6 April 2018

Mr Peter Adams
General manager - Wholesale Markets
Australian Energy regulator
GPO Box 520
Melbourne Vic 3001

Lodged via RIT@AER.gov.au

Friday,6 April 2018

Dear Mr Adams,

RE: Issues paper - Review of the application guidelines for the regulatory investment tests

ENGIE appreciates the opportunity to comment on the Review of the application guidelines for the regulatory investment tests issues paper.

The RIT-T, and its regulatory predecessor, was designed for an environment that is quite different to today. There are many new uncertainties and challenges to be addressed. An effective allocation of risks and costs is critically important to market efficiency and costs to consumers.

Transmission and distribution assets are long lived and costs are recovered from consumers (with the exception of shallow connection costs of generators). The level of uncertainty regarding technology advances and costs, economic conditions, customer choices, and environmental policy are unprecedented. This makes consumer/load patterns extremely difficult to predict with any degree of certainty.

When the RIT-T was developed, the level of certainty and predictability of the future was much higher and network augmentations risks were mainly confined to project timing. Positive demand growth and unidirectional power flows meant that networks augmented early would eventually be utilised. The level of economic inefficiency was relatively small and confined to underutilisation in the early years of a project.

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Changes to demand and generating patterns (local and large scale) and potential bi-directional network flows make the network economic efficiency assessment extremely challenging. Expensive and long-lived network assets may become stranded, and customers burdened with augmentation costs without a benefit.

Flexible non-network solutions, although less risky to consumers, are difficult to progress as inherent bias towards network solutions exists.

ENGIE strongly suggests that developing and applying appropriate futures/scenarios in the RIT-T process will deliver more robust analysis and better economic outcomes for customers.

ENGIE made a submission to the COAG “Review of the regulatory investment test for transmission” in October 2016. Key elements relevant to the application of the RIT-T of this submission are included in the appendix.

1. Inherent bias towards TNSP solutions exists

Non-network solutions by third parties are inherently more expensive than identical projects undertaken by the TNSPs. This is due to TNSP sponsored projects being less risky once they are included in the RAB. This results in a lower cost of capital (WACC) when compared to the same project contracted to provide services from a third party. Contracted projects face additional risks such as limited contract duration and uncertainty of future contract extensions (ie contract duration will typically be much shorter that asset life of the project).

However, future network requirements are subject to a plethora of assumptions and without a crystal ball can never be certain. Shorter duration of contracted projects/services provides increased flexibility to the TNSP when managing the network as circumstances change. This flexibility is important to minimise the cost to consumers, as they don’t have to pay for stranded assets.

This is in contrast to having network solution costs locked in for the duration of the asset life and the risk of asset stranding underwritten by customers. It is important to clarify and quantify the level of risks and costs shifted to the customers because of network augmentation and compare it with a contracted service option.

Recommendation: The AER should prescribe an effective methodology to deal with the inherent bias in the current process and ensure that the option value of the non- network solution in the face of uncertainty and on-going customer costs are effectively assessed.

2. Modelling methodology in the RIT-T is extremely important

Modelling of scenarios and sensitivities to determine economic benefits of specific projects is time consuming and expensive. Whilst it is desirable to minimise complexity and reduce project assessment costs, it is paramount that modelling methodology is not simplified to the point where it becomes ineffective and/or misleading (ie "It should be made as simple as possible but not simpler").

In the process of responding to a recent TNSP consultation, ENGIE analysed the modelling used to support the economics of a network augmentation. Abridged modelling conducted by the project proponent determined economic value in locating additional wind generators in the augmented network area.

However, ENGIE sponsored independent assessment using time series modelling clearly showed that locating wind generators in the augmented area was not economic.

It may be tempting to use abridged modelling techniques to cut project assessment costs, but unless the abridged modelling is benchmarked against time series modelling the AER should deem any such modelling as "unfit for purpose".

Recommendation: Prescribe the type of modelling methodology principles to be used in the RIT-T analysis. Participants should not have to run complex models to re-analyse the proposed projects for potential benefits as part of a consultation process. The use of abridged modelling methodology should only be allowed in cases where benchmarking against time series modelling shows that they are fit for purpose. In addition, to achieve a greater transparency, the AER should prescribe that submissions to TNSP consultations are made public.

3. Scenario development and application

The scenarios used in the RIT-T are fundamental in assessing risks and economic impacts and need to be standardised. The methodology for developing scenarios/futures needs to be prescribed, rather than left to the status quo. The scenarios used in the RIT-T need to be:

- Relevant to the electricity sector
- Stretching yet believable (explore the full range of uncertainty)
- Cover the range of uncertainties (driving forces)
- Common to all RIT-T assessments

Specifically, scenarios should not be developed by the individual TNSPs on an ad-hoc basis to suit specific augmentations. The AEMO process of developing scenarios has changed a number of times over the last decade. The current approach to scenario development can be described as "blinkered", quite limited in scope and mainly reflects current policies and government ambitions. It is essentially ineffective in capturing the key uncertainties and driving forces affecting the electricity sector.

The resultant scenarios/futures can be best described as a single scenario/future, with a cluster of sensitivities as distinct from a range of truly stretching scenarios. Another problem is that the assumptions are not necessarily internally consistent within a sensitivity/scenario.

The current processes attempts to second-guess a particular future, rather than exploring the full range of uncertainties. This results in over confidence about a specific scenario/future (ie confirmation bias due to using common set of assumptions). The main shortcomings are that uncertainties are underestimated and distinctly different futures missed in the process.

An effective process to develop scenarios must follow proven methodologies. One such methodology is the scenario planning process (or scenario learning process) as initially pioneered by Shell. Appropriate scenarios, with attributes as described above, are a product of such a process.

There is a need to explore at least four "stretching" scenarios/futures to capture the full range of uncertainties. Each of these describes what a particular future would look like at the end of the planning horizon (typically 20+years). As part of a specific scenario/future, there needs to be a "story line" to explain how the future develops over time to get to the end state. Such scenarios can then be used to "wind tunnel" test projects and strategies.

In addition to the "stretching" scenarios/futures, there needs to be a view of a "most likely / betting future" which forms the base case.

RIT-T assessment can then be conducted using the base case and tested for robustness in the stretching scenarios/futures.

AEMO should be tasked with facilitating such a scenario planning process and engaging industry in the process.

Recommendation: The AER needs to prescribe a scenario planning process (eg Shell scenario planning/learning) for AEMO to follow when preparing the NTNDP/ISP. The TNSPs/DNSPs should be obliged to use the AEMO prepared scenarios for the purpose of the RIT T/D (some local customisation of the AEMO scenarios would be permissible as long as the scenario definitions were retained).

4. Complementary role of the ISP and RIT-T

The AEMO prepared integrated system plan (ISP) is valuable in informing the market regarding level network issues and opportunities. To a limited extent, participants are able to influence some elements of the ISP process and assumptions via industry reference groups. However, the ISP is a high level view and does not contain detailed project specific costs and benefits as currently addressed by the RIT-T.

The modelling used to develop the ISP is not sufficiently detailed to effectively assess each element of transmission augmentations. In addition, it is beyond the scope of the current ISP process to fully consider non-network solutions. There is no prescribed consultation process regarding specific augmentation of network elements and non-network solutions.

Incorporating the missing elements from the RIT-T into the ISP process would make the whole process massively complex and unworkable.

In combination, these shortcomings make the ISP process unsuitable to replace the RIT-T process.

Recommendation: The AER ensures that the ISP is not used as a replacement for the RIT-T but is used as a key input into full and detailed RIT-T modelling conducted for a specific project.

5. Shortcomings in the NTNDP/ISP modelling

The process employed in the NTNDP and ISP utilises time series modelling using cost based bidding or least cost modelling. These modelling techniques are used, as they are simpler and non-controversial since cost assumptions are generally agreed across the industry. However, such modelling results in dispatch and congestion patterns that substantially different to real market outcomes (ie market modelling/non-cost based bidding).

The result is that incorrect congestion can be identified while congestion experienced in the real market is missed either in part or entirely.

Historically this has led to some benefits being overstated and some costs of augmentation understated, as other elements contributing to the congestion were missed. Inter-regional congestion crippled by intra-regional constraint was missed due to different dispatch patterns.

Recommendation: The process for developing the NTNDP should include market modelling as well as the existing cost based modelling to ensure that “real world” dispatch pattern variations are also captured. Model benchmarking against real market outcomes should be included in the process to ensure the model is “fit for purpose”.

6. Question 10 - Wealth transfer considerations and impacts

ENGIE supports the treatment of external funding of projects as a reduction in project costs as they also reduce costs to consumers. The definition of a sector (ie producers, consumers and transmission) and the proposition to ignore wealth transfers within this sector make sense in the context of pure economics.

However, there is a potential issue as illustrated in the following example.

1) New renewable generation project is expected to cause congestion in the shared network.
2) The removal of the congestion would result in 60% of the transmission augmentation benefits flowing to the customers and 40% to the generator
3) The RIT-T assessment shows that the benefits of the augmentation are only 90% of the cost
4) Therefore based on the RIT-T the renewable project doesn’t go ahead

5) The renewable project proponent offers to fund 50% of the augmentation costs. This is in excess to the proportion of the benefits derived and hence reduces the costs to consumers.

6) <u>However since the funding is coming from within the sector, the payment is treated as wealth transfer and doesn't affect the project cost used in the RIT-T.</u>

7) <u>Consequently the project still doesn't pass the RIT-T and doesn't go ahead</u>

8) <u>The renewable generator proponent would have to fund 100% of the augmentation costs outside of the RIT-T test for it to go ahead. If this was to occur, customers would receive 60% of the benefit and get a free ride</u>.

9) <u>The renewable generator would not have any rights to the capacity delivered by the augmentation and the augmentation would not make economic sense</u>.

Recommendation: Allow the additional funding by any entity or participant to reduce the project costs used in the RIT-T test and hence reduce the cost to consumers.

7. Q12 and Q15 - Selection of a base case and environmental policies

There is unprecedented level of uncertainty regarding climate change policies and approaches to reductions of CO_2 emissions both domestically and globally. Domestically the CO_2 reduction policies have changed numerous times over the last decade and several party leaders have lost their positions as a consequence of their policy stance on this issue.

Technology advances and developments in CO_2 sequestration science will play an extremely important role in the future. The CO_2 sequestration will include soil carbon and "blue carbon" (sequestration in coastal echo systems) and is expected to have a major impact on the quantum of abatement available and will ultimately impact the climate change policies adopted by governments.

Current focus on electricity in isolation of other sectors is bound to be flawed, as the electricity sector is highly unlikely to be lowest cost sector to abate emissions in the future. A much broader approach to abatement needs to be considered.

It is extremely important that strong opinions, and bias towards extending existing climate change policies, doesn't bias the base case (ie bias is "baked" into the base case (or BAU) scenario). An effective scenario planning process as outlined earlier will ensure that climate change policy uncertainty is fully considered in stretching futures/scenarios. As a matter principle, the base case should not have "linear" extension to the existing (legislated) environmental policies.

Recommendation: The base case must only include current policies and not attempt to second-guess global responses and future state and federal government environmental policies. Global responses and additional policy assumptions should be tested together with internally consistent technology assumption in the relevant stretching scenarios/futures.

ENGIE trusts that the comments provided in this response are of assistance to the AER in its deliberations. Should you wish to discuss any aspects of this submission, please do not hesitate to contact me on, telephone, 0417343537.

Yours sincerely,

David Hoch
Regulatory Strategy and Planning Manager

Appendix 1

Extract from ENGIEs submission to COAG to the Review of the Regulatory Investment Test for Transmission

The NEM design was based on a relatively fixed set of assumptions

- Electricity demand was met by large generators distant from load centres.
- Demand was growing and was expected to continue to grow into the future.
- New entrants were expected to be conventional gas or coal fired plant.
- Large quantities of intermittent generation weren't contemplated.
- Transmission and distribution provision was a recognised monopoly service, needing regulation to co-exist with the NEM market based arrangement.
- Transmission augmentation was justified from a consumer benefits perspective (since they paid for transmission). Generators paid for shallow connections to the network and consequently didn't have any firm transmission rights under the so called "open access regime".

It should be noted that a "more predictable environment" was quite forgiving to over investment in transmission as the capacity was likely to be used eventually as demand grew. Hence, it can be argued the risk of inefficiency of building too early amounted to the "time value of money".

Current developments make for a more uncertain future

- Demand growth is flat or decreasing.
- Large and increasing volume of distributed renewable generation (mostly intermittent) is entering the market.
- Large uncertainty surrounding climate change policy makes investment decisions difficult and risky.
    - This is compounded by unilateral actions by states to increase renewable generation beyond the existing RET.
    - Climate change policies are in a state of flux and will not be "locked in" for the duration of a transmission project (say 20+ years).
- There is steady exit of fossil plant due to the reduced demand for dispatchable generation, low electricity prices and uncertainty of environmental policies.
- Technological developments in solar PV and battery technology make these options more economically attractive and contribute to increased penetration.

- RIT-T process is severely challenged by vastly different possible futures which are not currently captured by AEMO NTNDP scenarios.
- Range of ancillary services provided by thermal plant is diminishing over time.
    - Some services required for system stability, provided by conventional plant, such as inertia and load following, are already difficult to manage in some regions (as is evident by the recent SA blackout).
- Changing requirements from networks (transmission and distribution) due to changing customer behaviours and choices.
- Fault level currents are becoming an issue as large generators exit the mix.

⇒ More uncertain decision environment

The original regulation of transmission was replaced by the RIT-T rule change implemented in July 2009. At this time some of the intermittent generation had entered the market, but the technological and cost advances in renewables and storage technology were yet to come. Distributed generation has grown beyond even the most optimistic levels and has challenged the large centralised generation and transmission models.

In addition, since the RIT-T was introduced, uncertainty around climate change policies has increased, not decreased as expected.

A combination of these developments has made the future far less certain and made accurate long range planning extremely challenging.

⇒ Customer benefits are uncertain

In this environment it is far from clear that large interconnectors, if built, will be sufficiently utilised over their asset life.

In the event that generators locate to benefit from the underutilised transmission, they effectively receive a subsidy from customers by gaining access to “free transmission”. For example, renewable generators could locate in a higher wind/solar yield region and receive “free transmission” to maximise their returns. This represents a value transfer from customers to generators. This makes even more uncertain that interconnectors will deliver sufficient customer benefits to underwrite their high capital costs.

The long lead-time of large transmission augmentations means that the claimed benefits under a RIT-T may no longer exist by the time the interconnector is constructed, yet customers remain committed to funding these projects over their asset life. Under the current regulatory model, risks of underutilised transmission, and cost of economic value transferred to generators by providing “free transmission”, is passed onto consumers.

Given the recent views of the growing role of decentralised generation, customers acting as prosumers, and move away from large generation, it could be argued the RIT-T should be more not less stringent.

Given the level of uncertainty, the RIT-T in its current form may no longer be sufficient to avoid inefficient investment in transmission.

⇒ No level playing field

Transmission projects compete with generation projects, yet the investment drivers and risk allocation profiles between the two are entirely different. Generators face a wide range of risks including market, technology, economy, fuel and environmental policy uncertainty. In contrast to this, transmission projects remain completely shielded from such risks.

When assessed on an economic resource cost basis, it is usually more efficient to build additional generation either side of an interconnector instead of funding a major upgrade of an interconnector when similar levels of WACC are used (in least cost expansion studies).

The asymmetry of risks affects the cost of capital, and can bias solutions towards transmission projects.

⇒ Only certainty is that customers will pay

Customers already face substantial increases in electricity costs and affordability will be further negatively impacted by such a wealth transfer.

It is arguable that the existing RIT-T model is no longer effective and a substantial redesign is called for.

Summary of the issues with the current RIT-T arrangements

- Benefits are only justified once up front, hence the over reliance on the RIT-T to screen economic efficiency once and for all.
  - Costs are locked in for a long time but the delivery benefits are not .
  - Transmission projects tend to be expensive and have long asset lives in the order of 20-40 years.
  - Assessment will only be as good as the ability to forecast the long term future, which is all but impossible.
- The current regulatory arrangement shields transmission projects from all risks (except for operational and maintenance).
- Consumers wear the risk of inefficient planning decisions and construction of uneconomic assets.
- The value of some generation projects can be enhanced by receiving transmission for free at the expense of customers.
- Transmission projects compete with generation projects, but don't compete on a level playing field. Specifically transmission is shielded from most risks and has a regulated rate of return, whilst generation and other competing options are exposed to a wide range of risks. These projects will typically require a higher WACC making the projects more costly (they cannot pass their risks onto customers).
- The range of scenarios used in the RIT-T process doesn't capture the full range of future uncertainty
  - Some scenarios are simple sensitivities around a central theme instead of distinctly different internally consistent scenarios.
- The RIT-T allows for catastrophic events but because these are averaged over the scenarios there may not be an economic case to undertake an augmentation project. However governments and business may

not be prepared to accept such eventualities (as they may lose office or their business). In this case there could be a third leg of the RIT-T introduced dealing with payments for “insurance” type augmentations.

The need for scenario planning

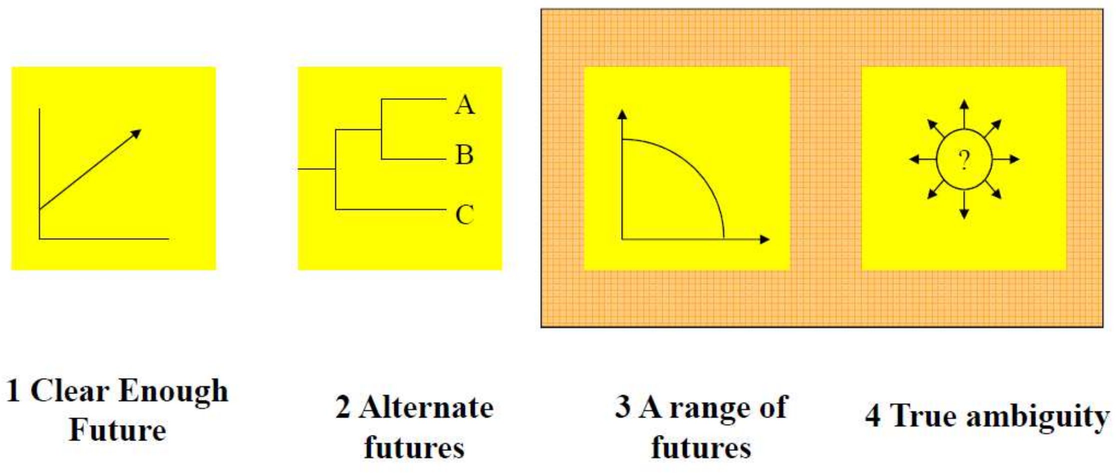
The use of effective scenarios in the RIT-T process is imperative to deal with the range of uncertainties in the future. The AEMO developed scenarios for the NTNDP tend to be used in the RIT-T process, but there is no obligation to use these by the TNSPs.

The process for developing scenarios by AEMO has varied over time, but remains over simplistic and more suited to a reasonably certain future, rather than a range of “stretching” futures or high level of ambiguity. The current approach of using neutral, weak and strong scenarios is suited to a highly predictable environment and amounts to a single view of the future with a couple of sensitivities (uncertainty levels 1 and 2 in the diagram below).

To deal with higher levels of uncertainty, different techniques are needed, and scenario planning as pioneered by Shell is considered more appropriate. The scenario planning process is a planning technique that produces a set of scenarios with a special set of properties. Whilst the technique provides a holistic approach to assessing strategic options, its scenario development attribute is advocated here.

The technique uses a rigorous process to identify key uncertainties and provides a framework for building them into an internally consistent scenario cut set.

The following shows shaded areas where scenario planning is useful and appropriate when there is a large



(Ref 20/20 Foresight, Hugh Courtney, McKinsey & Co)

uncertainty, such as a range of futures or true ambiguity (ie uncertainty levels 3 and 4).

A new arrangement is needed to deal with the changed environment

The key elements of a modified regulatory arrangement for transmission are as follows:

- The arrangement needs to efficiently meet customer needs in the longer term by more effectively dealing with an increasingly uncertain future.
- Once in operation, the project must be more responsive to changing circumstances and sheet some of the risks back to the transmission project instead of the consumer.
- Simplify the RIT-T process / more appropriate risk sharing.
    - Transmission projects should be relied on for “insurance” against some events only in the near future which is reasonably clear (and not in the medium to longer term which is increasingly uncertain).
- The guaranteed transmission cost recovery from customers should not cover the full cost of the transmission.
    - One possible way of calculating customer funded payments can utilise the scenario modelling under RIT-T and calculate a base payment on the lowest value of benefits determined in any of the scenarios. This would essentially form a “riskless investment” and as such attract low level of WACC.
    - The remainder of a project cost would be subject to market conditions and have a much higher level of WACC as the revenue is at risk and would not be funded by the customers. Instead, these payments could come from other beneficiaries of the transmission project, or third parties such as governments if they wanted the project to proceed for other reasons (externalities to the market and of little customer benefit).
- Ideally, payment to transmission should be based on actual provision of services/benefits. This would be a dynamic process rather than “historical view of the future”. It may also include some generators as they gain benefits from the augmented interconnection (eg intermittent renewables).
- The process for developing scenarios used in the RIT-T assessment should be prescribed. The process of developing scenarios should be based on proven techniques such as the scenario planning process AEMO should be tasked with facilitating the scenario planning process and engaging an industry reference group (this happens now but the scenario planning process is not prescribed).
- The process for developing the NTNDP should include market modelling as well as the existing cost based modelling to ensure dispatch pattern variations are captured. Cost based modelling is simple but produces dispatch and congestion patterns that are quite different to the real market outcomes.