

ECCA

Demand Flexibility In New Zealand Homes Tender Submission



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CATCH Power

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Q1. The main use cases for demand flexibility presented in this paper are: managing peak demand (generation and line capacity) constraints, optimising renewable energy use, and optimising home energy use. Do you think these are the main use cases?

Yes. Managing peak demand constraints, optimising renewable energy use, and optimising home energy use are core use cases for demand flexibility.

However, this programme should be coordinated with the Electricity Authority (EA). Demand flexibility and flexible export/import controls must be developed under a unified framework.

Australia's experience shows that when each DNSP creates its own technical requirements, the result is fragmented standards, low compliance rates, and slower industry adoption. A nationally consistent approach is essential for scalable, safe, and cost-effective integration of distributed energy resources (DER).

Additional use cases and considerations:*Standardised controls for both exports and imports are critically important. As electrification increases, especially EV uptake, the grid faces a new evening peak risk: households arriving home and simultaneously plugging in EVs. Without coordinated flexible import limits and the ability to orchestrate EV charging in real time, networks can quickly become overloaded.*

EV charging must be incorporated into demand flexibility programmes by design. Integrations using OCPP and centralised control via APIs enable networks to dynamically adjust charging rates based on real-time grid conditions.

Additionally, distributed batteries must also be treated as both loads and generators. Batteries can absorb energy during periods of excess renewable generation and export energy when the grid requires support. Recognising batteries as bi-directional assets is critical for maintaining grid stability, unlocking VPP participation, and enabling retailers to orchestrate decentralised storage.

The success of VPP-based approaches such as Amber in Australia highlights the system-wide benefits when batteries, EV chargers, and flexible loads operate under standardised visibility and control frameworks.

Q2. In the residential sector, the following products have been identified as key end-use products for demand flexibility: EV chargers, heat pumps, electric hot water systems which use a storage tank, fridges/freezer, clothes washers, dishwashers, clothes dryers, inverters for solar and battery systems, and HEMS. Do you think these are the key demand flexible end-use products in the residential sector?

Yes, however true two-way integration across all devices is complex and costly. For practical implementation and best value for money, efforts should focus on the largest and most controllable loads, the assets that have the biggest impact on both grid stability and household energy costs.

From our experience, the three categories that offer the greatest immediate value are:

- EV chargers Mandating OCPP provides a secure, standardised communication pathway, enabling real-time orchestration of charging and flexible imports to avoid evening peak overload.*
- Conventional hot water cylinders Easily managed based on Exports/ Time of Use / Energy Tarrifs / Network signals or wholesale pricing providing an immediate, low-cost flexibility solution at scale.*
- Heat pumps — Proven to respond effectively to centralised control via DRM signals for peak shaving and load shifting.*

If not, what are the key products and why? While heat-pump hot water (HPHW) systems are highly efficient, the upfront cost is a significant barrier. In contrast, managing existing conventional cylinders can be achieved cheaply and quickly, delivering large-scale flexibility without requiring homeowners to replace appliances.

Summary of integrated control capability: The need to focus on controllable, high-impact loads is reinforced by the capability of advanced energy management systems such as CATCH Control. These systems can simultaneously manage multiple loads, including hot water, EV charging, and Heatpumps (Pool and Hot Water) while also coordinating with multi-brand inverters and batteries on the same site. This level of integrated control ensures that flexible imports/exports, load shifting, and battery charging/discharging are all orchestrated in a unified, coordinated manner.

This holistic approach prevents conflicting behaviours between loads, supports network stability, and maximises the effectiveness of demand flexibility programmes.

Q3. Do you think a standardised end-use product/application-based approach is relevant for the commercial sector, or is a bespoke/customised approach needed?

For the commercial sector, a blended approach is needed. A standardised end-use product/application-based approach is suitable for small-scale commercial environments, where typical loads such as heat pumps, hot water systems, and light EV charging infrastructure can be controlled using common protocols and readily available technologies. Our products, for example, are already designed to operate effectively in these small commercial settings, providing centralised control over multiple loads, inverters, and batteries in a way that aligns with standardised communication pathways.

However, larger commercial and industrial environments often require bespoke or customised solutions due to:

- higher operational risks*
- site-specific process requirements*
- unique safety considerations*
- complex energy profiles*
- multi-system interactions*

In these cases, the control strategy must be tailored to the operating characteristics of the site while still interfacing with centralised pricing or demand-flexibility signals.

Q4. What do you think the key end-use products/applications are in the commercial sector?

The key end-use products and applications in the commercial sector depend heavily on the scale of the site and the operational risk profile. Demand flexibility needs to be matched to the type of load and the nature of the business.

For small-scale commercial operations (e.g., offices, retail, small businesses):

- Heat pumps/air conditioning systems These can be effectively managed via DRM (Demand Response Mode) signals, providing predictable load reduction or shifting without impacting comfort.*
- Conventional hot water systems Easily orchestrated through simple relay/contactors control.*
- Lighting and general HVAC Can be incorporated into scheduled demand shifting during peak pricing periods.*

These types of loads are standardised and respond well to common control mechanisms, making them ideal candidates for a standardised demand flexibility approach.

For medium-to-large commercial or industrial environments:

- Industrial process heat*
- Large chillers or refrigeration systems*
- Large-scale EV fleet charging*
- High-demand manufacturing equipment*

These loads typically require a more sophisticated approach. In these cases, the most effective method is often a partnership-based model between the energy retailer and the site operator, using:

- real-time price signals*
- dynamic tariffs*
- midday renewable-overload incentives*
- night-shift or off-peak energy scheduling*

This allows the business to modulate production or thermal demand in alignment with grid conditions without compromising safety, productivity, or product quality.

Q5. Do you think a standardised end-use product/application-based approach is relevant for the industrial sector, or is a bespoke/customised approach needed?

A bespoke/customised approach is needed for the industrial sector. Each industrial facility has its own processes, safety requirements, and energy profiles, so a standardised end use product approach is not practical.

However, the control framework should be standardised. A centralised, publicly accessible API providing real-time price signals, similar to Australia's 5-minute market updates, this allows each plant operator to build its own tailored response strategies while still aligning with system-wide needs.

Q6. What do you think the key end-use products/applications are in the industrial sector?

This will be site specific as Industrial sites often manage:

- specialised production lines*
- continuous or batch processes*
- strict thermal or pressure requirements*
- significant safety and compliance constraints*

These factors make it impractical to impose standardised control interventions at the end-use product level.

Q7. What are the barriers to the uptake of demand flexible technology?

The primary barrier is the lack of a centralised, publicly accessible control mechanism, which creates fragmentation, increases complexity, and limits broad adoption of demand flexible technology.

Q8. The paper describes the three main end-use product components for demand flexible capability as: communication protocol, product response, and operational information. 8.a Do you agree that these are the main components for demand flexible end-use products?

Yes, we agree this document is a good starting point with good intentions. 8.b What other components or considerations are important for end-use products? A strong focus on Distributed Energy Resources (DER) standards is essential. Aligning with the DER frameworks used in Australia will allow New Zealand to leverage proven products, ensure interoperability, and avoid fragmented, incompatible solutions across the market.

Q9. Do you think to support the development and uptake of demand flexibility there is a need to create a minimum level of standardisation at an end-use product level (covering communication protocol, product response, and operational information)?

Yes, absolutely. Minimum standardisation at the end-use product level is essential to ensure interoperability, consistency, and predictable performance across different brands and technologies. Standardising communication protocols, product response behaviour, and operational information will reduce integration complexity, lower costs for manufacturers and installers, and give consumers and networks confidence that devices will behave reliably under demand flexibility programmes.

Q10. Would you support EECA creating a voluntary approved list of residential demand flexible end-use products, similar to EV Smart Charger Approved List Yes, we would strongly support this.

A voluntary approved list would provide clarity for consumers, installers, and retailers, and help ensure that products meet minimum interoperability and performance standards. We would welcome the opportunity for our products to be included.

Q11. Would you participate in working groups on the key end-use products to develop voluntary demand flexibility requirements (covering communication protocol, product response, and operational information)? 11.a If so, what product based working groups would you like to be part of?

Yes, we would participate. As a manufacturer, we are committed to ensuring our products are fully compatible with the New Zealand market and aligned with any emerging demand flexibility standards.

We would be interested in contributing to working groups focused on:

- EV chargers and OCPP-based control
- Hot water management
- Heat pump/HVAC control
- Solar inverter and battery integration
- Home energy management systems (HEMS)

This involvement would allow us to share practical insights from our Australian deployments and help shape requirements that are technically robust, interoperable, and scalable.



Q12. If you are an end-use product supplier, would you manufacture/import/supply end-use products that meet the voluntary specification?

We are open to engaging in further discussions around these specifications. Our products are already proven in some of the most demanding regulatory environments in Australia — including Dynamic Exports and Imports in Queensland, Flexible Exports in South Australia, Backstop requirements in Victoria, and recent approval within the Synergy framework in Western Australia. We are one of the few suppliers able to meet these requirements across multiple jurisdictions.

At CATCH Power, we own 100% of our hardware, software, and control platforms. This end-to-end ownership gives us full visibility and flexibility to adapt to evolving standards. Where feasible, we are happy to explore additional requirements to ensure our solutions remain suitable for this programme, acknowledging that our technology has already been successfully deployed and validated in real-world conditions.

Additional Note: demand flexibility for heat pump/air-conditioning systems has already been demonstrated to be highly effective using simple DRM control — even in fan-only mode — as shown in the Western Power trials in Western Australia. refer to Western Power trials;

<https://thewest.com.au/news/wa/utility-takes-control-of-home-air-cons-ng-ya-162969>