note this could be problematic and although the NSP's are best placed to manage this risk, they are unlikely to be able to manage this risk well.

Differing interpretations of current arrangements & Operation of Rule 5.4A

Commission's current views

The Commission notes the issues presented by stakeholders relating to current Rule provisions. However, the Commission considers that any changes to the non-firm access arrangements in the NEM should best be considered from first principles rather than attempting to structure them to fit certain provisions in the Rules which might be ambiguous, unworkable and contentious, and which would not result in a coherent regime.

AGL supports a review of the access arrangements based on economic principles and proposes that the models presented above be used as the basis for determining which level of service best meets the objective outline by the Commission in the Directions Paper.

As a basis for assessing the current and any revisions to the transmission frameworks against the AEMC objective for transmission, AGL has prepared the following investment principles. They are based on the existing cost allocation principles in the Rules and are considered to be consistent with the objectives of the National Electricity Rules and a competitive market.

Any revisions to the framework and generator access should be consistent with the following principles.

1. Transmission policy should deliver efficient transmission prices which incentivise generation proponents, all other things being equal, to locate their investments as close to load centres as possible.
2. Access charges for generators should be specifically oriented to the type and timing of the decisions they are making, specifically to ensure that when making:
    - long-term locational investment decisions; generators face the location specific short-run signals provided by transmission congestion and losses or location specific long-run cost of any transmission investment required which reflects the cost of removing that congestion; and
    - short-term production and consumption decisions; generators face the location specific short-run signals provided by transmission congestion and losses.

3. Extensions of transmission networks that are directly attributable to a particular network user should be financed solely by the benefiting.
4. To encourage negotiated services the entities financing transmission network infrastructure should receive tradeable access rights to the RRN, (or dispatch priority over those that do not fund transmission expansion and cause congestion). This may include rights in parts the shared network, that have been financed both as prescribed and negotiated services.
5. The risks and returns of developing infrastructure should be appropriated on the same entities.
6. Electricity customers should not be required to underwrite the development of transmission services for generators as customers do not receive any share of the profits, should the investments generate economic returns.
7. Investment decision should to the maximum extent practicable be made in a competitive environment.
8. When making generation or load investment decisions the viability of transmission investment should be determined by the particular network user who pays for the network extension.

We are of the view that the rules provisions can be interpreted to be, and were intended to be, consistent with first principles. In the past AGL has been party to a number of submissions based on economic first principles which has included both qualitative and quantitative analysis which supports this view.

AGL is of the view that "non firm" access i.e. the "no agreed service" model is an all care no responsibility model you would expect to find in a state owned vertically integrated "no concept of service", bureaucratic monopoly. This is an anachronistic concept, which is totally out of step with a modern competitive market. This model may have worked in a centrally planned entity where the central planner would plan and control all investment in the supply chain, but is unlikely to be efficient in a competitive market with decentralised decision making based on project funded private investment.

The Commissions describes our view of access as being a "physical right of service" or "physical access" in planning time frames (p24). AGL would describe a "physical right of service" as the basic level of service and a "firm financial" right as described in section 4.3.5 as an enhanced level of service. AGL does not support a move to a financial access rights regime.

The Commission notes that this view is commonly held by Victorian generators, and notes that this may be due to the fact that the connection arrangements in Victoria are different to the other jurisdictions.

This is probably true however a more fundamental reason for the difference in views between the regions is that the Victorian generators and transmission assets are all privately owned and most generators are investors in supply side infrastructure. Having a defined level of access provides revenue certainty and minimises the risk and cost of investment funding.

In NSW and Queensland generators and the transmission assets are state owned, i.e. have the same shareholders. The State owned generators are not significant supply side investors and therefore do not have the same need to obtain infrastructure funding.

Secondly they do not face the same transmission access risk because the owner of the transmission planner has an incentive to ensure any new investment in generation does not constrain existing supply assets.

Operation of Rule 5.4A[9]

Since our previous submissions AGL has had a proposal developed by a consultant for implementing 5.4A. A summary of this proposal is contained in Appendix 1, and the full proposal has been included with our submission.

This new proposal allows new entrant generators to choose the level of access they require, pay for any network expansion and receive a defined level of access. The only constraint being that their operation must not reduce the access level of incumbents. If the level of access provided by the new entrant is insufficient, i.e. they have elected to gain only partial access, the proposal includes a compensation regime to encourage the generator to operate within an envelope that does not constrain others.

This compensation regime is applied only in the special case of a generator with partial access. The requirement to compensate is not expected to apply frequently. The intention of the compliance regime is to provide an incentive for compliance, thus making the calculation and payment of compensation unnecessary.

A feature of this scheme is that there is no involvement by the market operator and no change to the market arrangements. The obligations introduced by this scheme would lie solely in a bilateral agreement between the generator and the Network service Provider. This incentive scheme does not impose any additional risk on the TNSP.

The proposal does not require the implementation of nodal pricing or financial transmission rights and is consistent with the current drafting of 5.4A.

Factors perceived as exacerbating issues associated with the absence of generator access rights[10]

A number of participants have expressed concern that NSP's could fail to invest in an efficient or timely manner because of perceived difficulties with the RIT-T in quantifying market benefits. This is not an issue with the RIT-T per se; the calculation of market benefits in itself is not a simple exercise.

AGL is of the view that the RIT-T is primarily a test to establish the least cost way of meeting a customer reliability requirement and any assets funded through the application of the test are paid for by consumers.

The RIT-T is a central planning tool and is not intended to justify transmission investment for generators. The difficulties associated with doing this were identified in the SENE rule change. See Appendix 1. This issue is discussed further in this submission in the section headed "Costs imposed by generators under current frameworks - The RIT-T".

Reliability standards for generation[11]

Commission's current views

"The Commission is of the view that the potential for a transmission reliability standard for generation should be given further consideration in the review. In particular, such a regime might be easier to implement given the architecture of the NEM than a model of firm financial rights, for instance".

"The Commission notes that a model under which a new entrant was required to pay directly for any transmission augmentations required to restore compliance with the reliability standard on a mandatory basis would represent a deep connection charge. The Commission intends to give further consideration to such models in this review, although it

[9] TFR DP Section 4.3.1 page 26

[10] TFR DP Section 4.3.2 page 27

[11] TFR DP Section 4.3.3 page 28

has previously noted concerns with deep connection charges with regards to barriers to entry and first mover disadvantages."

The Commission appears to have characterised AGLs' submission to the TFR Issues Paper[12], i.e. the "physical access" model as proposing the establishment of a global reliability standard for generators.

AGL does not support the implementation of a global form of reliability standard for generators such as in the "Alberta" model, because as the Commission notes there is a risk that the reliability standard will be set at an uneconomic level.[13]

AGL sees no need to define a NEM wide transmission reliability standard to ensure competitive neutrality for generation as it is unlikely to result in economically efficient outcomes. If the reliability level is established through a regulated process there is a risk that the cost (which may be at a high level) would be carried by consumers, if the cost of a global reliability standard is carried by generators there is a cost allocation issue and this approach could create a barrier to entry because depending on the level set it may make some projects uneconomic, i.e. too high a cost or too low a level of reliability.

The model proposed by AGL and some other Victorian generators (including LYMMCo and International Power), proposes that a certain level of transmission capacity be provided for generators in planning timescales, and the level of capacity provided would be set under specified planning conditions as defined by the network planners using their established jurisdictional reliability standards. The proposal does not require that a specific reliability standard be established for generators on a global basis.

Under this model when generators are paying for transmission access, transmission costs with respect to the level of access and reliability will be optimised by individual participants through the decentralised decision making process to maximise profitability. Transmission costs can only be passed to the consumer through the market to the extent that competition allows.

The Commission has raised a number of issues with respect to this proposal which are discussed below.

What is the appropriate level for the reliability standard?[14]

Is the reliability standard set at an efficient level?[15]

In establishing a generator connection;

- The system conditions and reliability standards which are currently applied by TNSPs for transmission planning would apply for network development,
- The reliability standard that a generator faces at a connection point would be that provided by the network at that point. The generator could elect to accept that reliability and a level of access, or request a higher level of reliability and access,
- The scope of network augmentation and the cost of that augmentation (so that the connecting generator does not reduce incumbents generators access or network reliability) and to meet the generators specified reliability requirement would be established by the TNSP,The connecting generator would pay for the network expansion.

Under this model there is no need to set a global reliability standard for generators.

Subject to not reducing others access or the network reliability the level of access and reliability would be established by and paid for by each connecting generator.

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[12] AGL submission to the TFR IP page 25

[13] TFR DP, Section 4.3.3, Page 30

[14] TFR DP, Section 4.3.3, Page 29

[15] TFR DP, Section 4.3.3, Page 29

The network expansions are not paid for by consumers and the costs of these generator expansions will only be passed on to consumers through the market to the extent that competition allows. The cost of transmission expansions paid for by generators is constrained by competitive market pressure and the cost of any stranded asset is carried by the generator.

How can new entrants be accommodated when the capacity of existing networks is insufficient or the reliability standard could not be maintained? [16]

The new entrant could be accommodated by;

- augmenting the network as described above, or
- connecting to the network at reduced capacity and reliability either permanently or temporarily (for an agreed time period while augmentations are carried out). Where the generator decided not to augment the network (permanently or temporarily) the generator would be incentivised to constrain their operation within an envelope that does not constrain others.

Further to our earlier submissions AGL has attached the details of an arrangement or incentive scheme required to constrain participants connecting to a network with insufficient capacity to operate within an envelope that does not constrain others. This is described in Appendix 1. The incentive scheme is in effect implementation of 5.4A where the establishment of a level of "physical access" and reliability standards forms part of the connection application.

The Commission raises the issues of competition and potential discrimination with an arrangement of the above type[17].

AGL is of the view that an arrangement which includes new generators paying for transmission access is economically efficient and consistent with the AEMO objective of minimising total system costs and hence the NEO. The payment of an access charge provides a location specific transmission cost to new entrants at the time they are making an investment decision and also reduces barriers to entry by providing revenue certainty.

Apparently the Commission has concerns that new entrants paying for access will be discriminatory because most incumbent generators did not pay a specific charge for transmission access. Incumbent generators were located under a centrally planned electricity system which at the time would have considered total system costs. Application of a location specific transmission cost to assets that cannot be moved will not drive economic efficiency.

Models suggested by stakeholders [18]

Some participants support the "no agreed service" model otherwise known as "non firm access".

"Two stakeholders, Origin and the Northern Group, specifically discussed the benefits These stakeholders considered that the current regime "promotes competition between different types of generation plant and does not discriminate irrespective of fuel type or on the basis of new entry or incumbency",83 and that it "may have encouraged generators to locate where there is excess transmission capacity and deferred generation investment in constrained parts of the network".84 It was further contended that there is no evidence that the current non-firm access regime has discouraged generation investment." [19]

[16] TFR DP, Section 4.3.3, Page 29

[17] TFR DP, Section 4.3.3, Page 30

[18] TFR DP Section 4.3.4 page 33

[19] TFR DP, Section 4.3.4, Page 33

The majority of these stakeholders are State owned entities with investments in jurisdictions where the NSP's are also State owned. In these jurisdictions the customer reliability standards are deterministically based and established by the jurisdictions. Transmission investment can be more readily justified in these jurisdictions compared with the Victorian jurisdiction where reliability standards are determined on a probabilistic basis. The transmission asset owner is the transmission planner and NSP's have the same shareholder. For these reasons the there is a high probability that transmission will be built (and paid for by customers) to protect incumbent State owned generators access to market when constraints due to new entry appear.

Some of these stakeholders have fuel sources (renewable and low carbon) which are remote from the transmission network, they may have an interest in promoting a framework where customers subsidise transmission investment to theses resources.

AGL provides the following comments with respect to the benefits of the "no agreed service" model identified by the Northern generators.

"promotes competition between different types of generation plant and does not discriminate irrespective of fuel type or on the basis of new entry or incumbency",

This statement is based on the concept of "equity" not "economic efficiency" and appears to be based on the incorrect assumption that competition in the pool should be based on short run marginal cost alone. Competition occurs in the contract market based on LRMC and generators contract positions drive their offers. If a generator does not have to consider electricity transmission costs in their investment decisions, because customers will be paying for transmission, their required LRMC recovery will be lower. In effect this results in a subsidy to remotely located generators, and will encourage generators to locate next to the fuel source regardless of the cost of fuel transportation. This is particularly distortionary with respect to gas generators where gas transport costs are significantly lower than electricity transmission costs.

The argument that the "no service" model does not discriminate on the basis of fuel type is clearly not correct. Any access regime where generators do not have to consider transmission costs in determining their location will result in inefficient investment decisions.

"and that it "may have encouraged generators to locate where there is excess transmission capacity and deferred generation investment in constrained parts of the network"".

Since there is no transmission related location specific cost it is highly unlikely to have encouraged generators to locate where there is excess capacity, it would be more correct to say that it does not discourage generators from locating in constrained parts of the network. This means it is less likely to defer generation investment in constrained parts of the network than an access model with location specific transmission costs.

The model proposed by AGL and others <u>will</u> encourage generators to locate where there is excess transmission capacity and defer generation investment in constrained parts of the network. Further if generators decide it suits their business model to locate in constrained part of the network they can pay for expansion of the network and be provided with "physical" access.

"It was further contended that there is no evidence that the current non-firm access regime has discouraged generation investment."[20]

Except for Origin these entities are not privately owned entities competing in the wider capital market for funds to support new generation investment and therefore are unlikely to discover evidence that the current regime increases the cost new generation investment.

Financial access rights regime[21]

AGL does not place a high priority on establishing a "financial access rights regime", for the same reasons that the Commission excluded 'economic regulation'. Further in AGL's view reducing barriers to entry for new generation investment and ensuring efficient generation and transmission investment, (i.e. the lowest delivered cost of energy to consumers) as well as congestion management, can be achieved in the absence a "financial access rights regime".

Network Charging for Generators

The Commission has identified three areas for review;

- Costs imposed by generators under the current frameworks,
- Impacts of changes to access arrangements,
- Design issues for generator charging.

AGL agrees with the Commission "that there a number of issues that require consideration and the overarching issue to be resolved is the nature of the service for which charges are being recovered". This means this issue cannot be resolved in isolation from the other work streams.

AGL supports the Commissions previous recommendations that a long term signal is appropriate. The model proposed by AGL includes a long term signal fixed for the life of the power station, determined at the time an investment is made, with respect to planning timeframes and is a charge that varies by location and reflects the costs to augment the network so as not impede the access of others.

Costs imposed by generators under current frameworks - The RIT-T

AGL notes that the Commission intends to consider they way in which generator sunk costs may influence transmission investment for generators justified through the RIT-T. In AGL's view this review should consider wider aspects of the application of the RIT-T to fund transmission investment for privately owned generators which is to be paid for by consumers.

In a submission to SENE rule change the application of the RIT-T or the SENE test to competing market based options was found by NERA[22] to be problematic. Our summary of the difficulties in applying the RIT-T is attached (Appendix 2). The AEMC should consider whether the application of the RIT-T to justify transmission for private investment will result in economically efficient outcomes and if so whether:

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[20] TFR DP, Section 4.3.4, Page 33

[21] TFR DP Section 4.3.5, Page 4

[22] Submission to the SENE rule change by NERA Economic consulting for Grid Australia (Page 14)

- each generation project should be assessed on an individual basis, i.e. do the costs exceed the benefits, (noting that the benefits do not include the private investor benefits), or
- alternative generator and network investment options should be considered to select the least cost transmission and generation investment, given that consumers will be paying for the transmission investment
- the application of the RIT-T is likely to drive economically efficient outcomes consistent with the NEO.

As identified in the NERA report, in the case of the application of the RIT-T to a SENE it will be difficult to limit the scope and number of the credible options to be considered under the analysis. As the RIT-T will need to consider market wide impacts there is likely to be a large number of affected stakeholders with competing projects, who could press for consideration of credible network extensions for renewable generation in other areas of the NEM.

If all network extensions are subject to the RIT-T it is in reality the application of centralised planning approach to the competitive market.

In AGL's view the objective of the RIT-T is not to determine whether a network augmentation required for a generation project should proceed and be paid for by customers. However if a generator has committed to a particular location including a network augmentation, the RIT-T may justify some cost offset paid by customers if the augmentation also includes reliability benefits.

Congestion

The Commission notes that *"If insufficient transmission network capacity is provided to the market, either operationally or through insufficient or delayed network investment, there is a risk of inefficiently high levels of network congestion capacity."* [23]

AGL agrees that this is the root cause of congestion which also identifies that congestion that results from new generator investment and insufficient or delayed network investment (i.e. in planning time frames) can first be addressed through the access provisions.

This means that in addition to the effectiveness and efficiency of the planning frame work the discussion above under the heading "Selective negotiated or enhanced rights for generators" where the following access models were discussed, is relevant to whether or not congestion occurs in the first instance.

Non firm access, the no agreed service model, (The Commissions' base level of service)

This model provides uncertain outcomes with respect to congestion as generators have non firm access in planning time frames.

The first level of enhanced service, (AGL base level of service or "physical" access)

AGL suggests that providing an efficient level of transmission investment (capacity) through the generator access provisions will result in an efficient level of congestion.

The second level of enhanced service, ("physical" and "financial" access)

In addition to providing "physical" access the use of financial incentives on NSP's is likely to minimise the impacts of congestion in operational timeframes and increase network availability by minimising transmission outages and failures.

[23] TFR DP Section 6.2 Page 49

Materiality of Congestion

The Commission proposes to investigate the "materiality" of congestion in the future. As the Commission notes there have been a number of unsuccessful attempts to measure this in the past. The Commission has sought participants views as to how the materiality of congestion should be assesed. Assessing materiality of congestion requires a forecast or a range forecasts of the future which is inherently uncertain.

However in AGLs' view:
• the term "materiality" is to be interpreted in the context of the cost of introducing mechanisms to manage congestion and, more broadly, in the context of the NEM objective;
• that the relevant measure of congestion is the impact that trading risks caused by congestion – or the threat of congestion – have on NEM efficiency.

As a consequence:
• a materiality threshold can only be defined once potential congestion managemet mechanisms have been identified and their costs and effectiveness estimated; and
• analysis of congestion should be forward looking and focus on the uncertainty of congestion impacts, not the average or expected level of congestion.

The issue that should be addressed is not materiality but economic efficiency.

AGL has identified 3 congestion management mechanisms in this submission, and assessed their relative costs of implementation, namely;

1. "physical" access, (A very low cost of implemtation)
2. a congestion management regime to address the ineiciencies that result from mis-pricing as a result of congestion, (A moderate cost). This could be applied to the "base case" and the "physical" access model., and
3. "firm financial" access, (A high cost)

With respect to 1 & 2, the benefits of making these changes can be assessed by modelling the outcomes to measure the market outcomes in terms of the productive allocative and dynamic efficiency changes when compared to the base case of "non firm", access. These studies should be treated as a theoretical exercise and as such are unlikely to produce an accurate forecast of future congestion, however should be cable of producing an estimate of the likely magnitude of the efficiency increases. These studies cannot be concluded in a short time frame and the underlying (simplifying) assumptions need careful consideration.

A modelling exercise of this nature, for the Queensland region, was undertaken by IES[24] for a group of generators and was submitted to the AEMC for the congestion management review. This report was also completed in a short time frame and was unable to take into account the uncertainty of congestion impacts and measured only the average or expected level of congestion.

AGL understands that this report was used as a guide for subsequent AEMC analysis however it is not clear why the AEMC was unable to reproduce the results.

AGL is not aware of an alternative means of assessing the economic efficiency gains.

The "physical" access model proposed by AGL in allows participants the ability to hedge against future congestion by paying a fixed access charge determined at the time of investment. The cost of implementation, ie clarifying the Rules, is extremely low.
If this is implemented participants would be given the capability to hedge against congestion, if they so desire. On this basis whether or not congestion will be material in

[24] Intelligent Energy Systems (IES), Modelling of Transmission Pricing and Congestion Management Regimes, Report, 22 December 2006.

the future is an assessment that could be undertaken on a case by case basis by generation investors.

AGL does not support a global investigation into "materiality".

For the reasons stated above the Commission is unlikely to be able to assess materiality and should confine the review to establishing a framework to that supports an efficient level of congestion.

Finally, in previous transmission a framework review the Commission has determined that, because in their view congestion was unlikely to be material in the future, there was no need to make any significant changes to the transmission framework. AGL trusts that this will not be the case in this review.

Congestion Management Mechanisms

AGL supports the Commissions' intention to give further consideration to congestion management mechanisms particularly in the form proposed by AGL and the other Victorian generators. AGL notes that the scheme we support primarily addresses the mis-pricing issue and provides generators with increased certainty as to how generation would be allocated when it occurred. This proposal does not provide participants with a means to manage basis risk.

Planning

AGL supports the Commissions intention to consider the issues identified with respect to transmission planning.

AGL is of the view that the Commission has misinterpreted the objective of the RIT-T with respect to promoting transmission investment for generators. The Commission has stated that;
"The requirement for broader and deeper calculation of market benefits under the RIT-T is intended to encourage TNSPs' to asses and undertake the considerable transmission investment likely to be necessary for connecting significant volumes of new generation capacity and responding to changes in network flows."

The RIT-T was never intended to justify network expansion for generators, its primary function is to justify network expansion to meet customer reliability requirements, on a least cost basis and in justifying interconnector upgrades through a cost benefit analysis (both of which may also include market benefits), The RIT-T justifies assets for inclusion in the regulated asset base to be paid for by consumers, i.e. 'prescribed services'. Market benefits were always able to included in the RIT-T, the changes to the test were made to explicitly state this.

The application of the RIT-T to competing market based options was found by NERA to be problematic. (See our comments above in the section headed RIT-T.) The Commission has acknowledged this in the SENE rule change proposal. The RIT-T is a central planning tool and is unlikely to justify network expansion for generator investment, i.e. 'negotiated services'.

To achieve efficient investment, network planning and expansion should occur through two paradigms;

- expansion to meet customer reliability requirements and projects justified on a cost benefit basis through the RIT-T and funded by customers, and

- expansion to meet new connecting generator requirements funded by the new generator entrants, underpinned by by access rights through a defined level of service.

The object of the planning framework should be to integrate these transmission requirements to ensure efficient transmission network development while supporting efficient generation investment.

The Commission has acknowledged;
"the possible benefits that might be given by transmission rights in terms of providing additional information for transmission planning. The sale of these rights would provide certainty over the usage of the transmission system, and could therefore reduce the risk of transmission assets being under utilised.[25]*"*

AGL has proposed a form of access right described by the Commission as "physical" access that would achieve these benefits without having to implement "firm transmission rights". This proposal for generators to have a defined level of access in planning time frames, promotes efficient levels of transmission investment to support new generation investment, can feed directly into the planning process.

Connections

AGL agrees with the Commission that there is a lack of clarity surrounding connection arrangements, they are confusing and that they are open to different interpretations.

The Commission has described the lack of clarity at the high level as being about how new assets or capital works required for the purpose of connection should be classified and funded and because of a lack of distinction between assets and the services provided by NSPs'. Capital work is only one aspect of the service provided for the connection of generators, distribution and large end-users to the transmission network. The NSPs' activities include the build, own, operate and maintain functions for a network in order to supply a service to participants.

In AGLs' view the lack of clarity is about the classification of **'transmission services'** and what the services include and whether or not NSPs' are required to provide these services. The Rules are expressed in terms of the services TNSPs' provide, i.e. prescribed services, negotiated services, connection services and non regulated services.

In our view the lack of clarity stems from
- the lack of understanding that in most cases NSP's are providing services not assets, and
- inconsistency between Chapter 5 of the Rules which covers processes and services, in particular negotiated services and Chapter 6A which also regulates the provision of transmission services, and
- an access model described by the Commissions as an "open access" arrangement where generators have "non firm" access, i.e. the "no agreed service" model.

Because there appears to be no requirement for the NSP to provide any level of service the negotiation degenerates to the assets to be provided.

The Commission has proposed a structure to address the issues in a co-ordinated manner, however in our view before this review can commence the objective or intent of the connection provisions must be established. This means that the level of service (or a

[25] TRF DP Section 7.3.4, Page73

range of services) that generators are entitled to receive and NSPs' are required to provide in making a connection application must be specified. This should be established by the work in the other work streams.

Because of the view that generators have non firm access and NSP's are asset providers there is a lack of a service culture. NSP's tend to act as semi regulators or central planners and this mindset does not foster innovation.

An example of this is where AGL was negotiating to connect a generator in NSW, on line 61 at Dalton, and identified that the capacity of the transmission line which was subject to a thermal limit could be increased by up to 200MW by re-tensioning the line, to increase ground clearance, and installation of "run back" scheme. AGL proposed that the work would be undertaken at our cost in order to provide low cost connection to the shared network providing that the increased capacity was used to support access. This proposal was rejected by the TNSP because it was considered to be inequitable to other generators.

With respect to generator connections;

- AGL supports the underlying objective and intent of the current design for connection services to be provided through commercial negotiation;

- AGL considers that the current regulatory arrangements do not offer enough protection for applicants from poor interactions;

- AGL seeks a range of evolutionary improvements that recognise the unbalanced negotiating positions of the parties from the current arrangements. To this end the proposals are intended to require TNSPs to adopt more of an open book approach to negotiating prices. It is recognised that some TNSPs may already provide sufficient and timely information but this is not a general case and is open to interpretation by individuals;

- AGL supports moves to reduce overly restrictive confidentiality provisions about other applicants for possible use of the shared network. (*This should not be a barrier to timely and efficient arrangements*); and

- Considers the arrangements in Victoria need to be revised with objective of removing the overlap of responsibility which in practice forces AEMO into the middle of a commercial negotiation that it has no commercial role to play and is peripheral to what is understood to be the primary reason for the AEMO role – that of neutral planner of the shared network.

Appendix 1

An improved generator access regime for the NEM

This proposal describes an improved generator access regime for the NEM. The broad aim of this regime is to reduce the risks needlessly imposed on generators seeking access, many of which appear to be unintended. Risks imposed needlessly on generators ultimately disadvantage customers as generators will seek a risk premium before investing, thus reducing the reliability of supply or increasing the cost of supply (or both). This proposal reduces investment risk and drives efficient investment decisions because investors must take into account all the costs along the energy transformation and supply chain from fuel source to delivered energy.

The proposed regime –

- Includes a process by which a "base level" of access can be established under standard network planning conditions,
- Requires that this base level be maintained,
- Allows the base level of access to be chosen by the generator, while knowing the cost of that access and being able to estimate the consequences for future dispatch,
- Includes a cost allocation process for generators seeking access that will allow the location-specific costs due to transmission to be given their due weight alongside all other location- specific costs faced by the generator.
- Includes a compensation regime, which applies in the special case where a generator elects to connect with partial access, that acts as an incentive to ensure compliance with the partial access arrangement.

Att: An improved generator access regime for the NEM – Ken Secomb - April 2011

Appendix 2

AGL Submission to the Transmission Framework Review - Options Paper

Application of an Economic Test

Application of the RIT-T to competing regulated and market based interconnector options has been problematic.

Application of the RIT-T to include market based options competing with regulated options, i.e. other than evaluating the least cost regulated approach, can be problematic. A case in point is the NSW to Victoria interconnector upgrade, (at the time the Regulatory Test was conducted by NEMMCO), where there was both a regulated solution (proposed by Transgrid) and a market based solution, for a Market Network Service Provider (proposed by Transenergie) i.e. competing alternative solutions. The application of the Regulatory Test was contentious and difficult, ultimately resulting in the case being resolved through an expensive and protracted dispute resolution process, involving all three parties.

In the above case the scope of potential options was limited to a particular network augmentation and there were only two interested parties.

Application of the RIT-T to justify transmission augmentations for competing market based options.

As identified in the NERA Economic Consulting report for Grid Australia[26] submitted to the SENE rule change proposal in the case of the application of the RIT-T to a SENE it will be difficult to limit the scope and number of the credible options to be considered under the analysis. This would apply for other transmission augmentations. For competing market based options. As the RIT-T will need to consider market wide impacts there is likely to be a large number of affected stakeholders with competing projects, who could press for consideration of credible network augmentations for generation in other areas of the NEM.

In such cases the scope of potential options is much greater, i.e. not just related to a particular transmission augmentation and therefore the number of interested parties with competing options is likely to be large.

Further the NERA Economic consulting report identifies the complexity of the issues in applying the RIT-T.

Application of the RIT-T ortest is problematic because it:

- Requires the establishment of a base case of no extension which will be of key importance to the analysis. Decisions will need to be made as to whether the base case be conventional generation or renewable generation elsewhere, and what jurisdictional environmental policies will apply.
- Is heavily dependent on assumptions made by TNSPs' regarding;
    - future market development scenarios, and
    - forecasts of generation developments to be accommodated on the SENE and the relative efficiency of each type of generation in different locations where one type of generation displaces other generation,
- may require the inclusion of additional investment in conventional generation as back up,
- needs to determine the benefits from an extension to connect new generation which may be;

[26] SENE Rule Change Consultaion - NERA Economic consulting report for Grid Australia (Page 14)

    - deferment or displacement of other generation investment, and
    - fuel cost savings from displacing existing conventional generation,

  both of which will depend on their location and relative fuel costs and whether or not a carbon price is to be applied as well as other jurisdictional environmental or efficiency policies, and

- will be difficult to establishment a limit to the number of alternative credible options to be considered.

Establishment of all the modelling parameters and alternative options is likely to be very contentious and time consuming and therefore take considerably longer than a standard RIT-T test. There is a significant risk that the evaluation would not be completed in a timely manner and or may need to be resolved through dispute resolution.

Appendix 3

A review of the AEMC's interpretation of the NEM Access Provisions

The Commission describes the access provisions as "Prescribed transmission services are provided on an open access basis. That is generators do not receive firm access rights for the shared transmission network"

Since the terms "open access" and "firm access rights" are not defined terms in the Rules and because the definition is expressed in the negative, (i.e. what generators do not have), it is difficult to determine what this statement means.

For example under the above definition it would be possible to say that generators have "non firm access rights". However the Commission further notes that generators do have a right to be connected so as to access the "national grid" in accordance with the provisions under Chapter 5. What is important are the access rights generators are entitled to under the NEM access provisions[27].

Further in applying the principle of "causer pays" whereby generators are required to pay the full incremental costs of their connection to the network the Commission has limited this right, and the obligation to pay, to connection and extension assets.

"Generators' obligations (to pay) *do not extend into the shared network under either the existing or proposed SENE frameworks although they may chose to fund a network augmentation."*

If a generator connects to the network and creates congestion then an efficient interpretation of the "causer pays" principle would suggest that the generator should pay for the congestion it causes or pay to prevent that congestion.

A summary of the Chapter 5 Network Connection Provisions

The access provisions in this chapter do not limit participants' rights of access to connection and extension assets.

AGL has reviewed the network connection provisions in Chapter 5, (a copy of this review is attached as Appendix 1) and conclude that in establishing an offer to connect the scope and the cost of the work to be provided by the *Transmission Network Service Provider* at the *connection point* includes;

- *connection assets,*
- potential a*ugmentations* or *extensions,* and in addition,
- *access charges*.

The access charges include the transfer of compensation payments between generators via the TNSP should the dispatch of the Generator's generating units or group of generating units cause another Generator's generating units or group of generating units to be constrained off. This is not a firm access provision[28]. This provision ensures that the causer pays principle applies and the costs of congestion are borne by the causer of that congestion.

[27] The Access provisions approved by the ACCC include all of the Chapters in the Rules except Chapter 3

[28] All participants are subject to non firm access due to transmission unavailability as a consequence of transmission failure or outages for maintenance.

The scope of work and the cost for a connection applicant is calculated based on;

- the *power transfer capability*[29] *requested by the connection applicant* over the period of the *connection agreement,*
- maintaining the levels of service and quality of *supply* to existing *Registered Participants* in accordance with the *Rules*,
- consideration of all potential a*ugmentations* or *extensions* required to be undertaken on all affected *transmission networks* or *distribution networks* to increase the capability of a *network* to transmit or distribute *active energy* to meet the above requirements.

Augmentations are works to enlarge a *network* or to increase the capability of a *network and* the *connection* of a power line or *facility* outside the present boundaries of a *network* to transmit or distribute *active energy*." We therefore see no distinction in the access provisions between connection and extension assets and the shared network, as suggested by the AEMC and therefore no basis for treating augmentations to the shared network in a different manner to extensions to the shared network.

The NEM access provisions are consistent;

- with the "causer pays" principle, that is the generator must bear all the costs it imposes on connecting to the network, and
- in concept with the Commission's proposal for access rights, in Option1 (limited to connection and extension assets), where if generators pay for a SENE, they receive access rights and compensation payments if their access is reduced.

[29] NER provisions 5.3.3 (c) (2) & 5.1.2.(2) (iii)

Appendix 4

Chapter 5 – Network Connection

The relevant provisions of the Rules which defines the extent of work relevant to bilateral negotiations between a *Connection Applicant* and an NSP for the preparation of an offer to *connect* and hence would appear to be Rule 5.3.5 "Preparation of an offer to connect" *and* Rule 5.4A (e) to (h) Access arrangements relating to Transmission Networks.

Rule 5.3.5 "Preparation of an offer to connect"

Rule 5.3.5(d)[30], requires the NSP, so as to maintain levels of service and quality of *supply* to existing *Registered Participants* in accordance with the *Rules*, to assess the requirement for (and the costs of) all necessary *augmentations* and any possible material effect of this connection on the network power transfer capability including that of other networks.

The terms *augmentation* and *extension* are defined in the Rules as follows;

"augment, augmentation

Works to enlarge a *network* or to increase the capability of a *network* to transmit or distribute *active energy*."

"extension

An *augmentation* that requires the *connection* of a power line or *facility* outside the present boundaries of the *transmission* or *distribution network* owned, controlled or operated by a *Network Service Provider."*

"Network

The apparatus, equipment, plant and buildings used to convey, and control the conveyance of, electricity to customers (whether wholesale or retail) excluding any *connection assets*. In relation to a *Network Service Provider*, a *network* owned, operated or controlled by that *Network Service Provider*."

From these definitions it can be seen that an *extension* is a particular type of *augmentation* i.e. an *augmentation* outside the boundaries of the transmission or distribution network.

The cost attributable to a particular connection application therefore includes the cost of the *connection, augmentation* and *extension* assets required to ensure that the levels of service and supply are maintained for existing *Registered Participants*.

We note also the Rule 5.3.5(d) does not distinguish between generators or loads in relation to determining the extent of work or cost, i.e. the Rules envisage that generators and large loads be treated in a consistent manner.

Rule 5.4A (e) to (h) Access arrangements relating to Transmission Networks.

[30] NER Rule 5.3.5(d) Preparation of offer to connect is included in Appendix 1. This rule applies to all "Connection Applicants", i.e. it includes generators and loads.

Similarly in providing *transmission user access* arrangements with respect to generators Rule 5.4A (e) to (h) in determining the scope and the cost of the work to be provided by the *Transmission Network Service Provider* at the *connection point* includes;

- *connection assets,*
- potential a*ugmentations* or *extensions,* and in addition,
- *access charges*.

Rule 5.4A (e) defines the scope of work which includes the

- *connection assets* to be provided by the *Transmission Network Service Provider* or otherwise at the *connection point*; and the
- potential a*ugmentations* or *extensions* required to be undertaken on all affected *transmission networks* or *distribution networks* to provide that level of *power transfer capability* over the period of the *connection agreement* taking into account the amount of *power transfer capability* provided to other *Registered Participants* under *transmission network user access* or *distribution network user access* arrangements in respect of all affected *transmission networks* and *distribution networks*.

Rule 5.4A (f) to (g) defines the costs where the *Connection Applicant* is a *Generator* to include;

Rule 5.4A (f) includes;

- a *connection service* charge,
- *negotiated use of system charges* or *use of system services* charge, i.e. a charge in relation to any *augmentations* or *extensions* required to be undertaken on all affected transmission networks and distribution networks, and
- the amounts ('*access charges*') referred to in paragraphs (g)-(j),

Rule 5.4A (g)

- the costs reasonably incurred by the provider in providing *transmission network user access*,

Rule 5.4A (h)

- the compensation to be provided by the *Transmission Network Service Provider* to the *Generator* in the event that the *generating units* or group of *generating units* of the *Generator* are *constrained off* or *constrained on* during a *trading interval*; and
- the compensation to be provided by the *Generator* to the *Transmission Network Service Provider* in the event that *dispatch* of the *Generator's generating units* or group of *generating units* causes another *Generator's generating units* or group of *generating units* to be *constrained off* or *constrained on* during a *trading interval*.

The cost attributable to a particular connection application therefore includes the cost of the *connection, augmentation* and *extension* assets and if applicable *access charges* referred to in paragraphs 5.4A(g) to (j) the objective being to ensure that the levels of service and supply are maintained for existing *Registered Participants*.

We note also the Rule 5.4A does not distinguish between generators or loads in relation to determining the extent of work or cost except in relation to the *access charges* referred to

in paragraphs 5.4A(g) to (j), i.e. the Rules envisage that generators and large loads be treated in a consistent manner.

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Advice on the Electricity Market

April 2011

An improved generator access regime for the NEM

Prepared for AGL

This proposal describes an improved generator access regime for the NEM. The broad aim of this regime is to reduce the risks needlessly imposed on generators seeking access, many of which appear to be unintended. Risks imposed needlessly on generators ultimately disadvantage customers as generators will seek a risk premium before investing, thus reducing the reliability of supply or increasing the cost of supply (or both). This proposal reduces investment risk and drives efficient investment decisions because investors must take into account all the costs along the energy transformation and supply chain from fuel source to delivered energy.

The proposed regime –

- Includes a process by which a "base level" of access can be established under standard network planning conditions,
- Requires that this base level be maintained,
- Allows the base level of access to be chosen by the generator, while knowing the cost of that access and being able to estimate the consequences for future dispatch,
- Includes a cost allocation process for generators seeking access that will allow the location-specific costs due to transmission to be given their due weight alongside all other location-specific costs faced by the generator.

1. Defining a base level of network access

The capacity of the transmission network to accept a power injection from a generator varies with many circumstances. The power flow permissible through a network element will vary with ambient conditions, such as temperature, wind speed etc. It may also vary with the voltage profile over the network and hence depend on reactive power arrangements. The injection allowed from one generator will depend on injections from other generators. Also the magnitude and distribution of customer demand will affect the relationship between generator injections and network element flows.

The current market Rules, while requiring that access agreed with a new entrant should "maintain the levels of service" of generators with existing agreed access (see clauses 5.3.5(d) and 5.4A(e)(2)) ,

these Rules do not specify how this is to be determined, and in practice this requirement has generally been ignored.

The proposal here is to provide within the Rules a set of principles to be adopted in defining a base level of access, which can then be incorporated into a connection agreement.

While consultation with all affected parties would clearly be needed to define these principles, some initial suggestions will be given –

- The analysis should assume that all other generators that would be competing for access with the new generator would be fully using their agreed access level,
- All network elements that would normally be in service if available should be assumed to be in service,
- The ambient conditions affecting the capability of network elements should be at a reasonably worst case condition, similar in principle with the conditions used by AEMO in assessing reliability of supply (e.g. high temperature, low wind speed)

The base level of access defined by this process will therefore represent access that will be generally available apart from certain defined circumstances, namely abnormally severe ambient conditions, forced or planned outage of one or more network element or deficiencies in the provision of services such a reactive power.

2. Maintaining a base level of network access

The purpose of defining a base level of access in this way is to allow an enforceable obligation to be associated with a defined level of access in a connection agreement. Under this proposal the agreement of a level of access in a connection agreement would oblige the TNSP to continue to plan their network so as to provide that access level, but only under the defined planning conditions.

The concept is that a generator in seeking network access must adapt to the network conditions at any chosen place and time and must pay the cost of providing the chosen level of access (which cost will vary with the specific location).

But once this agreement for access is in place, the network must then in future adapt to the commitment that has been given, and any further development of the network for the benefit of other parties, whether customers or other generators, must be designed so that the agreed access in all prior connection agreements is maintained.

3. Generator choice in negotiating access

This proposal allows a generator seeking access to select from a range of choices, with consequences for both the cost incurred and the access received. The issues of cost and of the consequences of "partial" access will be explored later.

To illustrate how the calculation of a base level of access fits with this choice consider the following example –

- A generator seeks access at a particular node of the network for a generator capable of injecting 100MW into the network,
- Analysis by the Network Service Provider (NSP), based on the (proposed) principles in the Rules reveals that for any injection over 50 MW the system would be insecure,
- The NSP determines that a network augmentation costing $xx per annum would allow injection of the full 100 MW without a security violation.

Under this proposal the generator would have the following choices

- Agree to an access level of 50 MW, and pay for connection but not for shared network augmentation (with operational consequences to be considered later),
- Agree to an access level of 100 MW, and pay for both connection and the shared network augmentation cost of $xx per annum (with different and less onerous operational consequences), or
- Seek access at an alternative location.

In providing the prospective generator with these choices, each bringing appropriate consequences, the commercial freedom of the prospective participant is enhanced, while guided by the participant's evaluation of the consequences. This will facilitate efficient use of resources to the ultimate benefit of customers.

4. Generator expectations derived from a base level of access

As noted above, the base level of access, once agreed, must be maintained. This condition relieves the generator of the gravest risk to their access, namely that access will be granted to another generator in a way which impairs the first generator's access.

But this does not mean that the access is then risk-free. The obligation is simply to maintain that access under certain prescribed conditions, including that all network equipment is serviceable. When this condition is not met due, for example, to forced or planned outages on the network, the network capability will be reduced and if all relevant generators are seeking full dispatch at the time, then one or more of them will be dispatched below their desired level. Under the current market arrangements relating to network congestion, it will commonly emerge that every one of the relevant generators would be restricted in dispatch (as an outcome of "disorderly bidding").

But given that the base level of access is maintained, the variations due to network outages and other contingencies can be forecast with reasonable accuracy, based on the known network configuration, and the established statistics on outages of network elements. The details of such analysis are too case-specific and too intricate to be usefully considered here, but a very simple example may help.

If the connection of a group of generators was via a set of three similar transmission lines, then the normal security limit would be the combined rating of two lines, to avoid a post-contingency overload following the failure of any one line. In the case of a prior outage of one line, the security limit would be the rating of a single line, and hence half the normal limit.

Combining this analysis with statistical evidence on the likelihood of a prior line outage will allow the generator to quantify the risk from this particular source.

In general it is reasonable to expect that the risk profile evaluated by the generator at the time of connection will not worsen over time. This is because in broad terms any further development of the network is likely to increase the number of alternative paths for power and hence reduce the quantum of risk due to failure of any one of them.

Thus if a generator is assured of a base level of access being maintained over time, then they have a reasonable basis for estimating the risks they face through occasional restrictions on access.

Although this level of risk may be seen as manageable, and would be a major improvement on current conditions, this risk is not desirable and must result in the generator seeking a risk premium at a cost ultimately to the customers. However, no way of relieving generators of this risk is seen as practicable within the current market arrangements, and hence a more limited objective, namely protecting generators in the planning domain but not in the operational domain has been adopted here.

5. Partial Network Access

The concept of partial access to the transmission network now exists in the National Electricity Rules, in that the agreed level of power transfer capability may be anywhere between zero and the capability of the plant seeking access (Clause 5.4A(d))

However, while the concept is introduced, the consequences of this partial access are not currently set out in the Rules.

The aims of this part of the proposal are –

- To give a definite meaning to the concept of partial access,
- To describe the context within which this concept of partial access would enhance the achievement of the National Electricity Objective, and the form of such benefits,
- To describe the obligations that would apply specifically to a generator that agrees to partial access,
- To describe a compliance regime that would create appropriate incentives for a generator to comply with these obligations

These aspects are discussed in the following sections.

5.1. A concept of partial access

Before setting out the proposed concept of partial access, some intended outcomes will be considered. It is proposed that -

- A generator with partial access should be free to participate in the market in any desired manner where that conduct has no adverse impact on other market participants. Even where network capability is sometimes restrictive, there will be occasions where it is readily available and hence the unit can be dispatched a level higher than its partial access, for example when another generator that normally utilises that part of the network has an outage. This proposed outcome avoids wasteful underutilisation of network assets in such circumstances.

- In any situation where a generator with full network access is restricted by network congestion, it must always retain a proportional advantage relative to an otherwise equivalent generator but with partial access. The intention is that partial access should be a lesser standard than full access, consistent with its lower cost and hence where there are adverse consequences of network congestion, a generator with partial access will suffer first or suffer proportionately more.

- The level of access for any generator should be matter of agreement between that generator and the relevant TNSP, and should not require any action or differential treatment of participants by the market operator.

With these intentions in mind, the following concept is proposed for partial access. A generator with partial access –

- In the absence of relevant* network congestion, may participate in the NEM in any way consistent with the NER,
- In the presence of relevant* network congestion, must limit the availability offered to the market to a level not exceeding the partial access level,
- If it fails to comply in limiting the availability it offers when required, then it must pay compensation to the TNSP equal to the additional revenue obtained through its failure to comply

* relevant network congestion refers here to the binding of a network constraint equation in which the output of this generator is included in the "LHS variables" i.e. the output of this generator adversely affects the level of constraint experienced by other generators

5.2. Context and effect on the National Electricity Objective

The context in which the concept of partial access is relevant and leads to beneficial effects in relation to the National Electricity Objective is -

First, the agreement of a TNSP to provide access to a generator must be contingent on the transmission network having the capability to provide that new access without compromising any access that has been previously agreed. (This increases revenue certainty for investors and reduces investment risk) The means to achieve this certainty of access are covered above.

Second, if the agreement of access at a particular location needs the network to be augmented, then there will be a cost to the generator associated with this augmentation. (The form of cost will be dealt with later). The requirement for the generator to pay in relation to the cost of any network augmentation necessary to provide its access will ensure that transmission costs have their proportionate place among the various location-specific costs facing the intending generator.

The proposal that transmission costs be reflected to the participant so that they can be included along with the various other location-specific costs facing the participant supports overall cost minimisation. The provision for partial access further enhances this benefit, by allowing the generator to chose (and if necessary pay for) the level of access that suits their business model.

For example a peaking station with the main role of supplementing supply when one of a group of base-load units is unavailable, may accept partial access which would limit their operation when all those units are operating, as they would generally choose not to operate at those times.

The concept of partial access thus supports the National Electricity Objective by avoiding unnecessary transmission network expenditure where a generator does not need or value the additional access that would be provided if full access were the only form of access supported.

5.3 Compensation associated with partial access

This proposal for generator access does not seek a general provision of compensation to generators affected by congestion, for reasons discussed above. But in the special case of a generator with partial access, a compensation regime is proposed.

The concept of partial access described in 5.1 above, mentioned the first component of the proposed compensation regime, namely a payment by a generator with partial access to the TNSP if the generator fails to comply with the requirement under its connection agreement to restrict the availability it offers to the market (in order to either avoid congestion, or else use only its agreed access when congestion is present).

This requirement to compensate is not expected to apply frequently, but rather is intended to ensure compliance with the connection agreement. In the case of compliance no compensation is payable.

In the case of non-compliance the compensation regime has two aspects. First it deprives the non-compliant generator of the market benefits of its non-compliance. Second, the TNSP in receipt of these funds would be obliged to distribute them to those generators that were disadvantaged by the non-compliance, and in proportion to the magnitude of each generator's disadvantage.

As noted above, the intention of the compensation regime as proposed is to provide an incentive for compliance, thus making the actual calculation and payment of compensation unnecessary. This intention influences the design choices for the compensation regime.

The first of these design choices is to make the compensation owed to the TNSP the gross revenue earned by the non-compliance, and hence not allow the netting of any additional production costs incurred due to the non-compliance. This provides an incentive for any generator that incurs a cost through additional production to comply with the requirement to restrict offered availability. It also makes the calculation of compensation simple, and able to be completed without calling on any confidential information related to production cost.

The second design choice is for the counter-factual for analysis of the amount of compensation owed to be the reduction of offered availability to the partial access level. This means the counterfactual does not consider that the generator with the compliance obligation may have been able to satisfy it by reducing availability by a lesser amount so as to just avoid congestion occurring. The design choice is to not allow such finessing in the counterfactual, thus encouraging the generator to comply rather than pay compensation.

Consider the following example (in which transmission losses are ignored for simplicity)

	Capability (MW)	Agreed access (MW)
Generator A	100	100
Generator B	100	50

Consider a network constraint such that Gen A + Gen B ≤ 160

If Gen A and Gen B both offer 100 MW availability and both disorderly bid in the presence of the congestion, then each will be dispatched for 80 MW.

The two facts of (a) congestion, and (b) Gen B availability offer exceeding its agreed access, together create a compensation obligation under the Gen B connection agreement.

The compensation owed is assessed as the revenue due to the excess generation over the case of availability offer = 50 MW; i.e. the revenue from (80 - 50) or 30 MW. This reduces its net revenue after paying compensation to that from 50 MW.

However, if the operator of Gen B had sought to comply with their connection agreement, they could have offered 60 MW and congestion would have been avoided.

Thus they have an incentive to comply with the connection agreement as this allows them to retain, in this example, 20% more revenue (revenue from 60 MW rather than 50 MW) and also allows them to avoid the short-run-marginal-cost incurred by their excess generation (80 - 60 = 20 MW).

The practical implementation of this compensation regime would be –

- Re-run the dispatch process for each dispatch interval in which non-compliance occurred, with the data as used by AEMO except for one change, namely reducing the availability for the non-compliant generator to its partial access level. (Such re-runs of dispatch are a service provision by AEMO which is available to any market participant). This rerun will quantify –
    - The additional market revenue earned by the non-compliant generator, and
    - The loss of market revenue to each of the generators adversely affected by the non-compliance
- Require the non-compliant generator to pay the TNSP the amount of additional revenue gained by non-compliance
- Distribute this amount to those generators adversely affected by the non-compliance, but we suggest with a materiality cut-off to avoid the possibility of widespread but trivial payments

A notable and deliberate feature of this compensation regime is that there is no involvement by the market operator and the market arrangements continue to treat all market participants on a uniform basis. The obligations introduced by this regime would lie solely in the bilateral agreement between the generator and the Network Service Provider.

6. Cost allocation process

It is proposed that generators should be charged for generation access is a way that supports efficient locational decisions, meaning that transmission costs are given their appropriate weight alongside the various other location-specific costs that the proponent of the generator faces. This outcome will best support the achievement of the National Electricity Objective.

In order to satisfy this objective, the following characteristics are proposed, and will be supported by the discussion which follows –

- The cost allocation should be specific to a selected location at the time of connection, and not averaged over time or space, and
- The cost allocation should be known at the time that a locational decision is made, and should not be subject to material change thereafter, and
- Any decision by others to implement a scale efficient design should not affect the cost allocation to the generator seeking access.

6.1 Costs specific to place and time

In the context of the National Electricity Market design which seeks to maximise the commercial freedom of market participants, the overall cost of generation and transmission will be minimised only if the transmission costs of a generator locational decision are signalled to the participant making that locational decision. The success of this process will depend on the accuracy of the cost signalling. Hence it is necessary in considering the design of the cost allocation process to understand how the actual costs will vary between locations and over time.

The transmission costs associated with introducing a new generator are not uniform over any significant geographical scale, but rather are specific to a particular location in the network, and in some cases may differ significantly between different voltage levels at a given location.

At a location where demand dominates over supply, the introduction of a generator may incur only connection costs, with no augmentation of the shared network necessary. In such cases the net cost may even prove to be negative, with the generator deferring the need for additional transmission investment. (In such cases the generator should be rewarded through a network support agreement with the TNSP)

On the other hand, locating a generator where supply is already dominant over demand will lead to increased demand for shared network capability and potentially to significant costs to augment the network.

It follows that if a cost allocation process is to lead to efficient outcomes consistent with the National Electricity Objective, the allocation process needs to recognise the differences in cost between specific locations and specific voltage levels of connection. This suggests that the process, while relying on general principles, should give outcomes that are specific to each proposed generation installation.

The circumstances that affected the cost at the time of connection may change over time, a location dominated by demand may come over time to be dominated by supply or vice versa, and the appropriate treatment of this will be considered next.

6.2 Stable cost allocation over time

There are two separate considerations which, fortunately, both support a stable cost allocation over time -

- From the perspective of customers, it is inefficient to impose on generators the risk of increased transmission charges over time. The only possible response of generators to such risk is to seek a higher, risk-adjusted return, for example by delaying installation until reduced generation reserves increase the expected market prices. This reduces reliability of supply and also increases its cost, to the disadvantage of customers, whether or not the feared increase in transmission costs eventuates.
- From the perspective of the cost of transmission service, the cost is almost entirely fixed at the time of the generator connection. The cost of transmission services is dominated by capital charges, comprising about 70% to 75% of the total. Of the remainder, the largest part is operation and maintenance which is also directly influenced by the transmission plant installed. Hence, if the transmission network is augmented to allow the connection of a generator, then the increment of transmission cost over the life of that asset is largely predictable.

As noted above, circumstances may change over time. Consider a generator where network augmentation was necessary at the time of connection and the generator is paying the cost of that augmentation. It may be that over time the local demand grows to the extent that if the generator were now connecting, no network augmentation would be required. Should the generator now be relieved of that transmission cost?

The following observations can be made –

- The network augmentation, although no longer strictly necessary, is likely to continue in operation, as it will have residual reliability benefits which are likely to outweigh the small costs which could be avoided by discontinuing its operation,
- The ongoing cost due to the augmentation will largely, if not entirely, remain in place,
- If the generator were relieved of the cost, then some other party, probably customers, would need to pay instead. Any countervailing benefits to customers from the reduction in cost to the generator would be at best uncertain and perhaps unlikely.

In view of these observations, it is contended that there would be no benefit under the NEO in adjusting the transmission changes in this case.

In the contrary case, a generator which was able to connect without shared network augmentation at the time may over time be in circumstances where, if it were then connecting, it would need to have a network augmentation. In the event, of course, any network augmentation necessary would

be seen as associated with one or more generators connecting in the intervening period. But there might be an argument in equity to somehow spread the cost to incumbents.

This argument should be rejected. Firstly, as discussed above, the imposition of a risk of increased transmission charges on generators is inconsistent with the National Electricity Objective. Secondly, if there was an attempt to eliminate the uncertainty by forecasting future circumstances on the network, it would be basing allocated costs on a highly speculative endeavour. Thirdly, it would be inconsistent to expose generators, in one way or another, to increased costs over time, but not to reduced costs over time. Fourthly, the increased transmission costs due to the later generator installations form the appropriate locational signal to those generators, not to those that located there earlier, and this locational signal should not be diluted by spreading the cost.

From these considerations, it is concluded that the transmission cost allocation to a generator should be stable over time, and relate to conditions at the time and place of connection.

6.3 Alternative, scale efficient, design of network augmentation

The issue of scale efficient design is under consideration by AEMC, specifically in the context of an extension to the transmission network. But the issue is in reality a general one that should be considered in relation to any addition to the transmission network.

In the case of network changes for the benefit of customers, this issue is supposed to be managed by the concept of option value in the latest version of the regulatory test, the RIT-T. It is perhaps too soon to form a view on the success of this approach.

But network changes paid for by generators as part of their connection arrangements do not, and should not, be dealt with under the RIT-T test (... should not, for reasons beyond the scope of this note). Hence there needs to be separate consideration of the best way to deal with the issue of scale efficiency in the context of network augmentations to support the connection of a new generator.

In support of the National Electricity Objective, a number of principles are proposed –

- A generator seeking connection should not be advantaged or disadvantaged by a decision on the scale of the network changes which is made by another body,
- A generator seeking connection should not be given an incentive to advance or retard their market entry by any process of alternative scale efficient design,
- Participants should be free to gain benefits of scale efficiency by voluntarily co-ordinating their network connections, but not have any right to limit further scale efficiencies from being applied by another process.

These principles lead to the proposal that a generator, or a group of generators in voluntary association, should pay the cost of a stand-alone network augmentation to match their need for access. Where the connection is actually made with larger capacity for reasons of scale efficiency the payments by the generator or generators should be unaffected.

If the generator, or a group of generators, makes use of spare capacity created through a prior scale-efficient addition, the relevant stand-alone cost would be the cost of a stand-alone development absent that spare capacity.

One of the reasons for this formulation is to eliminate any advantage from a generator either being part of the initial need for the augmentation, or on the other hand being one of the later beneficiaries.

If the benefits of a scale-efficient alternative have been correctly judged, and the expected additional users are actually connected, then the charging regime proposed above will clearly lead to charges that are in aggregate higher than needed to simply recover costs.

The concept proposed here is that this excess of charges over costs forms a reward for the risk that has been taken in installing assets in the face of a risk that they could be stranded.

This discussion of scale efficient augmentation has so far avoided the issue of who bears the risk, in order to focus on maintaining efficient incentives on generators in this context. But the allocation of the risk is relevant and will now be addressed.

The above proposals for efficient incentives on connecting generators are compatible with the concept that the risk would be allocated to customers with their interest being protected by regulatory bodies, notably the AER.

Under this regime the customers would carry the cost of a poor decision, but would gain the benefit of a good decision though a reduction of TUOS charges below the level that would otherwise have applied.

But if, as has been more recently proposed, the risk is taken by a commercial entity, then it would be unreasonable to restrict in this manner, their commercial freedom to price the risk that they have taken. They should be free to define their service charges on the basis of their own assessment of the risk (including their option to revise their pricing over time). Hence this allocation of risk would entail degradation from the consistent and efficient charging regime proposed above.

If, as is also contemplated in the recent proposal, the risk were carried by a government or by a government-owned entity, then further complications emerge. This outcome would not actually remove the risk from electricity customers, but rather would impose the risk on essentially the same population, but in another role as tax-payers. In this case –

- The decision makers, lacking the technical skills and knowledge of AER and AEMO would be more likely to make an error of judgement, and
- Would be more susceptible to influence from interested parties, and
- Would impose the cost of any ill-judged decision not in proportion to a person's involvement in electricity consumption (and hence their potential to benefit from a good decision) but rather in proportion to their involvement in some taxation regime and hence in potentially quite different proportions.

In the light of these considerations and holding that efficient incentives applied to connecting generators is a necessary condition to meet the National Electricity Objectives, it is submitted that

the risk should be carried by electricity consumers and that the available and competent regulatory bodies should be tasked with maximising the net benefits to customers that arises from them bearing that risk.

7. Summary

An access regime for generators has been described above. It has been described in terms that relate it to the satisfaction of the National Electricity Objective. It is an open access regime in the sense that it does not discriminate been participants; it only reflects back to participants the cost and appropriate operational consequences of the decisions that they make in choosing the location and level of access.

It thus supports the intention under the Rules of allowing maximum commercial freedom to market participants while ensuring that the consequences of those individual choices apply to the participant making the choice and are not imposed on others.