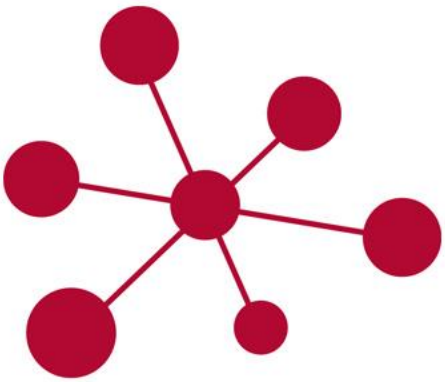

public interest
ADVOCACY CENTRE

Submission to the Coordination of Generation and Transmission Investment discussion paper

23 May 2018

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The Public Interest Advocacy Centre

The Public Interest Advocacy Centre (PIAC) is an independent, non-profit legal centre based in New South Wales. Established in 1982, PIAC tackles systemic issues that have a significant impact upon disadvantaged and marginalised people. We ensure basic rights are enjoyed across the community through litigation, public policy development, communication and training.

Energy and Water Consumers' Advocacy Program

The Energy + Water Consumers' Advocacy Program (EWCAP) represents the interests of low-income and other residential consumers of electricity, gas and water in New South Wales, developing policy and advocating in energy and water markets. PIAC receives policy input to the program from a community-based reference group whose members include:

- Council of Social Service of NSW (NCOSS);
- Combined Pensioners and Superannuants Association of NSW;
- Ethnic Communities Council NSW;
- Salvation Army;
- St Vincent de Paul Society NSW;
- Physical Disability Council NSW;
- Anglicare;
- Good Shepherd Microfinance;
- Financial Rights Legal Centre;
- Affiliated Residential Park Residents Association;
- Tenants Union; and
- Mission Australia.

The transformation of the NEM

The National Electricity Market (NEM) is in the process of significant transformation, driven by a variety of concurrent factors – commonly summarised in terms of the energy trilemma of reliability, affordability and sustainability. It is transforming from a market dominated by centralised, fossil-fuelled generation meeting passive demand, to one where a far greater role will be played by decentralised, renewable generation and storage responding to more active and responsive demand.

As a result, the fundamental role of the transmission network itself will change – not only as the location of the centralised generation moves from coal fields to areas of viable wind and solar resources, but also as reliance on the transmission network decreases. The greater role of distributed energy resources will see a smaller proportion of total electricity demand passing through the transmission network.

While this transformation is well underway, the path ahead is not without uncertainty given the numerous, complex, competing factors driving it. PIAC's view is that the long-term interests of consumers in the NEM is best served by managing this uncertainty through adaptable, long-term plans rather than relying heavily on narrow forecasts or overly prescriptive reforms.

The treatment of storage in the NEM is a good example of the need for a more holistic solution which not only anticipates the transformation, but also encourages it in a way which minimises risk and maximises benefit. Another example is the treatment of transmission network costs to enable new generation in a way which effectively manages the potential risk to consumers of both over- and under-investment.

Congestion

PIAC agrees with the AEMC's analysis that congestion in dispatch and operation of the transmission network is currently not a significant issue in the NEM. However, this may change as major flow paths and patterns shift as a result of new generation centres developing and older generation exiting the market.

The transformation of energy generation may lead to congestion in connecting to the network, as illustrated in the NSW transmission network map in Figure 1, showing the size of connection enquiries often greatly exceed the available network capacity to connect them. Ignoring this may result in misleadingly low levels of congestion in network dispatch and operation as otherwise efficient generation is not connected in the first place. Renewable Energy Zones (REZ) are one way of addressing this and PIAC's position is discussed in the section Enabling and coordinating new generation connection.

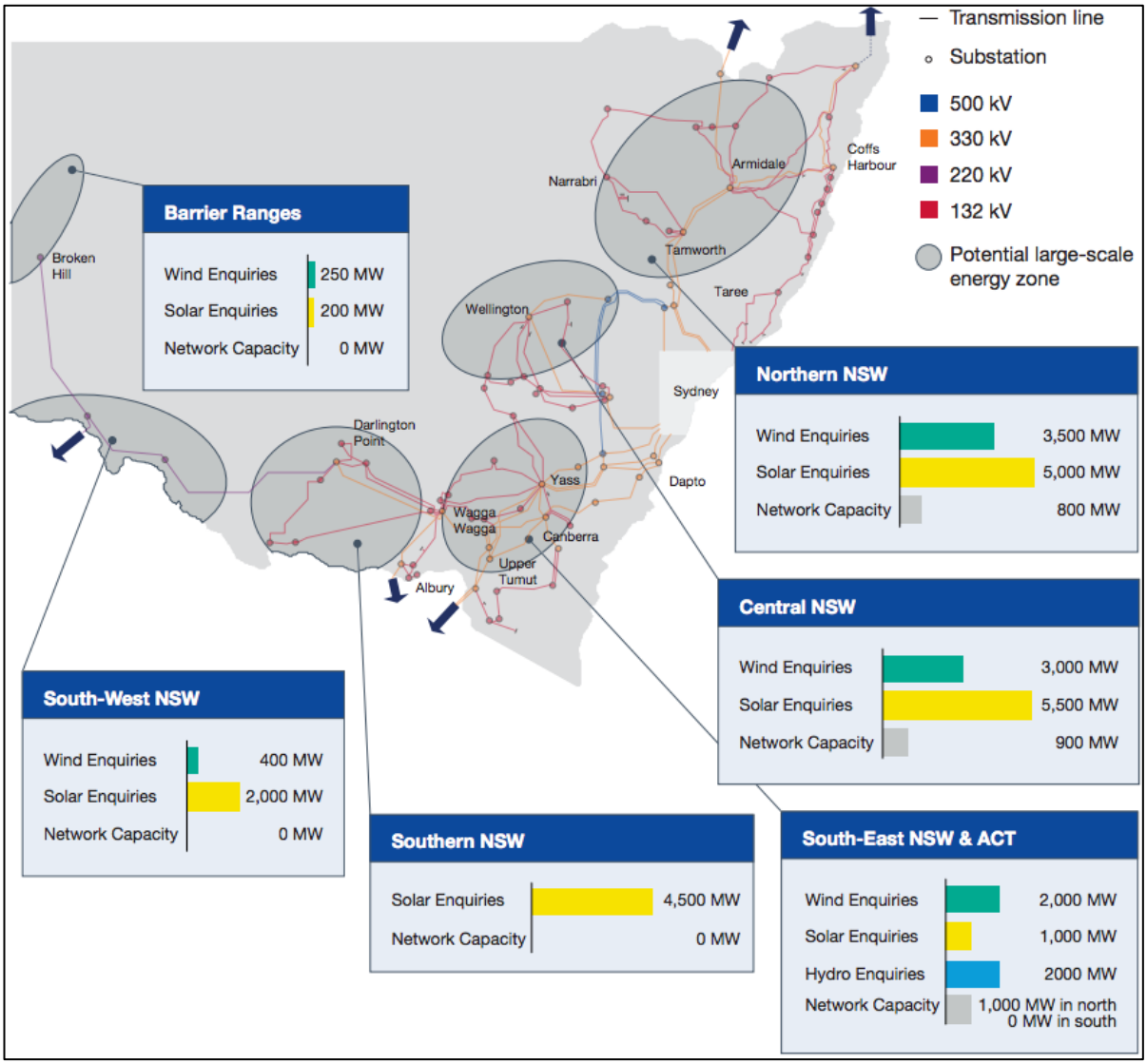

Figure 1 Current generation connection enquiries exceed available network capacity in many parts of the NSW transmission network[1]

In order to model the occurrence of congestion in the future, the impact of the energy transformation underway must be assessed. The NEM's historical reliance on centralised supply and transmission major flow paths will change and, therefore, trends developed purely from historical data and the underlying relationships may prove misleading. Instead, any modelling must be mindful of the impact from:

- The many substantive reforms recently implemented or substantially underway which may shift the quantum and location of new generation and loads connecting to the NEM but have not yet been fully reflected in the data;

- A greater role played by decentralised energy including distribution-connected assets (as opposed to transmission-connected assets) and behind-the-meter products. This may see

1 TransGrid, *Submission to the Integrated System Plan*, February 2018, 22.

more electricity flows staying within the distribution network rather than the transmission network and also a change in the reliance on the network for the supply of electricity;

- A greater role played by non-build solutions to supply-demand imbalances such as using demand response to address not only network constraints but also potential shortfalls in generation capacity, reliability or security; and

- The change in electricity flows caused by increasing use of storage in the network, both behind-the-meter and grid-connected. In modelling the impact of grid-connected storage in particular, it is essential to consider the ability and financial incentives[2] to coordinate the size, location, timing and charge/discharge patterns of storage with nearby generation output to remove peaks in electricity flows through the network. This could potentially alleviate or prevent the instance of network congestion.

Recommendation 1

PIAC recommends the AEMC expands its consideration of transmission network congestion to include constraints in connecting to the network and, in forecasting future levels of congestion, that the AEMC considers the impact of the energy transformation.

Regulatory treatment of storage

Whilst there are examples of grid-scale storage being connected in the NEM, PIAC considers that additional clarity regarding its regulatory treatment would be beneficial. As storage exhibits behaviour of both generation and load, it raises questions about the appropriate charging and registration arrangements. While it is related, PIAC considers this issue to be distinct from any proposal to introduce TUOS charges to generators more broadly.

PIAC recommends a separate registration category for storage and hybrid facilities. The creation of a storage-specific registration category would allow a decision to be made about whether or not storage facilities should be charged TUOS, independent of any decision on charging generators. A separate registration category would also encourage a more holistic integration of grid-connected storage into the regulatory and operations system of the NEM rather than potentially having to compromise between the generation and load categories. This is particularly important given the transition currently underway and expectations that grid-connected storage will become more common in the future.

The definition of the new storage-specific category must be agnostic of the technology used and the particular arrangements behind the connection point. Instead, it must be based on the potential impact from the point of view of the wholesale market and network – such as whether the particular facility both draws and injects material quantities of energy through its connection point. This impact-based categorisation allows for the many possible configurations of storage with and without co-located generation or load (both with respect to relative sizing and dispatch patterns).

[2] These financial incentives include reduced upfront connection costs as well as improved ongoing revenue through enhancing existing or unlocking additional value streams.

For example, a storage facility which is co-located with generation (or load) may display the same behaviour from the system-side as a pure generation (or load) facility and hence would not require being registered under the new storage-specific category. This could be due to the storage capacity being considerably smaller than the co-located generation (or load) capacity or by restrictions on its charge and discharge profile.

Recommendation 2

PIAC recommends that the AEMC creates a separate registration category for grid-connected storage and hybrid facilities. This category should remain technology neutral and be based on whether the facility both injects and draws material quantities of energy through its connection point.

Enabling and coordinating new generation connection

As part of the energy transformation in the NEM, many prospective generation proponents are looking to connect in areas which currently have limited network capacity if the network reaches the area at all. PIAC supports the timely and efficient connection of new generation to meet Australia's emission reduction obligations and to pass through the benefits of low cost generation in wholesale prices to consumers. Experience has shown that the current regulatory framework is insufficient to fully realise the benefits of the coordinated connection of new generation.

Socialising costs to enable generation connections

In general, PIAC agrees with the AEMC's conclusion that it

> does not necessarily think that it is appropriate for consumers to bear the costs associated with centralised resources… This risk is better placed with the generation and transmission businesses themselves.[3]

While PIAC considers this to be the first-best option, there may be certain cases where it is in the long-term interests of consumers for some costs and risks to be socialised (i.e. borne by consumers).

Imposing a new charge on generation may favour incumbents where their connection costs are already sunk or were socialised through earlier expansions of the transmission network. Furthermore, it may disadvantage new renewable generation connections where locating in remote areas provides benefits to the total system through higher capacity factors or greater diversity of generation sources (such as the time of wind generation). Both these measures would impede the effective transition to a cleaner, more flexible energy system.

If costs are to be socialised, scrutiny and transparency is required to ensure that this is indeed in the long-term interests of consumers and not simply providing a windfall gain to generation or transmission businesses. PIAC considers that, as the National Transmission Planner and in developing the Integrated System Plan for 2018, AEMO should identify any potential locations where such network expansions to facilitate new generation would be long-term interests of consumers. Further, PIAC considers that this should not be a one-off occurrence, it must instead

[3] AEMC, *Coordination of generation and transmission investment Discussion Paper*, 2018, 64.

be periodically updated to reflect revised load forecasts, changes in patterns of major transmission power flows, developments in generation technologies and the overall cost-benefit outcomes for consumers.

Recommendation 3

PIAC recommends that AEMO should identify and periodically update potential locations where network expansions to facilitate new generation would be long-term interests of consumers.

In addition to scrutiny of the cost and size of the investment, the manner in which the socialised costs are recovered from consumers is also very important. Affordability of energy services has been a growing concern throughout the NEM and new mechanisms should not be introduced which exacerbate this problem. Instead, it is preferable for socialised costs to be recovered in a progressive way. As electricity charges are not linked to a customer's ability to pay, they have a tendency towards being regressive rather than progressive. PIAC advocates for more progressive recovery of socialised costs such as, where possible, through government funding recovered from consumers via the tax system.

The AEMC's options for Renewable Energy Zones

Given the potential impact – both risks and benefits to consumers – to emissions and affordability from the introduction of REZs to the NEM, checks and balances are required to ensure that the risk of under- or over-investment is not borne unfairly by consumers. While this submission focusses on the framework for allocating risk and recovering costs for a REZ, the process for identifying and declaring a REZ are also of importance.

Option 1 – Enhanced information provision

PIAC supports the increased provision and coordination of information. In particular, PIAC sees that there is a strong opportunity for AEMO to play in providing this in its role as the national transmission planner and in developing its Integrated System Plan. PIAC also notes industry and stakeholders have already taken steps to proactively make this information available such as the Network Opportunity Maps developed by the Institute for Sustainable Futures and Energy Networks Australia.[4]

While enhanced information provision alone is unlikely to fully unlock the benefits of new generation connection, it is an important enabler. Therefore, PIAC considers that this is should be examined further and implemented in addition to other regulatory arrangements for REZs.

Recommendation 4

PIAC recommends that enhanced information provision for coordinated generation and transmission investment be examined in addition to any regulatory arrangements for Renewable Energy Zones.

Option 2 – Generator coordination

There are significant efficiencies possible if prospective generators were to coordinate their connections. Despite this, and despite the Scale Efficient Network Extensions (SENE)

[4] Network Opportunity Maps < https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-2 >

mechanism being in the Rules since 2011, this has not happened. Therefore, barring substantial changes to the current regulatory framework including the SENE provisions, PIAC does not consider this a viable option for delivering efficient or timely coordinated generation connections.

Option 3 – TNSP speculative investment

PIAC supports the prudent creation and use of a speculative investment mechanism for REZs similar to that intended for gas networks. As noted in our submission to the AEMC's Review into the scope of economic regulation applied to covered pipelines, we support

> incentivising pipeline service providers to use the speculative capital expenditure account with appropriate return on the risk associated with that expenditure but remain concerned about the operation of this mechanism. [5]

While PIAC supports the concept on the grounds that networks are better placed to bear the risk of speculative investment and are entitled to enjoy the benefits of successful speculation, our concerns stem from the shift in cost-recovery for connection assets from the connection proponents themselves to consumers. In particular we are concerned regarding:

- The appropriateness of applying this mechanism (which was designed for additional capacity in gas pipeline expansions to facilitate potential new load connections) to a REZ (to expand the transmission network to facilitate potential new generation connections); and
- The lack of detail regarding the higher rate of return to be applied.

Appropriateness of the speculative gas mechanism to electricity networks

The speculative investment mechanism for gas pipelines was designed to allow network operators, while expanding their core regulated network to meet load growth, to build additional capacity in expectation of further load in the future. The return allowed on the original assets and the higher return allowed on the speculative portion of the assets would both be recovered from consumers. In the absence of the speculative investment, should the further load growth eventuate, additional assets would need to be constructed alongside the original which would be recovered from consumers.

By contrast, for a REZ, the benefit of the speculative investment is reduced connection costs for new generation. In the absence of the speculative investment, these higher connection costs would have been borne by the connection generators and not by consumers.

This is further complicated if the speculative investment is unable to piggy-back off a regulated investment to the shared transmission network. For instance, it might be expanding the shared transmission network into a new geographic area with the primary target of connecting new generation.

Determining a rate of return for speculative investments

While the AEMC's review into gas pipeline regulation has recommended that the rate of return set as part of a revenue determination can act as a floor, there is no further detail. This lack of detail and guidance not only makes it very difficult for PIAC and other consumer advocates to

[5] PIAC, *Submission to the AEMC Review into the scope of economic regulation applied to covered pipelines Draft Report*, 2018, 10.

support this proposal, it may also discourage network businesses from using the provisions at all. PIAC considers that additional detail and guidance is required regarding:

- How should the AER and/or AEMO determine when a speculative investment has been undertaken? To ensure that TNSPs are not merely rent-seeking, it is essential that the speculative investment is additional to what would be prudent under the normal regulatory framework.

- How should the AER determine when and what portion of a speculative investment has been utilised and should begin earning a return?

- How can the AER accurately determine the additional risk, if any, the network business has borne by undertaking the speculative investment? This includes how this process relates to the new binding rate of return instrument the AER is intended to develop.

- How the higher rate of return for the speculative investment is applied to the assets once they are being utilised?
    - For instance, it could be defined as an uplift factor added to the base rate of return determined by the AER for its regulated services (e.g.: an additional 1% on top of the base rate of return). In this case, it raises questions of whether this uplift factor should be universal for any such investment or whether it is to be determined on a case-by-case basis.
    - Alternatively, it could be determined as a completely separate rate of return determined by the AER in parallel to the base rate of return.

- How long the assets will earn a higher rate of return? For instance, it could be for the life of the assets (which could potentially lock in higher returns for 40 to 50 years) or for a finite duration (e.g.: 10 years) before it its rolled into the normal Regulated Asset Base (RAB) and earns the base rate of return.

- Will assets continue to earn a higher rate of return if they are replaced? This is of particular relevance for secondary systems, such as protection relays, which typically have a shorter life than other assets such as transformers.

Option 4 – TNSP prescribed service

Similar to Option 3, this option would represent a shift in cost-recovery for connection assets from the connection proponents themselves to consumers. As noted earlier, in certain instances there can be in the long-term interests of consumers to socialise some costs of enabling new generation connection. However, PIAC has reservations regarding this proposal for a REZ given the affordability crisis currently facing many energy consumers and the role that growth in the RAB of many network businesses has played in driving this affordability crisis in the first place. Recovering costs purely as a prescribed transmission service places the risk of underutilisation entirely on the consumer – i.e.: consumers will continue to pay a regulated return for the life of these assets even if they are completely unused.

Therefore, if this proposed model is to proceed, very strong and independent oversight is required to ensure that it does not provide a windfall gain to TNSPs and that the benefits of unlocking new low-emissions and low-cost generation is passed through to consumers.

Oversight will be required of the prudent timing and capacity to meet upcoming generation connections. A threshold may also be required to determine the necessary level of commitment of prospective connections to justify qualifying as a REZ under this model. The Integrated System Plan to be developed by AEMO may play a role in providing this. As the assets are to rolled into the TNSP's RAB and recovered as prescribed transmission services, oversight will also be required as to the efficient cost of the network investment.

Recommendation 5

PIAC recommends that the AEMC develops a framework to provide the regulatory and planning oversight required to ensure that options 3 and 4 for a REZ only allow prudent investments which pass benefits through to consumers and do not provide windfall gains to generators or TNSPs. In particular, PIAC recommends further consultation on the merit of socialising of a portion of connection costs under a range of different scenarios.

Option 5 – "Clustering" connection applications

From the point of view of a TNSP's network planning and investment, PIAC considers there is potential benefit in being able to "cluster" connection applications to allow a more coordinated set of connection assets and process. However, while this may optimise the network component, it may not necessarily lead to the best whole-of-system outcome in regard to enabling efficient generation connections. PIAC's concerns include:

- Whether the incumbent TNSP is an appropriate body to run this process given that it would require discretion to delay or refuse a connection. Since the design, construction and ownership of transmission connection assets will become open to contestability,[6] this discretion over connection applications may provide (or appear to provide) an unfair advantage to the incumbent TNSP over other potential providers.

- Whether the proposed use of a 'season' for accepting connection applications may prevent otherwise efficient generation connections from proceeding due to the added time and uncertainty imposed on the connection proponent.

Recommendation 6

PIAC recommends that, if developing the option of clustering connection applications, that the AEMC considers the potential impact on the effectiveness of transmission connection contestability.

Impact of loss factors in coordinating generation connections

The marginal loss factors (MLF) are changing at a faster rate than earlier in the NEM. This means that an existing generator's MLF can change due to the subsequent connection of another

[6] Following the implementation of the Transmission Connection and Planning Arrangements rule change which come into effect from July 2018.

generator. This change in MLF can materially affect the future revenue, and hence value proposition, of the generator. As the MLF is calculated for each connection point in the transmission network and not apportioned according to a causer-pays principle, there is limited incentive (or signal) for connecting parties to reduce their impact on the MLF of other participants. As the transformation continues and more generators connect to the network in more remote locations, the potential volatility in MLF can be expected to increase.

A possible way to address this is to introduce a system which better signals the impact that a single connecting party has on loss factors, as illustrated in Figure 2. Connecting parties could have their MLF 'locked in' by AEMO for a standard period of time – allowing the party greater certainty of its future revenue. If a new party were to connect nearby and affect the local MLF, this change would be borne by the second party alone rather than being spread across both parties. This provides a much stronger signal to minimise the impact on loss factors, such as by incorporating storage. Once the determined period of time has elapsed, the MLFs are no longer 'locked in' and the revised loss factor at the connection point is applied to both parties.

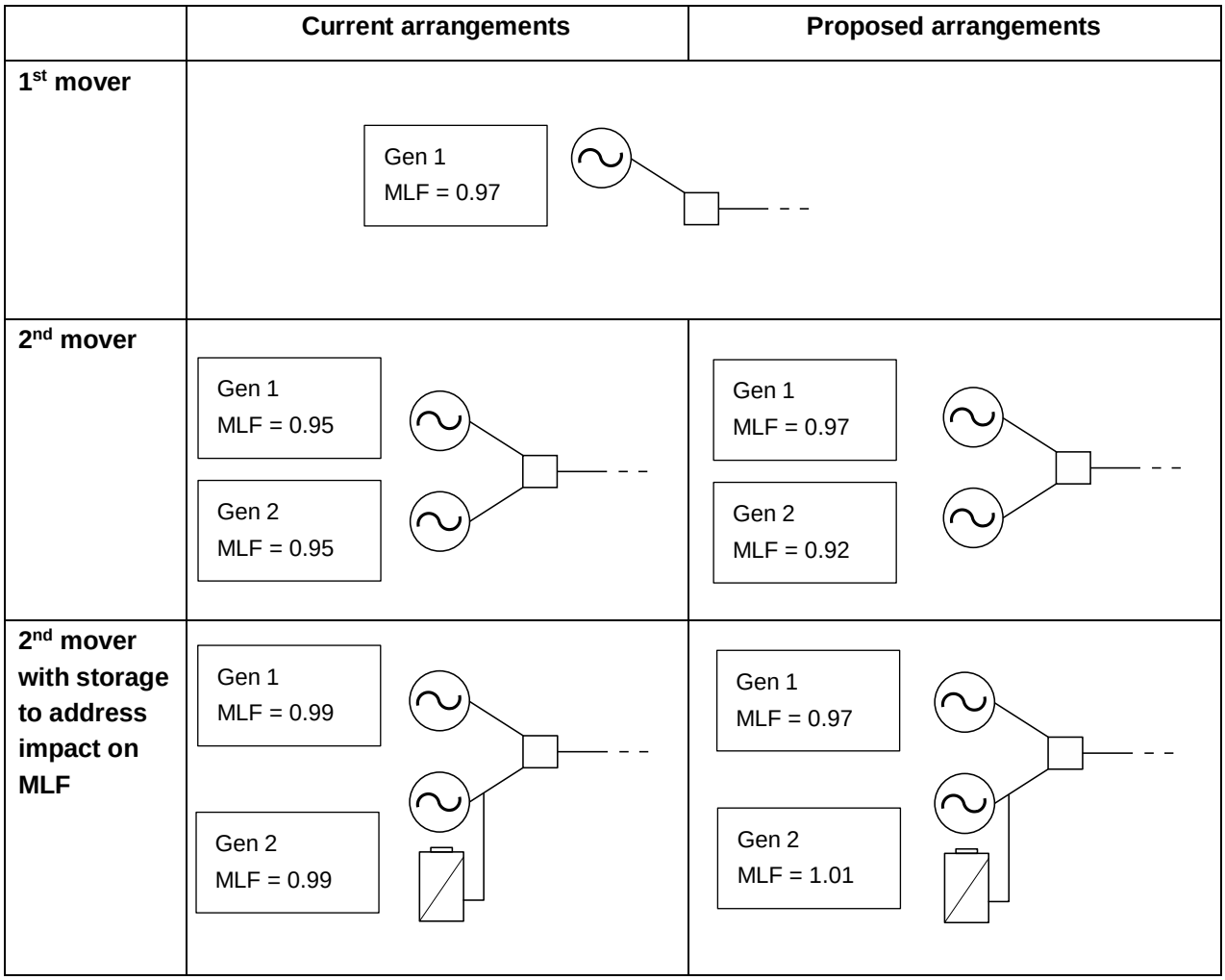

Figure 2 An alternative method for allocating the impact on Marginal Loss Factor (MLF) from incremental connections

Further engagement

PIAC thanks AEMC for the opportunity to respond to the Discussion Paper, and would welcome the opportunity to discuss the issues raised in more depth. Please contact Miyuru Ediriweera, Senior Policy Officer, Energy and Water, at mediriweera@piac.asn.au or on (02) 8898 6525.