FLEXFORUM

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Electricity Authority

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FlexForum advice on a more decentralised 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, and 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 that must be taken by the electricity ecosystem to make it easy for people to maximise the value of 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.

A flexible system is a decentralised system

FlexForum exists to support the shift to a more flexible, smarter[3] power system which is due, in part, to an increasing stock of decentralised, flexible, electricity resources.

Flexibility Plan 2.0 says "Households, businesses and communities in Aotearoa New Zealand are shifting from fossil fuels to electricity for transport, cooking, heating and cooling, and for industrial, commercial and agricultural activity. An increasing number of people have electric vehicles (EV), solar and distributed generation, battery storage, electric space and water heating, electric motors and machines."

We think this aligns to the view in the green paper: "In the electricity sector, decentralisation means shifting from large scale electricity generation at a small number of sites across the country, to smaller scale renewables and other DERs located closer to consumers."

The difference is in the focus. Decentralisation focuses on the location of the resources. Flexibility focuses on how those resources are used.

The rise of flexible, decentralised machines is important because they can, with the right settings and technical capability, flexibly modify their production or use of electricity in response to external signals.

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[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] "The smart electricity system of the future will need to be flexible, with an evolution in demand shifting and demand response from today's system. Flexibility will require new smart technologies to be developed and deployed across the electricity value chain, moving from the use of some technologies at scale to more dynamic responses from a broader range of technologies at a more targeted and granular level." BCG, The future is electric, October 2022, page 130.

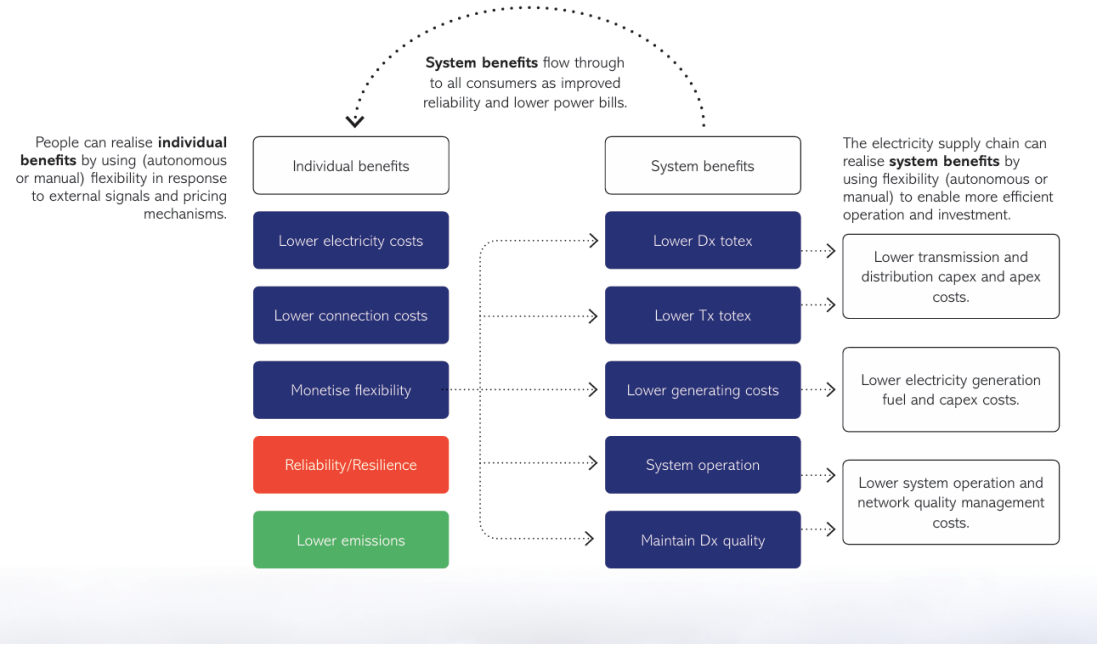
Flexibility empowers households, businesses and communities through choices and opportunities created by greater agency and autonomy to more easily and routinely have warmer houses, low emissions transport, increased resilience to extreme weather events, and lower power bills. Flexibility also underpins the benefits of a smarter power system.[4]

The opportunities range from individual households becoming more flex-y to 'A network of localised [flex-y] energy systems connected by a strong central spine' (an outcome of decentralisation flagged in figure 4). This is why FlexForum considers the defining characteristic of a flexible (or decentralised, or smart) system is that households, businesses and communities have autonomy, information, incentives and ability to make choices which maximise the value and benefits of their flexible resources for themselves, the power system and the economy.[5]

A flexible, smart, decentralised system promises more sustainable, reliable, resilient and affordable electricity

Flexibility can deliver benefits to individuals, consumers in general and the economy by enabling a power system that is more sustainable, reliable, resilient and affordable.

The individual and system benefits of flexibility are outlined in the graphic. FlexForum is working to provide indicative estimates of each benefit using existing research and studies.



The benefits of flexibility depend on making the flexibility journey easy and routine

A smart, flexible and decentralised system is not a foregone conclusion.

Most flexible resources will be owned and controlled by households and businesses, and in many cases the potential benefits of flexibility will be secondary to having a hot shower, a warm house, being able to drive to the beach and keeping the wheels of commerce turning. This means that realising the benefits depends on people finding it easy and routine to embrace their flexibility journey and 'say yes to flex'.

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

[5] With the qualification that the decisions people can make will take account of incentives and minimum physical operating parameters of the power system, and the coordination of resources may be exercised by someone choosing to make their flexibility available to an intermediary.

Unfortunately the flexibility journey[6] is not currently easy or routine.

Flexibility Plan 2.0 is a checklist of tasks and actions to smooth away the potholes and roadblocks which prevent or delay people throughout their flexibility journey. The role of the human is explicitly recognised by anchoring each step and action to the choices that people make to use flexibility options[7] to maximise the value and benefits of electricity for themselves, their community and for the wider economy.

Most tasks in the plan involve the electricity ecosystem developing 'back-office' capabilities, processes or practices to enable people to have and make choices to use their flexible resources.

The tasks can be split into four groups.

<table>
<tr><td colspan="2">Households, businesses and communities: people easily and routinely choose flexibility options which reflect their circumstances and preferences for sustainability, resilience and reliability and affordability.</td></tr>
<tr><td>Market frameworks: pricing and financial interactions efficiently integrate flexibility options into market arrangements to maximise the system and individual benefits of flexibility.</td><td>System operation: operational and physical interactions efficiently integrate flexibility options into system operation to maximise the system and individual benefits of flexibility.</td></tr>
<tr><td colspan="2">Digitalisation: to enable efficient exchange of data for market, system and human decision-making.</td></tr>
</table>

This framework highlights how the electricity choices people have (eg, a flexibility option) rely on integrating flexible resources (from decentralisation) into market frameworks and system operations, with digitalisation required to make the choices and actions of people, the market and system as easy and routine as practicable.

Flexibility Plan 2.0 lists tasks which should address many of the challenges to decentralisation

We think that delivering Flexibility Plan 2.0 will accelerate the transition to a flexible, decentralised, smart power system. We do not claim it is a comprehensive list of the actions required, but it covers the known knowns and will be updated as new actions are identified.

We expect that each of the challenges and risks identified in the green paper will be addressed, at least in part, through one or more steps in Flexibility Plan 2.0. The appendix identifies steps likely to address issues relating to governance design, local electricity sharing and markets, grid and system operations complexity and barriers to funding and finance.

Our experience, reflected in the Flexibility Plan, is there is real benefits to an approach which:

- Identifies challenges based on how they affect the choices and actions of people
- Is as specific as possible about the nature of the challenges faced, including recognising that the challenge is no one agrees about anything
- Is as specific as possible about the tasks required to address each challenge, noting that in many cases the initial task will be to get agreed facts.

Some challenges highlighted in the green paper are not explicitly addressed in the Flexibility Plan due to their overarching nature. We expect parties delivering steps will consider things like future needs, aspirations, choices

[6] A similar flexibility or customer journey framework is used by ARENA.

[7] The five options are: minimise day-to-day energy costs, minimise network connection costs, monetise flexibility, manage reliability and resilience, and reduce emissions. The options were defined through a series of FlexForum workshops between April and August 2022. You can check out the discussions at https://flexforum.nz/session-notes/. Starting with outcomes was a deliberate effort to ensure the Flexibility Plan reflects the perspective of a household, business or community – who may have flexible resources either now or in the future – making choices about flexibility and wanting to maximise the value of their resources for themselves, their community and for the wider economy.

and behaviours, intergenerational perspectives, ensuring equitable access to benefits and capability development.

The electricity ecosystem should strive to realise the opportunities and benefits of a flexible, decentralised system as soon as possible

The electricity ecosystem should strive to realise the opportunities and benefits of a flexible, decentralised system as soon as possible.

We suggested two things the Authority can do to fasttrack progress in our December 2024 advice on the Electricity Authority 2025-26 levy proposal and indicative workplan:

1. Develop a consumer-centric, whole-of-system forward looking work programme which identifies the practical steps required to give people choices in accessing energy so they and Aotearoa New Zealand prosper.
2. Use the resulting detailed checklist to coordinate 'outsourcing' market development activity to industry experts while focusing its efforts on issues where there are obvious irreconcilable views and to complete the Code amendment process.

A work programme to help create a flexible, decentralised system

Flexibility Plan 2.0 is a starting point for the Authority to identify what to include in its work programme to help create a flexible, decentralised system.

- The product of an ongoing discussion between experts across the ecosystem about the practicable, scalable steps to maximise the value and benefits of flexibility
- Provides a whole-of-system view anchored to the electricity outcomes households, businesses and communities
- Focuses on the practical steps required for people to easily and routinely obtain electricity and flexibility options which provide their preferred mix of sustainability, reliability and resilience and affordability outcomes (the hallmark of a flexible, decentralised, smart system)
- Emphasises testing options and solutions through learning-by-doing.

Each of the 41 steps listed in the plan are important to decentralisation and realising the benefits of flexibility. However, some steps warrant greater priority because the outputs are necessary conditions of progress. Drawing on the 2024 progress report and views emerging from the 2025 progress assessment, areas to prioritise are:

- **Provide accurate cash signals to motivate and incentivise efficient electricity choices**, including choices about when and where to use flexibility.
  - #7 Develop an initial common description of the use cases for each electricity outcome
  - #10 Develop and deliver a plan to provide cash signals which are accurate (as possible), give easy access to benefits, and motivate efficient responses.
  - #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.
- **Enable digitalised data exchanges between data holders and data users**, focusing on removing barriers to data users plugging into the data system to support people choosing and using flexibility options.
  - #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
  - #19 Develop a common minimum functionality for each flexibility use case so the same device can provide the same services across the country.
  - #28 Make changes to the registry to make flexible resources visible to the market and system
  - #30 Develop a minimum set of operational visibility requirements and capability to support integration of flexible resources into distribution networks and the system.

- #31 Develop a minimum set of forecasting requirements and capability to support integration of flexible resources into distribution networks and the system.
- #36 Develop a common approach to connectivity which easily integrates and maximises the value of flexible resources.
- #39 Identify the functions, capability and roles required to coordinate a power system with multi-directional power flows and flexibility.

- **Make it easier for people to make decisions**

- #2 Determine if people can easily get information about their existing electricity retail rates and charges.
- #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.
- #12 Determine the options to make it easy for people to compare their connection options and costs with and without flexibility.

We will update this priorities list once the 2025 assessment of progress with the Flexibility Plan is complete in August.

How the work is done is just as important

How the work is done is just as important to the pace of progress.

We recommend the Authority make far greater use of open structured discussions, eg, via a workshop series, to uncover issues and facts on the challenges faced and the potential solutions.

We consider the issues raised in this green paper, and in the recently released discussion paper 'Our future is digital' could be considered faster, more effectively, and more enjoyably via a series of structured workshops.

Consultation papers should be reserved for the end of a policy process once the facts (or obvious irreconcilable views) are known and to complete the Code amendment 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.

By contrast, written consultation processes promote echo chambers and siloed thinking as each responder documents a position which reflects their individual commercial interests. Further, written consultation processes are resource intensive which tends to exclude people and parties who do not have the luxury of resources to consider a proposal and develop a response. Many FlexForum Members do not submit to Authority consultation processes, but do contribute perspectives through FlexForum workshops.

The final benefit of open structured discussions is the faster cadence. A robust, expert consensus is doable within 3-4 months versus the 6+ months of a traditional consultation process.

Concluding points

The green paper is a welcome contribution to the ongoing discussion being had by FlexForum and other groups about the future state for the Aotearoa New Zealand power system.

FlexForum considers a decentralised power system is a flexible power system. The difference is in the focus. Decentralisation focuses on the location of the resources. Flexibility focuses on how those resources are used.

We think that delivering Flexibility Plan 2.0 will accelerate the transition to a flexible, decentralised, smart power system. We do not claim it is a comprehensive list of the actions required, but it covers the known knowns and will be updated as new actions are identified.

The Authority is fundamental to the pace of progress and is working on several tasks which are or could support delivering the tasks in Flexibility Plan 2.0.

We have listed areas to prioritise, and will update this list in August once the 2025 assessment of progress with the Flexibility Plan is complete.

However, no single party can do the job on its own. We see and appreciate the growing use of working groups, hui and workshops, but consider the Authority can further step up its coordination and collaboration game to make faster progress. Doing things differently means at a minimum making a serious effort to try this approach for regulatory and policy work that requires understanding and exploring how to get stuff done.

Our key piece of advice is to deliver the work programme and have conversations like this via structured workshops involving people from across the electricity ecosystem.

We have built considerable experience in running workshops to extract expertise and develop consensus from a group involving diverse and contradicting viewpoints. These are a faster and more effective way to deliver what will be an extensive and urgent work programme.

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.

Appendix. Flexibility Plan 2.0 steps likely to address the potential challenges and risks of decentralisation

Potential challenges and risks	Flexibility Plan 2.0 reference
Governance design… The shift toward decentralisation will likely make governance of the sector even more complex.	Upgrades to decision-making structures inherent in market frameworks and system operation arrangements and digitalisation are required to support the owners of flexible resources to decide how, when and why their flexibility is used. Most Flexibility Plan steps involve tasks to more clearly define decision making between the levels and layers or to more empower people.
Local electricity sharing and markets… Many of the benefits from decentralised electricity systems flow from optimising supply and demand in time and place, for example through peer-to-peer sharing or community VPPs within a network area. These can also enable equitable access to the benefits of DERs across a community.	Upgrades to market frameworks and system operation arrangements and digitalisation are required to support the owners of flexible resources to realise benefits individually or through community schemes. Relevant Flexibility Plan steps include: #10 Develop and deliver a plan to provide cash signals which are accurate (as possible), give easy access to benefits, and motivate efficient responses #17 Introduce rules to allow people to easily contract with separate market interface agents (ie, retailers, flexibility coordinators). #23 Develop participation requirements that enable specialist flexibility coordinators to interface with and integrate their activities into the market and system #39 Identify the functions, capability and roles required to coordinate a power system with multi-directional power flows and flexibility.
Grid and system operations complexity… DERs' use creates more dynamic and two-way power flows across the grid … This means sophisticated management tools are needed to maintain grid stability and optimise operations.	Upgrades to market frameworks and system operation arrangements and digitalisation are required to support dynamic system and power use. Relevant Flexibility Plan steps include: #30 Develop a minimum set of operational visibility requirements and capability to support integration of flexible resources into distribution networks and the system #31 Develop a minimum set of forecasting requirements and capability to support integration of flexible resources into distribution networks and the system #35 Develop a consistent approach to the design of flexibility-enabling operating practices such as operating envelopes so people and flexible resources have an equivalent experience where ever they are. #36 Develop a common approach to connectivity which easily integrates and maximises the value of flexible resources #39 Identify the functions, capability and roles required to coordinate a power system with multi-directional power flows and flexibility.
Barriers to funding and finance… The initial costs of DERs can be high for many people. Limited or no access to funding or loans can further prevent people from adopting DERs.	Flexibility Plan step #18 Develop and deliver a range of financing arrangements and options for people in all circumstances.