10 July 2025

Electricity Authority

Level 7, 1 Willis Street,

Wellington 6011

c/o digitalisation@ea.govt.nz

FlexForum advice on a digitalised electricity system

FlexForum exists to support coordinated and collaborative action across the electricity ecosystem and speed up progress to make it easy and routine for households, businesses, communities to maximise the value of their distributed and flexible resources.

We are an incorporated society with 42 Members from across the electricity ecosystem.[1] Our touchstone is the Flexibility Plan which is a whole-of-system list of the practical steps and actions required for people to routinely and easily maximise the value of their flexible resources and support the affordable and reliable operation of the electricity market and system.

Flexibility[2] is our focus because it is central to an affordable, sustainable, reliable and consumer-centric electricity market and system.

This advice draws on FlexForum conclusions[3] about the need to develop a digitalised electricity system to fully realise the value of flexibility. A detailed FlexForum perspective on digitalisation is being developed and should be available in September 2025. We will say more on this topic then.

We have three points:

- A digitalised electricity system is needed for flexibility to fully play its part.
- The key to a digitalised electricity system is the relationships between data users, holders and creators. The focus needs to be ensuring a set of robust and flexible arrangements which allow relationships and interactions between data users, data holders and data creators that make it easy for data users, now and in the future, to get the data they need to do what they want to do.
- Flexibility Plan 2.0 lists practical steps we can take now to accelerate progress toward a digitalised electricity system.

---

[1] The list of FlexForum Members is available here. Members include: gentailers, retailers, metering services suppliers, electric vehicle charger manufacturers, energy management software firms, Transpower, distributors, solutions providers, universities, and some real people.

[2] Flexibility is the modification of generation injection and consumption patterns, on an individual or aggregated level, often in reaction to an external signal, to provide a service to the owner or within the power system.

[3] FlexForum Insights, April 2023, A digitalised electricity system is needed for flexibility to fully play its part and FlexForum Insights, March 2025, Filling the holes in the value stack will let people and their flexibility do more.

A digitalised electricity system is needed for flexibility to fully play its part

An increasing number of people have electric vehicles (EV), solar and distributed generation, battery storage, electric space and water heating, electric motors and machines.

These devices can flexibly modify their production or use of electricity in response to external signals to provide people with warmer houses, low emissions transport, increased resilience to extreme weather events, and lower power bills. This flexibility also underpins the benefits of a smarter power system.[4]

But realising the opportunities and benefits of flexibility relies on flexible resources being integrated[5] into the market and system AND people having the information they need to confidently say yes to flex.

FlexForum said in April 2023 that 'Digitalisation must be at the heart of this integration to deliver the information needed to balance the electricity systems required to keep the lights on from second-to-second, across seasons and for planning years ahead. This information also enables households, businesses and communities to make choices about electrification and their level of participation in the electricity markets, including the choice to invest in and supply flexibility.'

More recently, FlexForum outlined how digitalisation is key to filling holes in the value stack by enabling the cash signals needed to underpin flexible customer propositions and making it easier for people to pick the proposition which suits their flexibility and preferences.

The key to a digitalised electricity system is the relationships between data users, holders and creators

We use the terms digitalised electricity system and digitalisation as shorthand for a state where people and supply chain participants have easy and routine access to the data they need for the decisions and actions involved in the flexibility journey.

The guiding principle for designing a digitalised electricity system is to make decision-making and action easy and routine for people and supply chain participants. As an example, the January 2022 Energy Digitalisation Taskforce report said…

We need our own description of what a digitalised electricity system feels like. However, practically a digitalised system will mean data are created and stored in a digital and computer-readable format, and are processed, intermingled, stored, shared and transmitted efficiently and securely between recognised data users, holders and creators.

---

[4] The opportunity and benefits of flexibility are flagged by a range of parties including Transpower, the Market development advisory group, and in the BCG The future is electric report.

[5] Integration means a resource is plugged into a set of open access communication pathways and the counterparty relationships which are needed to enable the routine use of flexibility.

- **Data users**. They use data to make decisions or perform an action. There are many types of data. For example, households use price and quantity data to select between various retail offers or to size a solar system; distributors use power factor data to manage quality of supply; retailers use consumption data to calculate power bills. Data users get data from a holder or a creator via regulated or commercial arrangements.
- **Data holders**. They hold data because as a user or a creator. For example, retailers provide the historical consumption data they use to calculate power bills to distributors to use for planning purposes. Holders need to store the data securely. Storage incurs costs. Holders can be asked or required to provide the data to a user.
- **Data creators**. They create data by owning a device with measurement and communication functionality. Data creation incurs a range of costs for hardware, storage, processing and other activities. Not all creators are in the data creation business. For example, metering equipment providers do just that to create consumption and other data for data users under regulated and commercial arrangements. However, inverters and other devices create data which is not currently held (other than on the device) or used.

Flexibility Plan 2.0 includes several steps and tasks to achieve the easy and routine access to the data needed during the flexibility journey, and support the shift to a digitalised electricity system. Each of the tasks is to address two types of trouble in the relationships between the data user, data holder or data creator.

1. Data is not easily accessed because the relationship with a data holder or a creator does not exist or is not fit for purpose. An aspect of the relationship is the mechanics of the exchange, eg, communications protocols, data formats and standards. Access is typically easier with open communication protocols which enable secure, automated, instantaneous data exchanges.
2. Data is not created because users are not prepared to cover the costs of creation. Data is not free. Someone needs to cover the collection, processing and storage costs.[6] It is important to identify if data access is hard due to disagreements about covering the costs of data creation.

Mapping these relationships, and the gaps and blockages, is the focus of a FlexForum deep dive into digitalisation and data. Our deep dive is intended to produce:

- A list of the decisions and actions in the flexibility journey which rely on electricity sector data
- A map of the interactions between data users, holders and creators associated with this ‘flexibility’ data
- A list of blockages and gaps in the data system affecting the flow of flexibility data to people and supply chain participants.

We think the key to developing a digitalised electricity system is effective relationships between data users, holders and creators to enable the efficient data exchanges needed to support decision-making and actions through the flexibility journey.

Practical steps we can take now to accelerate progress toward a digitalised electricity system

Drawing on our 2024 progress report and views emerging from the 2025 progress assessment, steps in Flexibility Plan 2.0 to prioritise to **enable a digitalised electricity system** are listed here. We have also identified the underlying relationship issue for the step. This is a simplified and indicative overview of the relationship issues, but we note these issues are complex and FlexForum will be considering the relationships as part of its deep dive.

[6] A word here about consumer or personal data, such as the record of consumption or generation at a home or business. Regulation and practice in Aotearoa New Zealand is that the consumer ‘owns’ this data and has rights of access, including a right to authorise an agent to access this data.

Step	Underlying relationship issue
#2 Determine if people can easily get information about their existing electricity retail rates and charges.	Users (people, their advisers) cannot easily get the data from creators (retailers).
#3 Determine what network capacity information people need for decision making, what data is available, what data is needed, and how the missing data will be obtained.	Users (people, their advisers) cannot easily get the data from the holder/creator (distributor). Some of this data may not be created.
#4 Determine the options to report historical and current network reliability and quality information (eg, voltage) for the LV layer.	Users (people, their advisers) cannot easily get the data from the holder/creator (distributor). Some of this data may not be created.
#9 Introduce rules to require data holders (eg, retailers) to instantaneously respond to requests by a person or their agent for usage data from the data holder.	Users (people, their advisers) cannot easily get the data from holders (retailers).
#11 Identify the causes and impact of transaction costs for discovering retail and electricity pricing information, and find options to reduce those transaction costs	Users (people, their advisers) cannot easily get the data from holders (retailers).
#24 Identify and develop mechanisms for exchanging flexibility for each use case which are low cost, support liquidity and participation, and make it easy for people to maximise the benefits of their flexibility.	Users (people, their advisers, retailers, flex coordinators) cannot easily get the data from holders/creators (distributors, retailers).
#28 Make changes to the registry to make flexible resources visible to the market and system.	Users (people, their advisers, retailers, flex coordinators) cannot easily get the data from holders (people, flex coordinators, retailers). This is complicated by the users and holders/creators being the same people.
#30 Develop a minimum set of operational visibility requirements and capability to support integration of flexible resources into distribution networks and the system.	Users (people, flex coordinators, retailers distributors) cannot easily get the data from holders/creators (distributors). Some of this data may not be created.
#31 Develop a minimum set of forecasting requirements and capability to support integration of flexible resources into distribution networks and the system.	Users (people, flex coordinators, retailers, distributors) cannot easily get the data from holders/creators (distributors, people, flex coordinators, retailers). Some of this data may not be created.This is complicated by the users and holders/creators being the same people.
#36 Develop a common approach to connectivity which easily integrates and maximises the value of flexible resources.	Users (people, flex coordinators, retailers distributors) cannot easily get the data from holders/creators (people, flex coordinators, retailers). Some of this data may not be created.
#39 Identify the functions, capability and roles required to coordinate a power system with multi-directional power flows and flexibility.	Users (people, flex coordinators, retailers distributors) cannot easily get the data from holders/creators (people, flex coordinators, retailers, distributors). Some of this data may not be created.

Concluding points

The data system exists to support decision-making across the electricity ecosystem, but was designed for a predictable power system without many decentralised resources.

Things are changing. We need a digitalised electricity which enables free-flowing data and information for people and the system to realise the value and benefits of flexible resources.

Households, businesses and communities need data to decide whether to say yes to flex and to realise the value of their flexible resources day. Supply chain participants need data to operate a flexible system, including to let people (or, more realistically, the retailer or flex coordinator which interfaces with the market for them) know the value of using their flexibility at a given time and place.

We think a digitalised electricity system can be achieved by following the following design principles:

- take a whole-of-system approach to ensure the relationships and interactions between data users, data holders and data creators are based on a set of robust and flexible arrangements which allow relationships to be established and adapted so that data users can get the data they need to do what they want to do.
- prefer automated data exchanges. Automation is what underpins the customer experience from our digital lives through the plethora of apps and internet interfaces we all interact with daily. The simplification of experience is possible due to automated data exchanges making it easier to manage the underlying complexity.[7]
- take a transparent and consistent approach to standardisation of communications protocols. Some standardisation (or interoperability) is needed, but cannot be set in stone. (Imagine if we had locked in zigbee?) The data architecture must be based on open and non-proprietary standards so that a person, retailer or flex coordinator can realise the value of any flexible resource anywhere in the country. Standardisation should occur in a way which allows anyone considering, or who already owns or manages, resources capable of delivering flexibility to understand the processes and specifications to acquire information about opportunities, register devices, exchange information, and react to signals.

Data and digitalisation has proved to be a contentious topic. We think the contention is a lot due to the lack of common facts and little shared understanding of the topic and underlying issues. Our deep dive is intended to build the stock of common facts and understanding of the issues with data.

We are happy to see that ‘During August and September 2025, we [the Electricity Authority] expect to undertake further targeted workshops or other engagements to clearly map out relevant work across the electricity system (and beyond).’

We look forward to contributing to this process.Our experience is that structured discussions are superior to written consultation processes. They provide a streamlined way to identify facts and issues, and enable the iterative exploration and testing of ideas, while also directly exposing people to alternative positions, provoking debate between viewpoints, and getting expert views (versus a commercial position). The result is greater consensus and more robust conclusions.

[7] Automation is possible because the relationships, users, holders and creators, are well established for the authorised and secure exchange of information across the digital services we’re all used to using on a daily basis.

This is FlexForum advice. Individual FlexForum Members will have their own perspectives and positions. You can contact FlexForum at info@flexforum.nz with any questions and to arrange further

discussion.