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Why I don't lie awake at night thinking about microgrids

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Thank you to CEDA for inviting me to participate on today's panel sessions and also thank you to my colleague James Clinch for his assistance in preparing me for today.

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People here and overseas are talking a lot about micro grids, which can combine localised generation, storage and control systems to improve the efficiency and resilience of the network. They are also talking a lot about network tariff reform, time-of-use retail tariffs, smart meters, solar panels, electric vehicles, virtual net metering, energy efficiency, batteries, demand-side management, virtual power stations, and the 'internet of things'.

People are talking a lot about energy; and people are thinking hard about the future.

The last 18 months has seen some fabulous work being undertaken by the CSIRO (Future Grids project) and the Energy Network Association (in partnership CSIRO) developing the *Electricity Network Transformation Roadmap*. So much is happening overseas as well, including New York's ambitious *Reforming the Energy Vision* (REV) program.

Here in Victoria, there is also an ambitious agenda and we, at the Essential Services Commission, are playing our small part in that program.

Our inquiry

Earlier this year, the Victorian Government asked us to inquire into the 'true value' of distributed generation: What value do distributed generators produce? And, are they being adequately remunerated for that value?

Our inquiry has proceeded in two parts.

The first part, which has now concluded, looked at the value of the energy produced by distributed generation.

In short, we have proposed a time-varying feed-in-tariff based on the same time blocks used for flexible retail tariffs — that is: we have proposed peak, shoulder and off-peak feed-in-tariffs. These time-varying feed-in-tariffs reflect how the wholesale

value of the electricity exported by a distributed generator varies with the time of day.

We also found that the value of the electricity produced by a distributed generator varied with the avoided losses associated with the electricity that was displaced. Looking at the line loss data, we suggested the State could be divided into two zones: one with higher line losses and the other with lower losses (rather than the simpler, state-wide average we currently use). We used these different loss factors to show how feed-in-tariffs might vary across the State.

In addition, we also proposed a critical peak feed-in-tariff that would apply whenever the spot price in the wholesale market exceeded \$300/MWh.

We were also tasked with examining the social and environmental value of distributed generation. This proved to be the more a challenging exercise. There are certainly strongly held views in the community about the value of these benefits. Indeed, we received over 2500 submissions on these issues. We examined each claim carefully but in the end, we could not find sufficient data to support the link between a given unit of DG output and a given quantum of social or environmental benefit — with one exception. We were able to develop a sufficiently robust methodology for quantifying the tonnage of greenhouse gas emissions avoided when distributed generation displaces a central generator. However, we could not take the next step and place a monetary value on those reduced emissions. That is ultimately a question for policymakers. So too is the question of whether some or all of these avoided emissions have already been remunerated through existing policy instruments (such as the Commonwealth's small scale renewable energy scheme (SRES)). Our inquiry left these questions open.

The second part of our inquiry (which is still underway) is looking at the network value produced by distributed generation.

The question of whether and how distributed generation provides network value is complex from an engineering perspective and from a regulatory perspective. One of our aims has been to demystify the question of whether distributed generation actually leads to the deferral of network augmentation. We are undertaking a comprehensive empirical analysis to get to the bottom of this question.

We have been piecing together information published by network businesses and developing a methodology that can use this data to calculate the benefits produced by DG at various levels of the electricity network. A couple of key findings are already emerging. These will not be news to anyone in this audience. First, the network value of distributed generation is highly locational.. Second, controllability is a central factor in determining value — the more controllable the DG, the more potential it has to provide a benefit to the network.

Of course, our inquiry is also taking place in the context of a dynamic regulatory environment where, for example, the AEMC recently released its Draft Determination on a rule change proposal for Local Generation Network Credits.

We have been consulting with the DG industry and the distribution networks on all these matters. Our draft report on network value will be released in early November and we're looking forward to receiving submissions. (Our Final Report must be provided to Government by the end of February.)

A departure from my notes

At this point, I am going to depart from the thoughtful and carefully drafted notes that James prepared for me so that I can share a few thoughts with you — thoughts that probably don't get raised very often at conferences like this one. As an economic regulator, these are the questions that play on my mind when I'm lying awake at night thinking about the future.

It's not my role to determine what the future should look like. I have no idea whether microgrids are the way of the future or not. But that's not the question over which I lose sleep. Rather, I spend my sleepless hours wondering about: How do we, in administering rules and regulations on behalf of the Victorian Government and Victorian consumers, **how do we avoid promoting the wrong future and how do we avoid inhibiting the right future?**

I'm sure you think about similar questions, and as you do, you will have thoughts on topics such as system configuration, technological possibilities and even market

design. I too think about these things, but that's not really what keeps me awake at night.

Instead, I spend my time trying to understand the role of regulation in the interplay between market forces and government policy; and I spend my time trying to understand how I can best fulfil my statutory objective of promoting the long term interests of Victorian consumers.

Since the reforms of the 1990s, the question of technological choice has been assigned, in large part, to the market to resolve. As regulators, our role has been to try not to fetter that choice on the presumption that the market, if left unfettered, will deliver the outcomes that promote the long terms interests of consumers — with our role limited to providing customer protections that seek to prevent potential excesses in the market place.

This model has stood us in reasonably good stead for the last 20 years. I believe this is because tensions between market determinism and customer protection have not been great, nor would we expect them to have been too great when change in the market has been incremental, predictable and time-consistent — by which I mean, foresight and hindsight have not given wildly varying answers to questions about the appropriateness of any particular investment by suppliers or by consumers.

Therefore, it has been a reasonably straight-forward task for regulators to promote the long term interests of consumers by simply letting the market 'do its thing' and by enforcing a few reserved customer protections in the meantime.

But, is our underlying assumption still valid? Looking to the future, will change still be incremental, predictable and time-consistent? I doubt anyone here would think so.

These days, all the talk at seminars and conferences such as this one is about 'disruption'. The natural consequence of disruption is that what looks good today, may not look so good tomorrow. Buying a taxi licence looked like a 'sure bet' not so long ago. It no longer looks that way. Microgrids might be the coolest thing going down today, but what confidence can we have that they'll still be of much use on the other side of the disruption (or disruptions) that lie ahead?

It would appear that uncertainty is the only certainty. In the face of such uncertainty, how can regulators continue to promote the long term interest of consumers of this essential service? Or, are we forever destined to be playing catch-up (or give-up)?

I believe there is a way forward — a way forward that is better than catch-up or give-up. There is a way forward because there is one element that remains constant despite all the uncertainty. One thing remains true irrespective of the disruption; irrespective of the technology; irrespective of who delivers it. That one constant is: the customer. The customer is there now and the customer will be there in the future — no matter what else changes.

Therefore, how we regulate must be constructed from the perspective of the customer and what the customer receives. In future, regulation cannot be constructed around what is provided, how it is provided or who provides it. That is all subject to too much uncertainty. In the future, it won't make sense to have a distribution code or a retail code or microgrid code (or their equivalents in the national energy rules). In the future, it will only make sense to have a consumer code.

But what might a consumer code look like? — one that is not beholden to old-world notions of distributors and retailers, central generators and distributed generators. What might such a regulatory framework look like? Now, that's the question that keeps me awake at night.

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