



OPEN ENERGY MARKETS

A PATHWAY TO PROSUMERS & NEXT GEN UTILITIES

AEMO & Energy Networks Australia

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SUMMARY

The rapid convergence of utility and mobility solutions enabled by new emerging business models, next generation digital technologies including Internet of Things (IoT), data analytics, AI and Blockchain, is future-proofing economies around the world, delivering liveability, sustainability and resilience, and importantly putting downward pressure on utility bills and infrastructure costs.

Open Cities welcomes AEMO and Australian Energy Networks foresight in instigating this crucial review. We welcome the opportunity to participate and hope it results in urgent action to establish a two-way grid and prosumer market underpinned by sustainability and self-sufficiency. Self-sufficiency is defined by the ability of people, communities and businesses to own renewable energy infrastructure themselves, going beyond bill reduction to revenue generation.

Australia's last century siloed utility approaches are not embracing this future. The policy, regulation and market settings remain backward focused and do not reflect technological advancements or peoples' changing needs.

Yet despite the historic unstable energy policy, Next-Gen utilities and energy providers are forging ahead in precincts to build a sustainable energy future that enables people get free energy from the sun, reuse their waste, and importantly own renewable energy infrastructure themselves – rather than a handful of companies.

Policy and regulatory leadership is required to shape our energy markets to create a two-way grid and enable a prosumer market. This means Australia's energy networks must be modernised – they are currently geared to support aging and monopolised business approaches. They are not implementing best practice fast enough and are shutting out innovation and prosumer autonomy. This is because their business models do not allow more agile approaches.

It is essential new markets and business models are catalysed, enabling competition and innovation. This is only achievable with an independent market operator overseeing the activities of existing networks, setting the terms for and rules of engagement with Next-Gen utilities, prosumers, microgrids, and emerging technologies.

Open Cities would like to see an Independent DSO, separate from AEMO and the distribution utility, working not just with the distribution utility but with these market participants to derive change.

URGENT REFORM

01 PROSUMERS

The rise of prosumers (consumer and producer) is being enabled by innovation, smart apps, and IoT. While the term energy prosumer is a familiar one used to describe those producing their own energy and consuming it, the prosumer tag is starting to apply to customers in the digital, mobility and water and waste markets. The rise of prosumers highlights an exciting trend in utility /mobility convergence. These emerging technologies are driving economic development, protecting the environment and putting downward pressure on pricing while providing more choice in the market. Prosumers will also catalyse greater competition and productivity in these markets.

RECOMMENDATION 1: AEMO develop an energy prosumer framework - that is also supported by prosumer rights policy and legislation - to enable renewable energy market participation and ownership by people, families businesses.

02 AN INDEPENDENT & TRANSPARENT OPERATOR

Currently there is no independent oversight over network behaviour. For example network providers are not putting in place agreed inverter frameworks to manage active and passive DER opportunities despite having forced inverter technologies to be certified to standards that have these functionalities inbuilt.

In addition, AEMO is the only party providing transparent information to the market around state-based price signals, however to truly unlock the potential of active and passive DER opportunities the level of detail needs to go down to the street level. This level can not be achieved without an independent operator that holds all DNSP's and TNSP's accountable to provide reliable and transparent price signals to help manage capacity and voltage.

Networks have their own monopolistic discretionary powers to curtail solar adoption or restrict market participation as they see fit. An independent body is urgently required to oversee the exercising of this discretion and direct the market to a prosumers-led outcomes.

RECOMMENDATION 2: Establish an independent DSO urgently to reframe the market with prosumers rights informing market structure and operation.

03 TRANSITIONING FROM CENTRALISED TO LOCAL UTILITIES

Australia needs to transition to a renewable future from the ground up. Technologies are enabling new services and lower costs for local renewable energy generation, enabling homeowners, businesses and industrial sites to embrace and lead the zero carbon market.

The zero carbon energy revolution will be here in the next 18 to 24 months despite an historical lack of stable energy policy, because businesses are leading the transition. Connected microgrids with renewable energy generation need to be enabled in new developments where they increase grid stability.

While Energy Networks Australia and CSIRO have costed the benefit of optimization and coordination of DER at the distribution level, what is missing in this modelling is the value of Next-Gen utilities and how the network should respond to their emerging technologies. Legacy networks must respond to innovation and alter their business models to accommodate change and enable access. This includes solutions to limitations including:

1. Managing the voltage in local area
2. Managing the capacity in fault current rating of equipment
3. Power flow between the different nodes the network needs to manage

In addition, single integrated platform is also incredibly critical however again under the current market structure it is going to be available almost exclusively to the retailers who will willingly pass on the benefits of the price signals being provided. Urgent consideration needs to be given to the following:

RECOMMENDATION 3: AEMO work with Open Cities on costing the benefit of local generation from Next-Gen utilities / microgrids and how the network should respond to emerging technologies with new infrastructure and solutions. Open Cities would be an invaluable emerging business models expert on AEMO's panel.

RECOMMENDATION 4: Recognition that local renewable energy generation has a network benefit which the generator should be paid for. (For example, via a Network Benefit payment similar to that in the UK.)

RECOMMENDATION 5: Prioritising and fast-tracking grid connections within two months for local renewable energy with storage that increases grid stability, instead of the current average of 3 to 4 months.

RECOMMENDATION 6: Enabling microgrids by 2021 with the provision of energy and water data gateway metres for new communities. (A deeper understanding of the water energy nexus is required by regulators.)

RECOMMENDATION 7: Establishing transparent pricing that values the broader benefits of renewable energy and storage installed in local zone substations beyond state-based price signals.

RECOMMENDATION 8: Introducing new classifications of retailers to facilitate peer to peer trading of smaller more frequent transactions.

RECOMMENDATION 9: AEMO should evaluate the results of its DER trials to see the evidence of market failure around large scale feed-in tariffs.

RECOMMENDATION 10: AEMO should work with Next-Gen energy utilities to prioritise value streams into the future.

RECOMMENDATION 11: Market participants along with the growing number of large market customers should access swaps reliably.

04 DATA

Open Cities is also concerned that a lack of data from Next-Gen utilities and infrastructure coupled with extensive data on centralised business models is distorting assumptions. For example, there are assumptions that coordinating distributed resources is required to alleviate challenges to the system. Open Cities would like to work with AEMO on real examples that are then categorised and applied back to scenarios.

There are also assumptions around cost rises that Open Cities believes need to be tested. Network charges on electricity bills may not rise as networks invest to facilitate higher DER. Augmentation savings may in fact alleviate impacts of networks costs eg microgrids and solar. It is essential AEMO not just anchor debate on existing business models but undertake data collection through pilots or partnerships that inform policy / regulatory design.

RECOMMENDATION 12: Open Cities recommends AEMO delay locking in detailed technical solutions that benefit existing monopoly networks as this will be to the detriment of prosumers.

RECOMMENDATION 13: Open Cities would like to work with AEMO on data collection and pilots to better inform key policy assumptions.

05 PLANNING

PLANNING GATEWAY CHANGES

At the moment, only centralised energy utilities participate in utility planning for new communities. Decentralised or local solutions including microgrids, renewable energy generation, batteries, micro trigen, organic waste to energy (biogas) hydrogen and other solutions - are not part of the planning gateway processes. They are shut out of new growth.

Only registered '*Public Authorities*' are entitled to participate in planning gateway processes with developers and NSW Planning. While private companies are listed under the '*Public Authorities*' schedule, licensed local utilities are not. This means decentralised energy providers along with their solutions are shut out, entrenching BAU utility choices and blocking faster, cheaper and more innovative ways to release land.

For example, a key barrier to local generation is the inability to achieve cross boundary supply when land is subdivided. State law prohibits the carrying of power across Torrens title boundaries if you are a non-public authority. These planning matters are critical barriers preventing transition in new growth areas and they require attention from AEMO and policy makers.

RECOMMENDATION 14: Next-Gen local renewable energy solutions should be mandated in new growth areas, ensuring network providers provide flexible and innovative servicing designed with innovators.

RECOMMENDATION 15: Enabling next generation local utility providers to have a seat at the State and local policy and planning tables in the development of new communities.

RECOMMENDATION 16: Amendment to the Environmental Planning and Assessment Regulation 2000 (NSW) (EP&A Reg) prescribing licensed precinct energy utilities with embedded generation, as a 'public authority'.

ANSWERS

Pathways for DER to provide value

1. Are these sources of value comprehensive and do they represent a suitable set of key use-cases to test potential value release mechanisms?

Yes, they do they represent the most common use-cases. The fact that there are so few passive value streams in comparison to available advanced inverter technology, is very disappointing. This reflects a failure of the current market. Two out of four are not applicable to the whole market, they are only applicable to large market participants, highlighting the need for a higher level of detail in price signals to allow smaller but aggregated businesses to participate in this market

The current method in which passive DER is priced only incentivizes self-consumption. This needs to change in order to create a bidirectional grid that rewards the prosumer.

2. Are stakeholders willing to share work they have undertaken, and may not yet be in the public domain, which would help to quantify and prioritise these value streams now and into the future?

For 100kW (or less) solar system business cases - we know a feed in tariff is a significant benefit to the end customer, impacting their desire to invest in solar. However, above 100kW the benefits delivered fall way below where they should be – making them insignificant and not applicable in most cases.

Inverter standards and DNSP's are continuing to narrow the voltage window of solar inverter operation and this is beginning to negatively impact the performance of solar systems. However due to a lack of visibility on grid voltage at the substation level we are unable to quantify how this is impacting passive DER revenue streams.

Maximising Passive DER potential

1. Are there additional key challenges presented by passive DER beyond those identified here?

Yes. The current challenges are focused around the existing network service providers and not the existing customers of the network. It is both urgent and essential that government and regulators put prosumers at the heart of policy and utility approaches. As Australia transitions to the future, people and communities need reap the benefits of free energy from the sun and other technologies.

The cost of connecting embedded generation to the grid has gone up tremendously in the last few years and we need to ensure that new requirements are not cost prohibitive.

2. Is this an appropriate list of new capabilities and actions required to maximise network hosting potential for passive DER?

Yes. However, network modelling should include street transformer constraints not just zone substation constraints as is currently referred to in each DNSP's adequacy report.

In parallel to networks increasing their capabilities to better manage their responsibilities, there needs to be the capability of publishing and accessing a register of the actions that took place, similar to AEMO's settlements register. This will allow prosumers to better understand and evaluate passive and active DER revenue streams or revenue curtailment which will impact systems sold on PPAs.

3. What other actions might need to be taken to maximise passive DER potential?

Figure 8 describes how prosumers could work with an IDSO to untap passive and active DER revenue streams. However, it will be important to keep in mind the different market segments that this applies to, such as HV customers, Large LV customers and Small LV customers, and how they currently participate in the market. Framing the discussion in this manner will help to keep it relevant to prosumers and DNSP's involved.

Maximising Active DER potential

1. Are these the key challenges presented by active DER?

Yes

2. Would resolution of the key impediments listed be sufficient to release the additional value available from active DER?

Yes

3. What other actions might need to be taken to maximise active DER potential?

Reliable data streams from the different technologies being installed behind the meter or within an embedded network will help to increase the reliability of the planning and forecasting required by the DNSPs to participate in dynamic revenue agreements. It will also ensure innovation is curtailed off but enabled.

4. What are the challenges in managing the new and emerging markets for DER?

Having effective competition and transparent price signals without an independent market operator is impossible. The current market failure to adapt to change and to stifle innovation and more cost-effective and sustainable solutions.

5. At what point is coordination of the Wholesale, FCAS and new markets for DER required?

Ideally this would be the role of the IDSO keeping in mind the principles listed on page 4 while understanding that Next-Gen utilities and their new networks and customers exist because of each other and not prioritizing the needs of one over the other.

Disaggregation of the value stack is influencing the development of local energy utilities and microgrids. There is a lack of coordination and transparency between participants that control access to value streams including DNSPs and retailers. This is constraining microgrids' delivery of full value to the network. Market Participants have the advantage because they can better access value. Most participants are too small so miss out on this value.

Frameworks for DER optimisation within distribution network limits

1. How do aggregators best see themselves interfacing with the market?

Currently the only way to unlock active DER revenue streams is to create micro-grids. This allows businesses to fix wholesale costs of energy and power (from retailers and networks respectively). However, this limits DER opportunities to simply within the micro-grid. To unlock the value between street-to-street (s2s) or zone substation-to-zone substation (z2z), networks need to offer more dynamic pricing to aggregators who will be given negative and positive price signals to participate in different geographical areas of the network and state. This further emphasizes the importance of an independent DSO.

2. Have the advantages and disadvantages of each model been appropriately described?

Yes, the advantages and disadvantages have been adequately described.

3. Are there other reasons why any of these (or alternative) models should be preferred?

Open Cities believes an independent DSO is urgently needed – separate from AEMO and the distribution utility - to remove the conflicts of interest that exist and also play out in options 1 & 2. Model 3 does not have to be complex. Working with Open Cities and other Next-Gen infrastructure and service providers, there is an opportunity to improve and adapt current global best practice for Australia.

Immediate actions to improve DER coordination

4. Are these the right actions for the AEMO and Energy Networks Australia to consider improving the coordination of DER?

Yes

5. Are there other immediate actions that could be undertaken to aid the coordination of DER

See Recommendations above.

CONCLUSION

Open Cities would like to work with AEMO on progressing real reforms to a two-way grid and a new utility model. We would welcome further opportunities to participate in advisory policy work on behalf of our members to demonstrate the rapid conversion occurring in the utility and mobility sectors and how the market can support a sustainable resilient energy future.

Please let me know when a good time is to meet with you to discuss a potential working relationship.

Best,

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OPEN CITIES

Open Cities Alliance is helping Australian cities open up their planning, regulations, and programs to deliver next generation data, energy, mobility, waste, and water, that is innovative, sustainable, local and lower cost to businesses and the community.