Resi-Flex – Incentivise flexibility from residential consumers by exploring commercial mechanisms with flexibility stakeholders

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Abstract

The transition towards net-zero emissions is leading to an increasing reliance on electricity. Recent reports, such as "The Future is Electric"[1] by The Boston Consulting Group, highlight the importance of more demand side flexibility to support the integration of intermittent renewable generation and to improve the utilisation of electricity networks.

Research by Concept Consulting[2] suggests EV charging and hot water heating will drive much of the change in residential electricity demand and provide almost 90% of the potential for flexibility from consumer appliances. However, most consumers are unaware of the existing or future value of flexibility or how this impacts their power bill. This was confirmed by the Electricity Authority Market Development Advisory Group which recently emphasised the need for tariff and technology innovation to ensure customers have access to the information they need to make informed decisions about electricity use and demand-side flexibility[3].

In response to these challenges, Orion and Wellington Electricity partnered to deliver the Resi-Flex project. This collaboration leverages shared resources and expertise to drive progress and gain scalable insight. The project aims to incentivise flexibility from residential consumers by exploring commercial mechanisms in collaboration with flexibility stakeholders.

The ongoing Resi-Flex project is taking a learning-by-doing and exploratory approach. It started by discovering user requirements from various perspectives across the flexibility value chain including consumers, flexibility stakeholders, and distribution network companies. These insights have informed the development of commercial mechanisms that could incentivise greater use of flexibility resources in the future.

The next step in the project is to partner with flexibility suppliers to co-design customer offerings based on the selected commercial mechanisms and trial these with consumers. These trials will help inform Electricity Distribution Businesses on which mechanisms to scale, ultimately creating opportunities for residential consumers to provide flexibility, while supporting equitable outcomes for all consumers, including those in energy hardship.

This paper shares early insight from Resi-Flex to facilitating further input and engagement to refine the project and create opportunities for collaborative and coordinated action. We will continue to share our progress and learnings with the electricity industry through the FlexForum[4] and other avenues as the project continues.

[1] BCG - The Future is Electric
[2] Concept Consulting EV Study
[3] Price discovery under 100% renewable electricity supply, Market Development Advisory Group
[4] FlexForum

Resi-Flex overview

Terminology

Flexibility is defined by Ofgem[5] as "modifying generation and/or consumption patterns in reaction to an external signal (such as a change in price) to provide a service within the energy system". This definition has been recommended for use by Electricity Authority (EA) Innovation and Participation Advisory Group (IPAG) and Market Development Advisory Group (MDAG)[6]. In this paper, we refer to **two types of flexibility** from an Electricity Distribution Businesses (EDB) lens:

- **Price signals** through distribution pricing, where networks charge for the use of lines;
- **Flexibility services** (or Payments), where the network procures and pays for a response.

Throughout Resi-Flex, we have used the terminology in Figure 1 to describe the relationships between the key parties in the flexibility value chain for residential consumers. Given the role of various parties to enable residential flexibility, we have used the broad term 'Flexibility Stakeholders' to represent Retailers, Flexibility Suppliers, Aggregators, Technology Platform suppliers and end-user Customer Integrators (see 'Flexibility Stakeholders User Requirements' section for more information).

Figure 1: Distribution flexibility value chain and Resi-Flex terminology

Context

Historically, EDBs in Aotearoa have largely managed peak demand electricity use by managing consumers' hot water heating through ripple relays. This has enabled EDBs to defer network investment, demonstrating the value of modifying customer consumption patterns. With the demand increase due to decarbonisation, the smart capabilities of Distributed Energy Resources (DER) and the increasing share of intermittent generation, the potential and need for demand-side flexibility is increasing.

Flexibility has been identified as central to decarbonisation in New Zealand through:

- The Ministry for the Environment's Emission Reduction Plan[7], which calls for more efficient use of New Zealand Transmission and Distribution infrastructure

[5] Ofgem – UK: Our flexibility vision
[6] FINAL Demand side flexibility review for publication (ea.govt.nz)
[7] Emission Reduction Plan, MfE, May 2022

- The Boston Consulting's '*The Future is Electric'*[8], which includes high-priority actions to develop flexibility services, improve distribution peak pricing signals and smart managed tariffs to "Enable a smart electricity system".
- Transpower's Whakamana i Te Mauri Hiko[9], which identifies the development of flexibility at the grid and distribution level as key deliverables.

Research by Concept Consulting[10] suggests EV charging and hot water heating will drive the majority of the increase in residential electricity demand, but also provide almost 90% of the potential for flexibility from consumer appliances. However, most consumers are unaware of the existing or future value of flexibility or how this impacts their power bill. This was reinforced by the Electricity Authority Market Development Advisory Group (MDAG) which recently emphasised the need for tariff and technology innovation to ensure customers have access to the information they need to make informed decisions about electricity use and demand side flexibility[11].

To unlock the value of DER and flexibility for households, businesses, communities, the power system and Aotearoa New Zealand, a cross-sector working group called the FlexForum was established. In August 2022, they published a Flexibility Plan 1.0[12], as a starting point for coordinated and collaborative action, with an emphasis on learning-by-doing to deliver on the steps set out in the plan. Aligned with this is Wellington Electricity's (WELL) EV Connect Roadmap[13], which was developed through a series of industry workshops to identify the actions needed to implement flexibility.

Resi-Flex scope

The concept for Resi-Flex was initiated by Orion in March 2022 through its Innovation Pipeline. The project aims to incentivise flexibility from residential consumers by exploring commercial mechanisms in collaboration with flexibility stakeholders. Building on connections through the FlexForum, Orion and WELL partnered on the project to drive progress, leverage shared resources and expertise, and develop scalable insight.

Resi-Flex, as described in Figure 2, started by understanding the requirements of all users across the value chain for flexibility from consumers to flexibility stakeholders, to distribution network companies. This is informing the development of commercial mechanisms that could incentivise greater use of flexibility resources in the future. During the next stage of Resi-Flex, we intend to partner with flexibility stakeholders to co-design and trial customer offerings that encourage household flexibility, underpinned by the commercial mechanisms. Lastly, we will consolidate learnings and establish recommendations to support the implementation or scale of successful insights or approaches.

[8] Climate Change in New Zealand: The Future is Electric and Summary Brochure The Future is Electric: A Decarbonisation Roadmap for New Zealand's Electricity Sector, Boston Consulting Group, October 2022
[9] Whakamana i Te Mauri Hiko Monitoring Report, Transpower, September 2022
[10] Concept Consulting - EV Study
[11] Price discovery under 100% renewable electricity supply, Market Development Advisory Group
[12] FlexForum - Flexibility Plan 1.0
[13] WELL - EV Connect

Figure 2: Resi-Flex Workstreams

Links to broader initiatives

Enabling flexibility requires significant and widespread action across the sector, as set out in the FlexForum 'Flexibility Plan 1.0' and WELL's EV Connect Project. Resi-Flex has a narrow, yet critical focus, on exploring user requirements and commercial mechanisms that will encourage residential consumers to provide flexibility. Insights from Resi-Flex will develop insight that will support the following aspects of these broader initiatives:

- FlexForum Flexibility Plan 1.0
  - Step C – Flexibility user and customer journey mapping to identify how households make choices and decisions about flexibility.
  - Steps 20 & 21 – Creating a common framework to understanding how flexibility is valued and the interaction between commercial mechanisms, including distribution pricing, flexibility services and the broader value stack.
- WELL EV Connect Roadmap
  - Action 17 Research consumer preference & price points - understand consumer preferences and price points. Design flexibility services that match consumer preferences and have high levels of participation.
  - Action 18 Prototype service offerings - develop trials and pilots to test different aspects of a flexibility service and possible services.

Pre-requisites and limitations

EV Connect and the Flexibility Plan 1.0 also highlight critical regulatory and market changes needed to ensure that flexibility services can be provided while maintaining a secure and stable electricity system. While wider regulatory and market changes are outside of the scope of Resi-Flex, the project assumes that these will be in place to enable flexibility to be scaled. Orion and WELL have other activities and projects focused on the changes needed to provide a stable electricity system that can support flexibility. The project assumes key capabilities are being developed in parallel, these include (but are not limited to):

- ensuring DER can participate in flexibility;
- making flexibility available to EDBs in emergency situations
- rules to ensure EDBs can maintain network security when resources connected to distribution networks are used to provide flexibility to the wider electricity system;
- providing regulatory allowances to EDBs to develop and purchase flexibility services.

We acknowledge that the flexibility market in New Zealand is in its infancy and the views (both stakeholders and EDBs) identified through Resi-Flex are likely to evolve. We expect that the user requirements gathered will continue to be refined as the industry gains experience.

The insights identified through Resi-Flex will inform the design of trials to explore a range of mechanisms and allow us to learn by doing in collaboration with other partners. The project is not prescribing solutions or services for business-wide implementation. Any shared insights do not supersede Orion and WELL's existing delivery and pricing strategies: the early findings expressed here are solely to explore options to stimulate residential flexibility in the future.

User requirements

EDB user requirements - Network Use Cases

Each EDB will have different flexibility use cases depending on their specific network and customer characteristics, demand forecasts and capacity limits. Due to this, each EDB may also use different combinations of mechanisms to incentivise a flexibility response that solves their specific challenges. Figure 3 describes types of flexibility by the desired response – classifying this as Shape (predictive), Shift (corrective), Shimmy (optimise) or Shed (emergency).

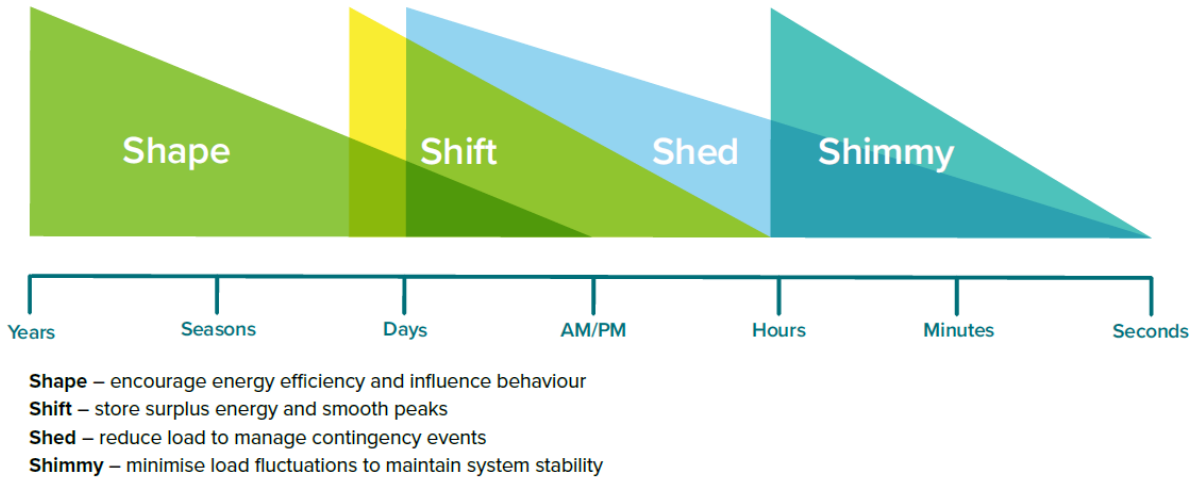

Figure 3: Types of flexibility response (adapted from Lawrence Berkeley National Laboratory study)[14]

To define the network use cases for residential flexibility, we considered these factors and the spatial granularity of the need, from system-wide flexibility needs to individual households. Specific drivers and constraints are described below for Orion and WELL, including case studies showing the potential impact and types of flexibility that may be needed.

Orion

Drivers and constraints

Orion's 2023 Asset Management Plan (AMP)[15] lists nine main drivers of network investment due to the changing environment described in the first section of the AMP. We have identified

[14] Lawrence Berkeley National Lab, 2025 California Demand Response Potential Study, March 1, 2017
[15] Orion - 2023 Asset Management Plan

the four main ones related to residential customers, although all drivers have an impact on the whole of Orion's network:

- Transport electrification, including EV Growth on the network
- Changing consumer behaviour, including demand, storage, or generation management
- Uncertainty around hot water control as consumers adopt new offerings e.g. retailers
- Housing intensification and population growth

Orion's strategic approach in response to these drivers, and relevant to Resi-Flex, is "creating a more highly utilised network – particularly at the low voltage level where our aim is to enable customer participation, prosumers, utilise new technology and information to squeeze as much as we can out of the existing network."

We have identified two case studies to illustrate Orion use cases and needs for flexibility.

Case study: Clustered uptake of EVs

The use case is described in section 6.2.1.3 of Orion's 2022 AMP[16]. EV uptake in Orion's region is estimated at around 4.4% of our customer connections as of February 2023. However, these are not evenly distributed across the network and clusters of EVs are likely to develop in some areas more rapidly than others, and those clusters can provoke issues. In 2020, we completed a study to forecast the potential impact of EVs and residential batteries on our Low Voltage (LV) network. These results clearly illustrated the benefits of diversified charging behaviour to spread load more evenly. By incentivizing EV owners to shift their charging patterns to off-peak hours or actively participate in demand response programs, the load on the distribution network can be managed more effectively, if done at LV level.

Case study: Hot Water Load Management

This use case is about access to hot water load control as described in section 2.6.8 of Orion's 2023 AMP[17]. Orion has a long history of managing peak loading, using ripple control technology, to promote efficient operation of the network and avoid or defer costly transmission and distribution network reinforcement. In the future, customer's hot water load could be managed by technology within the customer's smart meter. This would enable hot water systems to be more easily controlled by other parties for purposes and value streams other than network load management. For most periods there is likely to be alignment between the desire to control hot water by retailers and distributors. However, there will be times when this is not the case. Over time, this could impact Orion's ability to manage hot water load predictably and our AMP indicates that reduced access to hot water load management could increase peak load by 31MW by 2035. Orion is committed to collaborating across the sector to better understand and mitigate this risk.

Wellington Electricity

Drivers and constraints

Wellington Electricity's 2023 Asset Management Plan (AMP)[18] forecasts the impact that New Zealand Decarbonisation plans will have on electricity demand and future distribution services. Demand on its network is forecast to rapidly grow and peak demand is expected to increase by

[16] Orion - 2022 Asset Management Plan
[17] Orion – 2023 Asset Management Plan
[18] WELL - 2023 Asset Management Plan

108% over the next 30 years. The primary drivers of that demand are the electrification of transportation and the potential transition from natural gas to other energy sources. WELL's primary use cases for residential flexibility services are managed EV charging and hot water heating, reflecting that:

- The majority (80%) of future demand growth is from the electrification of transportation and the reduction of fossil gas use. The use cases target demand, which has the largest potential impact on network capacity and future network investment.
- The low voltage networks that residential customers are connected to were not designed for large devices like EV chargers. They will become constrained as new devices connect. WELL's studies have shown that 30% penetration of EV chargers larger than 2.5 kW will exceed what its network can accommodate.
- Most EV charging will be at home[19].
- Wellingtonians are New Zealand's highest residential gas users with one in three homes having a gas connection. The transition from gas to electric hot water heating has a similar demand impact as charging a modest sized EV at home.
- EV charging and hot water heating can be shifted away from peak demand periods without impacting customer quality of life.

Two different types of flexibility use cases will be needed:

1. Important early steps are needed so that networks can manage, aggregate and coordinate **the connection of large DER** so their combined operation remains within the network's operating limits. WELL's EV Connect Roadmap shows that an early form of flexibility services is needed because the flexibility market will not be developed to the scale needed in time to manage the rapid uptake of new EV charging devices.
2. **Future flexibility services** which are traded in a market and that can deliver the full value stack to customers. These services will be traded within a framework of rules which will ensure a secure electricity system.

Case study: The Impact of Gas Transition on the Low Voltage Network

The transition from gas use to electricity for residential space and water heating will have a large impact on the low voltage network, increasing the demand from existing connections. To better understand its impacts WELL commissioned ANSA to undertake an LV impact assessment on a sample of 10 distribution substations located in residential areas. The study is described in Case Study 2 on page 67 in WELL's 2023 AMP. The study showed that within five years, the additional demand is forecast to cause network constraints, primarily at the distribution transformer.

Case study: The Impact of Home EV chargers on the low voltage network

Case study 3 on page 70 of WELL's AMP studies the impact of dedicated home EV chargers connecting to the low voltage network. The study shows that a 30% penetration of EV chargers larger than 2.5 kW will exceed what its network can accommodate. However, if large EV chargers are smart and are participating in a flexibility service, their combined use can be coordinated to remain within the network operating limits. Doing this ensures that EVs are

[19] EECA Research suggests that 97 percent of charging sessions occur at home at least some of the time, and 80% more than half of the time, and mostly in the evenings

charged and ready to be used when customers want, without their use impacting the supply of electricity to other users of the network.

Flexibility Stakeholders User Requirements

As part of the User Requirements workstream, we have surveyed and interviewed 17 stakeholders across the flexibility market to identify barriers and enablers to residential flexibility. Figure 4 shows the different roles each of the consulted stakeholders considered themselves playing. The emerging messages extracted from this engagement were summarised into a report, with consulted stakeholders given an opportunity to provide feedback.

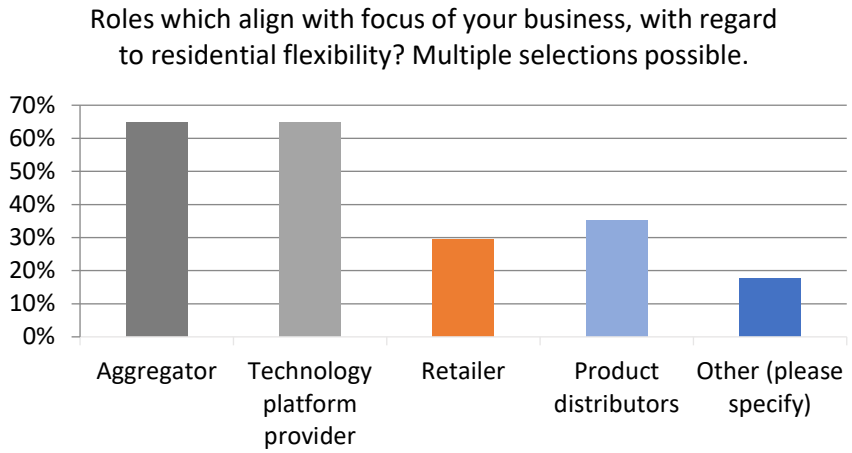

Figure 4: Consulted Flexibility Stakeholders and Roles

The key barriers to residential flexibility raised by stakeholders were grouped into five main categories: Regulation and Standardisation (lack of, procurement processes, etc); Mindset (simplicity over education for consumers and legacy); Enabling Process – Pilots (isolated, limited scope); Commercial & Scale-ability (limited access to value stack, especially for new entrants); and Accessibility & Predictability (data access, etc).

Stakeholders also provided the characteristics that they considered necessary for residential flexibility to be successful. We then used this feedback to identify a range of factors for EDBs to consider when developing flexibility services and the supporting commercial frameworks. Table 1 summarises the characteristics and factors.

Table 1: Flexibility Stakeholders' Wants and Needs

Wants and needs	Factors to consider
Customer Value: there is a real challenge with high upfront cost and simplicity for consumers is key.	• Reduce upfront costs barrier • Simple solutions for the end consumer • Create value for all consumers
Market Stimulation: EDB flexibility is a key component of the value stack and collaboration and co-design is important.	• Sufficient real value • Accessible to all for an open market • Enabling other EDB value streams • Collaborative • Scalable
Commercial Mechanisms: need access to multiple value streams, importance of cost reflective price signals from EDBs, need a combination of distribution pricing and flexibility services and requirement for predictability.	• Value stack accessible • Predictability of events • Usability for products and fulfilment • Predictability of value • Tenure (long terms) and frequency are key
Operational Efficiency: need for transparency in processes for assessing flexibility and consistency between EDBs is key for scalability.	• Consistency across EDBs, including standardisation of procurement and processes • Operationally efficient

Consumer user requirements

To inform how we can influence consumer participation in flexibility, we first wanted to understand their flexibility journeys, perceptions, motivations, barriers, and enablers. While Orion and WELL will not have customer offerings directly with households during Resi-Flex (this is the role of flexibility stakeholders), research shows that how we design our commercial mechanisms has an impact on consumer uptake.

Methodology

We engaged The Research Agency (TRA) to conduct the consumer research, using the following methodology:

1. **Identification and refinement of persona groups**: We identified relevant persona groups, based on the ability and willingness of different groups to provide flexibility.
2. **International secondary research**: We analysed secondary data, using international research from ongoing flexibility trials, as well as behaviour change research and data about New Zealanders current electricity usage and behaviour. We assessed and refined the persona groups based on this research.
3. **In depth interviews with New Zealander's**: We acknowledge the limitations of applying findings from international secondary research to the New Zealand market. To mitigate this within the scope of our research, we conducted in-depth interviews with one New Zealander who fit into each of the finalised persona groups – five in total.
4. **Testing and verifying with FlexForum members,** including consumer-facing organisations and Resi-Flex Partners: This stage involved one session presenting a draft version of the report to collect early feedback, which helped to refine our persona journeys.

We used two key frameworks to develop each consumer persona:

- to describe the behaviour change element of flexibility, we defined each persona according to the Com-B model[20], including the three key components: Capability, Opportunity and Motivation.
- to describe each consumer persona's journey to flexibility, we used the Discover, Assess, Enable and Operate journey developed by FlexForum[21].

Rather than a comprehensive analysis of the Aotearoa New Zealand market, this work initiated a common set of consumer journeys toward flexibility that can be further built upon over time. International data used was skewed towards early adopters who are more likely to engage in trials, so there is less detailed data representing less engaged or energy-literate consumers.

Key insights

International research, using case studies or research papers mainly from the UK and Australia, led to the summary in Figure 5 around the two main motivators and two main barriers, leading to solutions that have been found or implemented through those studies. Note that cost saving means lower bills for consumers.

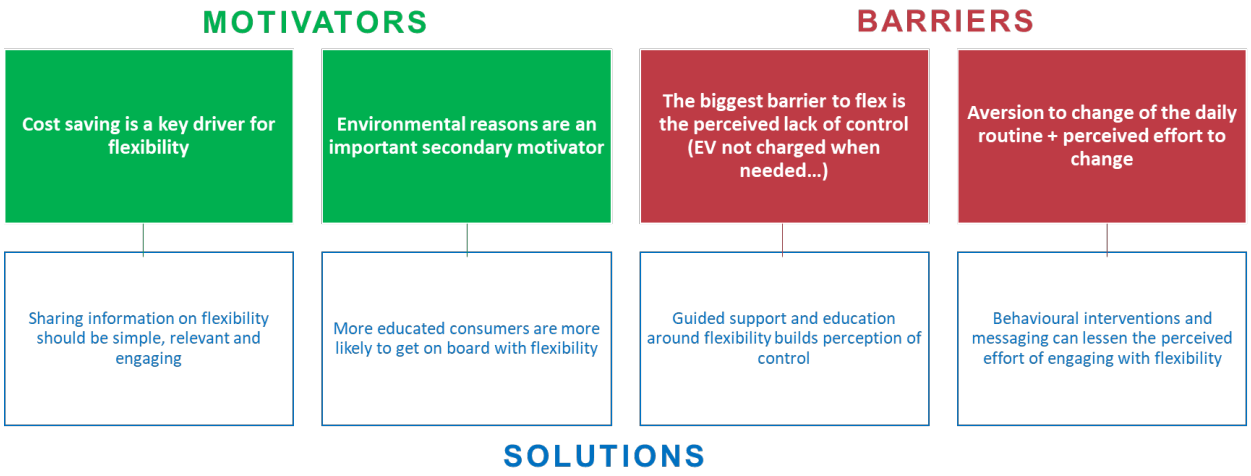

Figure 5: International findings and key common themes - from main barrier/motivators to solutions

Using the methodology and the frameworks described above, we defined the five following personas, defined their profiles, and mapped their detailed consumer journeys. In Figure 6, these personas are placed by their ability and willingness to provide flexibility, alongside their likely approach and attitude toward flexibility.

[20] A cheat's guide to the COM-B behaviour change model
[21] FlexForum Flexibility Plan 1.0

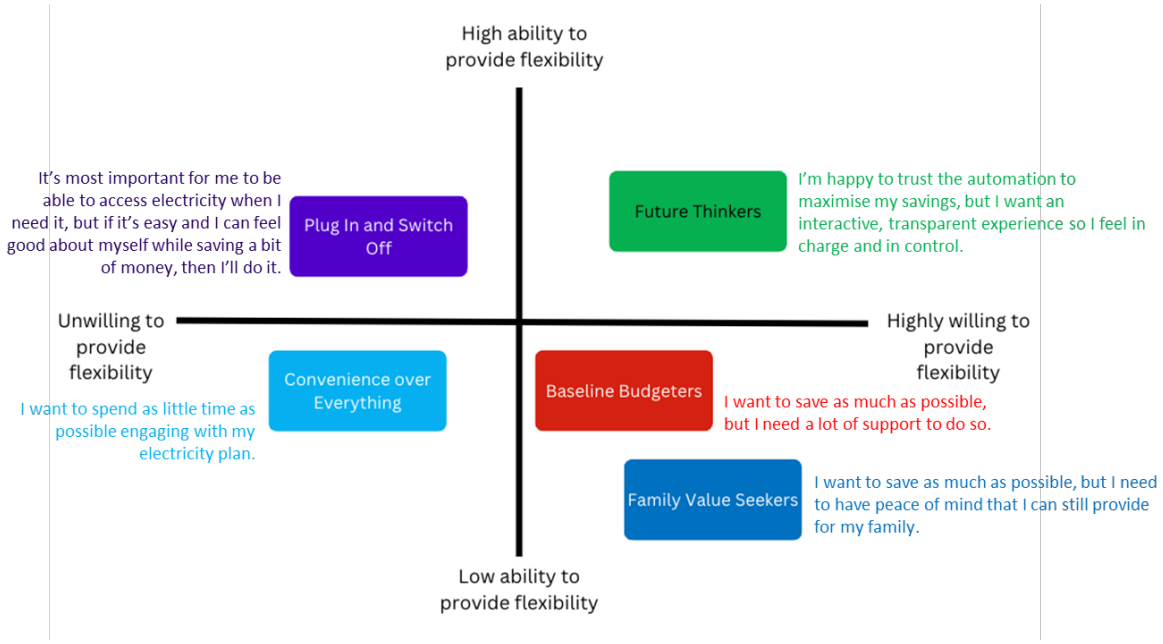

Figure 6: The five consumer personas and their "attitude" towards flexibility

From the five personas' consumer journeys, we extracted a high-level summary of the user requirements (Table 2) which should be considered during the trial design and across different stages of the consumer journey.

Table 2: Consumer Requirements

Customer journey stage	Consumer Requirements
1. Discover	• Building education around flexibility in NZ • Communication that flexibility can reduce costs • Using relevant channels and message framing to engage consumers
2. Assess	• Showing how flexible customer offerings can help consumers reach their goals • Making it easy to compare customer offerings
3. Operate	• Perceived control over electricity usage • Simplicity and clarity in how flexible customer offerings work • Working alongside existing habits and routines
4. Enable	• Support in operating any technology associated with flexible customer offerings • Ongoing motivation and encouragement to engage

EDB Commercial Mechanisms

Concept Consulting was engaged to develop a framework of commercial mechanisms for EDBs to incentivise flexibility suppliers and their household consumers to participate in flexibility. The framework reflects the value that flexibility provides directly to distributors and considers how mechanisms to exchange this value interact with signals the wider value stack and consumer needs. The framework includes:

- **Commercial framework** – calculating the economic value of flexibility to distributors and translating that value into price signals and payment budgets.
- **Commercial mechanisms** – evaluation of possible options for Resi-Flex trials
- **Stacking analysis** – insights on the interaction between potential uses for flexibility

During the trials, we will use this framework to simulate prices and payments that reflect the value of flexibility and explore combinations of commercial mechanisms to exchange this.

The commercial framework

The commercial framework's design reflects that flexibility, as defined in Context, can be incentivised through a combination of payments (procured flexibility services in response to a specific network constraint) and distribution tariff price signals (overarching tariffs applied to a pricing region). The combined payments and price signals should match the economic value provided by flexibility to an EDB. Correctly valuing flexibility allows a distribution network to make optimal investment decisions about when it is better to purchase flexibility and when it's better to build new capacity.

The largest value driver for distribution businesses is from deferring capex. There is also economic value from not having to adopt higher design capacities, especially for LV networks. The value of deferred capex can be assessed using long-run marginal cost (LRMC) methodologies. The commercial framework provides standard calculation methodologies that can be used to calculate price signals and procurement prices that are consistent. The calculation methodologies are based on the current regulatory framework, ensuring that the value of deferring expenditure is releasable and not just theoretical. Changes are needed to the regulatory rules to provide EDBs allowances or incentives to purchase flexibility services – without these changes' networks will not be funded to make payments for flexibility services.

Figure 7 reflects that the prices for procuring flexibility services must account for the value already included in tariff price signals. The commercial framework also highlights that flexibility standards and service levels impact the value realisable by flexibility suppliers and their customers.

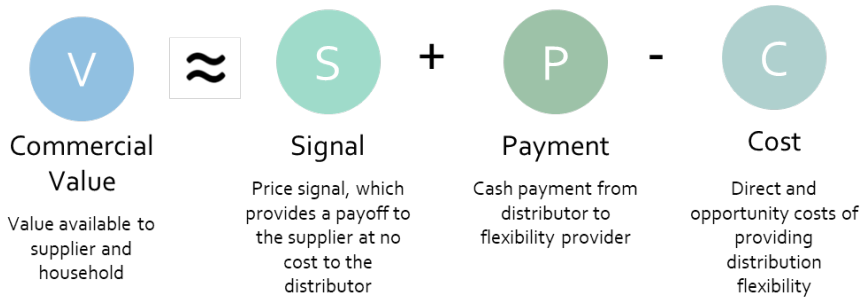

Figure 7: Commercial framework

Development of commercial mechanisms

A range of different commercial mechanisms have been considered and listed in Figure 8. The commercial mechanisms can be grouped into three components of the economic framework to enable flexibility.

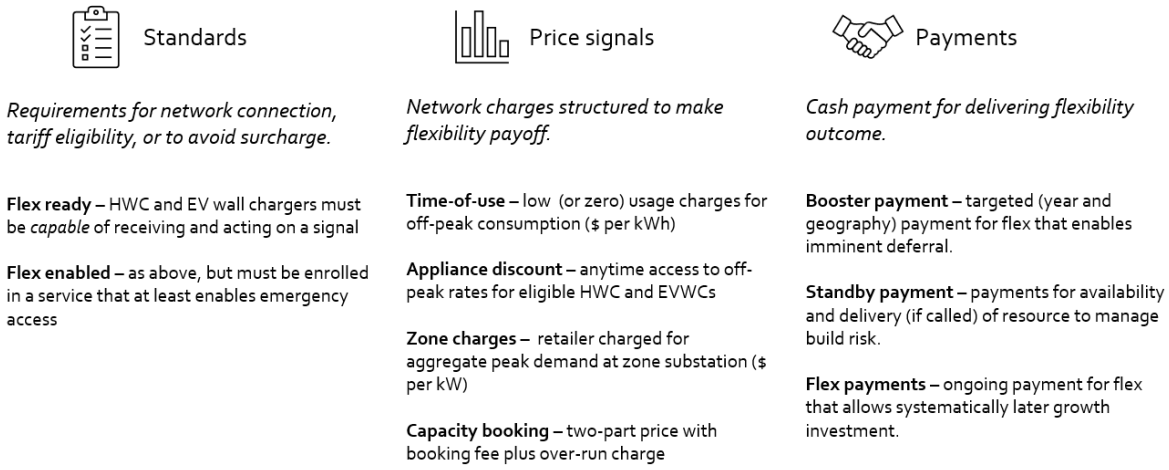

Figure 8: Examples of Commercial Mechanisms

Distributors set **standards** for connecting to their network, which can include flexibility obligations. Standards are an important tool to help ensure flexibility is effective at shifting peak demand: if peak demand cannot be shifted then a network will have to build traditional new capacity. Standards impose costs on connecting parties and can lead to ongoing costs for the distributor – for example, to verify compliance and ongoing availability. Standards can also ensure properties have readiness built in and can reduce the transaction cost for accessing flexibility – including by reducing the difficulty and the lag involved in recruiting customers. Standards can also reflect capacity constraints by restricting connections to those who are participating in flexibility services until a constraint is resolved.

The framework established evaluation criteria to assess combinations of the commercial mechanisms, including impacts on affordability for consumers less able to provide flexibility, such as those in energy hardship or without DER:

1. **practical** – reasonably feasible to develop and implement
2. **scalable** – could grow and endure beyond the trial
3. **compatible** – fits with regulatory, commercial, and asset management arrangements
4. **attractive to suppliers** – likely to attract participation by flexibility suppliers
5. **attractive to households** – likely to attract participation by households
6. **effective** – provides useful access to flexibility resources
7. **fair** – equitable impact for all consumers

We are in the process of evaluating combinations of the mechanisms and selecting which to explore further through the trial. As the flexibility market is immature, there is a bias toward options that are easy to understand and implement. We expect that more complex, cost reflective options will become more attractive as the flexibility market matures.

Beyond distribution networks, we recognise that signals on the wholesale market will change as the share of intermittent renewable generation capacity increases. Other market signals will also impact flexibility incentives, meaning we must consider how these signals interact with EBD commercial mechanisms, and what arrangements will best maximise whole-of-system value and long-term benefit to consumers. Analysis for Resi-Flex showed that generation and network flexibility needs are likely to diverge as renewables increase. Through the trials, we will assess the ability of flexibility resources to meet both needs.

Next Steps

Using a learn-by-doing and collaborative approach, the research and engagement on Resi-Flex to date have helped us understand the perception and motivations of the people and stakeholders we are developing incentives for. This paper aims to encourage further input and engagement, refine our next steps and create opportunities for collaborative and coordinated action.

Our approach to Resi-Flex to date will support the development and trial of more effective commercial mechanisms and customer offerings to encourage flexibility. As we finalise the workstreams described in this paper, we will share more detailed learnings through public reports which will outline how the requirements phase feed into the Trials design.

In parallel, we will prepare trial specifications, identify opportunities to partner with flexibility suppliers and seek the funding required to progress to the trial phase. During the trial phase, we intend to explore different combinations of the commercial mechanisms with flexibility suppliers, co-design customer offerings based on these mechanisms and other market signals and measure the effectiveness of these in the real world with households. This insight into household flexibility will support efficient network development planning and assist in the scaling and deployment of effective solutions. More broadly, the project will stimulate opportunities for residential consumers to provide flexibility and for the whole energy system to benefit.