Network of Illawarra Consumers of Energy

Network of Illawarra Consumers of Energy

Transmission Access Reform

November 2020

Network of Illawarra Consumers of Energy

Submission in Response to the AEMC's Transmission Access Reform Interim Report

Summary

This submission is made by the Network of Illawarra Consumers of Energy (NICE), a newly formed entity advocating for the energy transition to a net-zero carbon future to be managed with the interests of consumers at the heart.

There has been a long history of approaches to coordination of transmission and generation investment and a variety of international alternatives. Locational Marginal Pricing (LMP) with or without Financial Transmission Rights (FTRs) – or equivalent measures – have featured highly in earlier Australian work and internationally. There are cases of systems going from regional to local models, but none in the reverse. This is presumably a good indicator of the superiority of locational pricing.

Of all the initiatives being discussed under the rubric of Post 2025 Market Design, access reform is the only one that is advanced to a point of potential implementation. The remainder are simply collections of ideas about possible directions, or worse, discussions that seem to have no grounding in theory or practice (e.g. the 'two-sided market' processes).

In addition, the implementation of LMP is valuable even in an environment of well planned renewable energy zones or an environment of transmission capacity oversupply (as there will almost certainly be constraints that bind at times). Therefore, the Australian Energy Market Commission (AEMC) with Energy Security Board (ESB) support should continue to progress the LMP development.

FTRs are less clear and a greater sense needs to be determined from industry on whether they prefer LMP with or without FTRs. The AEMC has a further hurdle to demonstrate how FTRs will contribute to the achievement of the National Energy Objective.

Notwithstanding our support for LMP, the ESB needs to progress the Energy Council request for further work on the 'cost allocation' process, which we translate to the charging regime, for transmission.

Contents

Introduction

NICE and Consumer Advocacy

The Network of Illawarra Consumers of Energy (NICE) is a newly formed informal network advocating for the energy transition to a net-zero carbon future to be managed with the interests of consumers at the heart.[1] This necessary transition needs to occur at least cost to consumers while maintaining reliability and security of energy services, appropriate consumer protections for essential services and a just transition for affected workforces.

We believe there is a role for regionally based advocacy within the context of nationally consistent energy policy. The choice and options for energy supply differ by geographic region having regard to different climatic conditions affecting demand and supply options, and different risk factors impacting on resilience planning. This submission has been prepared by David Havyatt who is the sole author.[2]

There are three agencies involved in the management of the Australian energy system, the Australian Energy Market Commission (the AEMC), the Australian Energy Regulator (the AER) and the Australian Energy Market Operator (AEMO).[3] Despite their names all three are in whole or part regulators because they establish the rules (or in AEMO's case procedures and plans) for system and market operation and are potentially subject to the concept of 'regulatory capture.'

'Regulatory capture' covers a collection of different theories. We use the term as a reference to their being a small number of players with a lot at stake (industry) who will devote more resources and effort to regulatory processes than a diverse group each with a little at stake (consumers) and hence capture the attention of the regulator. Both theoretical and empirical studies conclude that organised consumer advocacy participating directly in regulatory proceedings is effective in mitigating the potential for capture.[4]

There is a tendency for consumer advocacy to be marginalised to the issues that directly impact consumers, issues such as retail markets and consumer protections, network price determinations and increasingly the functioning of Distributed Energy Resources. The operation of the wholesale market has significant impact on price and reliability but gain less attention by advocatess. Market bodies sometimes make a requirement for technical expertise a barrier to advocate participation. For the energy transition to occur at least cost to consumers, advocates need to be active in all parts of system design and operation.

---

[1] The network has not yet started actively recruiting participants.
[2] Mr Havyatt was employed as Senior Economist at Energy Consumers Australia from October 2015 to August 2020 and is contracted till the end of 2020 to work on some matters. For the avoidance of doubt, nothing in this submission is the position of ECA other than any references to previous ECA submissions or ECA's consumer research. In his role at ECA Mr Havyatt was a member of the COGATI Technical Working Group.
[3] These three agencies collectively, with an independent chair and deputy chair, make up the Energy Security Board. All the agencies are responsible to the 'collective of energy ministers previously known as MCE/SCER/COAG EC'.
[4] https://d3n8a8pro7vhmx.cloudfront.net/nice/pages/21/attachments/original/1606353006/Regulatory_Capture.pdf?1606353006

Background to Access Reform

We appreciate the opportunity to comment on the AEMC's Interim Report *Transmission Access Reform: Updated Technical Specifications and Cost-Benefit Analysis* of September 2020 (the Report). The Report is the latest stage in an access reform proposal that has emerged from the AEMC's biennial Coordination of Generation and Transmission Investment (COGATI) review.

The AEMC was directed by the 'Ministerial Forum of Energy Ministers' formerly known as the COAG Energy Council (the Ministerial Forum[5]) to conduct the COGATI reviews as a response to a recommendation from the AEMC.[6] This was in response to the AEMC's Optional Firm Access Work, which was itself at the time only the last in a series of reviews.

The manifestation of uncoordinated investment is excessive congestion on transmission links (note, efficient design dictates that there will always be some congestion). In 2009 the AEMC reported to the Ministerial Forum on its Congestion Management Review.[7] That review didn't recommend large changes, however it noted:

> *If analysis were to indicate that material transmission congestion is likely to emerge as a consequence of changes to the underlying economics of the NEM, it is likely that there will be numerous options for reform that warrant consideration...A more extensive reform option would be the introduction of Generator Nodal Pricing (GNP) on a NEM-wide basis. GNP would solve the dis-orderly bidding problem, and would be more effective at addressing the locational decision problem than would a localised, time-limited pricing intervention.*

The report also noted 'The profound impact of policy responses to climate change on the underlying economics of the NEM suggests that it is timely to consider the case for more fundamental change.' That Review of Energy Market Frameworks in light of Climate Change Policies was commissioned by the Ministerial Forum[8], and actioning a recommendation of it the AEMC was tasked by the Ministerial Forum with undertaking a review of transmission frameworks.[9] In the report of that inquiry the AEMC proposed 'an integrated package of market arrangements, termed optional firm access. It creates the ability for generators to "insure" against the risk of congestion.'[10]

---

[5] The term 'Ministerial Forum' will be used throughout this document to refer to the entity previously known as the Ministerial Council on Energy (MCE), the Standing Committee on Energy and Resources (SCER) and the COAG Energy Council. The entity appears to now go by the ungainly name of the Energy National Cabinet Reform Committee and I, like the AEMC, don't want to use it. (See https://nice.nationbuilder.com/let_s_rationalise_by_duplicating for an update on the Ministerial Forum which will apparently now exist in two guises).

[6] https://www.aemc.gov.au/sites/default/files/content/97164a7b-09bf-49fb-9f2e-f6b996f5a96b/Reporting-on-drivers-of-change-Terms-of-Reference.PDF

[7] https://www.aemc.gov.au/markets-reviews-advice/congestion-management-review

[8] https://www.aemc.gov.au/markets-reviews-advice/review-of-energy-market-frameworks-in-light-of-cli

[9] https://www.aemc.gov.au/sites/default/files/content/b3a6c99a-e853-4b30-b8dc-5f2dceaf1127/MCE-Terms-of-Reference.PDF

[10] https://www.aemc.gov.au/sites/default/files/content/c4773c34-c142-41da-95b0-35697b8b1109/Transmission-Frameworks-Review-Final-Report.PDF

The AEMC then undertook the effort, at the request of the Ministerial Forum, to undertake detailed design and testing of Optional Firm Access (OFA).[11] Having proposed OFA, the AEMC ultimately recommended against it[12], writing:

> *The Commission's assessment of the benefits and costs of optional firm access is that, in the current environment, absent some major shift in market conditions or government policy settings, the implementation of optional firm access would not contribute to achievement of the National Electricity Objective.*
>
> *However, circumstances may arise in the future when there is a need for additional generation and transmission investment, in an environment where the location and type of investment is highly uncertain. In such an environment, benefits may be derived from a more integrated approach to transmission and generation investment and operation achieved by adopting a model such as optional firm access, which would introduce more commercial drivers into transmission and generation development.*
>
> *Successful implementation of a reform of this nature would require a substantial amount of effort and time from a number of stakeholders, including market participants and market bodies in the NEM. When considering whether to implement such a model in the future, the COAG Energy Council should also consider the level of stakeholder support. Given the magnitude of the reform, and the effort required to implement optional firm access, an important factor to consider would be how the level of stakeholder support would impact on how the task is managed.*

It was in response to the OFA recommendations that the AEMC was tasked with COGATI. The Report is Stage 2 of COGATI developing detailed proposals.

This quick run through of history serves four purposes:

1. It highlights the fact that the topic of transmission congestion has been considered for some time.
2. The consideration has taken the form of a game of 'hot potato' between the AEMC and The Ministerial Forum; in response to each review by the AEMC, the Ministerial Forum has provided an additional tasking to the AEMC.
3. There are two elements that have been previously thought of – nodal pricing and some kind of access right.
4. It includes the AEMC observation that successful reform often depends on the effort that is required from stakeholders to make it effective.

This last point is, perhaps, an alternative version of 'regulatory capture' – where implementation success is highly reliant on incumbent behaviour, or put more accurately, ongoing incumbent resistance can frustrate reform.[13]

---

[11] https://www.aemc.gov.au/markets-reviews-advice/optional-firm-access%2C-design-and-testing
[12] https://www.aemc.gov.au/sites/default/files/content/147d4f18-5274-4310-8ce9-9569f0f48eaf/OFA-Final-Report-Volume-1-to-be-published.pdf
[13] As recent examples incumbents tried to push back late on both metering contestability and five minute settlement on the grounds that they would not have their systems ready in time.

The AEMC's Proposal

Overview

The AEMC is proposing two separate but linked elements – a change to both dispatch and settlement under the heading of Locational Marginal Pricing (LMP) and the introduction of Financial Transmission Rights (FTRs). While LMP reflects the existing process of dispatch and therefore is primarily a settlement matter the inclusion of dynamic loss factors creates the potential for some changes to dispatch.

The LMP will be paid to scheduled and semi-scheduled generators while unscheduled participants (load and generation) will settle at the volume weighted average price (VWAP) of all unscheduled generation. This preserves a residue to be used under the AEMC proposal to settle FTRs, that is, it is the right to the residue that is being auctioned.

The move to VWAP means the required changes to the National Energy Market Dispatch Engine (NEMDE) will be more extensive than in earlier versions of the proposals. This has significant cost impacts which the AEMC has sought to quantify through the report prepared by HARD Software.[14] It is unclear how these costs have been incorporated into the Cost Benefit Analysis conducted by NERA.[15] It is important to note that these costs should not be considered as entirely only occurring in the 'with reform' model as NEMDE is unlikely to be able to operate all the way through to 2040 without major revision.

The most challenging part of the design has been the construction of the Financial Transmission Rights. The AEMC has been keen to develop the FTRs to enable generators to reduce their risk in the face of the reform. However, at every stage in the development of the detail of FTRs the consequence has simply been to introduce more risks to be managed.

This highlights an underlying tension that exists in all considerations of the design of the energy markets, the question of risk. The underlying theory of competition reforms and privatisation is that markets are better able to manage risk than governments and that extends to private capital markets and the combination of investors and managers responding to investor interests. A significant part of this responsiveness was expected to be consumers responding to price signals in the market and seeking to be able to exercise flexibility in their load to avoid high prices.

This thinking is incorporated in the AEMC's *Power of Choice* review and its emphasis on cost-reflective network tariffs. These only constitute half of the cost of goods sold faced by retailers, the other half being energy costs. But consumers have been 'insured' against the variability of wholesale prices by contracting arrangements in the wholesale market. In short, the AEMC's

---

[14] https://www.aemc.gov.au/sites/default/files/2020-09/IT%20costs%20of%20implementing%20NEM%20locational%20_ng%20-%20Hard%20Software%20-%20Information%20Technology%20costs%20of%20nodal%20pricing%20-%202020_09_07.PDF
[15] https://www.aemc.gov.au/sites/default/files/2020-09/NERA%20report%20Cost%20Benefit%20of%20Access%20Reform%202020_09_07.pdf

desire to introduce FTRs as risk management tools directly contradicts the intent of the AEMC's network charging and metering reforms.

As the short outline of the background revealed the AEMC has previously mentioned the possibility of locational pricing without a hedge, and has considered a version of a transmission guarantee without marginal pricing. That is LMP and FTRs do not have to be taken as a package deal.

Views of the AEMC Proposal

The AEMC has seldom found itself as friendless as it has with the access reform interim report. The quality of that criticism should, however, give the AEMC staff who have worked on the project greater confidence that at least parts of the reform are correct. In being friendless the AEMC has the rare occasion of having both the old and new generation lobbies, the Australian Energy Council (AEC) and the Clean Energy Council (CEC) aligned against it. Both the Major Energy Users (MEU) and Energy Users Association of Australia (EUAA) also oppose the reform, though the Public Interest Advocacy Centre (PIAC) supports LMR but not FTRs (and the MEU supports going back to OFA).[16]

The most nonsensical of the submissions is that of the CEC (and a number of organisations that support it) labelling the proposals as the 'wrong reform at the wrong time.' If they really are the wrong reform, then they are wrong at any time, so the addition of 'at the wrong time' opens up the possibility that maybe the CEC thinks that these reforms would be right at some other time.

There are several arguments that relate to the timing question. The first is that the reform should be fully integrated with the Post 2025 reforms. The second is that they should only be considered after the REZ and actionable ISP reforms have occurred. The third is that considering these reforms now creates uncertainty in the market and will therefore make investing harder. The last of these will be considered in conjunction with the related concern that the reform increases risk and hence makes projects more costly.

On the first of these timing issues, the proposals that originally arose out of the Coordination of Generation and Transmission Investment (CoGaTI) process were bundled into the Post 2025 design process as a result of this timing question earlier. As such they aren't being proposed either in isolation of other reforms or particularly immediately. Unfortunately, they are the only aspect of the Post 2025 design worth that have any substance or merit. It would be greatly beneficial if they could be 'locked and loaded' as a plank in considering what other reforms may be necessary.

The challenge on the question of the REZ and actionable ISP reforms is that there is no clarity on how the REZ reforms will proceed. The ESB's proposals for Renewable Energy Zone rules have not been universally welcomed, in particular their need has been questioned by the AEC, the Aluminium Council of Australia, and EUAA. Unsurprisingly the REZ proposals are

---

[16] We also note that Bluescope Steel which is based in the Illawarra opposes the reform. Their particular issues relate to the work on REZs and the ISP.

supported by the Clean Energy Investor Group and the CEC. ERM takes a more pragmatic stance and asks how the proposals really add to the existing framework.

More detail is available in the recently announced NSW Electricity Infrastructure Roadmap and implementation legislation.[17] This reveals the ultimate answer to the question of how REZs work to create transmission infrastructure – a central planner determines the need for and size of a REZ, commissions transmission build and then charges consumers through a charge on distribution network operators. This isn't a solution to a coordination problem – it is supplanting a coordination problem with central planning.

Apart from the potential of these arrangements to increase costs to consumers, they do not, however, obviate the need for access reform. The REZ is, in effect, a private industrial park within which shared transmission infrastructure is constructed to create a common connection point. But that connection point is still a node, and as that node is most likely to be connected to a transmission route – at some point – that has both loads and generators scattered along it, congestion of that transmission link cannot be managed purely through the REZ planning process.

Therefore, LMP is an important adjunct development in conjunction with the REZ policy, it just simplifies the question of 'what is a node.' REZ policy will proceed more effectively if the decision is made now to introduce access reform.

Criticism of the reform itself – claims that it is the wrong reform – hinge on three main claims. The first is that the reform introduces additional uncertainty into the market which will necessarily lead to higher costs of capital. The second is that the reform will disrupt the contracts market and result in reduced contract liquidity. The third is that the cost benefit analysis is flawed.

The claims about introducing new uncertainty or risk that needs to be modelled by investors is simply not true of LMP itself. LMP is only a consequence of congestion which otherwise manifests itself as an inability to sell all available power to the market. Investors should, therefore, already be modelling the risk that will additionally manifest as a lower price as well as a lower volume. That the rules will change is not a new risk – anyone observing this market (see background above) will know that versions of this reform have been considered before and implemented in other jurisdictions.

To the extent there is complexity introduced it is through the operation of FTRs not LMP. The AEMC simply doesn't have enough information to design an FTR market without experience of the operation of LMP. It is worth noting that the existing contract market was not designed as part of creating the NEM, it was created separately.

The concern with contract markets is a re-run of arguments mounted against five-minute settlement. If the premises of market reform and privatisation – that markets and private sector businesses are better able to manage risk than a central planner – then we should expect the contract market to adapt. Indeed, the capacity of contract markets to adapt is a reason why the

---

[17] We provided comment on this here https://nice.nationbuilder.com/the_devil_is_in_the_detail

AEMC should not proceed to develop FTRs. The price risk of LMP can be as easily hedged under the existing contract market as any other price volatility.

Finally, the cost benefit analysis has been attacked because it depends on a variety of assumptions. Unfortunately, there is nothing the AEMC can do about the fact the future is uncertain. What can be known with certainty is that LMP with all load paying the volume weighted average price while all generation is only paid the LMP (this is different to the AEMC proposals) results in lower prices being paid for wholesale electricity. We can know with certainty that investors in generation will be more careful in making their citing decisions and will consider transmission costs as well as resource costs.

The cost of the reform is primarily a redevelopment of NEMDE. But this will need to occur at some point. The cost is simply in bringing forward this expenditure – not the expenditure itself. Within the reasonable bounds of estimation, the case has been made by the AEMC that there is both a welfare gain and a surplus transfer under the proposal. In our estimation the advantages for consumers entirely arise from LMP and FTRs only reduce these benefits.

Alternatives to the Proposal

To the extent that alternatives have been offered to the AEMC they are mostly varieties of 'just build more transmission' which is sometimes wrapped in a rationale based on the REZ and ISP work. It seems consumers are offered no choice but to have the supply side backing an environment of over supply of generation, transmission or both.

There are particular difficulties with the oversupply of transmission in the system after structural separation. The methodology used by the AER to compensate network operators uses a real straight-line depreciation model that has the attraction that consumers pay the same amount, in real terms, for the return of capital in each year. But the amount paid is still heavily weighted to the earlier years as consumers pay a lot more in return for capital in the earlier years.[18] This distortion is worse when a large transmission investment is made in advance of its full utilisation.

There have been suggestions that the solution to this problem is to be found by moving to a 'beneficiary pays' model, in which the beneficiary is identified as the generator seeking to get its electric power to market (i.e. to the connection point with distribution networks). This has a whole host of economic challenges. Firstly, the fact that electricity flows through every available route between point A and point B, not just the most direct route[19] means that a generating source is using every transmission route. Secondly, the theory of peak load pricing suggests that generation should only be charged the short run marginal cost of transmission except during periods of congestion when the long run costs should be recovered.[20] However, this approach

---

[18] This part of the problem can be overcome by using an 'real annuity approach' for depreciation rather than the preferred straight line version. This was expanded on in an unpublished paper the author prepared for Energy Consumers Australia *Economic Regulation of Electricity Distribution: Theory and Practice in Australia.* The relevant section can be provided by contacting the author.

[19] This is often referred to as the application of Kirchhoff's Law, these laws describe how the flows work in a DC circuit and may be used as a proxy in AC circuits.

[20] Boiteux, M. (1960). "Peak-Load Pricing." *The Journal of Business* **33**(2): 157-179.

would result in the new transmission being paid for when old transmission is congested. These are just two obvious challenges.

Unfortunately, the market bodies appear unwilling to examine in any detail how transmission costs should be recovered. The Communique from the Ministerial Forum meeting on 22 November 2019 noted:

> *Recognising that interconnectors should only proceed based on a positive cost/benefit assessment, the Council has asked the ESB to prepare advice on a fair cost allocation methodology (both in theory and practice) as part of its work to action the ISP.*[21]

The Communique from the meeting on 20 March 2020 recorded:

> *Ministers noted the ESB's preliminary paper on the fair cost allocation methodology. Ministers agreed that the ESB intends to analyse two options and provide an interim report to COAG Energy Council members. This analysis should consider the impact on consumers in jurisdictions and the scope of beneficiaries. Suggestions for further work should be made to enable COAG Energy Council to consider appropriate fair cost allocation methodology for transmission by 30 September 2020. We acknowledge this work will need to assess what is the fairest cost allocation, including the status quo.*[22]

Despite this last comment the author has been unable to find any evidence of work undertaken. It is understood that the ESB first sought advice from the AER that formed the basis of the advice to the March meeting, but that following the March meeting the task passed to the AEMC and it has now lapsed. However, the Australian Financial Review reported on 18 August that:

> *Amid speculation that Dr Schott was about to be axed by federal Energy Minister Angus Taylor, it is understood state energy ministers will be told at their energy council meeting on Tuesday that Dr Schott has had her role extended for another year. The 12-month extension followed discussions between Dr Schott and Mr Taylor about key reforms to be tackled including the 2025 market design, the fair cost allocation policy and market body accountability and transparency.*[23]

The actual status of this work is unknown. Related to this is the fact that the nomenclature of a 'national cabinet committee' now being applied to the Ministerial Forum means that it appears to be meeting in secret and doesn't issue communiques.[24]

A version of 'generator pays' could be implemented by using loss factors as a proxy for quantity of transmission used to get to the market. Currently there is an average loss factor used to vary the amount dispatched above the amount demanded, and it is proposed real time marginal loss factors will be included in dispatch decisions. These two data points added together and then determined as a proportion of total losses could be the basis for determining a share of

---

[21] http://www.coagenergycouncil.gov.au/publications/22nd-energy-council-meeting-communique
[22] http://www.coagenergycouncil.gov.au/publications/23rd-energy-council-meeting-communiqu%C3%A9
[23] https://www.afr.com/companies/energy/schott-survives-as-head-of-energy-reform-body-20200817-p55mk1
[24] See our blog post on the national cabinet reform processes https://nice.nationbuilder.com/let_s_rationalise_by_duplicating. We note that the decisions of National Cabinet are that Ministerial Forums should normally issue a communique or media release at the conclusion of the meeting.

transmission cost to be borne by each generator. This could conceivably be calculated and incorporated into the dispatch optimisation or it could simply be invoiced after the fact as currently occurs with TUOS charges that make their way to consumers' bills. The total amount to be recovered in any dispatch interval could also be time varying including an element of demand tariff much beloved by economists as a pricing principle for distribution network service providers.

Another alternative is to simply revert to the 'marginal controversy' triggered by Harold Hotelling that any infrastructure that is primarily made up of fixed costs is most efficiently paid for by way of taxation.[25] Alternatively one could argue that just like the interstate highway network the transmission infrastructure is a 'public good.' In both cases the conclusion is simply that the one piece of electricity infrastructure that it would make sense to be government owned and paid for out of general revenue is the transmission network.[26]

These are merely suggestions. We do not have the resources to undertake a full study of transmission pricing options. We do believe the ESB should be taking seriously the Ministerial Forum's interest in the topic and include it at least in the Post 2025 design work. However, transmission pricing reform should be an adjunct to access reform, not a substitute for it.

---

[25] Hotelling, H. (1938). "The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates" *Econometrica* 6(3 (Jul)): 242-269.

[26] A similar argument can be made that a large part of distribution network costs should be recovered from local rates (i.e. a land tax).

Conclusion

The significant welfare benefits and surplus transfer to consumers from LMP are too great to be deferred or not pursued. While we generally agree that surplus transfer is not in general a policy justification, we note that the practice of price discrimination in the retail market works as a very effective surplus transfer to the supply side of the industry. As 'gentailers' dominate the supply side in both circumstances the surplus transfer is an effective means of balancing interests.

LMP is a reform that sits perfectly well with the REZ and ISP policies being developed, the latter may reduce but certainly not obviate the benefits to be obtained from access reform. The arguments about complexity and risk are unfounded as the risks of congestion already need to be calculated by generators, the increased consequence of those risks is precisely the point of the reform – to make generators consider the impact of 'congestion' on their location decisions.[27]

The issue of FTRs is more problematic. FTRs provide no benefit to consumers, they are merely a risk minimisation strategy for generators. The design of FTRs is where the additional complexity and uncertainty is introduced.

Unfortunately, all submissions have focussed on the package as a whole (and mostly not favoured it). It is unclear which of LMP without FTRs or LMP with FTRs the supply side would prefer. We believe this is the only choice that now faces the AEMC.

Our preference is LMP without FTRs as it maximises the benefit to consumers. An argument may be found that FTRs would result in a promotion of the long-term interests of consumers if it could be demonstrated that it materially increased security of supply (i.e. the resource adequacy component of reliability).

Note that we haven't discussed in this submission at all a related question of why, if we move to LMP, there should be any concept of 'region' remaining in the NEM.

In addition, we encourage the AEMC to work with the ESB in undertaking a public inquiry on future transmission pricing arrangements.

---

[27] Congestion has been put in quotes here to note that being constrained off for system strength reasons is just as much a locational signal as being constrained off for genuine congestion.