

November 2018

Dr Kerry Schott AO
Chair – Energy Security Board
COAG Energy Council Secretariat
GPO Box 787
CANBERRA ACT 2601

By email: info@esb.org.au ; energycouncil@environment.gov.au

Dear Dr Schott;

ANLEC R&D Response to Consultation on Proposed Metrics for Strategic Energy Plan

Thank you for the opportunity to respond to the proposed metrics for the Strategic Energy Plan.

ANLEC R&D is acutely aware of the importance suitable metrics will play in monitoring the performance of a Strategic Energy Plan. In the circumstances of a rapidly transforming Australian national electricity asset portfolio, it becomes vitally important that these metrics are designed to deliver an “**optimised future system**”.

On this premise, conventional metrics will not suffice. We need new and revised metrics that are faithful across the changing electricity asset portfolio. These will inform the revision of the market rules, design market conditions, inform technology choices and shape regulations to deliver the competitive energy outcomes targeted.

ANLEC R&D commissioned modelling of the “Total Systems Cost” for the Australian Electricity System¹. Metrics developed for the Strategic Energy Plan may be usefully drawn from the outcome of such analysis. In the attached document, I provide for the Board’s consideration, feedback to selected proposed metrics. These views are substantively drawn from the systems analysis referred to earlier.

ANLEC R&D is willing to provide a detailed presentation of the most up-to-date results from our on-going modelling effort and/or deliver any further information you or your Secretariat may require.

Yours faithfully;



Dr Noel Simento
Managing Director

¹ [Boston, A., Bongers, G., Byrom, S. and Staffell, I.\(2017\), Managing Flexibility Whilst Decarbonising Electricity](#)



Response to Consultation on Proposed Metrics for Strategic Energy Plan

Dr Noel Simento – Managing Director

ANLEC R&D Response to selected metrics proposed to assess the outcomes and objectives of the Strategic Energy Plan

Outcome: affordable energy and satisfied consumers

- *Energy is increasingly affordable for all consumers, supported by adequate consumer protections and access to dispute resolution*
- The most important metric is The Total (electricity) System Cost (TSC). This underlies all of the proposed metrics as it is the cost of providing a secure electricity service to meet stakeholder objectives. It is the total system cost that needs to be minimised to protect consumers. This metric can be compiled and modelled from current data¹.
- The TSC is a measure the total amount paid to generators through wholesale price and subsidies, additional costs of the system operator to balance the system, network owners to maintain the wires and retail companies to service their customers. **This is the cost that has to be met (directly or indirectly) by consumers so rises here will inevitably feed through to household bills, and industrial competitiveness.**
- Reduction in energy spend as a % of household disposable income
- We agree that this is a useful metric, more useful than price, but is secondary to the total system cost suggested above which will be the most important driver for this one.
- Commercial & Industrial customers' energy costs are competitive with international counterparts

The energy costs charged to C&I customers will be a function of Total System Cost. Hence TSC is an important metric to inform investment in the electricity system

Vulnerable consumers are on suitable pricing plans, receiving concessions when needed, and can benefit from distributed energy and energy efficiency schemes

- Energy efficiency, solar and/or storage programs implemented in public housing where cost efficient
- We agree but the emphasis here is on “cost efficient”. For these measures to work they need to be beneficial to the consumer, the housing owner and the system as a whole. Developing such a metric must take account of the total system cost.

Outcome: Secure electricity and gas system

¹ [Boston, A., Bongers, G., Byrom, S. and Staffell, I. \(2017\), Managing Flexibility Whilst Decarbonising Electricity - the Australian NEM is changing](#)

Markets operate safely, securely and efficiently, under full range of operating conditions, with minimal intervention

- Electricity market operates within power system security standards (frequency operating standard) and technical requirements (voltage, temperature, current limits)
- The electricity system can operate within the frequency limits and technical requirements but still be insecure – it could be that the system is vulnerable but has not been tested. This metric should be strengthened to be defined in terms of there being sufficient grid services (such as reserve, response and inertia) for the system operator to run a system that is secure against realistic contingent failures at all times.
- As States are only weakly interconnected this should be reported on a state by state basis to ensure they are secure if interconnectors fail and they become “islanded”. As an aside, the current definitions of non-credible events should be re-examined and ‘tightened’.

Outcome: Reliable and low emissions electricity and gas supply

Electricity and gas sectors efficiently deliver at least their share of emissions reduction target/s while ensuring reliable supply

- Electricity and gas sector emissions reduce in line with the sectors’ share of national emission reduction target/s
- Emissions reduction is easier and lower cost for some sectors relative to others. Transparency in determining a sector burden for meeting national targets will be necessary.
- Therefore, to understand the “fair share” for each sector **there needs to be a clear and costed plan across all sectors and emission sources to reduce emissions in line with long term national targets and international agreements in an optimal way.** This should be the first metric. The second metric should then be the one suggested, benchmarked against this agreed national plan for each sector.
- Annual reduction in number of times RERT procured and activated
- RERT may not have to keep reducing, there will be an optimum level to achieve, reductions beyond that could be ineffective and costly as they represent a system that is over specified. Therefore, the optimum level of calls should be determined/specified and the closeness of the system to this level is monitored.

It is almost certainly not cost efficient for each sector of the Australian economy to reduce emissions in line with national targets. For example, transport will find it very difficult and expensive to make reductions in line with the commitments made at Paris, whereas the Land Use and Land Use Change sector has made large reductions since the 2005 baseline. The gas sector has seen increase in emissions since 2005 associated with the development of LNG and unlikely to return to 2005 levels never mind make a reduction. The electricity sector though has a relatively low cost of abatement and other markets have made large reductions in emissions intensity at a relatively low cost. (e.g. the UK)

- Development of, and then maintenance of or improvement in, key metrics:
 - Strategic reserves
 - Flexibility and dispatchability
- Demand reduction (for existing loads) is probably one of the most important measures and ought to be included as a metric. It is about the only measure that improves grid security, reduces emissions and improves affordability. By leading here Australia will have a competitive edge by more easily meeting its emission targets and reducing cost of production. A suitable metric could be “Demand reduction is at least as effective as the upper quartile of other OECD countries.”
- Potential policies to reduce CO₂ emissions should calculate the effective cost of abatement (the increase in total system cost divided by the amount of CO₂ abated). An additional metric on policy makers is that the ones undertaken specifically to reduce emissions should demonstrably have the lowest cost of abatement in comparison with potential measures across the energy sector and in other sectors.

Investors efficiently manage risk to support investment, operation, retirement and innovation decisions

- It is reasonable that private investors will drive to maximise their return and hence can be relied upon to manage risk, operation and innovation within a given “system”.
- There does not however, seem to be a metric around managing policy risk. What is needed revised/new metrics that are faithful across the changing asset portfolio. These will assist to revise the rules/market conditions/technology choices/regulations etc that will take Australia to the competitive energy outcome targeted
- **Total System Cost - properly defined - can be that metric to inform policy and regulatory development for a decarbonized** electricity system. The total system cost must take account of and be faithful to operational decisions taken by the market operator – consequently, the most qualified to develop and report on a TSC approach would be AEMO/AMC
- *Average forward swap and cap contract prices for electricity in line with the efficient levelised cost of energy*
- As the proportion of subsidised power delivered to the wholesale market increases it must be expected that the wholesale price will drift further below the cost of electricity production. For generators to “stay in business” other means of paying for their services will have to be devised. In this scenario of supplementary markets and payments around and often external to a pure electricity market, it is difficult to envisage how contract prices could reflect the real cost of electricity.

- It is important to note here that we do not believe that Levelised Cost of Energy (LCoE) has any value in comparing one technology against another. This metric was designed to compare baseload thermal plants with each other and it is tempting to think it can be extended to renewables and other non-baseload plant. However it hides costs that are picked up within the system and attributes all value to the production of energy, and furthermore assumes that the time of delivery of that energy is irrelevant.
- Many technologies provide a range of grid services (such as flexibility, reserve and firm capacity) which are increasingly valuable in their own right. In fact, some technologies (storage being one) consume energy and yet the value of the services they provide exceeds the system cost that they may incur. The value of a technology should be assessed on its ability to reduce the Total System Cost, and hence its ability to reduce consumer bills whilst achieving national targets such as carbon abatement.
- All market participants comply with any rules around notice of closure
- A well-functioning electricity market that procures sufficient firm capacity in advance does not need onerous rules around notice to closure, therefore this metric would seem to be redundant if the portfolio of metrics and initiatives are realised.

Outcome: Effective development of open and competitive markets (where appropriate)

Wholesale and retail markets are competitive and deliver efficient outcomes for consumers

- Retail and wholesale prices over time (contract and average spot) reflect the long run marginal cost (LRMC) of producing electricity and gas
- For this to happen there should be no subsidised providers (see point □ above) and each objective or service required by the market should have an associated commodity price (so if carbon abatement is an objective then there should be a carbon price). Without these it cannot be expected that prices converge on LRMC of production.
- Market concentration continues to decline across all regions
- An increasingly fragmented market is not necessarily good. Overheads multiply and innovation is stifled due to lack of financial underpinning to take on risks of large demonstrations. A better metric would be to target market concentration within a certain range.
This metric may also make it difficult for the individual States to further invest in power generation assets (this is relevant to Qld in the short term, where much of the power generation asset base is owned by the State.)
- Increase in new market participants year on year

- No – see above

Innovation is incentivised and enables value from new technologies

- Creation of value streams for the efficient delivery of system security services (e.g. inertia, fast frequency response)
- We agree that this is a good objective and metric but it should be broadened to give value to technologies that meet other requirements such as carbon abatement or demand reduction. This should also be considered with the objective of keeping the total system cost to a minimum.
- Increased uptake of service provision from DSR & DER (volume year on year)
- This would be better rewritten as development of a technology neutral market open to all forms service providers of which DSR/DER is one of many options available.

Outcome: Efficient and Timely investment in Networks

Networks incentivised to be efficient platforms for energy services

- Time taken to consider and process rule changes and regulatory approvals in line with best practice international regulatory processes
- An extra metric to foster innovation should be considered: “The creation of “sandpits” to test rule changes or allow new technologies to develop without incurring onerous regulations that could stifle innovation and early adoption.”