



## **ACT Climate Change Council Submission Sustainable Energy Policy 2020-25 Discussion Paper**

Thank you for giving the ACT Climate Change Council the opportunity to provide comment on the ACT Sustainable Energy Policy 2020-25 Paper.

Generally, the Council feels that the further development of an ACT Sustainable Energy Policy for 2020-25 will be an opportunity to frame the energy policy suite with a clear vision of a broader end goal: a future ACT as a sustainable city and territory. Although reaching that ideal end will not be completely realised within the next five years, articulating a clear vision helps ensure that the current policy addresses all that is currently feasible and necessary to proceed towards the final goal.

Already we see components of that vision in the discussion paper:

- National and international leadership in sustainable energy policy
- 100% renewable electricity supporting a zero emissions economy
- Equity of access to low cost renewable energy and climate resilient homes
- High efficiency residential and commercial buildings, ahead of Code, including existing buildings
- A smart grid that enables and incentivises ACT consumers to work with the distributor and the NEM to optimise the timing of loads via battery storage, charging and discharging of EV batteries, and demand management and thereby maximises the opportunity for EV penetration
- Gas use either eliminated or converted to a zero emissions alternative, integrated with any necessary grid augmentation
- A high penetration of EVs, with full integration to the local distribution grid to ensure charging loads are well managed with minimal distribution network augmentation, and increased mode switching to active travel
- A dynamic culture of innovation and collaboration between industry, academia and start-ups in the field of sustainable energy

In the form of appendices, I attach more detailed comment provided by a subset of the Council, namely from Councillors Paul Bannister, Karen Jesson and myself.

With best regards,

A handwritten signature in black ink that reads 'Penny D Sackett'. The signature is written in a cursive, flowing style.

Professor Penny D Sackett

Chair, ACT Climate Change Council



Selected Question in Sustainable Energy Paper	Thoughts of Council Member
<p>What is the role for ACT Government in setting the regulatory environment and creating an environment conducive to investment in renewables?</p>	<p>In principle, one might think that interacting through COAG would be the route to effect sweeping regulatory changes. In the current political environment, it may be more effective to work with other sub-national bodies directly to engage the AER, stressing the level of commitment to increased renewable energy at the sub-national level. Locally, leveraging the ACT REIF's current and future investments could be important, perhaps even extending the REIF.</p>
<p>What can be done to support the transition to a high penetration renewables electricity system? For example, should we invest in storage, grid support, transmission and/or access reform?</p>	<p>Local storage would seem a good option, particularly as relates to storage that households may install themselves. A strategic amount of local storage in the ACT, coupled with ACT's relationship with Actew-AGL may not only reduce electricity prices for Territorians, but also serve as an adaption measure in supply emergencies, allowing critical infrastructure, including extreme heat refuges to be properly powered. This is an additional response to supporting vulnerable populations (see below). The broader, general issue may be most effectively addressed by working together with sub-national counterparts.</p>
<p>What role can or should the ACT Government play in supporting vulnerable households to manage their energy bills?</p>	<p>Pressing energy efficient requirements (and support measures) in rental properties (existing and being built) is likely crucial here, as well as making them aware of hardship programs. I have a concern that goes beyond households managing their energy bills to those (especially elders) who simply do not use temperature control at all in order to avoid bills. This is a very serious and inequitable health risk, and may not be "on the radar" since these people manage their bills by extreme health hardship.</p>



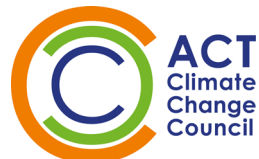
Selected Question in Sustainable Energy Paper	Thoughts of Council Member
<p>Are there any additional measures that the ACT Government should take to support community members to reduce their need for hardship programs and to access hardship programs when necessary?</p>	<p>See above. Some studies would be useful here to obtain data. (Perhaps they already exist?) Anecdotal experience suggests that those from non-English speaking origins and elders may be especially inclined to suffer health hardship in exchange for not being indebted. And many of the most vulnerable, those living on the streets, pay no energy bills at all. It would be interesting to consider whether some hardship programs addressing their needs directly in energy-efficient group housing could be a win-win-win on several social fronts for relatively modest economic investment.</p>
<p>How can the ACT Government better support uptake of energy efficiency?</p>	<p>Strong, simple, enforced regulations for rental properties (existing and new) are an absolute requirement. More and more of the ACT population (for better or worse) will be living in rental property. Providing living space should be treated on a par with providing food, in terms of basic health requirements and transparency. Any housing/accommodation (rental or not) up for sale might be required to meet same stringent requirements, or a full disclosure of deficiencies. Commercial buildings should be subject to similar requirements; they are places that people spend a sizeable fraction of their lives. Stringent requirements will save businesses money, and act as an additional attraction for low-carbon industries.</p>
<p>Should retailers be required to provide demand management tariff options?</p>	<p>Yes. Otherwise, they are not allowing customers an opportunity to see the financial benefit that accrues to all if the grid is better managed via demand response.</p>



Selected Question in Sustainable Energy Paper	Thoughts of Council Member
<p>What is the best way to roll out energy storage? Is it most effective behind the meter, at a community level, or by using a larger battery?</p>	<p>Is the right question? A better one might be: in what circumstances are each of the following effective, efficient, or risk-reducing: behind the meter, community level or very large battery storage. All might have a roll to play in different circumstances. Many households have and more will have behind the meter storage. The grid is finding it useful and stabilising to have some very large batteries in the system. And community-level storage may be especially appropriate for unit blocks with strata arrangements, also encouraging community-level discussions at AGM.</p>
<p>Should the ACT be taking any steps locally in relation to recycling and end-of-life management of solar panels and batteries?</p>	<p>Yes, this would show true leadership, and be an interesting way to begin to address whole-of-life cycle and Scope 3 emissions more generally. “End-of-life” is a somewhat fluid concept. For some panels and batteries this is defined as when the potential drops to 80% of that when new. Nevertheless, this equipment can still be quite useful. One Californian university (USCD?) produces a large fraction of its energy from “recycled” equipment. This might also provide a second-hand market to assist lower income groups.</p>
<p>What is the best pathway to decarbonise ACT gas use, considering the currently available options?</p>	<p>One could see the use of gas as ACT’s “coal transition problem.” We don’t have coal mines, but gas is now contributing a large fraction of our emissions, produces revenue for the Territory, has a large infrastructure, and worker base. I am sceptical that renewably produced hydrogen will be available economically on the scale and timescale required. Where it is available, I would advocate its use where electrification is not possible or very difficult. That is not the case in ACT buildings. Therefore, I am in favour of beginning the transition away from gas now, including a prohibition on the installation of gas in new suburbs. In the long term, this could reduce the amount and type of infrastructure to be maintained, also saving dollars and GHGs.</p>



Selected Question in Sustainable Energy Paper	Thoughts of Council Member
By what time frames should the ACT Government seek to answer this question?	In order to meet interim GHG targets, including the 2030 target, this decision should be made as soon as possible, but only after a rigorous just transition plan has been nutedt out. Perhaps 2022? If the ACT could achieve this locally, it could be a leadership example to others, who will also have to follow down this path.
Should the ACT government consider setting a renewable gas target, or investigate a clean gas certificate trading scheme for gas produced in other states or territories?	See above. The overarching goal is to reduce worldwide emissions to zero, and to do it as quickly as feasible. In my view, the plan should be to transition away from gas entirely, except where hydrogen (and only hydrogen made from wind/solar) can be used in special circumstances. That said, investigating a mechanism that allows other states and territories to provide the ACT with renewables-produced hydrogen may have longer term advantages. Anything other than renewables-produced hydrogen is simply not “clean,” and only locks in more carbon-based infrastructure. The concept of “lower” GHG transition fuels is not supported by the science of the speed and magnitude of climate change and its consequences.
How can the ACT Government support an efficient transition to ZEVs?	The ACT could lead faster in making its whole fleet (particularly buses) ZEV, and most probably electric. Appropriate distribution of charging centres will be key, as will information campaigns, as the market is changing very quickly and already old misconceptions are common. There may be potential to work with Queanbeyan and the airport on some issues. Could a system could be set up that would enable an EV owner (whether new car or used), to purchase a PV+battery system at a discount? It is important not to forget e-bikes, particularly at schools, Universities, and in government use.

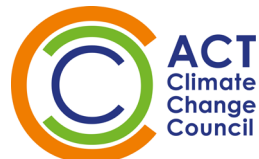


**Topic: General**

Subtopic	Discussion
Wellbeing	The issues paper does not directly reference the ACT Wellbeing indicators, probably because it was developed in parallel. The final policy must explicitly cross reference the many areas of interaction between energy policy and wellbeing.
Commercial sector versus residential	In general, the historical policy base of the ACT Government has been strong on residential measures but comparatively weak on commercial sector. There is significant scope to strengthen the commercial sector policies in the next policy.

**Topic: 100% renewable energy**

Subtopic	Discussion
ACT government role	Clearly continued advocacy by the ACT government at COAG level is critical, but of course the ACT is a small and occasionally isolated voice within this body.
Continuing to deliver 100% renewable energy	<p>I see few options other than continuing to seek purchase of large volumes of contracts for difference for 100% renewable energy. As this is a policy that has not significantly hurt ACT consumers to date, for massive benefit, I'd favour continuing this approach.</p> <p>Expansion of community solar/wind farms initiatives to improve accessibility to the financial benefits of renewables for the transient population</p>
Supporting the transition	It is important for both the market generally and for public perception for the ACT to explicitly have 100% renewable firming of its 100% renewable energy. It is not clear at this stage that the 100% renewable energy is firming (i.e. supported by storage so that the 100% electricity purchase is directly equivalent to a 100% coverage in every half hour period) as opposed to an annual equivalence. Currently the value of such storage is under-



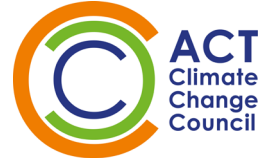
Subtopic	Discussion
	recognised in the NEM and as a result is inadequately supplied. The ACT taking a lead in this area could help stimulate the market.
Grid support services	At NEM level, see above – ACT government must actively hold 100% renewable firming for its renewable energy purchases. Within the ACT, the ACT government should work with EvoEnergy to ensure that all network upgrades are justified on the basis that there is not a demand side alternative that produces a cheaper outcome. Part of this may be either (a) facilitating a local market for demand abatement or (b) facilitating an ACT collective demand reduction scheme that enables aggregate power reductions to be made available (a bit like a demand side version of the Virtual Power Plant) and finds innovative ways of monetising the value of this (something the market is slow in doing, and the complexity of which is outside the reach of most users)
Inside government/outside government	<p>Inside government: continue to work at the leading edge of renewable energy as a consumer and an advocate on behalf of the ACT population.</p> <p>Outside government: Uptake of ACT government schemes.</p>

**Topic: Energy costs and consumer sentiment**

Subtopic	Discussion
Role of ACT in supporting vulnerable households	<p>The ACT governments role in this area should be</p> <ul style="list-style-type: none"> <li>• As a safety net for those vulnerable to the health and safety consequences of lack of access to energy</li> <li>• As a supplier of last resort for residents unable to obtain an electricity/gas connection from a commercial provider</li> </ul>

Subtopic	Discussion
Increasing competition	ACTEW AGL has a huge level of incumbency in the ACT market; if it is intended to increase competition, then the most effective method would be to break up ACTEWAGL. The value of doing so needs (in terms of potentially improved service or cost effectiveness) would need to be weighed up against the downsides. This would need to start with an assessment of the extent to which ACT customers are disadvantaged by the incumbency of ACTEWAGL, if indeed they suffer from any disadvantage relative to customers in more competitive markets.
Maximising investment in solar to low income households; ensuring low income and vulnerable households have access to solar	Maximisation of solar investment in low income households has to start with the recognition that a large number of these are renting. This means that either the government has to provide access (via bills) to cost-beneficial solar power on an equitable basis via investment in solar farms etc (this could be via some form of PPA arrangement) or find ways of incentivising landlords to install solar in a manner that incentivises them to do so, for the benefit of their tenants.
Improving understanding of energy offers	<p>Two items for consideration here:</p> <ul style="list-style-type: none"> <li>• Standardised methods of rates comparison that enable like for like comparisons</li> <li>• Introduction of smart meters and accompanying programs to ensure that the data is readily accessible, enabling customers to apply rates to their actual consumption profiles</li> </ul>
Which organisations best placed to deliver education programs	As an industry organisation and a regulated monopoly body, EvoEnergy is well positioned to be a provider of information and a conduit for government programs, in a manner similar to the way utilities are regulated in the US.





Subtopic	Discussion
Reduced need for/improve access to hardship programs	<p>Reducing need for access to hardship programs is basically an issue firstly of the national and ACT economy (unemployment, the working poor, social disadvantage) and secondly of energy efficiency (Access to energy efficient housing, as discussed elsewhere) So to the extent that the ACT government can influence these factors, it can reduce need.</p> <p>As for improved access – outside my area to know what barriers there are to access currently.</p>
Utility disconnections	As noted above, the ACT govt could become a supplier of last resort in this context.

**Topic: Energy efficiency**

Subtopic	Discussion
General	The energy efficiency issues discussed show that the ACT government has had a strong focus on residential energy efficiency. It is less clear that it has as strong a focus on its non-residential loads.
	Related to energy efficiency is the issue of urban heat island mitigation. Some aspects of this link to the built environment, including factors such as cool roofs, light coloured walls and landscaping.
Supporting uptake	ACT Government should participate in arrangements similar to the EUAs (Environmental Upgrade Agreements) used in many local government jurisdictions. While these have had less impact than desirable, they remain one of the smartest approaches to financing and can be achieved at very low cost to the ratepayer. The possibility of arranging such agreements at residential level should be considered.

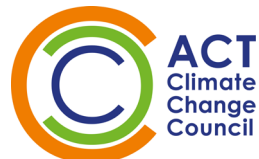


Subtopic	Discussion
	<p>A further option for improving uptake would be the expansion of mandatory disclosure beyond the housing sector, using NABERS for Offices, Shopping Centres, Hotels, Apartments and Hospitals. There is good evidence that mandatory disclosure works well as part of a suite of measures to improve efficiency (combined with finance, potential rates rebates, etc)</p>
	<p>Missing in the discussion of energy efficiency is the incentivisation of the purchase of chiller, AC and refrigerant equipment using low GWP refrigerants. Fugitive refrigerants are a significant line item in the ACT's carbon budget, and the new generation refrigerant equipment is generally more efficient than the conventional high GWP refrigerant equivalent.</p>
	<p>Many other local government jurisdictions drive beyond-code requirements for new construction (and refurbishment) by the imposition of additional requirements via the DA process, such as Green Star requirements and/or the requirement of NABERS Commitment Agreements.</p>
	<p>The ACT government has a significant role to play in improving the implementation of the NCC by enforcing more robust code compliance generally, and specifically in relation to Section J (Energy Efficiency) across all building classes. Initiatives in this area might include independent auditing of code compliance and changing the certification process from the use of private sector certifiers engaged by the projects to the same certifiers being engaged at the project's cost by the government.</p>
	<p>Consideration should also be given to the provision of rate/land tax discounts or rebates to rental properties with a high Star rating and/or high efficiency primary appliances (heating/cooling, domestic hot water), combined possibly with on-bill financing for upgrades; together these could make upgrading property cost-neutral to the landlord.</p>

Subtopic	Discussion
<p>Barriers to energy efficiency for larger uses, incentives to improve this</p>	<p>The major barrier for energy efficiency for larger users is the prioritisation of resources, both in terms of capital and staff time. This is a far greater issue than finance itself, as money and resources are available for projects deemed to be of sufficient priority. This means that in order to circumvent these barriers, initiatives must (1) not call on capital (i.e. operationalising the expense) and (2) make doing efficiency easier than not doing it (i.e. minimal call on internal resources to implement and manage) or, alternatively, make efficiency an issue worthy of higher capital/staff priority owing to its implications for core business. The former approach can include:</p> <ol style="list-style-type: none"> <li>1. Point interventions with on-bill financing – individual technology upgrades, supplied and installed by a competent (approved) third party. This can be particularly attractive for organisations with historically poor patterns of investment in energy services generally, such as the hotels sector (which always prioritises “the guest experience”)</li> <li>2. Full energy performance contracting (noting however that this model has never been particularly successful in Australia, as attempts to import the US model have generally ignored the huge scale of the EPCs there relative to the small scales used here)</li> </ol> <p>The latter approach is generally linked to a combination of mandatory disclosure and procurement policy. If the ACT government and its subcontractors make a policy of preferentially seeking contracts with organisations with demonstrated environmental credentials (higher NABERS ratings for their offices or hotels, for instance), this provides a core business incentive for the business to change behaviour.</p>
<p>Showing leadership</p>	<p>ACT needs a strong suite of programs such as outlined above. Currently its use of available policy levers is uneven, with some good work in the residential sector but relatively limited work in the non-residential sector. A comprehensive buildings strategy that places the territory one step ahead of other jurisdictions – even if only by adopting all their best ideas and implementing them in one place – in the application of NCC and the fostering of energy efficiency upgrades for existing buildings will show leadership that can be followed at state or local government level in other jurisdictions around the country.</p>

## Topic: Demand Management

Subtopic	Discussion
Accelerating roll out of smart meters and other smart devices, monitoring cost/benefit	The starting point here is to prove the business case for these, which is something the ACT Government needs to lead on. This should include looking at the cost of installation and operation, the ways in which the information can be and is provided (those may not be the same) to the user, and the resultant cost-benefit to the user. Once the structure of a cost-effective package has been ascertained, then it is possible to run coordinated information and on-bill financing program.
Oversight and control of smart meters and devices	Oversight here presumably means the provision of the load control signals: There are two possible bodies here, with differing reasons, being the retailer (seeking to minimise their own exposure at time of high spot price) and the distributor (seeking to manage distribution bottlenecks). Logically, it is the retailer that has the user contact and who can relay cost signals, so the front face of this needs to be in their hands. However, they have to pass through financial benefits and demand signals from the distributor, as well as providing their own. From a user perspective, there should be no difference between the signal from the two different bodies.
Should retailers be required to provide demand tariff options	Yes. It is essential that residential tariffs move onto demand tariffs due to (a) solar, and the changed in peak demand profile arising from that and (b) uptake of EVs. Without a demand cost signal there is massive risk to the integrity of the distribution network
Rolling out energy storage (behind the meter, community level, territory level?)	From a cost effectiveness perspective, it is far more cost effective (cheaper, and with a wider range of income streams) to install large batteries than small batteries; the only reason for the latter is that the investment is being undertaken by individuals rather than the ratepayers <i>en masse</i> . There is strong case therefore for a community battery scheme, which enables residents to access the financial benefits of a battery without having to invest in a singular battery for their own home – indeed, at scale it may be possible for a battery to provide a meaningful positive return, something that is difficult at homeowner level.



Subtopic	Discussion
Access to solar and batteries for multi-unit tenancies and renters	Similar to above, availability to access community level schemes is the best solution here.
Locations for shared storage trials	These should be located at the points where they achieve the greatest benefit to the local distribution system, particularly where they cost-effectively enable avoidance of investment in poles and wires
Who should coordinate a medium or large battery?	Ideally this should be done directly by the distributor as then it can be part of their planning for the network. However, I am not sure that they are permitted to own such assets (if not, this is an issue to be dealt with at AEMR/COAG level, perhaps). Failing in that, if the ACT government can make a cost-effective investment in a battery then it should take control of this.
Local measures for end of life for batteries and solar panels	It's unlikely we can set up our own industry for this, but the ACT government could establish contracts for the safe disposal and recycling, with collection at waste transfer stations.

**Topic: Natural Gas**

Subtopic	Discussion
Best pathway for decarbonisation	A two pronged approach is required, being a phased reduction in the gas load and the introduction of greener sources of gas.

Subtopic	Discussion
	<p>For the load reduction, this is a gradual process, the need for which may change over time, so it is important to phase efforts in a least regrets/no regrets approach. The highest priority loads to target are those that have secondary impacts – unflued gas heaters and gas ovens and stove tops, both of which have indoor air quality and safety issues. The second group of loads are those that have some capacity to be managed through peak events, being domestic hot water; this has a natural turnover period of around 10-15 years, so these can be replaced on failure. With heat pumps, the imposed electrical load is relatively small so peak demand impacts are minimal and the load potentially able to be shed due to the presence of storage. The final group are those loads that will produce large shifts in electrical demand, i.e. space heating.</p> <p>It is noted that the more intractable load is that in the commercial sector, where the electrification of existing buildings is a difficult and expensive task (far more so than in the residential market, where systems are essentially unitary). There are opportunities to encourage electrification of new commercial buildings via the DA process, which should be adopted; there are also significant opportunities to improve the efficiency of gas use in the commercial sector, with wastage being often very high (far more so than for electricity; on projects where we have taken average buildings to best practice, the electricity use has halved but the gas use has dropped by as much as 80%) However at this stage it is suggested that fuel-switching retrofit programs are generally avoided and that this sector of gas use is the primary target for greener gas supply initiatives.</p> <p>For the greening of gas supply, the starting point for this is at COAG level – there needs to be an effort to create greener supplies of gas and provide means of trading these across the network. This then facilitates such new supplies to be located next to the underlying fuel source thereby minimising impact and maximising the value of such supplies.</p> <p>If and when hydrogen becomes a feasible, the impacts of this on network infrastructure will need to be evaluated at a national level. It is noted that a possible consequence of the approach outlined above is that the infrastructure upgrade required upon introduction of hydrogen may be able to be limited to the commercial/industrial areas of</p>

Subtopic	Discussion
	the territory, with the residential gas networks being phased out entirely over time. This would significantly reduce the cost impacts of such upgrades.
	<p>It is also important that better data and modelling is developed on the impacts of electrification. Gas use in buildings is remarkably inefficient for a wide range of reasons, and replacement with electrical alternatives often sees a significant reduction in energy use due to reductions in waste above and beyond combustion losses. As a result, the impacts on peak system load may be less than expected. Conversely, the introduction of new peaks – by the coincidental provision of mechanical cooling that previous had none – may also produce some unexpected issues.</p> <p>Analysis should look at the energy use of comparable homes (similar socioeconomic status, similar ACTHers ratings) using different gas/electricity mixes, and also at the measured impacts of electrification in test projects. Electrification of social housing may provide an excellent data source for such studies.</p>
	One further possibility in this area arises from plans to develop a kitchen waste collection in the ACT in the next 5 years. Depending on volumes, it may be possible to develop a gasification plant using this waste as feedstock, and feed this into the gas grid. At this stage, a feasibility study of this may be required.
Timeframes	As noted, a phased approach takes some pressure off the timeline. The unflued heaters and gas cooking phase could be commenced immediately, along with incentives for the replacement of gas DHW with heat pumps upon failure. Targeting space heating upon failure is also reasonable. The use of an upon-failure approach puts the timeline at about 15 years, which is plenty of time for the biogas/hydrogen issue to resolve itself (and potentially change the course of the phase out process).
Range of policies	<ul style="list-style-type: none"> <li>• Unflued heater phase out</li> <li>• Incentives for replacement of gas cooking with electric/induction</li> <li>• Incentives for replacement of gas DHW with heat pump DHW upon failure</li> </ul>

Subtopic	Discussion
	<ul style="list-style-type: none"> <li>• Incentives for replacement of gas heating with heat pump upon failure</li> <li>• Commercial sector gas efficiency program</li> <li>• Work at national level to facilitate a market for biogas across the existing gas network in a manner similar to Green Power on the electricity network</li> <li>• Feasibility study into the generation of biogas from collected ACT kitchen waste</li> </ul>
Renewable gas target/trading scheme	<p>A renewable gas target is only a sensible measure once a national level trading mechanism is developed for biogas within the existing network and/or the feasibility of local gas generation linked to the collection of kitchen waste within the ACT has been established.</p> <p>Development of a national scale trading system (and regulatory infrastructure) for biogas connected to the national gas network should be advocated by the ACT Government at COAG level.</p>

### Topic: Zero emissions vehicles

Subtopic	Discussion
Regulatory barriers	<p>Major issues in this area are:</p> <ol style="list-style-type: none"> <li>1. Lack of peak demand charging at residential level. This will become critical if destructive loads from charging are to be avoided.</li> <li>2. Lack of smart network infrastructure to create more nuanced load control. I note that even adjusting the mass timing (e.g. ripple controlled chargers) will not protect the network adequately above around 25% adoption of EVs. This means that a more complex (networked) demand control mechanism is needed to share the available network capacity across the charging points, and ultimately also for the use of car batteries in grid support.</li> </ol>



Subtopic	Discussion
	<p>3. Subsidisation of fossil fuels through the failure to include externalities, especially the health impacts of internal combustion engine exhaust</p>
Supporting ZEV R&D	<p>As ZEV R&amp;D is largely happening overseas, the main contribution that the ACT Government can make is to be a user of ZEVs in its own fleet and an advocate and supporter of ZEVs in the ACT community. If there is research to be done locally, it is in the experience and practicality of ZEV use in the Australian context.</p>
Application for data	<p>The main application for data would be to provide an evidence base that help encourage vehicle buyers to make a rational decision around whether or not a ZEV is right for them</p>
New infrastructure for hydrogen ZEVs	<p>A network of around 4-5 hydrogen filling points around the territory would be sufficient to service hydrogen vehicles in the first adopter phase. These would be supplied possibly from a central storage/generation point, which should be co-located with the comparable petrol/diesel storage point (not quite sure of the details of the petrol distribution network serving the ACT). Note that just as vehicle fuel is currently moved via tankers, there is no reason for hydrogen to require a pipe network for vehicle fuel purposes.</p>
Incentives to support ZEVs in the light of changing market dynamics	<p>As it is not possible to call on whether electric or hydrogen vehicles will “win the day”, a policy to provide the minimal supporting structure for each is best, involving a network of electric charging points and a small network of 4-5 hydrogen fuelling points around the territory.</p> <p>Consideration should be given to other incentives for ZEVs, such as permitted use of transit lanes and preferential parking spaces.</p> <p>Any financial incentive should be based on the performance criterion of zero emissions rather than on technology.</p>



Subtopic	Discussion
Supporting an efficient transition	<ul style="list-style-type: none"> <li>• Roll out of charging points and limited hydrogen charging infrastructure</li> <li>• Permission for ZEVs to use transit lanes and preferential parking spaces</li> <li>• Increase registration discounts (can these be adjusted to reflect the avoided health costs?)</li> <li>• Working with EvoEnergy to create a strategy for management of EV charging</li> <li>• ZEV show days, where ZEVs are showcased both by users and suppliers</li> </ul>

**Topic: Innovation and industry development**

Subtopic	Discussion
Building on existing Renewable energy business and R&D strengths	<p>The ongoing challenge is to build strong links and trust between the academic and business communities, neither of which are strong in this field. The only way I can see to do this is to provide more fora where they can mingle and breakdown the tribal barriers. Best options are where one is working with SMEs and academia rather than big business; the culture of the latter tends to be defensive rather than receptive towards innovation, and of course there is a better chance that the SMEs will keep the innovation in town.</p>
Other energy sector innovation areas	<p>Given the high importance of behavioural change in the next phase of the ACT's zero emissions strategy, it is critical that innovation in social research and behaviour change is fostered in parallel with the technological research areas</p>
How best to support R&D activities with limited funding	<p>With the range of policy required to deliver on ACT's emissions targets, as well as innovations like the wellbeing indicators, one of the most influential roles that the ACT Government can play is in the collection and sharing of data that relates to the impacts of policy and technology. By making this data available, researchers and businesses can build the business case for new technologies that lead to a transition to a zero emission economy. A well-</p>



Subtopic	Discussion
	researched evidence base is a vital input to policy development and technological transition at state, national and international level.
How to attract investors into ACT clean energy sector	<p>A stable policy environment! Aside from this, some active promotion of the benefits of the ACT's unique mix of business, policy and academia into the investor market is potentially worthwhile.</p> <p>Perhaps the ACT should consider setting up an investor forum whereby small investments can be made into a collective innovation fund? Given the success of the CEFC in achieving above market returns, it would seem that there are possibilities here for something that is ACT focussed and perhaps aimed a little riskier than the CEFC but still able to generate good returns.</p>
How to facilitate collaboration, start ups, SMEs?	See comments above about creating mingling between academia and SMEs in the field. Also, there is a need to find ways to bring angel investors into the local market.

Selected Question in Sustainable Energy Paper	Thoughts of Council Member
What role can or should the ACT Government play in supporting vulnerable households to manage their energy bills?	<p>From personal experience working in the Energy Outreach program, we need to consider spending more time with those who are struggling to manage their energy/water/gas usage, as some may require extra support/guidance.</p> <p>An example of this, in 2012 the EO program was run with 27 senior residents living in an aged persons units. <i>*These units were built in 2011 and were designed to be more energy efficient.</i> Reconnecting with residents in late 2019 many stated their bills were "high" as they are having to heat/cool their homes due to due to health issues or orientation of their homes. Even though they had been through the program their homes were still cold in</p>



Selected Question in Sustainable Energy Paper	Thoughts of Council Member
	<p>winter and hot in summer. It would therefore be beneficial to reconnect with those that go through the program, so progress can be tracked, investigate any ongoing issues- in turn highlighting any gaps in the program, and identify what actions are required to improve outcomes.</p> <p>People can forget what they have learnt through the program, so consider refresher course.</p> <p>Consideration should be given to training volunteers to do the follow up visits with those who go through the Energy Outreach program.</p> <p>In some parts of the UK and Australia they have a volunteer program called Draught Busters, which trains volunteers so they can go out into the community to do draught proofing of homes.</p> <p>Another program has volunteers who go out with a thermal imaging camera, they go out to homes and take images, which are then shared with the occupant of the home. The images allow people to see very quickly what is happening as far as the efficiency of their home. As the say a picture paints a thousand words.</p>
<p>How can the ACT Government better maximise its investment to further extend the benefits of solar to low-income consumer types?</p>	<p>If the government goes down this path we need to make sure people understand how to use their solar, so the best outcomes are achieved. Consider setting up a volunteer team who can go out to individual homes to talk with community members about options, benefits etc. They could also do follow up visits to support the transition to solar (once installed) to make sure the system is working effectively.</p>



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How can the ACT Government ensure vulnerable and low-income consumers are able to benefit from new technology, such as solar?	As above.
How can the ACT Government best support consumers to understand energy offers and to choose the best deal to suit their needs?	Provide tips as to what to focus on when looking for energy offers. Could also consider investing in a small mobile office that goes out to community, so people can bring in their bills and you have a one on one appointment with qualified staff, to discuss their individual needs. They can look and discuss individual/family needs and from there narrow down the list of providers/deals for consideration. In some cases it will be very clear as to what options are best.
Which organisations may be most effective at delivering energy education programs?	Needs to be a multi-pronged approach so we all need to assist with this work. Consider including this outcome in funding contracts.
Additional measures that the ACT Government should take to support community members to reduce their need for hardship programs and to access hardship programs when necessary?	We need more people on the ground to spend time with these individuals. Some behaviours are generational/embedded so time does need to be spent with them to help create new habits and to understand why these changes will be of benefit to them.



Selected Question in Sustainable Energy Paper	Thoughts of Council Member
Are there any extra measures that the ACT Government should take to prevent utility disconnections?	Invest in more people on the ground to work closely with community, so we can address behaviour change, and prevent getting to this point. Again some people have complex needs so time needs to be spent with them, to develop a plan of action, budgeting strategies etc. Not one off visits, regular contact and support - could be trained volunteers - lots of community members with the skills required.
How can the ACT Government better support the uptake of energy efficiency?	Better promotion through a variety of channels, still many community members and services who are not aware of this program.
What is stopping industry and larger energy users from implementing energy efficiency measures? How can these consumers be better incentivised to do so?	Need to make time to meet and chat with industry to build relationships, understanding of what you are trying to do, and the many benefits it has for industry. This is also the perfect time to collect information on possible barriers.
How can the ACT show further leadership in energy efficiency?	Get tougher on the building industry so our buildings are more energy efficient and build to last.  Need to address the issue of retailers selling appliances that are not energy efficient.