

ARENA

DYNAMIC OPERATING ENVELOPES WEBINAR SUMMARY

WEDNESDAY 30 SEPTEMBER 2020



Australian Government
Australian Renewable
Energy Agency

INTRODUCTION

The [Distributed Energy Integration Program](#) (DEIP) is exploring the value that dynamic operating envelopes could offer to the energy transition. This workstream aims to:

- › build a shared understanding of the opportunities and challenges
- › share insights on approaches currently under investigation
- › identify reforms that could be implemented to establish dynamic operating envelopes.

A DEIP Working Group consisting of representatives from the Australian Renewable Energy Agency (ARENA), Energy Security Board (ESB), Australian Energy Market Operator (AEMO), Australian Energy Regulator (AER), Australian Energy Market Commission (AEMC), Australian National University (ANU) and SA Power Networks is leading a program of workshops to complete this work.

This document summarises the key points from an ARENA Knowledge Sharing webinar held on 30 September 2020 that introduced the audience to the concepts, issues and key projects investigating dynamic operating envelopes.

Find out more about the ARENA-funded projects involved in this event:

Zepben [Evolve DER Project - On the Calculation and Use of Dynamic Operating Envelopes](#)

Dynamic Limits [DER Feasibility Study - Role of Decentralised Control for Managing Network Constraints for DER](#)

SA Power Networks [Advanced VPP Grid Integration Project - Technical Description of API Implementation](#)

For more information contact us at knowledge@arena.gov.au

PRESENTATION SUMMARY



Bill Tarlinton from Zepben shared insights from the [Evolve project](#), which aims to increase the network hosting capacity of DER by maximising their participation in energy, ancillary and network service markets, while ensuring the secure technical limits of the electricity networks are not breached. The team is also focused on creating an open source, common data platform known as Evolve Platform to overcome issues of interoperability across the NEM. Bill highlighted the importance of data and communications standardisation for the development of dynamic operating envelopes.

Alex Lloyd from Dynamic Limits outlined an approach to operating envelopes from their recent [DER Feasibility Study](#), in which the term relates to the technical limits and boundaries of networks, voltage and frequency. The study examined existing approaches to managing network capacity constraints, investigated the general technical feasibility of implementing a dynamic DER control scheme, and undertook a site-specific analysis on regional, rural and remote network sections, examining implementation on feeders experiencing constraints. Alex highlighted the need to

reduce latency between the different levels of the grid operations hierarchy, but that control should initially occur at the lowest level - the DER assets.

Brynn Williams from SA Power Networks highlighted the work of the [Advanced VPP Grid Integration project](#), which aims to show how dynamic, rather than fixed, export limits can enable higher levels of energy exports to the grid from customer solar and battery systems. The team is developing analytical techniques to assess the residential solar PV hosting capacity of distribution networks by leveraging existing network and customer data, and have developed an application programming interface(API) to exchange real-time and locational data on distribution network constraints between SA Power Networks and the Tesla South Australian VPP. This will allow the VPP to optimise its output beyond site-specific 5 kW fixed limits to make use of the available network capacity. Brynn highlighted that recent trials indicated that export capacity could be doubled at times other than the middle of the day when passive solar PV output is at its highest.

PANEL DISCUSSION KEY TAKEAWAYS

ZEPBEN



BILL TARLINTON

MANAGING DIRECTOR

DYNAMIC LIMITS



ALEX LLOYD

PRINCIPAL CONSULTANT

SA POWER NETWORKS



BRYN WILLIAMS

FUTURE NETWORK STRATEGY MANAGER

ENOVA ENERGY



ALISON CROOK

CHAIR

RENEW



DEAN LOMBARD

SENIOR ENERGY ANALYST

WATCH
THE PANEL
DISCUSSION

- The development of dynamic operating envelopes is an ongoing process and many complex **technical issues** are yet to be resolved (e.g. the benefits of different methodological approaches, and the complexities of non-linearity on three-phase networks). There are also important **equity issues** that will need to be addressed, such as how capacity could be allocated in an equitable way to customers connected along a low voltage feeder.
- **Data availability and standardisation** was identified as a key issue. This includes what types of data can be shared by networks, and with whom, due to ambiguity in the National Electricity Law and licensing agreements, as well as a lack of visibility of DER assets and the low voltage network more generally. However, cost reduction in sensors and improved communication from assets is improving the situation but work is still needed in terms of standardisation.
- The outcomes and **benefits to customers** was highlighted as of utmost importance. Panelists agreed that dynamic operating envelopes are likely to provide cost benefits to all consumers (with or without DER assets) by enabling more solar exports onto the grid, as well as reducing the need for costly network upgrades. This will require transparency and considerations of equity to be front and centre when developing regulations around operating envelopes. Consultation and education of consumers were also highlighted to ensure that benefits are known to avoid poor outcomes.
- Panellists suggested that there were currently few regulatory impediments at this early stage but that it was important regulators did not try to pre-empt the outcomes of different trials taking place. It was suggested that regulators should wait for a critical mass of technological improvements before 'picking a winner.' The role of standards was again highlighted, along with the importance of making a clear case for DNSP investment into these new areas of network management.
- The discussion explored the interactions between **cost reflective pricing and operating envelopes**. These were seen as complementary mechanisms that could facilitate change in consumer behaviour, such as incentivising shifts in demand to when solar production is high and allowing exports to occur at times of higher network demand. Further automation of DER assets or appliances was seen as vital to enable these demand shifts. Future change in cost reflective exports as well as consumption were highlighted.
- A **bottom-up approach** was also touched upon, both in terms of shifting decision making to DER assets to manage the technical constraints of the network, as well as empowering communities in a more decentralised and equitable system to maximise the benefits of DER for all energy users.

Further information is available at
arena.gov.au

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