

Future-Proofing in Australia's Electricity Distribution Industry

EY Small Embedded Generation Value Workshop Minutes

13th August 2015, Perth, Mercure Hotel

Welcome

Meeting opened at 2.30pm.

CEC welcomed, thanked all for attending and gave an overview of the FPDI project, context for this work and expectations for the workshop.

EY presentation from Matthew Holmes.

Q&A

Issue: Planning and reliability standards

Energex has probabilistic planning criteria and reliability assessments. This means there are two ways to look at this work because DER's hide a certain level of load and VCR. The VCR assessment for augmentation is looking at demand on the system that is lower than it appears. If we lose the feeder then we lose a lot of net benefit from the utility. Customer reliability is the potential issue here but DER could be a possible benefit too. Is this issue captured in this work?

Response

It depends on who is paying. If it is the system then yes the DNSP would have to take that into account. But network augmentation would be included as a cost of DER's with this method.

It is covered in page 9 on network reliability, though there is not currently a clear path. We need to consider who should be calculating the cost and benefit of DER and then bringing it back to customers.

For instance DER could reduce losses in the system but it's really up to retailer to recognise those.

Issue: Carbon costs

With regards to distribution losses, are there any European cases where the networks bore the cost of carbon solution certificate costs?

Response

No can't recall any.

Issue: Customer benefits

Shouldn't we focus on customer benefits? Then the rest falls away to efficiency of the market.

Response

Broadly agree, it's important to identify cost and benefits to DNSP as well as other parts of the network and look at whole spectrum. i.e. what is the net cost and benefit of a particular aspect? Need to consider which party (e.g. DNSPs, retailers etc) is responsible for which value category.

Issue: Regulatory Investment Test

For network augmentation we are required in WA to do a net benefit test. Has this been attributed to in this report?

Response

Just like with the RIT-D if it doesn't have a financial impact then it is not in this report, broadly speaking. This is about the financial impact DNSP's have on my network. There could potentially be a huge amount of duplication.

Issue: Costs of DER

Have any utilities reported any instances of higher costs from the connection of DER?

Response

Power quality issues have been observed, but no firm amount of higher cost has been identified to our knowledge.

It's important to remember a key aim of the CEC and FPD project of which this report is a part is to demystify these statements. Distribution and transmission businesses think it is 'bad' for their business but none of those studied could quantify that cost. Small benefits were reported but none had costs. This report has identified quantitative benefits but recognizes that there may be costs too.

The background for this was that there have been many statements on DER creating a benefit or costs to networks but it has been perceived to be too hard to calculate. So we set out to create a methodology to break down this issue which EY, through this report, have done. The industry needs to recognise that DER penetration is growing and will continue to do so. Tried to come up with a way to demystify though it is really hard it is not impossible and needs more research.

Issue: Island networks

More investigation is needed for large and small penetrations and on large and small networks. With large there is a distorted loading. Very small networks that are vertically integrated as in remote WA have fixed costs and other issues have come up that prevent increasing DER.

Response

The methodology doesn't prevent broader costs and benefits from being captured. We expect that calculating the value of DER to be easier to capture in vertically integrated businesses.

Issue: Tariff reform

Perth has 22% DER on the distribution network. Current tariff structures mean that these customers are avoiding the full costs and imposing higher costs onto others. Has the work addressed this?

While tariffs have worked in past they need to be reformed to reflect true cost and value to provide the right signals and get a better response from customers. There is a need to look at the NPV of the costs and benefits.

Consumers have been cross-subsidising air conditioning on flat energy-based tariffs since 1995 when the air conditioning boom really took off. The CEC needs to make it quite clear that the tariff subsidy to PVs is small when compared to the magnitude of subsidies to air conditioners that contribute significantly to the peak but don't run for enough hours in the year to provide the revenue from flat energy tariffs to cover the costs of peak supply capacity.

Response

Important for distribution businesses to do this sort of calculation to get tariffs right. The outcome would feed into the tariff setting process. The tariff reform debate will address how cross subsidies are smeared. What this work is trying to understand is DNSP-specific costs or benefits so they can take it into account in their future planning processes and deal with it in a way that gets a better outcome for consumers.

The scope of work was to develop the methodology, but given the extensive reform going on it's hard to second guess an outcome. What the study does is add to a component of the debate, not solve the tariff issue altogether.

CEC outlined the next steps of FPDl project and invited feedback from attendees.

There is a need to progress this kind of work faster. EY investigated the CSIRO national feeder taxonomy study but they have not captured the same information in their report so it is not appropriate for this kind of analysis at this stage.

Is a market mechanism needed to capture the benefits? Reactive power or voltage control for example. It would be useful if someone could do simulations on residential versus commercial, day versus night time and long versus short term services. Incorporating shoulder seasons too.

Storage will increase the complexity here with charge and discharge profiles. In this case the investigation is on the product level, rather than on the feeder level.

The case for change will require political will, which will be much stronger than industry will. This will require cost-benefit assessment and quantification.

Should consider the feeder hosting capacity also, an ability to apply a broad-brush approach initially and then look more closely when the network gets towards tipping point. Good example from California where EPRI market networks are required to produce GIS maps of hosting capacity. Horizon power has another good example where they publish the hosting capacity by remote grid location. This is largely driven by system stability issues, rather than network issues.

Knowledge is everything and the more we get. This work and the FPDl project is trying to pull information together collectively to help all facets of the issue. Customer behaviour is not touched on though and this needs further consideration.

We also need to consider regulation, tariff models and what we do on edge of grid as 20% of cost to network is for the outlying areas. Ultimately we want to provide a benefit for customers generally in meeting what they want.

Next steps:

- CEC to circulate notes for feedback
- CEC will consider future work in light of these discussions

Registered attendees (**attended**)

David	Edwards	Horizon Power
Tom	Butler	Clean Energy Council
Graham	Benstead	Cape Automation
Erin	Rose	EJ Rose Electrical Services
Brian	Blanchard	West Australian Alternative Energy
Noel	Schubert	Western Power
Vince	Aitken	TPE Services
John	McIlhone	Carbon Footie
Cameron	Sharp	SMA Australia Pty Ltd
Maryanne	Coffey	Clean Energy Council
Mark	de Laeter	Energy Market Consulting associates
Aleg	Novik	Western Power
Peter	Howe	Anser Consulting
Ivona	Okuniewicz	Western Power
Brenton	Laws	Western Power
David	Martin	Future Effect
Choon	Tan	Western Power
Matthew	Veryard	Western Power
Chris	Barker	Cambridge solar
Gabor	Bencze	Infinite Energy
James	McIntosh	Department of Finance - Public Utilities Office
Tony	Stewart	Public Utilities Office
Steven	Kruit	Public Utilities Office
David	Stephens	Horizon Power
Laurie	Curro	Horizon Power
Phillip	Capper	Western Power
simon	barclay	western australian alternative energy

Future-Proofing in Australia's Electricity Distribution Industry (FPDI)

EY Small EG Value Workshop Minutes

18th August 2015, BRISBANE

Attendees:

Tom Butler, CEC
Maryanne Coffey, CEC
Nick Cutler, EY
Matthew Holmes, EY

Welcome

Meeting opened at 11.30am

CEC welcomed, thanked all for attending and gave an overview of the FPDI project, context for this work and expectations for the workshop.

EY presentation – Matthew Holmes and Nick Cutler

Issue: Data availability

Smart meter data, is it available? Can Victorian meters capture all the data needed?

Even a small number of meters can provide a lot of data. The issue is edge-of-grid data, not smart meters.

Issue: island networks

Does islanding also cover micro grids that disconnect from the main network (there may be benefits in long term)?

Potentially, the model does not differentiate between how the island is formed.

Issue: Reliability Standards and Avoided TUoS

Shouldn't these generators be receiving avoided TUoS payments?

Yes reliability cost and benefits and measurement there is an issue on how that is captured currently and what is included and not included in each of those. Revenue caps for TNSPs mean that avoided TUoS has no impact as the TNSP gets paid regardless.

Issue: Tariff reform

Peak demand costs are significant and augmentation costs will change with time. Consumers are changing behavior to invest in renewables. Momentum from industry is to have more cost reflective tariffs.

This report should feed into what tariffs make sense, this report looking at technical point of view. Tariff reform changes where taking place at time this report was being and didn't want to second guess them.

There is parallel work being done by UTS on a similar issue, the CEC would like to see the results converge.

Issue: Two-way network charges

If you are installing solar and exporting, then DER does not get anything. It's not two way pricing.

Distribution Use of System charges (DUoS) is how networks get paid, so is a generator use of system charge needed?

Two way pricing needs to be transparent if implemented.

Tariffs are subject to review at the moment, but the generator use of system question is a fundamental change in market design that is not being complemented at all.

DB's don't charge on a locational basis. When calculated did you use network broad brush (actual cost). Maybe and LRMC could work? AEMC would say REPEX, how do you forward those analytics savings into cost saving for the future. It looks like a very daunting exercise.

Issue: Customer impacts

Investment in DER will transfer capital costs from DER customers to non-adopters of DER, which cannot be accessed in all cases. Does that impact customer integration inebriation with network? Need to look at incentives for homeowners and other customer. Cross-subsidies need to be considered across the board, for instance cross-subsidy from air con use in QLD is significant. In QLD, as we have state owned networks we have a vested interest in getting a return on the asset.

Issue: DER ownership

Perhaps networks could own PV and batteries to invest in their customers?

There is a tendency in Australia for customers to want to own things as opposed to leasing, which is more accepted in the US. The issues is how to change customer perspectives.

Supply behind the meter side - don't know how networks can do this given the role of retailers.



National energy customer framework contract couldn't lock a customer in for 15 years. A lot of work for a DNSP but not to say there isn't a need for regulatory framework.

Ergon battery trial has batteries owned by Ergon Retail and not Ergon Networks,

Possible priorities to address this:

- 1) Networked owned assists or mix of private and network ie. Batteries incentivized in Germany. But networks have not been established to use PV and battery as an asset. PV on edge of grid in Cali and helped to solve some of the feeder problems but it all behind the meter now.
- 2) Batteries could be owned by customers or networks - the question of who is better to incentivise (customer or distribution network) to put PV etc in. The issue of command control vs decentralised control is also relevant.
- 3) Should focus on getting settings right and see what market creates? This is likely to be the best outcome for customers.

Additional note

Energex Case Study in the report is contrived, rather than real world. It's close to real world but was not a real planning scenario.

Next steps:

- CEC to circulate notes for feedback, and consider next steps to progress this work.

Registered attendees

Grant	Dyer	edenPOWER
Dean	Comber	Ergon Energy Corporation Limited
Tom	Butler	Clean Energy Council
Greg	Flynn	Energex Limited
Richard	Romanowski	Elevare Energy
Theo	Verrills	Department of Energy and Water Supply
Charles	Hsia	ReneSola Australia Pty Ltd

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Tony	Pfeiffer	Ergon Energy Corporation Limited
Maryanne	Coffey	Clean Energy Council
Paul	Connolly	Queensland Dept of Energy & Water Supply
Tara	Wood	Department of Energy and Water Supply
Louise	Mahony	DEWS
Mischa	Goldberg	Precise electrical contractors pty ltd
Tom	Doss	Precise electrical contractors pty ltd
Candice	Hincksman	Energex Limited
Laurie	McLeod	Sunshine Solutions

Future-Proofing in Australia's Electricity Distribution Industry

EY Small Embedded Generation Value Workshop Minutes

27th August 2015, Melbourne, CEC offices Melbourne

Welcome

Meeting opened at 11.30am.

CEC welcomed, thanked all for attending and gave an overview of the FPDl project, context for this work and expectations for the workshop.

EY presentation from Matthew Holmes.

Discussion

Issue: model applications and possibilities

Challenge in understanding 100% penetration of PV through this model.

This proposed framework can allow all DNSP's to do cost and benefit analysis at whatever level of penetration.

Would analysis available to community as well as the DNSPs. It's public work but aimed at DNSPs. Someone else can apply it but DNSPs have all the information to do so with high granularity.

This would enable a discussion on possible control schemes to minimise longer term costs on the network. For example change orientation of PV panels to face west, or control a storage system to reduce loading on a feeder.

How many feeders are there? Possibly 10's of thousands.

Is this considering network-controlled DERs only? The Framework allows the operating modes or generation profile to be an input to the analysis so it can be any mode.

Issue: Data availability

Is regulatory support needed? Uncertainty of generation, how to get around? Good data would probably rely on some regulatory requirement.

If a DNSP had good interval data, EY's view is that it shouldn't take more than several weeks' effort to implement this and then it would get easier.

Not known that impacts of DERs are? This is not fully tested and a DNSP doesn't always have data or analysis to see what network can do.

Issue: Island networks

Islanding, why is it 'not allowed'? It's referring to the option to keep running in 'islanded' mode. It's got to work and be safe but there are some issues to work through. Like who is responsible for supply. It could work technically and at a point in the future it might become more viable. The report didn't find it wasn't allowed as such. However DNSPs don't support it as an acceptable operating mode.

Islanding a 'customer facility' specifically with a DER (operating as an embedded generator) may be negotiated with existing provisions with a DNSP if the proponent design can satisfy the DNSP technical requirements. This is currently in effect on a relatively small population of DER throughout the NER. It may also have potential to be part of demand management strategy.

All large office complex or critical infrastructure such as Hospitals, in general have backup generators to operate during power interruption. This in effect operates the 'customer facility' in island mode as 'break before make' scheme and is not unusual. To note a DER generator inadvertently 'islanding' the DNSP's network is prohibited. All DER generators must implement protection scheme and or otherwise to guard and prevent this scenario from occurring.

DNSP not accepting a 'customer facility' islanding may require more appropriate re-phrasing (otherwise item 2 would be very challenging). It may be important to provide distinguishing context between all large office complex or critical infrastructures and a DER generator inadvertently 'islanding' the DNSPs network.

Next steps

CEC is putting this methodology out there. UTS is also doing report and testing a similar framework.

The next steps are to undertake a trial and identify areas where this framework may be applied. Ideally this would be half dozen areas to roll out for example green field sites, high demand or constrained feeders or remote fringe of grid sites.

AREAN may be a source of funding for this. They have a priority focusing on grid integration and would look to industry to identify a demonstration project.

Actions:

- CEC to circulate notes for feedback, and consider next steps to progress this work.

Registered attendees

Steve	Oh	United Energy
Hilton	Garcia	EnergyAustralia
Anwar	Mohammed	ZAPD Energy
Stuart	Johnston	Energy Network Association
Anna	Sexton	Clean Energy Council
Leigh	Ewbank	Friends of the Earth

Eli	Court	ClimateWorks Australia
Miguel	Brandao	AGL Energy Ltd
Maryanne	Coffey	Clean Energy Council
Lyle	De Sousa	Legal Energy Lawyers and Consultants
David	Watkins	SunTrix
Peter	Dobson	Department of Economic Development, Jobs, Transport and Resources
Renzo	Gaggioli	Canadian Solar (Australia) Inc.
Darren	Gladman	Clean Energy Council
Philip	Barresi	Energy Users Association of Australia
Iain	Maitland	Ethnic Communities' Council
Helen	Scott	Ethnic Communities' Council
Irene	Oakley	Department of Economic Development (Victoria)
Rob	Law	Northern Alliance for Greenhouse Action
Scott	McKenry	EAGA
Matthew	Sullivan-Kilgour	Hux
Russell	Marsh	Eseential Services Commission
David	Meiklejohn	NAGA
Vany	Gunaratnam	City of Melbourne
Ada	Young	Department of Premier and Cabinet
David	Blowers	Grattan Institute
Dylan	McConnell	University of Melbourne Energy Institute
Emily	Cox	Siemens Limited
JORGE	CARBONELL	SunPower Corporation Australia
Chandra	Sundareswaran	Moreland Energy Foundation Limited
Prem	Panickar	Department of Economic Development Jobs Transport and Resources
Ian	Foster	ReneSola Australia Pty Ltd
Damien	Moyse	ATA
Yes 2 Renewables	Intern	Friends of the Earth
Paul	Fisher	SunPower
Gavin	Mountjoy	Darebin City Council
Aditya	Upadhye	Jemena
Tom	Langstaff	AusNet Services
Martin	Cavanagh	AusNet Services
Lynne	Gallagher	ENA
Tom	Keddie	SunEdison Australia Pty Ltd
Philip	Cohn	ARENA
Marc	Ting	EY
James	Miller-Randle	EnergyAustralia
Valentin	Muenzel	Relectrify