Powering Australian Renewables Fund

18 July 2019

Mr John Pierce AO
Chair
Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

Dear Mr Pierce

NATIONAL ELECTRICITY AMENDMENT (TRANSMISSION LOSS FACTORS) RULE CHANGE – ERC0251

The Powering Australian Renewables Fund (**PARF Group**) welcomes this opportunity to make a submission to the Australian Energy Market Commission (**AEMC**) in relation to Adani Renewables' (**Adani**) proposed changes to the National Electricity Rules (**NER**).

PARF Group was established in 2016 as a co-investment between AGL Ltd, QIC and its client the Future Fund. PARF Group aims to construct and own at least 1,000 MW of large-scale renewable generation in Australia and, in doing so, support Australia's transition to a low-carbon economy. PARF Group wholly owns solar and wind generators near Broken Hill and Nyngan in New South Wales, and at Coopers Gap in Queensland. Upon completion of projects currently under construction, PARF Group will own approximately 800 MW of renewable generation capacity.

PARF Group is a member of an industry group (fronted by John Laing) which has also prepared a submission regarding this rule change. PARF Group considers the issue to be sufficiently important that it has also chosen to make this submission in its own right and has engaged ACIL Allen to assist in its review and assessment of the options within the regulatory framework and objectives.

The issue under consideration is whether to change the way transmission losses are treated in the National Energy Market (**NEM**). In the short time since the formation of PARF Group in 2016, Marginal Loss Factors (**MLFs**) have become highly variable, largely due to the rapid transition of the network away from traditional base-load generators to more remotely located renewable energy generators. This significant increase in MLF variability has increased the revenue volatility and risk for renewable generation projects (in particular) and has thereby increased risks for both debt and equity investors.

The current MLF framework is not fit-for-purpose with this rapid influx of renewable generation into the NEM. As investors require higher returns to compensate for higher risks, the increased revenue risk from MLF variability will significantly restrict access to low-cost capital for current and future investment in the NEM. AEMO currently forecasts Australia will require $8-27 billion[1] of capital to fund its transition to a low-carbon economy. A restriction in low-cost capital caused by MLF-driven revenue risks will flow through to electricity consumers as increased electricity prices, in conflict with the National Energy Objective (**NEO**).

For generators with committed lending obligations, the significant variability in MLFs is directly impacting the ability of these generators to service debt. This increases the probability of financial stress and diminishes debt and equity investor returns over the long term. It is also materially reducing the amount of debt capital able to be raised to

[1] 2018 AEMO Integrated System Plan

support projects, both at the time of final investment decision/financial close and at the time of refinancing existing lending arrangements. To avoid these impacts identified above, action ahead of the FY21 loss factor determinations is needed to reduce MLF variability and provide a more stable framework for both future and existing projects.

Adani's proposal will bolster investor confidence

PARF Group ***supports*** the proposal by Adani that average loss factors (**ALF**) be adopted.

In PARF Group's view, the ALF approach represents the optimal balance between restoring investor confidence (by making loss factors both more stable) as well as retaining the locational signalling aspect of the existing approach to assist with grid planning objectives. A change to the ALF approach could be implemented quickly after the AEMC makes the necessary rule change, which PARF Group urges the AEMC to do. In concert with supporting a rule change to ALFs, PARF Group supports various information transparency initiatives and more frequent publication of loss factors (for information purposes) to enhance the predictability of annual loss factor determinations.

Attached to this letter is a detailed submission on this issue and PARF Group's answers to the questions raised in AEMC's consultation paper.

PARF Group is committed to achieving an outcome that minimises the current, unacceptably high MLF variability by replacing it with the ALF methodology, in a manner consistent with the NEO. PARF Group welcomes the opportunity to discuss its submission with AEMC and provide further information should this be helpful. Please do not hesitate to contact me if there are any queries.

Yours faithfully,

Katie Barnett
Chief Executive Officer
Powering Australian Renewables Fund

SUBMISSION TO THE AUSTRALIAN ENERGY MARKET COMMISSION'S CONSIDERATION OF A RULE CHANGE PROPOSED BY ADANI RENEWABLES

NATIONAL ELECTRICITY AMENDMENT (TRANSMISSION LOSS FACTORS) RULE CHANGE – ERC0251

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Powering Australian Renewables Fund

ACIL ALLEN CONSULTING

TABLE OF CONTENTS

KEY MESSAGES

- Variable Marginal Loss Factors (**MLF**s) are creating unmanageable revenue risks for debt and equity investors in +20 year generation assets.
- Continued revenue variability due to MLFs will lead debt and equity investors to add risk premia to current and future projects, deterring efficient investment and ultimately driving-up electricity prices for consumers.
- Failure to act prior to the Coordination of Generation and Transmission Investment review (**COGATI**) process completion to stabilise MLF variability may result in undue financial stress on incumbent generators and slow the pace of new generation coming into the market - placing added supply pressure on the National Electricity Market's (**NEM**) ability to replace aging, existing plant as it retires.
- Adani Renewables' (**Adani**) Average Loss Factor (**ALF**) proposal will bolster investor confidence by reducing MLF variability.
- Coupled with greater transparency of calculation methodologies and data sets, the ALF approach represents a suitable balance of reasonable revenue stability and support of the National Electricity Objective (**NEO**):
  - *efficient investment* in the NEM – by providing debt and equity investors with reasonable revenue stability to assist with continued investment in the NEM
  - *efficient operation and use* of the electricity system – by allocating losses, reducing settlement residues and ensuring that locational signalling/ranking is retained
  - *for the long-term interests of consumers of electricity* – by providing debt and equity investors with reasonable revenue stability, lower risk premia from debt and equity investors will result in lower long-term prices for consumers.

1. THE CASE FOR CHANGING MLFs AND THE WAY FORWARD

a. Powering Australian Renewables Fund

PARF Group was established in 2016 as a co-investment between AGL, QIC and its client the Future Fund. PARF Group aims to construct and own at least 1,000 MW of large-scale renewable generation in Australia and, in doing so, support Australia's transition to a low-carbon economy. PARF Group wholly-owns the following assets:

- The 102 MW Solar Plant at Nyngan in New South Wales, which commenced operation in June 2015.
- The 53 MW Solar Plant at Broken Hill in New South Wales, which commenced operation in October 2015.
- The 200 MW Wind Farm Project at Silverton in New South Wales, which is under construction.
- The 453 MW Wind Farm Project at Coopers Gap in Queensland which is under construction.

PARF Group reached financial close of all its existing assets by August 2017, prior to the significant changes seen in recent MLF determinations and in a period where there was significantly less variability (and arguably more predictability) in MLFs. With the significant influx of new renewable generation in the NEM, this has changed and the MLF methodology is now producing materially variable results.

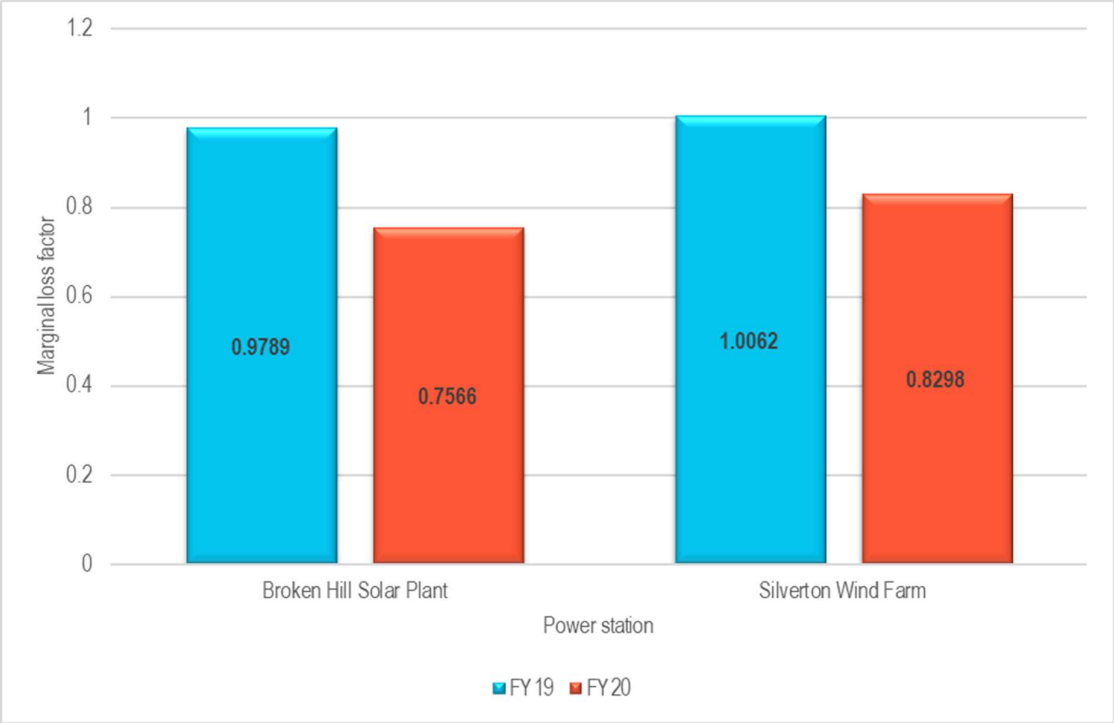
b. The case for changing MLFs

Electricity generators have typically connected to the network in a location near their fuel source. For example, the brown coal power stations in Victoria's La Trobe Valley are built alongside coal mines. Renewable generators are no exception to this, with many locating in areas with copious amounts of sun, wind, or other renewable resource. This means that as the NEM transitions to low carbon resources, generators will increasingly be located in areas where the transmission network was not originally designed for them. This has placed, and will continue to place, strain on the network in these areas. As more and more new generators connect in 'untraditional' areas, power flows and therefore electrical losses on the network increase, bringing down the revenue of operating generators who committed to investing when the network was relatively available.

The proliferation of renewable generators utilising the same weaker connection points amplifies the amount of electricity lost. It was broadly expected that this would cause MLFs to decrease. However, with a highly complex network and little or no visibility of the particular projects connecting to the NEM in short periods, and MW volume never before experienced (around 5,800 MW of new capacity since 2016), it was impossible for PARF Group and other debt and equity investors to quantify the impact that losses would have on their projects.

The variability of MLFs, and therefore the risk to debt and equity investors, is highlighted by PARF Group's experience at Broken Hill Solar Plant. In 2016-17, the MLF for the Broken Hill Solar Plant was 1.1220[2], and had fallen to the more reasonable level of 0.9789[3] by 2018-19. However, next year (2019-20), it will be 0.7566[4]. This variability is extreme and represents greater than a 20 per cent decline in FY20.

Figure 1 – changing MLF at PARF Group's Broken Hill assets



Additionally, as the representative from AEMO articulated at the 4 July 2019 AEMC public forum on this rule change, a significant portion of the data and therefore the models it uses to conduct MLF calculations, are commercially sensitive or otherwise not in the public domain. The information that is available is not well coordinated, some of it subjective, is highly complex and changes rapidly. Consequently, debt and equity investors (and their expert advisors) find it extremely difficult to create reliable forecasts of marginal losses and, therefore, the return they can expect on a given investment. This lack of transparency, and the lack of predictability that results from it, manifests as greater risk for debt and equity investors.

The current variability of MLFs and the corresponding revenue risks will adversely impact the bankability of current and future investment in generation needed to replace retiring generation capacity. Project finance lenders analyse the ability to service the project debt based on forecast cash flows and place significant emphasis on revenue certainty. Australian lenders are now losing confidence in the MLF forecasts provided as due diligence reports by expert consultants during lending assessments. In order to minimise MLF revenue risk, lenders are likely to include additional 'margins of safety' for MLF forecasts (including decreasing total dollar debt available for generation

[2] Source: AEMO, Regions and Marginal Loss Factors: FY 2016-17
[3] Source: AEMO, Regions and Marginal Loss Factors: FY2018-19
[4] Source: AEMO, Regions and Marginal Loss Factors: FY 2019-20

projects and other measures) which will have adverse impacts on the cost of debt capital for existing and new renewable energy projects.

Equity investors seek stable project returns, in particular for +20 year assets, and have similar concerns to debt investors regarding MLF revenue risk. The current variability and relative unpredictability of MLFs, if left unchecked, will not only lead to greater amounts of more expensive equity capital required (as lenders decrease total dollar debt available for generation projects), equity investors will also add additional risk premia for existing and new investments in renewable energy. Further, unlike exposures to spot wholesale prices, there are no financial instruments available for debt and equity investors to manage the MLF revenue risk. This MLF risk will inevitably increase the cost of re-contracting offtakes and/or re-financing existing generation assets and increase the cost of constructing new renewable energy generation - thereby leading to higher electricity prices for consumers.

From the broader perspective of Australian electricity consumers, and therefore of the AEMC, PARF Group's experience may appear insignificant and consistent with generator ownership. However, its impact on future investments should not be underestimated. In its recently released directions paper for the COGATI process, AEMC notes:

> *In light of the electricity market transition, prospective generators require greater certainty that their assets will remain profitable even if subsequent parties connect to the network and congestion arises. This is being reflected in the debate around the significant changes in annual marginal loss factors that are currently being experienced.*

c. A response is required ahead of FY21

As noted earlier, the current MLF methodology is significantly affecting the stability of revenues for existing and future projects and will have an adverse impact on the cost of electricity supplied. Given AEMO has forecast between $8 - $27 billion[5] in new generation investment will be required to replace retiring generation capacity and meet demand growth, a response before FY21 is required for revenue stability to support continued investment in new generation capacity in the NEM.

To create the environment required for ongoing investment to bolster investor confidence and to deliver low cost generation in the long-term interests of Australian electricity consumers, it is imperative that loss factors become more *stable*. It is also important that loss factors for existing generators remain as close as possible to the level at which each generator made their investment decision, given that, if fully contracted, the investment decision is the only opportunity that a generator has to manage its exposure to MLF risk.

Key to improving/enhancing the *predictability* of loss factors is generators having access to the methodologies and data/assumptions used to calculate loss factors, including an appropriate process to question and challenge loss factor determinations. PARF Group recognises some of the MLF related information asymmetry and transparency issues are being addressed through related AEMC rule change consultations and AEMO projects[6]. PARF Group also acknowledges the interdependency between the COGATI review and this Adani rule change request. The market reforms anticipated under the COGATI process are fundamental changes to the operations of the NEM. However, the initial implementation is expected in 2022, and fully implemented in excess of four years (including any transitional arrangements). In PARF Group's opinion, waiting for COGATI will cause debt and equity investors to continue to lose confidence in the sector and interim measures need to be put in place.

The AEMC is currently considering certain rule changes proposed by the Australian Energy Council, the Energy Networks Association and AEMO. Together these are referred to as the "transparency of new projects" rule change. If adopted, the transparency of new projects rule change will increase the information to debt and equity investors about forthcoming changes in the NEM and better forecast potential changes to transmission loss factors that may arise.

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[5] 2018 AEMO Integrated System Plan

[6] AEMC COGATI reforms, AEMC Transparency of New Projects (ERC0257) and AEMO Review of Marginal Loss Factor Calculation Processes

These transparency initiatives and projects are complimentary to PARF Group's preferred ALF methodology (see below) as they improve the ability for debt and equity investors to forecast the changes in loss factors, enhancing predictability.

Further, to support stability, the current frequency of calculating loss factors should remain as a single volume-weighted loss factor value for a given financial year (for a given connection point). However, PARF Group supports increasing the frequency of loss factor *publication for information purposes* (at least on a semi-annual basis) to better equip debt and equity investors with timely information for investment decision making processes. Increased frequency of published information within a financial year is critical to achieve future efficient investment as some renewable energy generation is able to advance from development to construction phase within 12 months.

2. ADANI RULE CHANGE REQUEST (CHANGE THAT HAS BEEN PROPOSED)

Adani submitted two rule change requests to AEMC:

(1) To revise the process for the allocation of Inter-Regional Settlement Residues (**IRSR**s) to include generation connection points and not only the network users who are subject to non-locational prescribed Transmission Use of System (**TUoS**) charges[7].

(2) To specify that AEMO must determine the Intra-regional loss factors MLFs according to the ALF methodology[8].

Sections 2.a and 2.b provide a brief overview of Adani's arguments.

a. Change request 1: Equal distribution of IRSRs between consumers and generators

Adani argues that IRSRs arise from imbalances in the settlement process conducted by AEMO. If AEMO accrues more from consumer payments than it pays to generators, the surplus (or positive) IRSRs will be paid, in full, to Transmission Network Service Providers (**TNSP**s). TNSPs pass this on to consumers in the form of reduced TUoS fees (generators are excluded). Similarly, if AEMO pay more to generators than what they receive from consumers, negative IRSRs will be recovered against TUoS charges (generators are excluded). Because generators do not pay to use the system, this does not benefit them.

Adani proposes that by sharing IRSRs between consumers *and* generators, 'effective' MLFs will decline, therefore resulting in more competitive generation bidding and lower prices to market consumers.

b. Change request 2: implementation ALF methodology

Adani argues that because MLF calculations are forecasts, they are often inaccurate and therefore result in 'significant distortions to the true cost of transmission'. Adani argues that by using 'average or real time (accurate) losses', these distortions will be eliminated.

c. AEMC consultation paper questions

The following is PARF Group's response to the AEMC's first question.

Question 1: Identifying the problem
a) Do you agree with the problems identified by Adani Renewables? Adani's proposal is not particularly detailed, however Adani appears to be concerned that: • current marginal loss factors are inaccurate estimates of actual losses • the inaccuracy in MLFs;

[7] Adani Renewables, Intra-Regional Settlement Residue Reallocation Rule Change Request, December 2018.

[8] Adani Renewables, Average Transmission Loss Factor Rule Change Request, February 2018.

- has, and will continue to, distort investment decisions by generators
- results in large and growing IRSRs

- it is inequitable for IRSRs to be allocated only to consumers because they have been paid by generators so they should be shared with generators.

PARF Group agrees that the recent variability in MLFs is problematic for investors and will drive up the price of electricity in the longer term and supports ALFs (see further section 4.a).

Regarding IRSRs, PARF Group's view is that these are a consequence of the mathematical difference between average losses and marginal losses. Therefore, IRSR would arise even if true marginal losses were known in advance with certainty and used in pricing.

In any event, PARF Group notes IRSRs will diminish if an ALF approach is adopted and recommends AEMC to implement the ALF approach expeditiously.

b) Do these problems have a material impact on the long-term interest of consumers?

PARF Group's experience has been that the recent variability and the inherent unpredictability of MLFs has had and will continue to have a material impact on the cost of capital for existing and new generation projects. This will inevitably flow through to electricity prices paid by the consumer and will therefore have a materially adverse effect on their long-term interests.

c) Do you have other concerns (not identified by Adani Renewables) about the operation and impact of the transmission loss factor framework?

PARF Group is concerned that recent variability in MLFs has introduced a risk to the market that had not previously been observed in such concentration. The existing approach to assigning MLFs misallocates that risk - it is borne substantially by:

- generators that have already made their commitment to the market;
- existing generators that did not cause the MLF variability/risk

and as such, are able to do little to manage it.

It is a well-accepted economic principle that it is most efficient for risks to be minimised where possible and that residual risks should be allocated to those who can manage them most cheaply. However, this is not currently happening with MLF risk, which is being misallocated in a way that leads to inefficient outcomes for consumers.

It may be tempting to conclude that investments affected by past changes in MLFs are already made and that they represent sunk decisions and sunk costs. This might lead to the conclusion that there is no rational argument for considering them.

However, this overlooks the fact that tomorrow's investors will set their expectations, and requirements, based in part on the experience of 'yesterday's' investors. If MLF risk remains misallocated, future investors will take note and as discussed in section above, the future price of electricity will be driven up inefficiently.

Key areas in which change can be readily achieved are:

- modifying MLF risk to make it more stable via ALFs;
- modifying MLF risk to make it more predictable including:
  - AEMO's "transparency of new projects" being implemented expeditiously; and
  - Increased frequency of publishing of loss factors for information purposes, at least on a semi-annual basis.

The key areas of change (as noted above) will bolster investor confidence in the sector and will support continued investment in generation capacity in the NEM to assist with the NEM's transition to a low-carbon economy.

3. ASSESSMENT FRAMEWORK

The AEMC's second question relates to the appropriate assessment framework to apply in deciding whether to adopt the rule change proposed by Adani or whether to make a 'more preferable rule'. Broadly PARF Group agrees with the AEMC's framework. PARF Group's response to question 2 is in the box below, along with suggested additions.

Question 2: Proposed assessment framework

Do stakeholders agree with the proposed assessment framework? Anything else to consider?

The NEO is (with emphasis added):

> *… to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity …*

In other words, the focus of the NEO is the long-term interests of consumers, protected by pursuing efficiency in:

- investment in generators and networks
- operation of that equipment and use of electricity

AEMC's proposed assessment framework is to consider:

(1) the impact a proposed change to loss factors would have on efficient investment;

(2) the impact a proposed change to loss factors would have on efficient operation and use of electricity services; and

(3) the way risks would be allocated under each proposal and therefore long-term costs to electricity consumers.

Broadly, PARF Group agrees with AEMC's proposed framework, and suggests that:

- *in assessing the impact any proposed change has on efficient investment in generators and networks*, AEMC should consider the impact on efficient investment by reference to:
  - (a) stability of loss factors;
  - (b) predictability of loss factors; and
  - (c) the extent to which future loss factors will reflect the reasonable expectations of generators at the time their investment decisions were made.

- *in assessing the impact of a proposal on the efficient operation and use of electricity*, AEMC should consider the impact on the efficiency of central dispatch and, in doing this, should have regard to the facts that:
  - (a) efficiency requires that the marginal unit of electricity is priced by reference to marginal cost but that there is no requirement that any other unit of electricity is priced this way. If the marginal unit is priced efficiently, the rest is about distribution of welfare.
  - (b) renewable generators have zero or negative marginal costs and, as such, are unlikely to be the marginal bidder or, therefore, to set the price in the spot market
  - (c) the existing approach to estimating MLF provides a highly averaged result, which bears little or no resemblance to the true marginal losses associated with a given generator at a given time.

- *in assessing the way that a proposal allocates risks*, AEMC should consider the fact that allocating risks to generators with no means of managing that risk can have no short term benefit, but in the longer term will have the effect of increasing the cost of investments, and therefore the cost of electricity

4. OPTIONS AND ASSESSMENT

This section outlines the two options PARF Group recommends for the way transmission losses should be treated, then applies the assessment framework developed in section 3.

The first option, which is discussed in section 4.a, is the ALF approach as proposed by Adani and is PARF Group's preferred approach. It will improve the relative stability of loss factors while preserving locational signals and will do so with no material impact on the marginal pricing of losses, which is already highly averaged. The ALF approach can be implemented quickly from a technical perspective and could be put into effect prior to the publishing of the loss factors for the 2020-21 period.

An alternate option, whilst not the preferred choice, is to apply a "compression mechanism" to the existing MLF approach, subject to the appropriate choice of the 'normalisation number'.

The preferred and alternate options are expected to provide similar outcomes to the allocation of loss factor values to generators in the NEM. However, ALF method is preferred due to lesser implementation complexity, and consideration of the setting of the 'normalisation number'.

a. Preferred Option: Average Loss Factors

Description of approach

As described above, Adani proposed that the existing approach be modified to ALFs rather than MLFs. Adani's proposal is not particularly detailed and there are several ways ALFs could be calculated or estimated.

While PARF Group anticipates that AEMC would make a change to the rules and leave the operational details for AEMO to consider, PARF Group proposes to apply a mathematical transformation to current MLF calculations and approximate ALFs by applying the square root of the 'standard' MLF.

Alternatively, AEMO could compute a load-weighted average of the average losses incurred at each connection point. This would require a relatively modest modification to the existing process and AEMO could:

- forecast generator output at each connection point on a half hourly basis for a year;
- uses a network model to estimate losses given that forecast; and
- divide the estimated loss by the forecast load at the connection point in each interval.

At this point AEMO would have a set of simulated estimates of actual losses for each generator on a half-hourly basis and averaged these across load. AEMO could then reduce them to a single value to be used through the year as it does with the current MLF approach.

Regardless of the detail, it is reasonable to expect that IRSRs would be reduced under an ALF approach – the only cause of IRSR in this approach would be forecast and estimation error, unlike the current approach where positive IRSR residue are to be expected due to the difference between average and marginal losses.

Benefits

The benefits of the ALF methodology are that it will:

- improve stability of loss factors for generators and, therefore, reduce revenue variability by approximately half;
- reduce IRSR from their recent levels;
- increase bankability of renewable generation projects throughout the NEM and minimise the need for debt and equity investors to add risk premia to the cost of capital for existing and future projects;
- be simple to implement, requiring only minor changes to the process AEMO uses now; and
- preserve a locational signal for generators.

Supporting the long-term interests of consumers by supporting efficient investment

Whether loss factors would be stable

Electrical losses are quadratic in nature. That is, the change in losses is proportional to the square of the change in power. It follows mathematically that for a given change in load, the change in average loss factor will be smaller than the change in marginal loss factor. As such, the magnitude of change under the ALF approach is lower and ALF will improve the stability of loss factors.

Whether loss factors would be predictable

The approach to calculating ALFs is similar to the approach used to calculate MLFs as it uses the same type of network model and the same load forecast. Given this, ALFs will change as frequently as MLFs, and PARF Group considers the predictability is equivalent to the status quo. However, the magnitude of change would be restricted to a narrower band yearly (see section 1.c for transparency measure to enhance predictability)

Whether risks are allocated to those who can manage them

ALFs would be calculated, and therefore change, as frequently as MLFs do now, though the magnitude of the change would be smaller. Further, the 'sharing' of the change between incumbent and entrant generators would remain the same. The ALF approach would be equivalent to the status quo in terms of risk allocation.

Complexity

As noted above, the methodology to calculate ALFs is similar to MLFs. Hence the ALF approach will be equivalent to the status quo in terms of complexity.

Supporting the long-term interests of consumers by supporting efficient operation and use of electricity

Whether price would be efficient and in the long-term interests of consumers

The current MLF approach does not accurately reflect marginal losses on the network as it's a highly averaged approach. Changing to the ALF methodology will not materially reduce the extent to which bids, and therefore prices, reflect the true marginal cost of supply. Therefore, the ALF approach is expected to have a similar impact on pricing efficiency relative to the current approach.

b. Alternate Option: Irish Compression Method (ICM)

Description of approach

PARF Group's alternate option draws on an approach currently used in the Northern Ireland and the Republic of Ireland. There are a number of ways in which the ICM approach could be implemented. The preferred methodology could employ the Irish approach where a 'compression algorithm' is used. The compression algorithm is based on a 'normalisation number', which is applied as described in the breakout box below.

The ICM approach is expected to deliver similar loss factor results to the ALF methodology (subject to the normalisation number adopted) and provides reduced revenue variability relative to MLFs. Nevertheless, the ICM approach is PARF Group's second preferred option as its less reflective of the actual losses than the ALF approach and is reliant on the assumption considered for the 'normalisation number'.

ICM methodology

The ICM methodology begins with a single, load weighted average marginal loss factor for each connection point. That 'raw MLF' is calculated as per AEMO's current method.

The compression algorithm takes each 'raw MLF', denoted 'X' and 'compresses it by reference to a normalisation number.

The calculation is as follows:

If $X<NN \rightarrow X_{Compressed} = \frac{NN-X}{2*NN} + X$

If $X>NN \rightarrow X_{Compressed} = X - \frac{NN-X}{2*NN}$

Benefits

The benefits of the ICM approach is that it will:

- improve stability of loss factors and therefore reduce generator revenue variability with the magnitude determined (partly) by the 'normalisation number';

- reduce IRSR from their recent levels (depending on the parameters applied);
- increase bankability of renewable generation projects throughout the NEM and minimise the need for investors to add risk premia to the cost of capital for future projects; and
- preserve a locational signal for generators, albeit dampened.

Supporting the long-term interests of consumers by supporting efficient investment

Whether loss factors would be stable

Applying the ICM approach would limit the extent to which individual loss factors could vary and 'compress' loss factors into a narrower band around the 'normalisation number'. In terms of stability, PARF Group's assessment is that the ICM approach is better than the status quo.

Whether loss factors would be predictable

Individual loss factors under the ICM approach could change as frequently as the status quo and would be confined to a narrower band making them relatively more predictable. In terms of predictability, PARF Group's assessment is that the ICM approach is better than the status quo.

Whether risks are allocated to those who can manage them

The 'sharing' of MLF risk between incumbent and entrant generators would remain the same. In terms of risk allocation, the ICM approach is equivalent to the status quo.

Complexity

The computational method used for the ICM approach is the same as the current MLF approach except for the application of the compression factor. In terms of complexity, PARF Group's assessment is that the ICM approach is marginally worse than the status quo.

Supporting the long-term interests of consumers by supporting efficient operation and use of electricity

Whether price would be efficient and in the long-term interests of consumers

Under the status quo MLFs are a highly averaged estimate of the marginal cost of losses. If the ICM approach is adopted they would still be highly averaged and compressed, However, given the averaging already used, the difference is unlikely to be material. In terms of pricing efficiency, PARF Group's assessment is that the ICM approach is equivalent to the status quo.

c. AEMC consultation paper questions

The AEMC's third questions related to specific adjustments it might make to the rules. As discussed above, PARF Group's preferred approach is the AEMC adopt the ALF approach. The box below provides direct responses to the questions raised in the consultation paper.

Question 3: Changing the transmission loss factor framework
What improvements do you suggest could be made to elements of the transmission loss factor framework and why? In particular with reference to: **1. calculating transmission loss factors on a marginal or average basis** Please see PARF Group's response above at section 4.a, supporting calculating transmission loss factors on an average basis **2. allocating intra-regional settlements residues** As discussed above at section 2.c, adopting ALFs is expected to cause IRSR to decline.

3. the frequency of calculating MLFs

As outlined in section *1.c* above, in order to support stability, the current frequency of calculating loss factors should remain, with a single volume-weighted loss factor value for a given financial year (for a given connection point) retained. However, PARF Group supports increasing the frequency of loss factor *publication for information purposes* (at least on a semi-annual basis) to better equip debt and equity investors with timely information for investment decision making processes. Increased frequency of published information is critical to achieve future efficient investment as some renewable energy generation is able to advance from a development to a construction phase within 12 months

4. the notice period provided to market participants

The notion of providing market participants with more notice of changes in loss factors is appealing as is any change that would improve stability or transparency (and therefore predictability). However, PARF Group is concerned if 'providing more notice', means calculating loss factors further in advance of the time they will take effect. Longer notice periods potentially imply forecasting further into the future and, therefore, increasing the risk of forecast error.

Notwithstanding PARF Group's comments above regarding the notice period, what is critical is that an appropriate process and timeframe/structure is put in place for generators to seek meaningful clarifications, be provided with appropriate information and, where necessary, challenge draft loss factor determinations, by having access to the necessary information to do so. This will require AEMO to be appropriately resourced to respond to multiple generators' enquiries. The recent FY20 MLF determination process provided limited ability for PARF Group to seek and receive meaningful clarifications about MLF determinations which have ultimately had material impacts on PARF Group assets.

5. whether a forward-looking or backward-looking methodology should be used

In PARF Group's view the methodology should remain forward looking. This rule change has been raised because MLFs have changed substantially, and quickly, in recent years driven by rapid growth in generation in non-traditional locations. A backward-looking methodology would have no way of accounting for this type of growth, making it inherently inaccurate in the current climate. A backward-looking approach would defer the impact of changes in loss factors, but it would not change the underlying volatility.

6. If a collar and cap should be applied to transmission loss factorsif a collar and cap should be applied to transmission loss factors

As discussed above in section 4.b, PARF Group supports the use of an 'Irish compression' or ICM approach to 'collar' loss factors as an alternative to our preference, which is the ALF approach.

7. if grandfathering MLFs should occur

PARF Group's view is that the grandfathering approach provides greater revenue certainty than the other options under consideration and the status quo. By flooring MLFs for a period, it removes MLF risk for existing generators by making MLFs entirely stable and, therefore providing revenue certainty.

A key aspect of the grandfathering approach is that it would not involve sharing of MLF risks. In this 'causer pays' approach, the generator that causes an increase in electrical losses, bears the full extent of that action with a reduced MLF determination. New entrants bearing 100% of the MLF downside could act as a barrier to entry and may impact future efficient investment. Additionally, a grandfathering approach will create complexity in terms of loss factors assigned to incumbent generators and may be controversial during implementation.

While PARF Group appreciates the benefit of the grandfathering approach for incumbent generators in terms of revenue certainty, PARF Group acknowledges it is likely to distort the locational signal for entrant generators and arguably be inconsistent with the NEO.

5. CONCLUSION

In conclusion, PARF Group welcomes the opportunity to make a submission to this critical process and agrees with Adani that the recent variability in MLFs has created increased revenue risk for investors. If that risk is left unaddressed ahead of FY21, the cost of capital for existing and future projects will increase, which will ultimately drive up electricity prices for consumers.

The AEMC has the opportunity to intervene to prevent these problems and must act quickly ahead of FY21 - waiting for the completion of the COGATI process may prove to be too late.

We urge the AEMC to adopt Adani's proposed change and to ensure that loss factors for 2020-21 are based on the ALF methodology to bolster investor confidence in the sector for the $8 - $27 billion of investment required to build out the NEM.