



7th November 2025

The Energy Efficiency and Conservation Authority (EECA)

By email: STAR@eeca.govt.nz

Dear Sir/Madam,

Re: - Unlocking the potential of demand flexibility – a residential product perspective

Thank you for the opportunity to submit feedback.

About Dux

Founded in 1915, **Dux Hot Water** is Australia's longest established water heater manufacturer, proudly producing more than **12 million water heaters** for Australians and New Zealanders.

Executive Summary

1. **Confidential independent research by the Institute for Sustainable Futures (UTS)** demonstrates that smart scheduling of electric water heaters can increase solar self-consumption from 24% to over 80%, reduce household energy bills significantly, and deliver aggregate savings in Australia of over \$700 million annually across the National Electricity Market.
2. **Thermann™ Smart Electric water heaters**, available in Australia for the last 18 months, feature app-based scheduling, solar soaking, machine learning, and integration with time-of-use tariffs, enabling households to optimise energy use and participate in future flexibility markets.
3. **Smart water heaters reduce grid peak demand**, support renewable energy integration, and help avoid costly infrastructure upgrades.
4. **Dux recommends** that EECA recognise smart electric water heaters as a priority technology for residential demand flexibility, support incentives and standards for adoption and retrofit, and encourage integration with solar PV and time-of-use tariffs.

Dux Hot Water is committed to working with EECA and industry stakeholders to unlock the full potential of demand flexibility in residential hot water systems, delivering benefits for households, the electricity grid, and the broader energy transition.



Consultation Questions & Dux Hot Water's Response

1. Main use cases for demand flexibility

We agree with the Green Paper's identification of the main use cases—managing peak demand, optimising renewable energy use, and optimising home energy use. Additional use cases include:

- Grid resilience during extreme events.
- Enabling consumer participation in energy markets
- Facilitating integration of distributed energy resources (DERs), such as solar PV and batteries.

2. Key residential end-use products

We support the identification of EV chargers, heat pumps, electric hot water systems (with storage tanks), fridges/freezers, clothes washers, dishwashers, clothes dryers, inverters for solar/battery systems, and HEMS as key products.

For hot water systems:

- Electric storage water heaters are widely deployed and offer significant opportunity for demand flexibility, especially when equipped with smart controls and communication protocols.
- Heat pump water heaters, while highly efficient, require careful consideration of operational timing to avoid efficiency losses when operated during off-peak periods with low ambient temperatures.

Dux has no response regarding commercial and industrial applications in questions 3 – 6

7. What are the barriers to uptake of demand flexible technology

Key barriers include:

- Water heaters are often an unplanned grudge purchase. Additional costs may be a powerful barrier.
- Space may be a consideration for water heaters with only very limited space in many cupboards.
- Lack of consumer awareness and education about benefits.
- Limited interoperability and standardisation of communication protocols.
- Upfront costs and uncertainty about return on investment.
- Concerns about loss of control or service quality (e.g., hot water availability).
- Regulatory uncertainty and fragmented market signals.
- Some products cross over trade skill sets, or involve multiple trades which discourages recommendation as it increases installation complexity and cost



8. End-use product level components for demand flexible capability

Dux agrees that communication protocol, product response, and operational information are the main components. Additional considerations:

- Cybersecurity and data privacy, to ensure consumer trust.
- User interface and ease of consumer opt-in/opt-out.
- Integration with legacy systems and retrofit options for existing appliances.

9. Standardisation at product level

Whilst Dux conceptually supports the development of minimum standards for communication protocols, product response, and operational information, we are cognisant that a competing hot water manufacturer holds a number of patents in related areas.

10–12. Voluntary Approved List & Working Groups

Dux Hot Water would support the creation of a voluntary approved list for demand flexible products, like the EV Smart Charger Approved List. Dux is willing to participate in working groups focused on hot water systems and related technologies to develop voluntary demand flexibility requirements.

Thermann Smart Electric Water Heaters puts power in the hands of the homeowner

Thermann Smart Electric water heaters, manufactured by Dux, were awarded the prestigious Innovation Award in 2025 by Master Plumbers NSW. These units exemplify the next generation of demand flexible hot water systems, designed to give homeowners and energy providers greater control over energy consumption, cost, and grid impact.

Key Features and Demand Flexibility Capabilities:

- **Smart Scheduling & Control:** Thermann Smart Electric water heaters can be programmed via the Thermann Control App to operate during off-peak periods or when renewable energy (such as solar PV) is available. This enables load shifting, reduces peak demand, and maximises the use of clean energy.
- **Operating Modes:** Users can select from four operating modes:
 - Manual Mode:** Allows users to lower tank temperature for maximum savings while maintaining anti-legionella cycles.
 - Eco Mode:** Employs machine learning to analyse usage patterns and adjust heating cycles, minimising energy use.
 - Holiday Mode:** Remotely turn the system on or off before holidays or when the house is vacant, preventing unnecessary energy consumption.
 - Schedule Mode:** Customise operation to match household routines and optimise around solar generation or time-of-use tariffs.



- **Energy and Cost Monitoring:** Real-time energy usage and cost data are available through the app, empowering consumers to make informed decisions and track savings.
- **Remote Access:** The system can be controlled remotely, providing flexibility for homeowners and enabling participation in future demand response programs.
- **Integration with Solar PV:** Thermann Smart Electric units can be scheduled to heat water when solar generation is highest, effectively acting as a “latent battery” and supporting grid stability.
- **Machine Learning:** The system learns household hot water usage patterns, automatically adjusting heating cycles to minimise energy consumption while maintaining performance.
- **Ease of Installation:** These units have the same footprint and connection points as standard electric water heaters, making them suitable for retrofit and new installations. They can be installed by plumbers without requiring an electrician, streamlining deployment.

Benefits for Demand Flexibility:

- Enables hot water load shifting to renewable-rich periods.
- Supports consumer participation in future flexibility markets.
- Reduces household energy bills and carbon footprint.
- Provides for grid optimisation.

Independent Research Evidence

Recent confidential research conducted by the Institute for Sustainable Futures (University of Technology Sydney) for Dux Manufacturing Limited provides robust modelling of the benefits of smart electric water heaters for absorbing excess solar generation in Australian homes. Key findings include:

- Smart scheduling of electric storage water heaters can increase solar self-consumption from 24% (uncontrolled) to 70–82% (optimised), significantly reducing household energy bills.
- Aggregate bill savings across the Australian National Electricity Market could reach \$548–\$713 million per year.
- Grid benefits include a reduction of up to 1.7 TWh/year in excess electricity, supporting grid stability and reducing the need for infrastructure upgrades.
- Smart water heaters make time-of-use tariffs more attractive and accessible for households.

These findings provide strong evidence for the inclusion of smart water heaters as a priority technology in demand flexibility policy and programs.



Policy Recommendations

Based on the independent evidence and real-world product capabilities, Dux Hot Water recommends that EECA:

- Recognise smart electric water heaters as a key technology for residential demand flexibility.
- Support incentives and standards for the adoption of smart electric water heaters.
- Encourage integration of water heating with solar PV and time-of-use tariffs in future programs and regulations.

Conclusion

The combination of independent research and proven product solutions demonstrates that smart electric water heaters—such as those manufactured by Dux and distributed under the Thermann brand—are ready to deliver substantial benefits for households, the electricity grid, and the broader energy transition in New Zealand.

Dux Hot Water is committed to working with EECA and industry stakeholders to unlock the potential of demand flexibility in residential hot water systems. We believe that with the right standards, consumer education, and market incentives, hot water systems can deliver significant benefits for households and the wider electricity system.

We look forward to further engagement and collaboration.

Dux thanks you for the opportunity to provide this feedback on the proposed changes and recommend additional changes.

Should you have any queries or questions, please don't hesitate to contact me at your earliest convenience.

Yours sincerely

A handwritten signature in blue ink, appearing to read "Simon Terry", with a long horizontal stroke extending to the right.

Simon Terry
Chief Executive Officer