Major Energy Users Inc.

Australian Energy Markets Commission

Modelling Report

National Electricity Amendment (Inter-regional transmission charging) Rule 2011

Comments on the Modelling Outcomes

Submission by

The Major Energy Users Inc

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1. A general view of the IRTUoS proposal

The Major Energy Users (MEU) has long been a supporter of cost reflective pricing of network services and as a matter of principle, it supports the concept that when using transmission assets when energy is exported from one region to another, an importing region should pay for the use of those assets used in the exporting region.

Equally, the MEU notes there are many significant flaws in the current transmission revenue and pricing frameworks used by transmission networks and these are likely to be accentuated by the many governmental policy interventions onto a supposedly competitive market. The MEU considers that these are clearly higher priority issues for review than the aspect of some cost re-allocation addressed by this proposed rule change. This view has been reinforced by the significant changes being addressed within the current Transmission Frameworks Review being undertaken by the AEMC.

In its response to the Discussion Paper on this issue, the MEU commented:

1 Any changes in usage that is caused by the introduction of inter-regional charging will impact the spot market and this needs to be taken into account
2 Introducing an inter-regional charge will not result in the lowest costs for consumers as local generation might give a lower cost to consumers than imported power when the inter-regional charge is added.
3 Consumers will have little ability to change their behaviour because their investment costs are sunk and the only effect they can make is to reduce their demand which might not affect the amount of imported power at all
4 Reliability is improved by interconnection. Thus a region which commonly exports but imports for short periods of time could get a significant benefit. Under all options that reflect the volumes of flows as the basis for charging, an outcome might be that an exporting region would receive a significant benefit which it does not pay for[1].
5 Where there are two interconnectors, (eg Heywood and Murraylink between Victoria and SA where, on average, SA imports on Heywood but exports on Murraylink) the actuality of the flows can be perverse, raising complexities that impinge directly on the issue of reliability and generator locations.
6 Price signals are intended to change the behaviour of the party most able to manage the risk, yet the inter-regional charge is a cost to consumers which

[1] For example, Victoria sends bulk power to Tasmania and Tasmania sends peak power to Victoria at times when Victoria has a shortage of generation. On a volume basis, more power flows to Tasmania. In both cases (exporting and importing) Victoria gains a benefit because when it exports, it allows the large brown coal generators to run efficiently and stably so if there was less generation the costs (for technical reasons) to Victorian consumers would be higher. When Victoria imports peaking power from Tasmania it avoids having to install large amounts of peaking generation. Yet on a volume basis, Tasmanians would pay a charge to Victoria, giving Victorian consumers a considerable benefit at no cost.

have little ability to manage or mitigate the risk and costs. Conversely any such export charge does not impinge on generator location decisions which have a major impact on the size of the export charge.

7 Options considered require a normalisation of cost allocations in all regions which might not be in the interests of consumers because a different approach used in one region might better benefit consumers in that region than the approach used in another region.

8 Because the inter-regional charge is levied purely as a transmission charge and does not reflect the delivered costs to consumers, competitive neutrality between all parts of the supply chain (eg between generators in different regions, between transmission and generation and between consumers in different regions) is put at risk.

9 Introducing a load export charge might not reflect the most efficient outcome. For example, SA has high quality wind generation locations, but the cost to transport this generation to Victoria (enabled by Victoria paying an import charge to pay for the transmission assets) will not deliver the overall lowest cost to Victorian consumers because it might be more economically efficient to build less technically efficient wind farms in Victoria where there would be no load export charge applicable. By implementing a load export charge through transmission costs that generators do not see, less efficient locational signals are provided to generators resulting in higher overall costs.

10 For price signals to provide the outcome sought, there must be consistency in both their development methodology and in the actual prices. If the actual price and impact on consumers shows significant variability year on year, then the price signal will not provide the outcome of improving location decisions of generators and consumers.

11 An inter-regional charge needs to reflect basic actualities. For example,

a. All of the costs for Basslink are paid for by Tasmanian consumers but the use of Victorian transmission assets by Tasmanian consumers is very small (Basslink connects at the heart of Victorian brown coal generators)
b. The connection between Victoria and NSW is close to the Victorian generation locus, but NSW has its generation locus remote from the Victorian border, north of Sydney. This means when Victoria imports from NSW it pays a higher charge than when NSW imports from Victorian, even though the amounts of power might be similar.

12 Perverse and inequitable outcomes are still likely even with the new approaches to this inter-regional charge.

13 The variability in costs is also a major concern especially in regions that have a large degree of weather risk (eg Tasmania in drought conditions)

14 The nominated new approaches are not supported by quantitative analysis or modelling to ascertain the economic costs and benefits. Furthermore, with the introduction of the carbon tax and increasing MRET the demand and regional inter-connector flows are likely to be very different to the current regime. Without extensive modelling and analysis it is difficult to fully evaluate approaches.

15 Whilst satisfying cost reflectivity appears reasonable the MEU questions the benefits (either in the short or long-term) given the issues and complexities inherent in the new approaches.

Of all these important issues, the modelling report addresses only point 10 above and to a lesser extent point 14.

None of the other issues are addressed at all by the modelling report, raising questions as to its usefulness in resolving what appears to be quite an intractable issue. Unless these issues can be adequately addressed (and the MEU has considerable doubt that they can be accommodated in an acceptable way), the MEU must remain opposed to the LEC approach for calculating a cost for inter-regional transfers. We are very surprised and disappointed that the substantive issues raised by the MEU have been ignored or swept aside WITHOUT being addressed within the modelling process. This is a serious shortcoming, especially in light of the fact that very considerable time and resources have been spent on this review, not only by the AEMC, but also by the MEU and other stakeholders who have extensively participated in the process.

The MEU does not propose repeating the comments made in the response to the Discussion Paper on this issue (and the LEC in particular), but refers the AEMC to the detail provided in that response.

2. Load Export Charge modelling

In its Discussion Paper issued in August 2011, the AEMC posited a number of alternative mechanisms to calculate how a charge might be calculated to recognise the use an importing region of transmission assets used in an exporting region. One of these was the modified Load Export Charge (LEC). The AEMC has since sought more detailed modelling of this LEC process in order to quantify the outcomes under various scenarios.

This modelling work has identified the basis for how a LEC might be applied. The modelling report is of the view that a LEC should be based on:

> "… full year, capacity mode, standard CRNP, all assets approach … as it has the following attributes:
>
> - Reasonable consistency between annual outcomes
> - Capacity Mode most closely reflects transmission cost drivers
> - The full year approach aligns with the methodology used by most TNSPs in determining intra-regional locational charges
> - It avoids the need to select a limited number of intervals that may not adequately capture the usage of interconnections for both import and export" (Modelling report page 6)

The modelling report quite rightly recognises that an iterative approach is needed to refine the LEC to recognise that the transmission costs of an exporting region would change with the payment of the LEC as this would reduce the transmission charges in the exporting region.

The modelling identified that similar outcomes for the LEC resulted from a NEM wide approach to calculating the LEC (rather than one based on regions) although it did not provide the same outcomes for Queensland, raising further concerns about the concept of the LEC as proposed.

It is not clear as to the bases used for the modelling. For example, the assumption made as the basis for the modelling is that the importing region is seen as a load at the regional boundary, yet there is no clarity as to:

- Whether only locational TUoS charges have been used or whether the postage stamped elements (non-locational TUoS and common service charge) have been included. The initial design of the LEC included all costs but subsequent iterations of the concept limited the LEC to purely the locational cost, so clarity in this aspect is needed.
- How aspects like the land tax recovery used in Victoria or the fact that Basslink is paid for by Tasmanian consumers have been appropriately addressed in the quantifications.
- How the transfers on different interconnectors between two regions have been accommodated[2].
- How varying transmission cost recovery methods have been addressed[3].
- How the model has addressed the interface of the charge with the spot market[4].
- The fact the LEC concept does not recognise any ancillary benefit that may occur (eg increased reliability) and so despite a region getting a benefit, if it is an exporter of power, it receives a payment and does not pay for the improved service it receives from the interconnection.

The modelling report states that the LEC should be based on capacity for transfer, yet does not make it clear as to what capacities have been used[5].

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[2] For example, interconnection between Victoria and South Australia is by Heywood and Murraylink. However, historically there is a net flow into SA via Heywood but a net flow out of SA via Murraylink

[3] For example, in NSW demands are reset each month yet in other regions, demands are based on peak annual usage. The concept that was behind the LEC development was that the same basis for setting prices would have to apply across the NEM

[4] The charge will be imposed as a transmission use of system which is paid by consumers yet flows on interconnectors are driven by generator pricing. Therefore it is possible that import costs (generation plus IRTUoS charge) will be greater than the cost of intra-regional generation, causing consumers to pay a higher cost for power – essentially a less efficient outcome.

[5] For example, the transfer capacity of Basslink is the same in both directions (implying that there would be no benefit for flow in either direction) yet the modelling outcomes indicate there is an impact.

As the modelling report identifies, transmission assets are built in order to provide the ability to transfer certain maximum amounts of power, but indicates that this capacity might be used infrequently and, in some years, not at all. This assessment makes setting a LEC somewhat problematical – should the charge be based on the annual usage (flows or capacity reached) in a particular year or should they be based on the cost of the assets that allow the flows as and when needed, to the maximum capacity that is possible? As assets are built to provide capacity, the LEC should, in theory, be based on the maximum capacity of transfer, whether or not it is utilised in any one year.

This issue needs deeper analysis as it is often the intra regional transmission capacity of a region that determines its ability to import power from another region. Thus, where there might be an apparent net flow from one region to another leading to the importing region to pay a LEC, it might be that the reason for this net flow in one direction is caused by the inability of the exporting region to receive flow from the importing region. This inability to import by the exporting region would be a result of insufficient transmission capacity in the exporting region. The outcome of this would be that the transmission cost in the exporting region would be low and further receive the benefit of an additional payment of a LEC payment. An example of this anomaly occurs for flows from SA to Victoria via Murraylink. It would be perverse for SA to pay Victoria a LEC because Victoria was incapable of receiving large flows from SA via Murraylink because of constraints in the Victorian transmission network.

The modelling does not address the limitations for flow transfers caused by constraints within intra regional transmission networks that then bias the outcomes of net transfers.

Generator locations also have a major bearing on the amount of the LEC that will be levied. For example, the generational centre of Victoria is in the east of the state, conveniently located for connections to both Tasmania and NSW resulting in lower LECs for export to these regions. In contrast, the generation centres in Tasmania and NSW are remote from the connections to exports to Victoria, meaning that the LEC for export to Victoria from these regions has a higher cost than imports from Victoria. In a similar way, the generation centre in SA is closer to the border with Victoria than the Victorian generation centre, meaning SA pays a higher cost for imports than does Victoria for its imports from SA. This aspect is not addressed in the modelling, but has implicitly a major bearing of the LEC values.

Without these aspects being clarified it is impossible for any useful analysis to be undertaken of the results provided by the modelling report other than, perhaps, to identify some trends. The MEU does not consider that any substantive conclusions can be reached in the absence of resolution of these aspects noted above.

3. What is intended by the load export charge?

It is useful to go back to first base and ask the question what the LEC is intended to do.

The market is intended to send price signals to cause change to develop a more efficient market. In its response to the Discussion Paper, the MEU asked the question as to what usage practices will be changed by the introduction of the inter-regional charging. The MEU highlighted that TNSPs are indifferent to any IR charging and generators will not be influenced as they only pay entry charges to the shared network[6] and therefore will not "see" the LEC which will be embedded in the TUoS and common service charges. In fact, generator location has the greatest impact on the IR charge, yet generators do not see this cost at all, and nor do they see any benefit!

For example, Origin Energy recently commissioned a power station at Mortlake, in western Victoria. From a fuel supply point of view, the power station could have been readily built nearby in South Australia at little (if any) extra cost. If it had been built in SA, there would have been more generation in SA reducing the need for flows into SA. This generator locational decision means that SA consumers would have to pay increased transmission costs via a LEC because of the Origin decision but not because of any decision by consumers which will pay the cost.

Consumers with sunk assets cannot change their locations and new consumers will only see an increase in costs after they have made a commitment to their location as the IR charge will be calculated after they have commenced operations.

The modelling does not address these aspects at all.

In the modelling report, it comments

> "A number of issues were identified during the project, the most significant of these were:-
>
> - The quality of the load and generation data provided by the TNSPs was generally poor. An approach to derive the data from a system wide model, as produced by AEMO in its National role, and used for the calculation of Marginal Loss Factors, should avoid these inaccuracies. Such a system wide model could be split into regional equivalents and be provided to the various TNSPs for their calculations, and provide a consistent basis for inter-regional charges. [This would require some effort by the TNSPs to align their cost data with the AEMO network model.]

[6] The MEU recognises that one of the Transmission Frameworks Review recommendations might result in some generators paying some transmission charges but overall, these are likely to be a small component of the total cost of transmission

- Some sensitivity to TPRICE results was seen in variation in the modelled generator source impedance. It is suggested that a unified approach should be defined for the calculation of inter-regional charges, particularly generator source impedances." (modelling report page 7)

This indicates that the modelling carried out reflects some additional identified issues that need addressing before the results of the modelling are robust enough to be used for developing the basis of the LEC. These issues are additional to those identified by the MEU in section 1 above.

One of the concerns the MEU has with the LEC approach, is that the very design of pricing used in the Rules and implemented by TPrice[7], already has a number of shortcomings that lead to outcomes which result in a less than cost reflective outcome. Therefore, the overlay used by the modelling of the LEC is building on an approach that is already flawed and beset by averaging which detracts from the concept that the LEC is intended to improve – that of cost reflectivity. To build on a model which already averages away considerable cost reflectivity with the assumption that it will improve cost reflectivity is simply bizarre and a pointless exercise. The MEU strongly considers that the AEMC must reflect on this carefully before proceeding further with this review.

4. Outcomes and analysis of the modelling

Using the full year, capacity mode, standard CRNP, all assets approach to modelling with subsequent iteration (the approach recommended in the modelling report), the modelling report calculates the LECs that would apply in each region for financial years 2009/10, 2010/11 and 2011/12 (modelling report page 19, table 9):

Year	Tas	SA	Vic	NSW	Qld
09/10	3.17	-10.26	11.91	-13.43	8.60
10/11	4.34	-10.49	11.01	-13.63	8.77
11/12	4.94	-8.65	8.10	-12.48	8.09
Average	4.15	-9.80	10.34	-13.18	8.49

Table 9 Estimated nett revenue ($M) from inter-regional charges for each region following iterative solution.

Except for Victoria, all inter-regional charging is only from one region to another; in the case of Victoria, payments for inter-regional charging would be from the three regions adjacent to Victoria (viz, SA, Tasmania and NSW). A new table

[7] The computer program used for setting transmission pricing by all TNSPs

can be developed from the modelling report table 9 which identifies specific payments between each region[8].

Payments $m	Tas to Vic	Vic to NSW	NSW to Qld	Vic to SA
2009-10	-$3.17	-$4.83	$8.60	-$10.26
2010-11	-$4.34	-$4.86	$8.77	-$10.49
2011-12	-$4.94	-$4.39	$8.09	-$8.65
Average	**-$4.15**	**-$4.69**	**$8.49**	**-$9.80**

The actual flows[9] between each region in the same years were:

Net flows MWh pa	Tas to Vic	Vic to NSW	NSW to Qld	Vic to SA	Vic net export
2009-10	-1,132,257	2,102,496	-5,694,497	617,990	3,852,743
2010-11	211,748	3,760,059	-6,445,132	566,066	4,114,377
2011-12	-291,507	3,122,333	-5,335,486	1,136,392	4,550,232
Average	**-404,005**	**2,994,963**	**-5,825,038**	**773,483**	**4,172,450**

This table can then be converted to show the LEC cost per MWh for each region.

Payments $/MWh transferred	Tas to Vic	Vic to NSW	NSW to Qld	Vic to SA	Net Vic payment
2009-10	-2.80	-2.30	1.51	-16.60	3.09
2010-11	-20.50	-1.29	1.36	-18.53	2.68
2011-12	-16.95	-1.41	1.52	-7.61	1.78
Average	-10.27	-1.57	1.46	-12.67	2.48

When the outworkings of the model results are analysed in this way, there are some quite perverse outcomes. For example, in 2009/10 and 2011/12, when Tasmania is a net importer from Victoria, it receives a payment from Victoria. When Tasmania is a net exporter to Victoria in 2010/11 it receives a massive payment for a modest amount of export. In 2009/10 when Victoria exports the least on a net basis, it gets its highest LEC payment. In 2011/12 when Victoria exports the most to SA it receives its lowest payment from SA.

When the LEC values are compared to the maximum allowed revenues for each region, this shows that the regions with smaller networks pay proportionally larger LEC costs than the regions with larger networks.

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[8] A positive number indicates a payment or flow in the direction indicated in the heading whereas a negative number indicates a payment or flow which is not in the direction indicated in the heading

[9] Sourced from NEM Review using AEMO data

MAR $m pa	Tas	SA	Vic	NSW	Qld
2009-10	165	248	469	678	661
2010-11	178	266	487	734	734
2011-12	191	287	505	795	814
LEC as % of MAR					
2009-10	1.92%	4.14%	2.54%	1.98%	1.30%
2010-11	2.44%	3.94%	2.26%	1.86%	1.19%
2011-12	2.59%	3.01%	1.60%	1.57%	0.99%

This results in a greater imposition for the smaller regions than for the larger regions, despite there being greater flows into the larger regions. The cost impact on consumers in the smaller regions will be significant but in the larger regions, the impact will be quite modest, leading to the conclusion as to why the issue is seen as a significant issue when there are other more important issues that still require resolution. What this analysis shows is that the market can be highly distorted for consumers.

In particular, although SA imports between 10-20% of the amount of power from Victoria compared to the amount sent from Queensland to NSW, the SA LEC cost is comparable to that paid by NSW to Queensland. When compared on the basis of % of MAR, the cost to SA consumers for receiving 10-20% of the energy is three to four times the cost imposed on NSW consumers for receiving many times the amount of energy transferred. This is inequitable!

The MEU notes that the average payment by SA to Victoria in terms of $/MWh for the imported power is considerable when compared to the spot price in the SA market:

LEC as % SA average annual spot price	Average annual Spot price	LEC cost	% impact
2009-10	55.31	16.60	30.0%
2010-11	32.58	18.53	56.9%
2011-12	30.28	7.61	25.1%
average	39.39	12.67	32.2%

The premium impact on the cost of power is considerable and reinforces the observation in section 1 that the LEC will have a considerable distortionary impact on the market basics. In this case, it would be by far cheaper for SA consumers to pay a smaller premium for regional generation than pay the spot price plus the LEC for imported power which is more than 30% above the three year average spot price.

Unfortunately, the modelling report does nothing to assess the realities of the outcomes of its modelling. This lack of any analysis of the realities is disturbing

to say the least. The MEU's reality check provides a quite different view on the modelling than the modelling report opinion of there being:

> "Reasonable consistency between annual outcomes" (modelling report page 6)

The MEU strongly disagrees with this assessment as, in fact, the modelling identifies some massive anomalies and stands the risk of massively distorting the electricity market. The deeper analysis by the MEU of the outcomes from the modelling shows the calculation of LEC still has a long way to go before a sensible and realistic approach to developing the basis for calculating an equitable inter-regional charge for transfers between regions.

5. MEU conclusions

After devoting significant time and analysis to the issue of an export charge, the MEU considers that introducing an export charge provides a massive increase in complexity and risks for all, with the greatest risk being the introduction of massive distortions to the electricity market which is not in the "long term interests of consumers". The MEU sees that, inevitably, to manage the complexity simplifying assumptions will have to be made which will result in the concept providing much less benefit (if at all) than was first anticipated.

The MEU considers that the complexity of implementing the proposal might reach a level where the value of the proposal has only a marginal benefit compared to the costs of implementation and moving from the relative simplicity of the current arrangements. At the same time, there is potential for great harm to eventuate to consumers in the smaller regions, especially SA.

What is unlikely to occur from the imposition of the LEC is a more efficient market operation but merely a reallocation of costs which achieves little (but could impose real harm), yet the whole purpose of providing price signals is to drive change so that a more efficient market evolves. It is clear that the current pricing structures for transmission have driven little change so it is unlikely that imposing an inter-regional transmission charge will result in a change in practices by TNSPs and generators (as consumers will pay the new charge), recognising it is generator locational decisions that will have the largest impact on the inter-regional charge. It is also unlikely that consumers will change their practices as the inter-regional charge will only occur after a consumer has made its locational decision, and by then, the costs of the locational decision will already be sunk.

The work provided in the modelling report does not change the MEU views on this matter but reinforces the view that the LEC proposal is still a lower order issue than many other issues and that the modelling work demonstrates considerable concern with the use of the modified Load Export Charge approach proposed by the AEMC.