flextalk

SOLAR HOME EV WIND CHARGE

The Demand Flexibility Common Communication Protocols Project

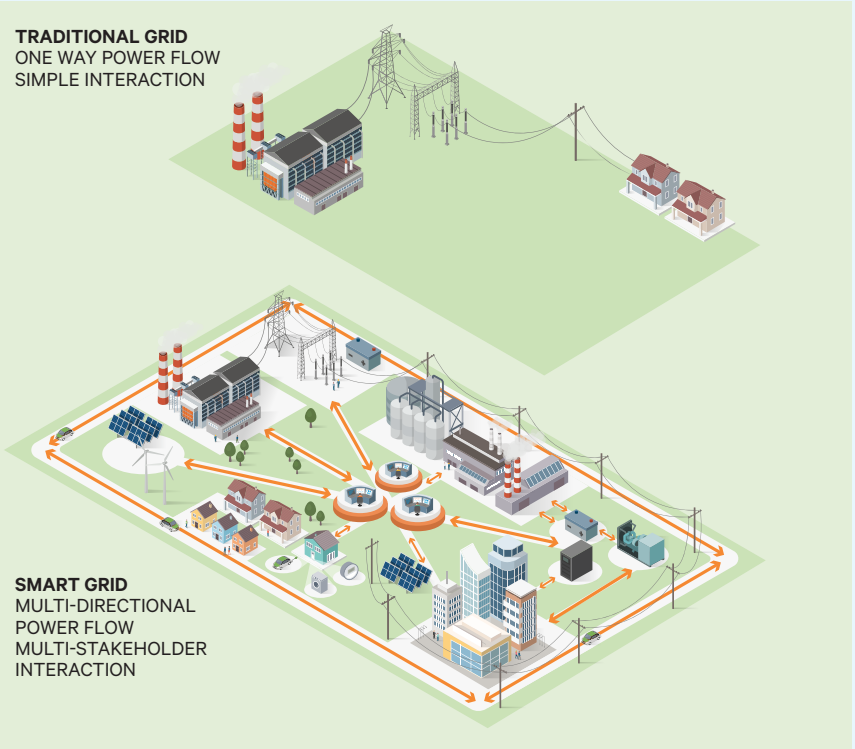
AUGUST 2024

Why is there a need for flexibility?

Aotearoa New Zealand's electricity system has served the country well for the last 100+ years, providing secure, reliable, and affordable energy for all consumers. However, after decades of stability, the system is entering a period of unprecedented change.

The key drivers of change:

1. **New Zealand policy on emissions reduction** in alignment with the Paris Agreement (2015) which includes a commitment to net zero greenhouse gas emissions by 2050. Emission reduction will result in an increase in electrification and the need for infrastructure to accommodate this increase in demand. Costly network upgrades can be mitigated through non-network solutions such as flexibility.
2. **Consumers have more options** than ever to meet their energy needs.
3. **Greater variability** – New technologies and the connection of consumer energy resources (CER) and distributed generation can result in more variable consumption patterns and makes the operation of distribution networks more dynamic and unpredictable.



4. The requirement to provide **access to electricity market ecosystems** for consumers and new market actors is increasing and diversifying.

WHY IS STANDARDISATION IMPORTANT?

Standardisation will be a key enabler of future electric vehicle charging and consumer energy resources being able to work together and integrate seamlessly within the wider electricity system to provide flexibility.

The primary obstacle: developing operational and technical approaches that maximise societal benefit, whilst overseeing market responses and ensuring the resilience of system operation.

WHAT ARE COMMUNICATION PROTOCOLS?

A communication protocol defines a standardised process on how to receive, transmit and exchange data allowing communication between different parties across the energy system (i.e., system operator, networks, retailers, flexibility suppliers/aggregators, and consumer energy resources).

KEY FINDINGS

Assessment of the OpenADR communication protocol within FlexTalk met all defined assessment criteria for 'least-regrets' functionality to enable flexibility.

Open communication standards and protocols are a key enabler of flexibility.

Agreed industry standardisation of protocols will provide enhanced interoperability, real-time data exchange, improved flexibility and scalability.

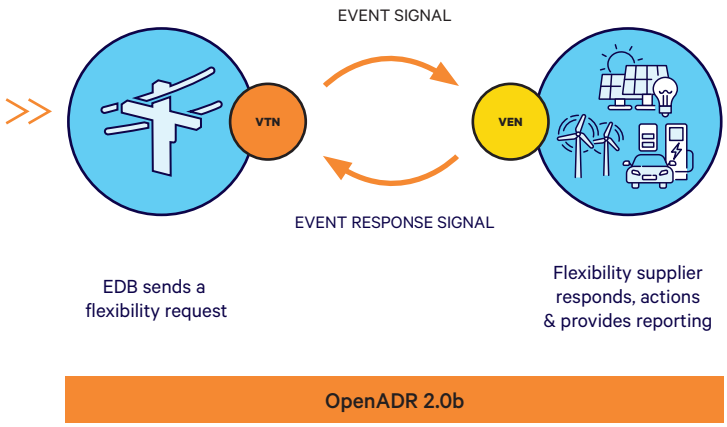
The two most mature open communication protocols are OpenADR and IEEE 2030.5, each have advantages specific to their intended use case.

International adoption of standard protocols vary due to individual needs and context.

While simple APIs allow industry to participate in flexibility, they are short-term solutions and will hinder long term participation, interoperability, scalability and security.

WHAT DID WE TEST?

The FlexTalk project explored how the adoption of a common communication protocol, could better enable customer flexibility to be utilised by testing interoperability of a two-way open protocol (OpenADR) between an electricity distribution business and flexibility supplier. FlexTalk also developed the procedures needed for active management of electric vehicle charging and battery charge management in near real time.



WHAT SHOULD FURTHER TRIALS EXPLORE?

- CER functional requirements
- Data access and data management requirements
- Consumer awareness and social license
- Market structures and stimulation mechanisms

KEY RECOMMENDATIONS

That any adopted industry communication protocol is inclusive of the following functional requirements:

- Open (non-proprietary)
- Scalable
- Platform Independent
- Interoperable
- Maintainable
- Backward and forward compatible

Work must be undertaken to engage and educate New Zealand consumers to gain social license on the energy transition. Consumers will play a more active role in the supply and demand of energy, it is essential consumers are the focal point of power system design to ensure a secure, sustainable and affordable energy future.

PROJECT SNAPSHOT

The trial **SUCCESSFULLY** demonstrated interoperability and active managed charging of EVs and batteries using the OpenADR communication protocol

57 customers

135 events

SEVEN defined use cases for flexibility – temporary distribution network constraint, power quality issues, unplanned outage management, planned outage event, network investment/deferal or replacement, grid emergency, system operator/ market support

ONE independant research report scanning the international landscape on what protocols exist and their rationale for adoption

SEVEN programs designed and tested to address industry use cases – in advance, dynamic, emergency, price responsive bid, price responsive discovery, dynamic operating envelope, battery level

* Source: CSIRO and Energy Networks Australia, 2017: Electricity Networks Transformation Roadmap: Final Report

WANT TO LEARN MORE?

Published May 2024 – The FlexTalk reports on the demand flexibility common communication protocols project assessment and findings, the technical insights (a practical guide for starting an OpenADR implementation) and the EA Technology international review of open communication protocols.

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