17 June 2016

Colin Mugglestone
Chair,
Queensland Renewable Energy Expert Panel
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via email: www.QLDREpanel.com.au

Queensland Renewable Energy Expert Panel – Issues Paper

Dear Mr Mugglestone

The Energy Networks Association (ENA) welcomes the opportunity to make a submission to the Queensland Renewable Energy Expert Panel (REEP) in response to its *Issues Paper* published in May 2016. Thank you for agreeing to consider this late submission.

The ENA is the national industry association representing the businesses operating Australia's electricity transmission and distribution and gas distribution networks. Member businesses provide energy to almost every household and business in Australia.

1. Policy Objectives and Options

ENA notes the stated energy policy objectives of the Queensland Government cited in Table 1 of the Issues Paper. It would be appropriate for the Panel to clearly establish what the underlying public policy objective of the Queensland Renewable Energy Target would be.

The Issues Paper focusses on its contribution to **carbon abatement.** If that is the objective, then the policy framework should have a clear focus on carbon abatement outcomes achieved at least cost. This will clearly stimulate significant increases in renewable energy generation where it is efficient form of abatement. As summarized in Attachment 2, recent analysis by Jacobs for the ENA assessed a policy framework which seeks to achieve a 45% emission reduction target (below 2005 levels by 2030). The analysis considered a scenario where the target is achieved through a 50% renewable energy target (certificate scheme) and a Baseline and Credit scheme, or scenario where the target is only achieved by a Baseline and Credit Scheme. The analysis found that:

- ***both*** policy options achieve the emissions abatement target of 45%;
- renewable energy output would increase significantly under all scenarios by 63,000 to 70,000 MWh, or twice the size of the current Renewable Energy Target; and
- while achieving *no* additional abatement and only 7,000 GWh additional renewable energy output, an additional requirement to achieve a 50% renewable energy target would add an additional $2 Bn to the cost over the decade to 2030; and increase customer bills by $122 per year in 2030;

The ENA also notes recent analysis for the Queensland Productivity Commission conducted by Acil Allen, which showed that the QRET (using large scale feed-in tariffs) would require a subsidy of about $10.8 billion (real) over the period to 2030.[1]

These analyses indicate that the introduction of a renewable energy target does not increase the *efficiency* or *effectiveness* of the growth in renewables. The "indirect policy incentives" recognized by the Panel Issues Paper appear better placed to achieve the energy policy objectives of the Queensland Government which the Issues Paper notes as: *better functioning energy markets; enhancing customer value; facilitating economic growth and innovation; protecting the environment; and improving government effectiveness.* There is material evidence that a legislated, technology specific renewable energy target would perform more poorly than technology neutral "indirect measures" against the Government's stated objectives.

If, however, the public policy objectives intended by the target are broader than carbon abatement - such as Queensland renewable energy **industry development** and supply chain participation – then it would be desirable for the Panel and the Government to:

- be explicit about the intended objectives unrelated to carbon abatement; and
- transparently evaluate the incremental costs and benefits of a renewable energy target rather than carbon abatement policy to confirm they are in the public interest.

ENA supports the development of policy initiatives that achieve the effective monitoring and abatement of greenhouse gas emissions to meet Australia's current and future international obligations. The ENA supports climate policy options that focus on outcomes - achieving Australia's abatement targets at least cost and in a technology neutral manner. Frameworks for abatement should facilitate national abatement outcomes in an economically efficient manner across all relevant sectors of the economy. They should seek to minimize economic distortions and, in the case of the stationary energy sector, emissions abatement policy must consider, and be appropriately integrated with, energy policy objectives and market frameworks.

2. Impact on the electricity system

The ENA considers that the potential implications of additional policy measures on the operation, safety, security and reliability of the system should be carefully evaluated. Energy networks are committed to enabling a low carbon generation future which is likely to feature increasing levels of renewable generation at large scale and small scale, in combination with other distributed resources.

Nevertheless, the design of policy measures and their integration with existing State and national instruments, can have material implications for the efficient operation of the electricity system. The efficiency of the NEM design may be impacted in the following areas:

- Reducing levels of synchronous generation and increasing levels of intermittent generation reduces the ability of network service providers to manage electricity frequency and voltage. Frequency and voltage of electricity directly impacts the performance of customer equipment.
- Re-establishing system security (in terms of safety, quality and reliability) following a major outage may be made more difficult by policies which reduce the ability of network service providers to manage the network or system operations;
- System constraints may be created by inefficient location of new generation sources (such as large scale solar or wind farms); and

[1] See the ENA Submission to QPC, *Electricity Pricing in Queensland Draft Report*

- A rapid and significant introduction of renewable generation may require reevaluation of existing wholesale market frameworks, challenging the commercial viability and contractual frameworks by which capacity and inertia are secured in the NEM, as short-run costs and bid prices impact on availability of generation and ancillary services.

These implications require assessment in advance and will require new system operation and network management capabilities to be developed in anticipation of, rather than after, emerging issues. Energy networks, together with the Australian Energy Market Commission and Australian Energy Market Operator have been assessing the potential implications of changing generation fleets on the National Electricity Market. ENA and CSIRO are also partnering in a long-term research program to develop the Electricity Network Transformation Roadmap. The Roadmap is designed to identify the preferred transition which the electricity network industry must make in the next decade, to support better customer outcomes. It is assessing the technical impact of changes in sources of electricity generation on electricity reliability and performance for all customers. To highlight two examples:

- The loss of synchronous generation will require other solutions to manage loss of inertia, and provide dispatchable, low carbon energy sources to balance the power supply in real time. There are potentially multiple solutions to these issues through a range of innovative options being developed. The solutions to intermittent generation could lie in concentrated solar thermal technology, battery storage or other options that remove the carbon footprint of conventional generation, like renewable biogas, carbon capture and storage, or storing energy in gas networks through Power to Gas technology.

- Safety and reliability impacts from standards of connection of residential solar PV, batteries and other new technologies to the electricity network should be considered when pursuing policies that may result in sudden uptake of these technologies. The ENA, together with industry stakeholders, is working with Standards Australia to ensure adequate connection standards and guidelines are in place to maintain required electricity safety and reliability; further support of Standards Australia initiatives is needed to ensure ongoing updates of Standards as technology changes.

Consistent with the recognition of the COAG Energy Council of the need to better integrate carbon and energy policy, a Queensland policy explicitly targeting an increase in the level of renewable generation connected to the electricity network should be accompanied by adequate supporting power system analysis and appropriate measures to address technical implications in the interest of all customers.

Should the Expert Panel or the Queensland government propose to develop a 50% renewable energy target regulatory framework, it is recommended it be accompanied by a 'readiness assessment' of the electricity system to accommodate the attendant loss of synchronous generation informed by recent work undertaken in South Australia and other jurisdictions.

Thank you for the opportunity to provide this submission.

The ENA would be happy to support your consideration of these issues in any way that would assist. Please do not hesitate to contact us via Dennis Van Puyvelde at (02) 6272 1548.

Yours sincerely,

John Bradley
Chief Executive Officer

Attachment 1

ENA Response to Consultation Questions

Policy options for increasing renewable energy

Consultation Question	***Response Type***
1. What policy options are likely to deliver increased renewables in the most effective and efficient manner under a Queensland renewable energy target, taking into account existing schemes such as the Federal LRET?	Renewables will "increase in the most efficient and effective manner" when they provide their optimum economic role under integrated carbon and energy policy and regulatory frameworks which achieve the required emission abatement outcomes. Recent analysis by Jacobs for the ENA assessed a policy framework which seeks to achieve a 45% emission reduction target (below 2005 levels by 2030). The analysis considered a scenario where the target is achieved through a 50% renewable energy target (certificate scheme) and a Baseline and Credit scheme, or a scenario where the target is only achieved by Baseline and Credit Scheme. The analysis found that: • **both** policy options achieve the emissions abatement target of 45%; • renewable energy output would increase significantly under all scenarios by 63,000 to 70,000 GWh, or twice the size of the current Renewable Energy Target; • while achieving no additional abatement and only 7,000 GWh additional renewable energy output, an additional requirement to achieve a 50% renewable energy target would add an additional $2 Bn to the cost over the decade to 2030; and increase customer bills by $122 per year in 2030; This analysis indicates the most efficient and effective growth in renewables is ***not*** by the introduction of a renewable energy target conflicting with carbon policy frameworks. Explicit and enduring national carbon abatement frameworks that rely on competitive market responses will result in renewables growth at the lowest cost to the consumer. It would be appropriate for the Panel to evaluate the underlying **public policy objective** of the Queensland Renewable Energy Target. The Issues Paper focusses on its contribution to carbon abatement. If that is the objective, then the policy framework should have a clear focus on carbon abatement outcomes achieved at least cost. This will clearly stimulate significant increases in renewable energy generation where it is efficient form of abatement. The increasing competitiveness of renewable energy sources

	is clearly demonstrated in the Australian Power Generation Technology Report[2] cited by the Panel at Figure 22: *Indicative levelised cost of generation from new power stations of different technologies –possible changes over time.* This is consistent with the "indirect policy incentives" recognized by the Panel Issues Paper, which appear better placed to achieve the stated Queensland energy objectives at Table 1 of the Issues Paper, including: Better functioning energy markets; Enhancing customer value; Facilitating economic growth and innovation; Protecting the environment; and improving government effectiveness. There is material evidence that a legislated, technology specific renewable energy target would perform more poorly than technology neutral "indirect measures" on the Government's stated objectives. The ENA notes recent analysis for the Queensland Productivity Commission conducted by Acil Allen, cited in ENA's submission[3]. "*ENA notes that the Acil Allen modelling shows that the QRET (using large scale feed-in tariffs) would require a subsidy of about $10.8 billion (real) over the period to 2030"* If however, the public policy objectives intended by the target are broader than carbon abatement - such as Queensland renewable energy industry development and supply chain participation – then it would be desirable for the Panel and the Government to: • be explicit about the intended objectives unrelated to carbon abatement; and • transparently evaluate the incremental costs and benefits of a renewable energy target rather than carbon abatement policy to confirm they are in the public interest.
2. What, if any, are the key policy barriers in Queensland preventing renewable energy investment?	The most significant policy weaknesses in the Queensland energy market impacting on renewable energy investment are caused where policy frameworks are inadequately integrated with energy policy and with other jurisdictions, given the national nature of Australia's energy market. The two most significant policy reforms required to support the efficient and timely development of renewable energy investments include: • The reform of electricity network tariffs to incentivize efficient investment in distributed energy resources, without unintended impacts on other customers; and • The transition from a disparate range of input-based, technology specific measures to address carbon policy objectives to outcome-based, technology neutral policy frameworks.

[2] http://www.co2crc.com.au/wp-content/uploads/2016/04/LCOE_Report_final_web.pdf
[3] http://www.ena.asn.au/sites/default/files/ena_submission_to_qpc_pricing_inquiry_draft_report_final.pdf

3.How might the Queensland Government expedite the delivery of renewable projects (eg regulations and development approvals)?	No response provided.
4.How can the existing framework better support alternative energy solutions, particularly in fringe-of-grid and isolated locations?	It is of critical importance that frameworks that are developed in this area: • provide economic incentives to promote efficient price, reliability and safety outcomes to both the affected local community and grid-connected customers as a whole. • provide flexibility for regulated networks to discharge their obligation to supply through flexible customised community solutions using the full range and most efficient mixture of new technologies, and ensure resulting savings are passed through to both local communities and those remaining on the grid, in circumstances where assets are decommissioned. • avoid creating unnecessary policy or regulatory risk, ensuring appropriate investment confidence for all parties including conventional service providers, new entrants and customer-led investments. • take account of the need for the costs of universal service obligations (or supplier of last resort obligations) to be sustainably recovered in a way that minimises inefficient investment and usage decisions.
5.Are there any other considerations that should be taken into account when defining a renewable energy target for Queensland (eg concurrent progress in energy efficiency, hybridization, the use of renewables in industrial processes)?	As noted above, it would be appropriate for the Panel to evaluate the underlying **public policy objective** of the Queensland Renewable Energy Target would be. The Issues Paper focusses on its contribution to carbon abatement. If however, the public policy objectives intended by the target are broader than carbon abatement - such as Queensland renewable energy industry development and supply chain participation – then it would be desirable for the Panel and the Government to: • be explicit about the intended objectives unrelated to carbon abatement; and • transparently evaluate the incremental costs and benefits of a renewable energy target rather than carbon abatement policy to confirm they are in the public interest.

Funding renewable energy

Consultation Questions	***Response Type***

6. If subsidies for renewables are required, how should they be funded (eg paid by electricity consumers, funded from the state budget, funded through social bonds, etc)?	The ENA supports technology neutral policy and regulatory frameworks and the achievement of public policy objectives including carbon abatement at least cost to customers. If a technology specific subsidy is proposed to achieve carbon abatement or industry development, it should be: • Fully evaluated and demonstrated to be a net public benefit; • Transparently funded at least incremental cost through the State Budget where it can be justified as a public policy program; • Avoid unnecessary distortions to national electricity markets and regulatory frameworks during a dynamic period of change.
7. Should any consumers be exempt or have their contribution discounted on either efficiency or equity grounds (eg trade exposed sectors, low income consumers, etc)?	No response provided.

Impact on the electricity system

Consultation Questions	***Response Type***
8. What factors should the Queensland Government consider when assessing power system reliability and stability outcomes from policy options?	The Queensland Government should consider: • Ability for network service providers (such as Powerlink, Energex and Ergon Energy) to provide adequate electricity safety, reliability and quality to all customers, managing the integration of intermittent generation sources and associated monitoring and management complexity. • Relevant analysis undertaken by electricity network providers, including ENA and its members with other industry stakeholders of potential implications of high penetration renewables and opportunities to effectively integrate these resources.
9. How might the policy options affect the efficiency of the current NEM design?	The efficiency of the NEM design may be impacted in the following areas: • Reducing levels of synchronous generation and increasing levels of intermittent generation reduces the ability of network service providers to manage electricity frequency and voltage. Frequency and voltage of electricity directly impacts the performance of customer equipment. Grid scale storage technology or renewable forms of synchronous generation should be considered if policies reduce the availability of traditional synchronous generation sources. • Re-establishing system security (in terms of safety, quality and reliability) following a major outage may be made more difficult by policies which reduce the ability of network service providers to manage the network or system operations; • System constraints may be created by inefficient location of new generation sources (such as large scale solar or wind farms); and • A rapid and significant introduction of renewable generation may require reevaluation of existing wholesale market frameworks, challenging the commercial viability and contractual frameworks by which capacity and inertia are secured in the NEM, as short-run costs and bid prices impact on availability of generation and ancillary services.
10. What changes to the NEM design might need to be considered with the implementation of the various policy options?	Energy Networks, together with the Australian Energy Market Commission and Australian Energy Market Operator have been assessing the potential implications of changing generation fleets on the National Electricity Market. See for instance the recent report of AEMO and Electranet. [4] As the power system evolves it may become more susceptible to frequency variation and AEMO's could be challenged in acquiring Frequency Control Ancillary Services (FCAS) in some circumstances. International jurisdictions are assessing the potential need to procure inertia, including synthetic inertia, and this may require a reevaluation of defined market services in Australia's energy-only NEM.

[4]Update to Renewable Energy Integration in South Australia.

11. What capabilities should be considered as requirements for new renewable generators of different technologies?	New renewable generators of different technologies should consider the following capabilities: • Location of generation should be optimised to ensure maximum benefit to network service providers and customers; • Adequate connection standards which minimise unnecessary barriers to distributed energy resources but manage the risk of impact of embedded generation on fault levels, voltage rise and power quality. • Adequate load control of suitable technologies should be available to network service providers to ensure delivery of required safety, power quality, and reliability to customers. • Technologies and connections should be required to meet suitable Australian Standards or industry guidelines. • Adequate training and skills are promoted within industry workforce to safely and efficiently install, maintain and dispose of new technologies.

Commercial and investment issues

Consultation Questions	***Response Type***
12. How might Queensland better leverage existing Federal support schemes, including attracting additional investment under the LRET?	The federal Large-Scale RET aims to achieve 33,000 GWh of generation from additional renewable energy sources by 2020. It is unclear whether the Government will increase this target beyond 2020, with both political parties reviewing their climate policies to reach a national 2030 greenhouse gas emissions target in mid-2017. ENA notes that both the Government's Emissions Reductions Fund and the former Government's carbon price provide lower cost abatement than the proposed QRET and hence the ENA suggests that the Queensland Government should work co-operatively with the other jurisdictional governments and the Australian Government on emissions reduction policy. ENA supports the COAG Energy Council's recent agreement to develop a national approach to better integrate carbon reduction and energy policies in the interests of consumers[5].
13. What role might the Queensland Government play when existing support schemes cease, and how might the Government attract increased private sector investment in renewable energy?	As above.

[5] COAG Energy Council Communique December 2015, p.1. http://www.scer.gov.au/publications/4th-coag-energy-council-meeting-communique-4-december-2015

14. Are there any key barriers to funding renewable energy projects in Queensland, and if so, how might these be overcome?	As above.

Attachment 2

Summary of Jacobs forthcoming analysis for ENA of Carbon Policy Options

The ENA recently commissioned Jacobs to analyse the potential outcomes for Australian energy consumers from a number of different policy approaches to market intervention to achieve carbon abatement.

This analysis has evaluated the achievement of abatement objectives under three policy scenarios:

1. '*Business as usual*' – This scenario assumes the continuation of the diverse range of various State and Federal abatement initiatives for specific technologies (e.g. renewables) or scale (e.g. SRES, Feed in Tariffs); and extends the use of a binding Safeguards Mechanism which limits sectoral emissions without trading.

2. *'Technology neutral framework'* – This scenario assumes that current abatement initiatives are made technology neutral via a low emissions target scheme (indifferent to scale) and that the Safeguards Mechanism evolves to a Baseline & Credit mechanism permitting trading among energy sector participants. The 2020 Large-scale Renewable Energy Target is met in this scenario.

3. *"Explicit Carbon Price'* – This scenario assumes that an explicit carbon price is established for the energy sector through an emissions trading scheme mechanism. This scenario is technology neutral.

The study considered both the power generation and the direct combustion sector, which included direct emissions from industry, and residential and commercial buildings. The modelling targeted both the 2030 emissions target and the cumulative emissions between 2020 and 2030. Two targets were considered in the study, the Coalition Government's 26-28% target agreed at Paris and the more challenging 45% target (including 50% renewables) proposed by the Australian Labor Party. The modelling focused on a national level but the results are provided here to provide insights for the Queensland Government in considering setting a 50% renewable energy target in Queensland.

While the final Jacobs' analysis will be available in the near future, the high-level results are instructive and provided to the Expert Panel for consideration.

The general conclusion of this study is that for either a 26 to 28% or a 45% emissions reduction target in 2030, that a technology neutral approach to reducing abatement can be achieved at a lower resource cost compared to business as usual (which specifies a renewable energy target) and offers the lowest energy bills to consumers.

The ENA supports technology neutral mechanisms to achieve abatement as they achieve abatement targets at lowest costs to consumers.

Summary of modelling results including a 50% renewable energy target

The issues paper questions which policy settings would be required to increase renewables in the most effective and efficient manner. The modelling by Jacobs provides insight into these issues.

1. Meeting the abatement target

The modelling work by Jacobs found that in the stationary energy sector, *the indicative Labor target of 45% below 2005 emissions by 2030 can be met through any of the policy options outlined above*. The emissions trajectory for different policies is shown in Figure 1. The main difference was in resource cost and the impact on residential bills.

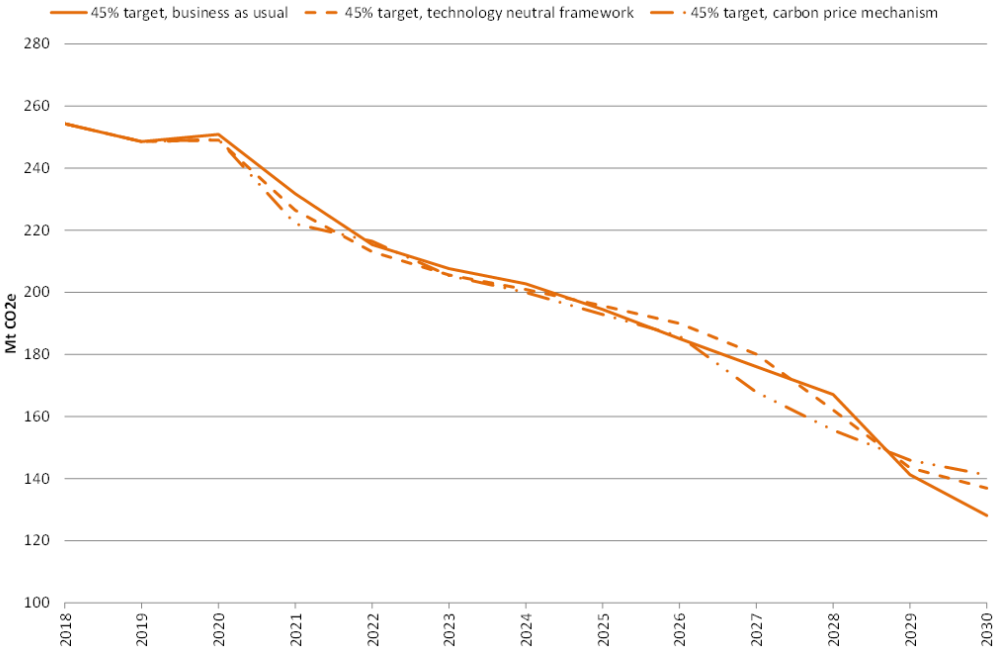

Figure 1: Emissions Reductions Trajectories

2. Cost of transition

A technology neutral framework would achieve Australia's current carbon abatement objectives in the stationary energy sector at substantially lower cost than current policy settings. A saving of between $2.0 and $9.9 billion could be achieved over the period from 2020 to 2035 to achieve the 45% abatement target, compared to the Business as usual scenario.

	Abatement Target
	45%
Policy Settings cf BAU	***Resource Cost Savings***
Technology neutral framework	$2,006 m
Explicit carbon price	$9,909 m

Table 1: Potential System Cost Savings compared to the Business as Usual scenarios

The results show that resource cost savings are made by adopting a technology neutral policy, not one that specifies renewable energy targets.

3. Residential bill outlook

The technology neutral framework provides the lowest residential tariffs over the ten-year outlook to 2030, providing bill savings to customers.

- Jacobs estimates that a technology neutral framework would deliver a 45% abatement target at a lower cost than "business as usual" settings for that target. By 2030 a typical customer bill could be an average of $122 per annum lower than the "Business as usual" policy settings for the 45% target. The cumulative savings to typical customers could be up to $1,291 over the decade between 2020 and 2030.

- In fact, the Jacobs' analysis shows that regardless of the abatement target, that the impact on customers are least using a technology neutral approach.

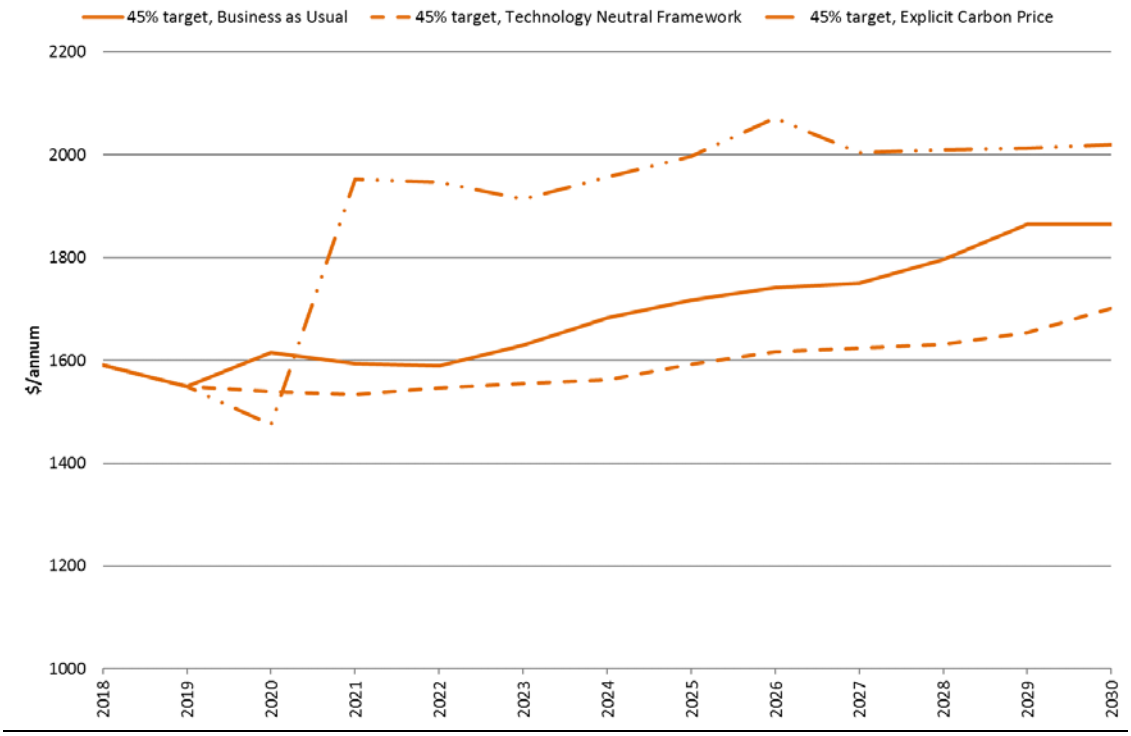

Figure 2: Typical residential bills under different policy options showing least cost under the 'technology neutral' option.