

## Parliament of Victoria Inquiry into tackling Climate Change in Victorian Communities

The Centre for New Energy Technologies (C4NET), welcomes the Parliament of Victoria's Inquiry into Tackling Climate Change in Victorian Communities, and the opportunity to make a submission.

C4NET was established by the Victorian Government to help the energy sector efficiently transition away from a fossil fuel-dominated industry into a sustainable, vibrant one. C4NET envisions the future grid being underpinned by reliable, well-managed data supporting significant new energy technology deployment. By providing solutions for complex, sector-based challenges that arise during this transition, C4NET works collaboratively to:

- Improve access to and utilisation of smart meter and other energy data sources
- Accelerate the uptake of new technologies that lower cost, improve sustainability and deliver value for consumers
- Support the upskilling participant and emergent workforce; and
- Provide sound, evidence-based policy support.

C4NET's members are Ausnet Services, Powercor, Deakin University, Federation University, Monash University, RMIT University, Swinburne University and the University of Melbourne, and is generously supported by the Victorian Government and the Australian Energy Market Operator (AEMO).

By combining significant academic expertise from university partners with data access and policy input, C4NET's projects are supporting the transition from large, centralised generation to high density Distributed Energy Resources (DER), most of which tend to emit no or only very low greenhouse gas emissions.

In relation to the topic of what urban, rural and regional communities in Victoria are doing to tackle climate change and how the Victorian Government could support these communities, C4NET submits the following views, insights and experiences for the Environment and Planning Committee's consideration.

Across Victoria, C4NET observes very high interest in individuals wanting to adopt solar photovoltaics (PV) and batteries/energy storage systems (ESS). Interest in new applications such as microgrids, virtual power plants (VPP) and community energy systems are also increasing.

Specific areas also have a high interest in combining efforts and acting as a community to tackle climate change. Examples include co-located community groups within the Hume region<sup>1</sup>, or industry-related

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<sup>1</sup> Examples include <https://eico-op.org.au/case-study-towards-a-totally-renewable-indi/>, and <https://totallyrenewablejack.org.au/>

community groups such as Mollongghip irrigation group and the Birchip Cropping Group<sup>2</sup>. These combined efforts can include joint investment, participation or shared interests and knowledge.

At a municipal level, many Victorian Councils are seeking to monitor the greenhouse gas emissions from electricity use (among others) to both report their impact over time, increasingly to comply with their undertakings under the Global Covenant of Mayors, and gather data to inform evidence-based policy formation and impact, such as impact of planning changes etc. C4NET is supporting this process, providing a 'brokering' role between councils and Distribution Businesses, standardising processes and helping ensure reliable, complete and useful data is provided. Local councils have significant ability to create programmatic, systemic or motivational change at the local or community level, and C4NET sees them as a key delivery bodies in the drive to tackle climate change.

Further, while penetration is low now, there is high interest across Victoria in being able to transition from fossil fuel driven internal combustion engine vehicles to electric vehicles (EVs) powered by up to 100 per cent renewable energy. It is noted that with no local manufacturer and the majority of global vehicle manufacturers transitioning to exclusive electric vehicle production, the Australian market will also transition almost entirely to EVs, it's just a matter of when. In this space, C4NET is working with various stakeholders to help identify EV chargers in the network, thereby assisting DBs and others to proactively manage their increasing penetration. C4NET is anticipating additional projects will follow to further this goal. A supportive policy environment will be critical to ensure EVs strengthen the future grid rather than challenging it further.

Through its work with stakeholders across the sector, C4NET has identified the following barriers to reducing greenhouse gas emissions by increasing adoption of new energy technologies and improving the use of data:

**1. The distribution networks are impacted by the increasing levels of DER**

- a. The networks were not designed for two-way flow and in future, the level of DER penetration may well exceed the design capacity of the low voltage (LV) network to provide safe, efficient and reliable electricity. There are potentially highly viable alternatives to reduce the cost of rectification/upgrade that C4NET could pilot, working together with Solar Victoria to inform future policy directions.
- b. There is limited understanding of the LV network's capacity and design, and limited ability to model and forecast to adequately inform the network's capacity for high DER adoption. C4NET is supporting the first stage of research to utilise the unlocking of Victorian smart meter data as a significant resource to inform and reduce the cost of additional monitoring investment. However, as this is a critical issue for Victoria's five distribution network businesses this could be significantly expanded to address more rapidly and avoid unnecessary infrastructure investment.

**2. The market structure limits the value of DER being realised by participants, which acts as a barrier to investment**

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<sup>2</sup> <https://www.switchdin.com/blog/2018/10/3/switchdin-project-selected-for-victorian-demonstration-initiative-grant>.

- a. For consumers, the price of electrons in the system is binary, whether they are traded behind the meter or exported into the grid. Yet the cost of distributing those electrons is very different when optimised on a local basis compared to a network-wide basis. Recognition of value on a bespoke local level rather than a network-wide basis would allow for optimised investment and solution adoption for each node (whether it be transformer, distribution node, zone substation or other) and incentivise innovative business models and community engagement.
- b. A localised LV market mechanism would unlock the value realisation of community infrastructure, such as shared batteries that could provide benefits for both participants and also networks through reduced investment needs.
- c. Localised LV markets would also enable dynamic price mechanisms to incentivise the charging behaviour of EVs. EVs have significant potential to be part of the challenge of the grid transition and also part of the solution, as for the first time there will be mobile generation that can move across the grid to support its function.

C4NET is perfectly placed to drive collaboration between the market operator, distribution networks and leading energy researchers to investigate the feasibility and value of such a mechanism that would bring Australia more in-line with international examples where virtual power plants and microgrids are emerging.

### **3. The limited accessibility of, and ability to utilise, energy data**

- a. Recent experience assisting the City of Melbourne to access the electricity consumption data across their municipality highlighted a number of challenges faced by such organisations. Despite the distribution businesses being very keen to support the provision of information, the questions were not asked in a way that facilitated the identification of the data sought, and the inconsistency of responses and lack of understanding of what the data represented frustrated those seeking the data. It is clear that a facilitator who understands both the data sought and the questions being addressed can make a significant impact for all parties. C4NET will seek to support other councils seeking such data and is keen to interact with other government bodies to ensure this is done in a consistent and efficient manner across the state.
- b. The ability of companies closely involved in the electricity industry to understand and effectively use energy data is relatively poor. This is even more limited amongst potential service providers to the industry. The understanding of data, including where it can be accessed, limitations to its access and efficient use, and appropriate governance are all key to the industry's progression but are currently inadequate. There are a number of initiatives underway to address this issue. For example, C4NET is conducting a 'road mapping' exercise to document data sources, initiatives to assist and identify gaps for further work, and is keen to share such information to help others.
- c. Any change of the meter data provider across Victoria could increase the complexity and challenge of data accessibility and this should be factored into any evaluation of such a change.

### **4. Electricity supply, transmission, distribution and retailing are highly regulated.**

- a. These regulations are typically for the industry of today and restrictive to the trialling of new models. C4NET encourages the use of “sandboxes” to trial new products/models with more limited regulation as the trial themselves often can be an informer of what regulation is required in future.

Looking beyond the barriers identified above, the other points that we would bring to the Committees attention are:

- The transition of the energy sector is creating considerable opportunities for communities. Increasingly, consumers will be able to adopt new technologies to manage their energy use, such as deployment of connected home devices creating the internet of things (“IoT”), demand orchestration, interoperability and advanced manufacturing incorporating machine learning and artificial intelligence (elements of “Industry4.0”). The opportunities will be underpinned by the availability and use of other data. Such technologies can assist communities to reduce their greenhouse gas emissions.
- Victoria’s research community, including multi-disciplinary researchers from C4NET’s member institutions of Monash, Deakin, RMIT, Melbourne, Swinburne and Federation universities, is highly skilled and internationally recognised in their leading research related to assisting communities reduce their greenhouse gas emissions is a key asset of the State in driving down emissions from energy and indeed other sectors.
- C4NET strongly advocates for collaboration, open data and knowledge sharing to tackle sector-wide challenges. The benefits of such an approach are evident in C4NET’s activities already, and its model could be applied to a broad range of complex issues.
- As communities transition, C4NET notes the need for education, training and adoption of different workforce skills within the energy sector and beyond as the transition progresses.
- The sector’s transition is happening now yet it is a long-term challenge. Commitment to long-term stable funding of structured and strategically aligned initiatives is critical to building and retaining momentum.

C4NET would be willing to discuss any elements of its submission with the Committee should there be an opportunity, or facilitate discussion with any of its member organisations.

Yours sincerely



**James Seymour**

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