

# How will DER and Flexibility play its role?

Webinar # 1

Wednesday 4 May 2PM - 3:15PM



**FLEXFORUM** 

# Members



# Agenda

- Mihi whakatau and overview of session [5 minutes]
- FlexForum origin story, scope and approach [10 minutes]
- Thinking so far [25 minutes]
- How to provide input and next steps [5 minutes]
- Discussion & questions [25 minutes]
- Close [2 minutes or less]

# House Rules

Use SLI.DO (search FlexForum or use the link in the agenda) to ask questions - there is time at the end for discussion

Lots of people here, if your question isn't answered

- email your questions or thoughts to [info@flexforum.nz](mailto:info@flexforum.nz), or
- ask for a further conversation

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Join at [slido.com](https://www.slido.com)  
**#FlexForum**

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# Who is most critical to the energy flexibility ecosystem?

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# Background

- Cortexo & Our Energy article series 2021
- Joint submission by Cortexo, Our Energy, SEANZ & Vector on “*Updating the regulatory settings for distribution networks*”

*“.. a learning-by-doing approach with industry-led development of products and practical solutions which are scalable across the market”*

## FlexForum

- Small enough to manage and progress, big enough to cover stakeholder voices
- ***Starting the discussion*** about common language & product definitions - these are essential for buyers and sellers to easily transact flexibility
- Hopefully resulting in some real world implementations as the FlexForum progresses
- Open and transparent <https://www.araake.co.nz/services-projects/flexforum>

# Goal & Purpose

## The Flex Forum goal is to:

- Create a set of actions to integrate DER into the electricity system and markets, to maximise the benefits for Aotearoa New Zealand.

## The Flex Forum purpose is to:

- Deliver three objectives - the things it will do - to integrate and maximise the value of DER
  - Identify the minimum specifications of the services that DER can provide, to who, when, where, how and for how much
  - Identify the practical, scalable, and no regrets steps to use the services that DER can provide
  - Support ongoing learning and collaboration across the electricity sector on real world deployment of solutions to realise the benefits of DER, including identifying and resolving barriers
- Build a broad consensus across the electricity sector and others interests for the set of actions to integrate DER
- Build capacity and capability to implement the set of actions to integrate DER.

***The focus is common language and practical products & services to start transacting flexibility***



# Scope and progress

- 1 Identify the minimum specifications of the services that DER can provide, to who, when, where, how and for how much



- 2 Identify the practical, scalable, and no regrets steps to use the services that DER can provide



- 3 Support ongoing learning and collaboration across the electricity sector on real world deployment of solutions to realise the benefits of DER, including identifying and resolving barriers.

# An ongoing approach to engagement

## Your input is needed

How flexibility is transacted - when, where, how, for how much - will be decided through learning by doing

The answer requires collaboration, both now and through the learning that follows

- Webinar today, with another in June on the next three topics
- See the thinking to date and keep up to date on progress via the website hosted by Ara Ake
- Email us at [info@flexforum.nz](mailto:info@flexforum.nz) to share your thoughts or if you want to talk to us

<https://www.araake.co.nz/services-projects/flexforum/>

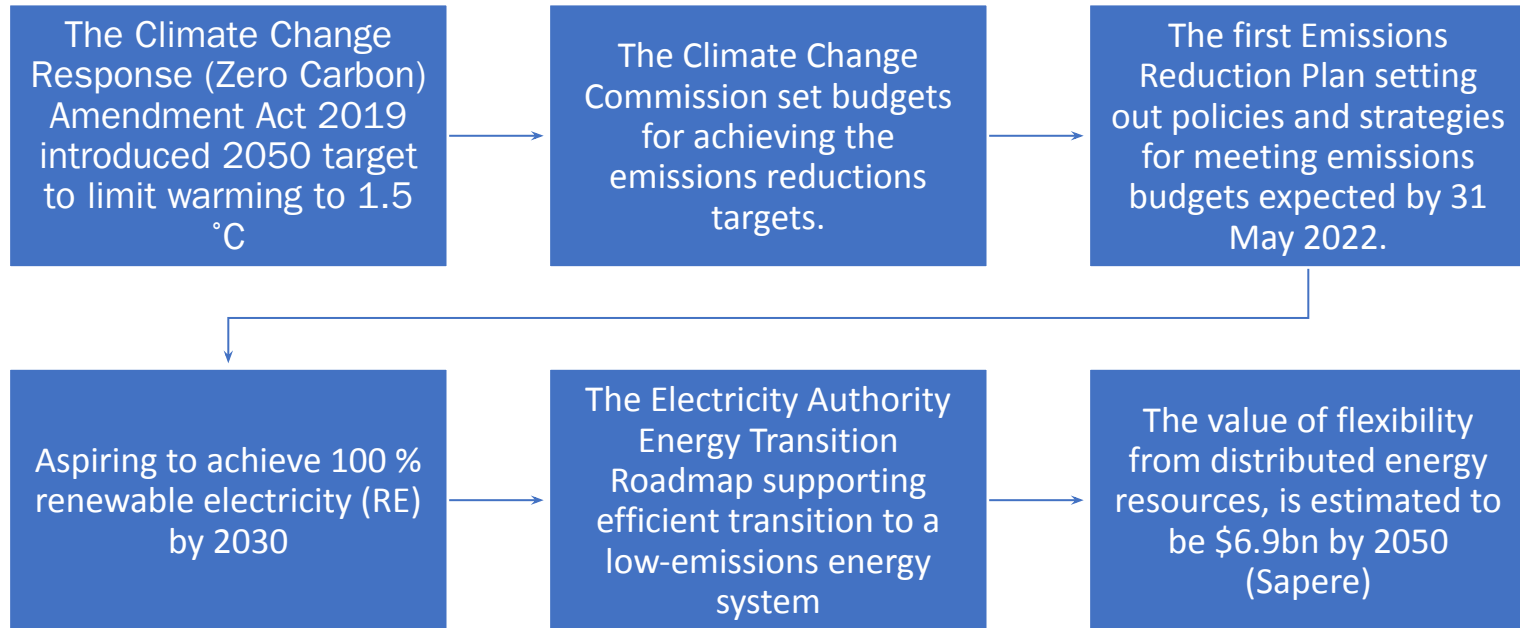


## FlexForum

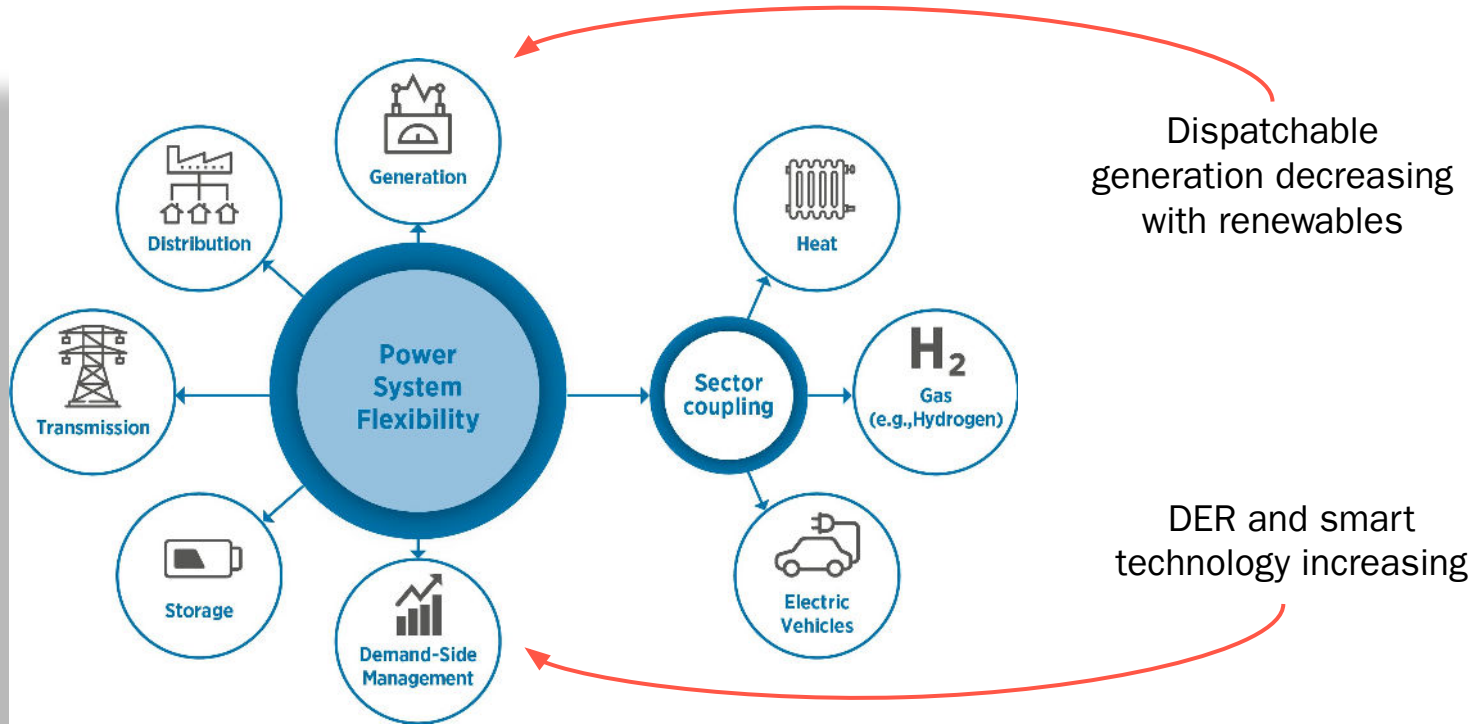
The goal of the FlexForum (the Group) is to create 'A set of actions to integrate distributed energy resources (DER) into the electricity system and markets to maximise the benefits for Aotearoa New Zealand'.

Learn more >

# NZ's energy system is changing



# Shifting from supply to demand side flexibility



Source: IRENA

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# There are many needs and use-cases for flexibility

## PRICE OPTIMISATION

- Spot price arbitrage
- Network charges arbitrage
- Generation revenue maximisation
- Emission reduction

## PRICE OPTIMISATION

- Sport price arbitrage
- Network charges arbitrage
- Generation revenue maximisation (self-use or export)
- Emission reduction
- Resilience

### RETAILER & GENERATOR

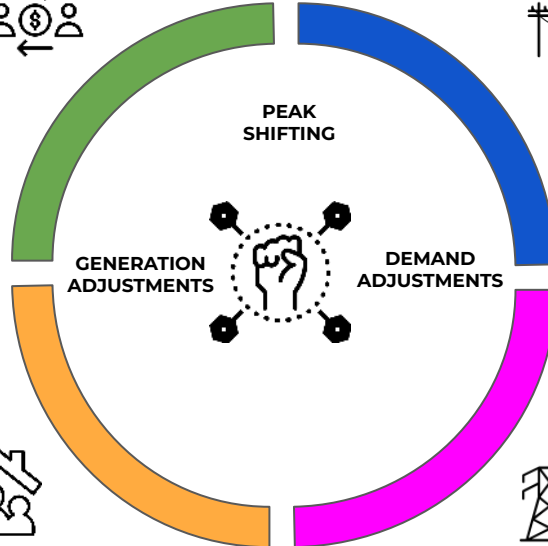


### Dx & Tx NETWORK



### NETWORK MANAGEMENT

- Predictive congestion management
- Corrective congestion management
- Generation capacity adequacy
- Balancing



### END CONSUMER & DER OWNER



### SYSTEM OPERATOR



### SYSTEM MANAGEMENT

- Generation capacity adequacy
- Balancing

# We've identified five situations where flexibility might be useful

## Price optimisation

- Electricity (spot and retail) price risk management
- Fuel stock management
- Arbitrage / optimise distribution charges & costs
- Maximise generation revenue

## Corrective congestion management

- Network reliability: avoid/shorten outages at peaks
- Network reliability: voltage management

## Predictive congestion management

- Network security: manage risk of outages at peaks
- Network planning: right-size connection and infrastructure costs.

## Generation adequacy

- Power system security of supply
- Network reliability: avoid or shorten planned / unplanned outages
- Network resilience: avoid or shorten outages due to major asset failure

## System and network balancing

- Frequency Keeping
- Instantaneous Reserve
- Over-frequency Reserve
- Voltage Support
- Black Start

# Identifying technical requirements

For each situation where flexibility might be used, we have identified the key technical information about the solution

This information is needed by flexibility suppliers for decisions about when and when and how to supply flexibility



## Planning information

- Detection event or trigger
- Location
- Procurement & deployment timeframe
- Response lifespan & commitment period
- Form of response



## Operational information

- Type of response
- Activation notice period
- Activation / deactivation speed
- Response duration

More detail is available in the paper we will share after this webinar

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**Are there other reasons for potentially using flexibility?**

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# DER Operational Model & Potential

RED TEXT =

- Currently not available for most DER

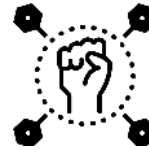


## DER CAPABILITIES

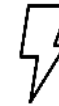


### MARKET

- Service required
- Price offered
- Current retail tariff
- Current wholesale price



- Peak shifting
- Generation Adjustments
- Demand adjustments



### Price optimisation

- Energy arbitrage
- Reduce operating cost (TOU, self consumption)
- Demand charge reduction

### Network management

- Predictive & Corrective congestion management
- Generation capacity adequacy
- Balancing

### System management

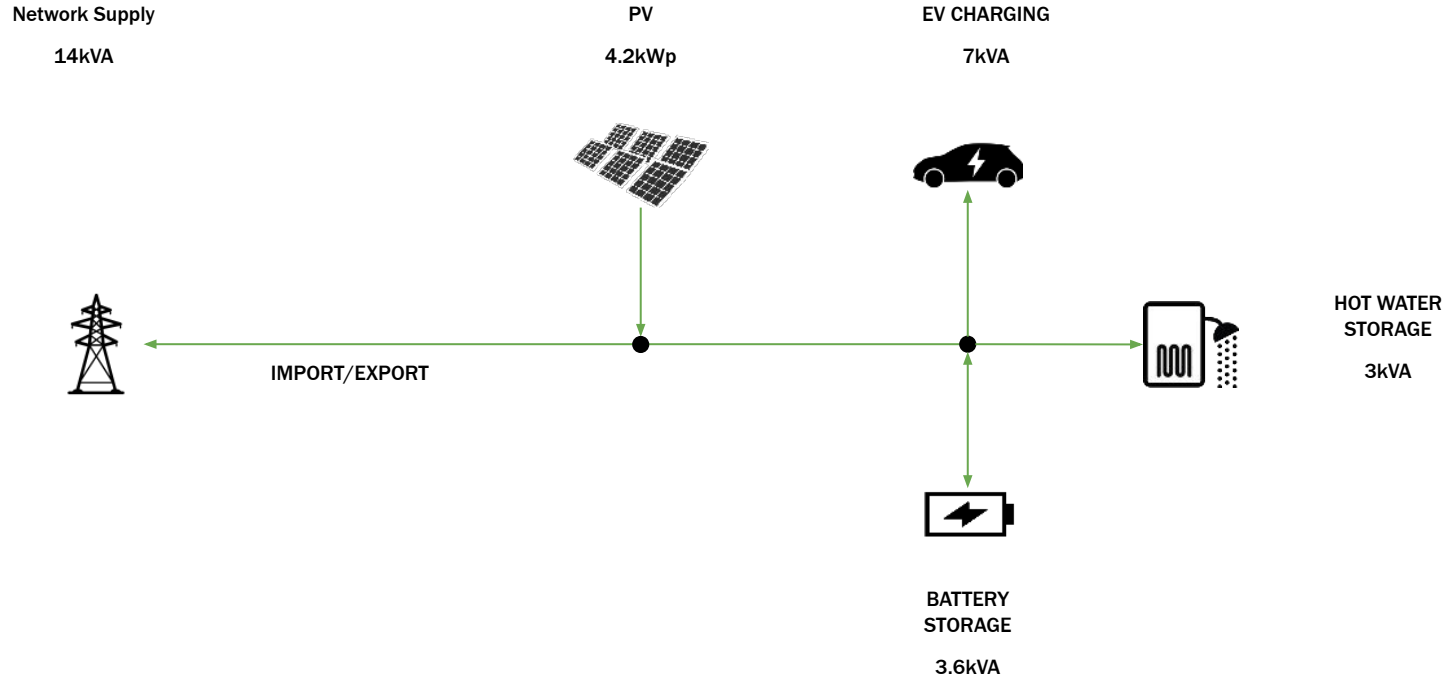
- Balancing
- Generation capacity adequacy



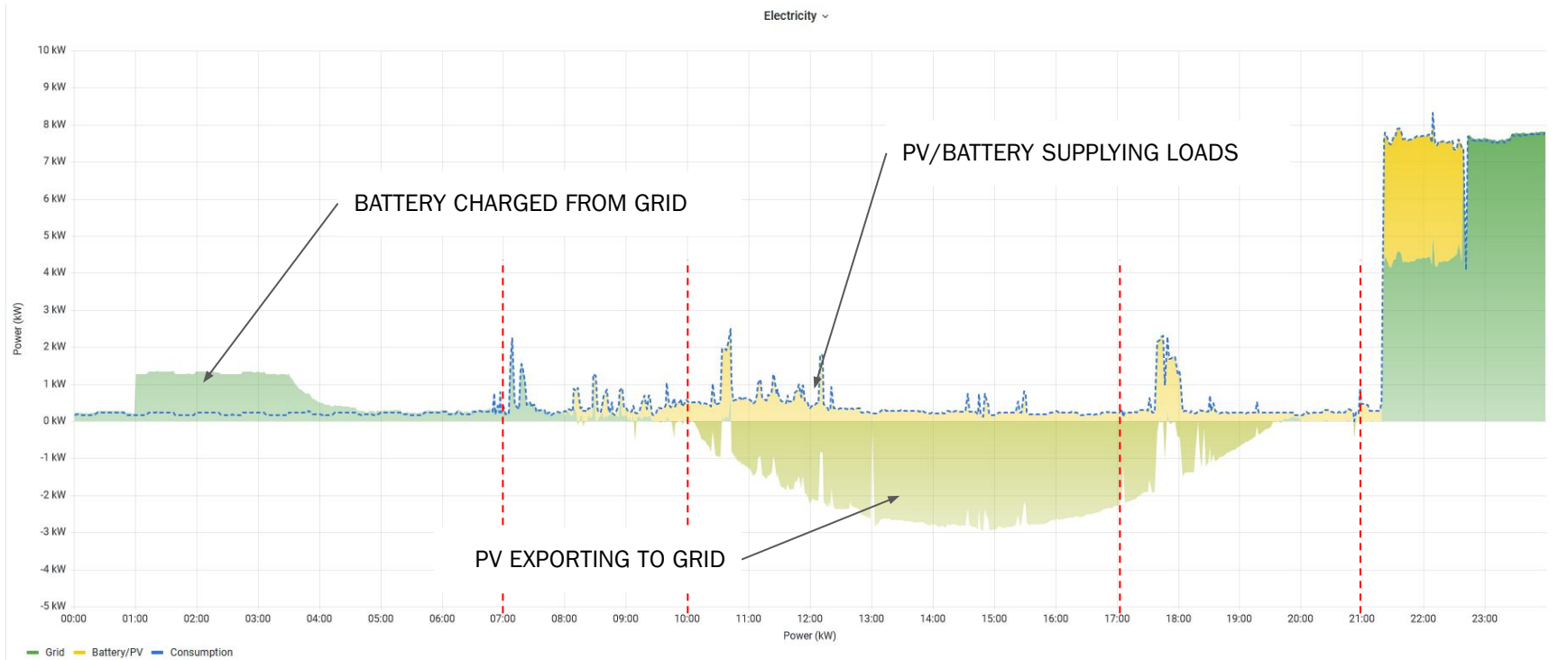
### TECHNICAL

- Frequency
  - Voltage
  - Power factor
  - Standard comms protocols
- } Measured

# Case Study - Residential

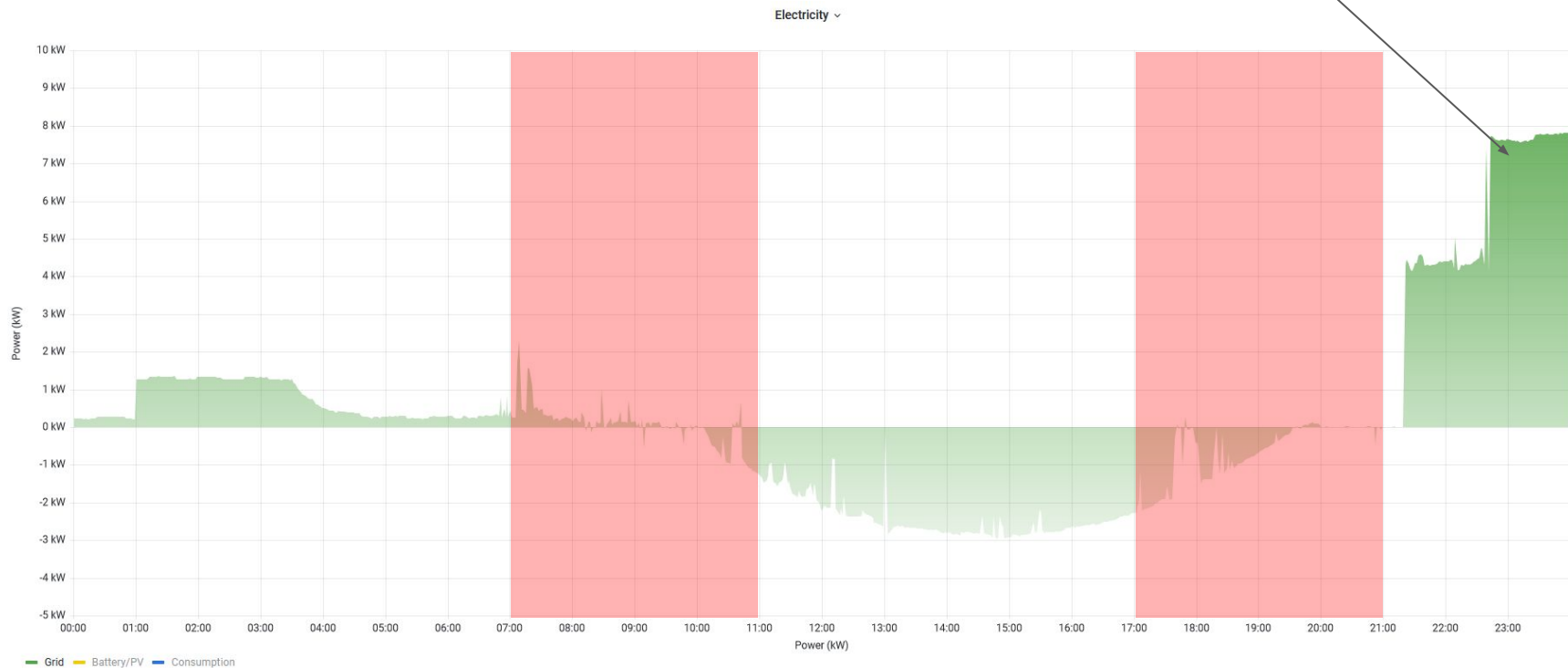


# Typical Daily Profile

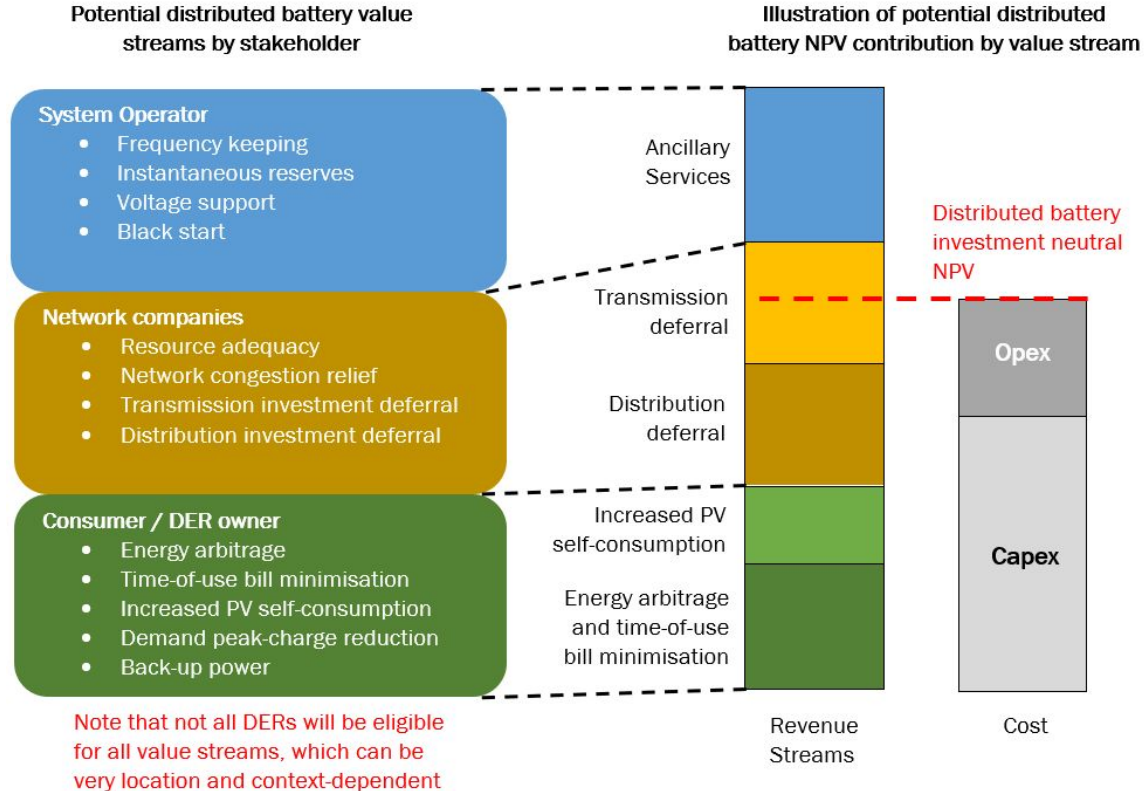


# Grid Demand Profile

GRID CHARGING CAR  
What if everyone did this at 9pm when the tariff changed?



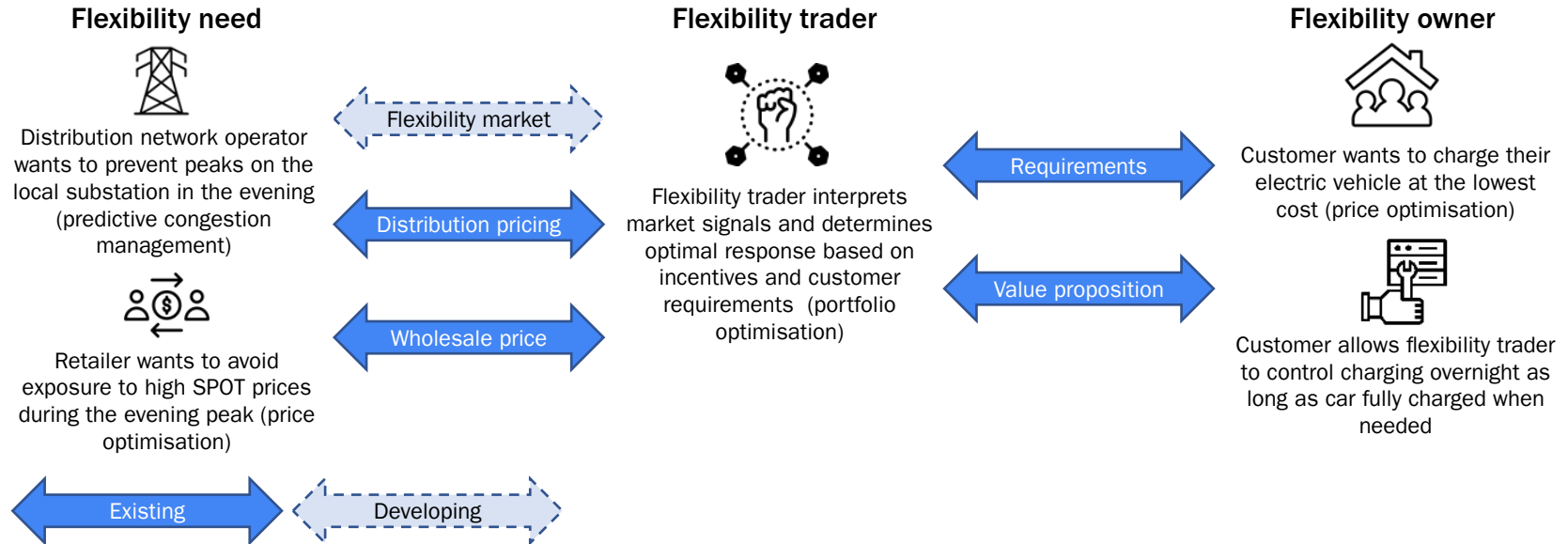
# The importance of value stacking



Transpower submission  
<https://www.ea.govt.nz/assets/dms-assets/28/Transpower-IPAG-DERM-briefing-August-2021-as-presented.pdf>

# Commercial frameworks and incentives are needed

Clear market signals and service requirements are required to unlock the value of flexibility and maximise the benefits for Aotearoa and all energy consumers.



# Unlocking the value of flexibility



## Key questions

- What are the value exchange mechanisms, how are they determined and who are the counterparties?
- What are the terms of trade?
- How does the exchange occur, and what operational processes are needed e.g. signalling, communication, monitoring and settlement



## Key questions

- What are the practical, scalable and least-regrets actions?
- What factors are blocking or are required to enable creation of attractive and effective propositions for transacting flexibility?

# How to provide your input & next steps

Tell us what you think about the thinking so far (circulated today)

- written responses to [info@flexforum.nz](mailto:info@flexforum.nz) by Friday 13 May – bullet points are fine
- targeted webinars with key stakeholder groups by arrangement (email [info@flexforum.nz](mailto:info@flexforum.nz))
- 1-1 sessions by arrangement (email [info@flexforum.nz](mailto:info@flexforum.nz))

Your views will be used to refine the thinking so far. Comments will not be publicly attributed, unless you say they can be

We plan a further webinar by early June on the next set of issues. Get in touch in the meantime with your views and thoughts



# Tell us what you think

A paper setting out the FlexForum thinking and ideas in more detail will be shared with you after this webinar.

We want your feedback particularly on 5 specific questions

1. Are there any other reasons for acting or services required by a DER owner, transmission or distribution network owner, the system operator, retailer or generator to need to respond?
2. What suggestions do you have for creating common terminology and descriptions of the service, the need or condition to be managed and the physical response?
3. Does the list of planning and operational information requirements reflect what is used for making decisions about responding to network, system and market conditions?
4. Does the list provide sufficient planning and technical information for flexibility providers to make decisions about when, where and how to supply flexibility?
5. What suggestions do you have for creating common terminology and descriptions for each of the technical requirements?

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**What challenges do you face in regard to flexibility and are these being addressed through any other forums?**

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## Audience Q&A Session

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## Close

- Please provide feedback to the questions we will circulate
- Feel free to contact us to arrange further discussions or provide feedback
- Thank you for your time today

**info@flexforum.nz**