



Electricity Engineers'
Association

Workshop
10th September 2024

EEA 2024

Streamlining Connections Workshop



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House Keeping

Emergency Procedures:

- Please follow the instructions of the automated emergency system and the Te Pae Christchurch team.
- The Assembly Area is located on the "Green" directly opposite the exhibition halls/ Lot 3 (next to the river walk)

Restrooms & Facilities:

- Washrooms are in the foyer outside the rooms.

Timing & Breaks:

- Session runs from 1:45 PM - 5:00 PM
- Break at 3.00 PM
- Please be back promptly to stay on schedule

Workshop Outcomes:

- Workshop materials and any outcomes will be shared via email after the event

Introduction

Today we will share our experience co-designing and implementing a new end-to-end connections process for DER and Large loads into distribution networks (i.e., easier, faster, consistent, equitable).



Paul Blue
Counties



Trent Tscheuschler
SEANZ



Allen Davison
Electricity Authority



Stuart Johnston
EEA



Sian Hughes
Orion

Workshop Agenda

MC: **Mr Paul Blue** (Counties Energy)

1.45 pm – Introduction and overview - Paul Blue (Counties Energy)

2.00 pm – Stakeholder/Proponent Perspective on current Connections process – Trent Tscheuschler (SEANZ)

2.15 pm – Electricity Authority - non-price barriers to the connection and prioritisation of large capacity DG and load – Allen Davison (Electricity Authority)

3.00 pm – Afternoon tea

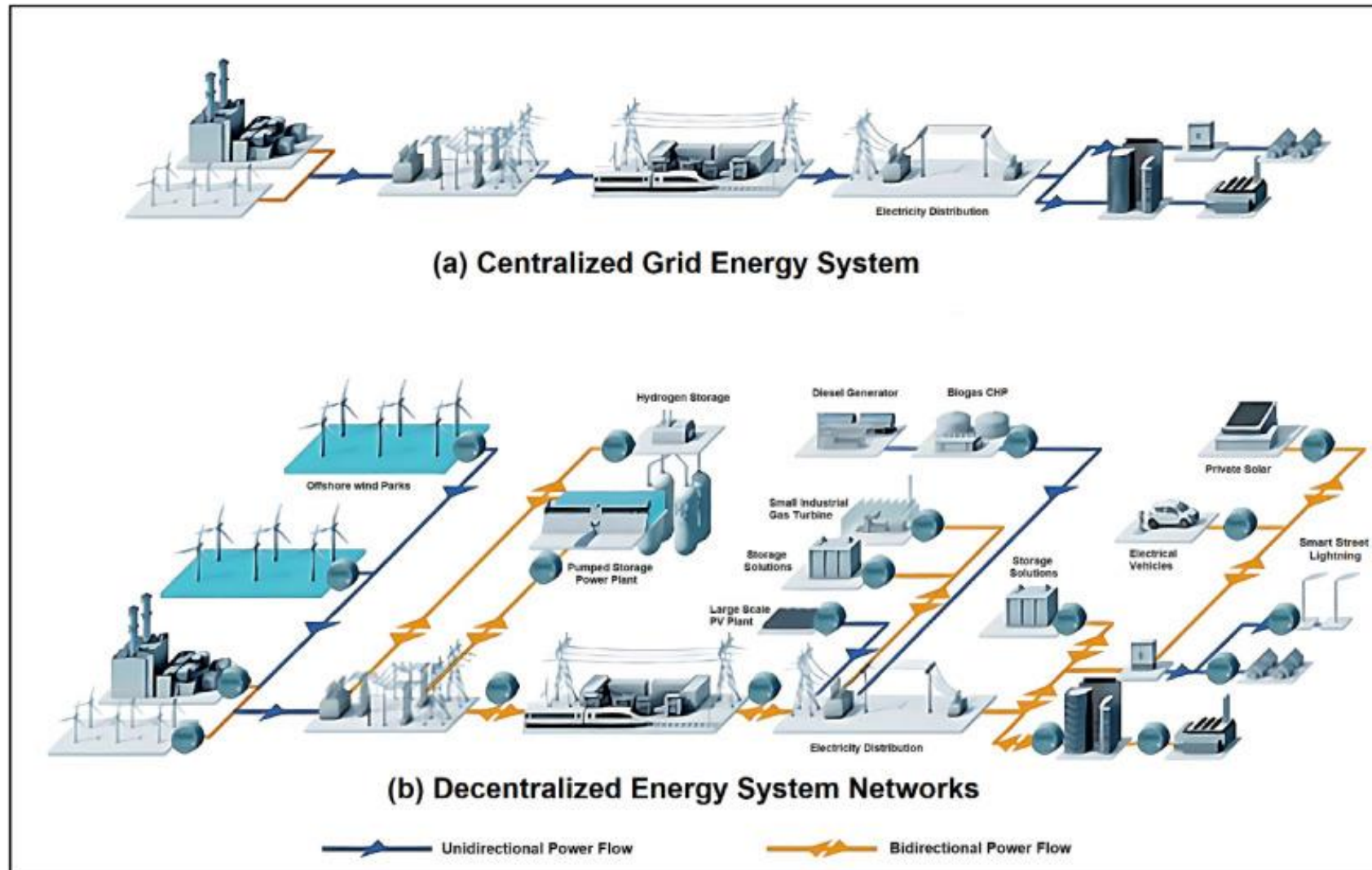
3.15 pm - Current State – EEA Common Technical Guides – Stuart Johnston (EEA)

4.00 pm – ENA/FNF EDB Connection Process and Customer Journey Mapping – Sian Hughes (Orion)

4.50 pm - Workshop Wrap up – Paul Blue (Counties Energy)

5.00 pm – Workshop close

A Changing Energy System



What is the issue?

Perception that the current process is costly and time consuming for DER proponents due to a combination of :

- Requirements being too onerous/complicated and not achieving the right balance between:
 - Mitigation of network risks / network costs
 - Efficiency in the connection process
- Inconsistency across networks in terms of level of technical requirements, documentation requirements and structure of documents
- Lack of clarity with respect to technical and documentation requirements.

STREAMLINING CONNECTIONS PROGRAMME

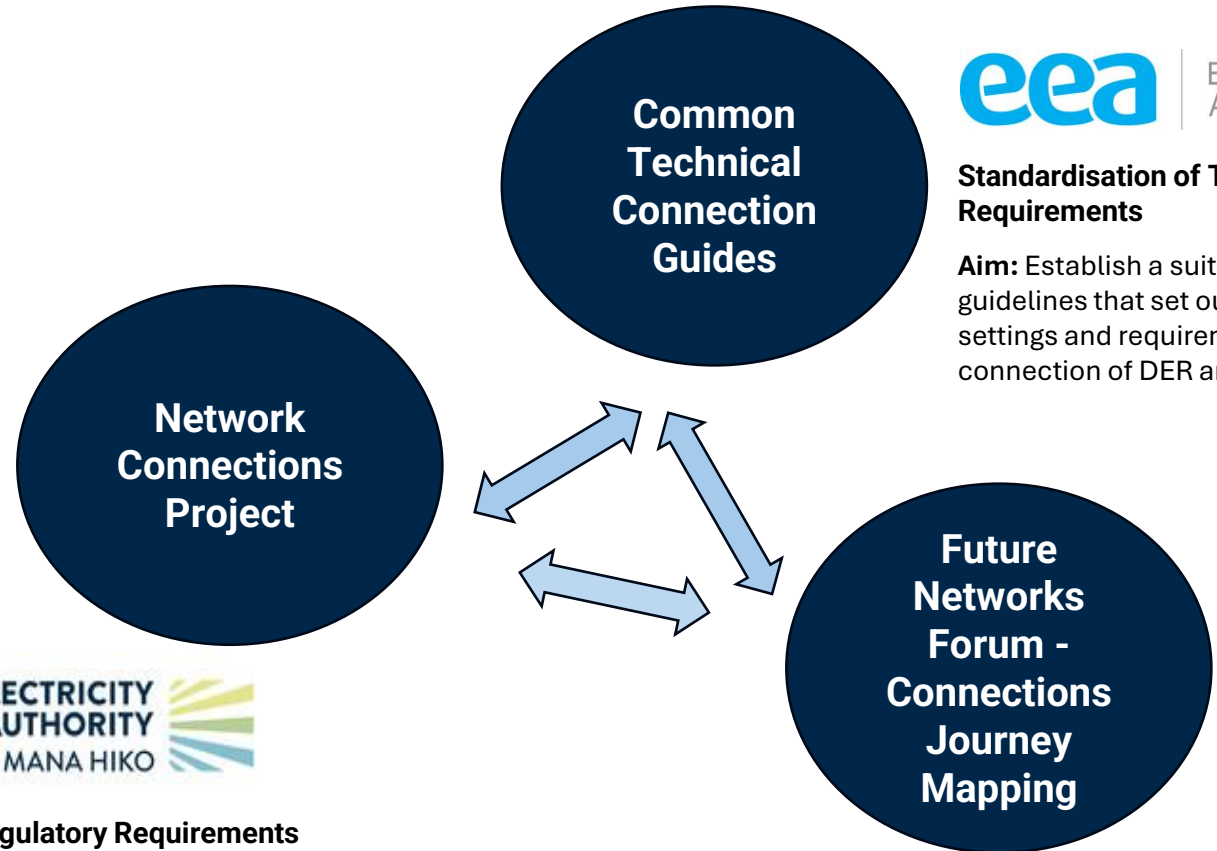
PROJECT OBJECTIVE:
MAKING CONNECTIONS
TO NETWORKS MORE
EFFICIENT (E.G., EASIER,
FASTER, CONSISTENT,
EQUITABLE)



Regulatory Requirements

Aim: Improve the efficiency of network connections by addressing the non-price barriers to the connection of DER and load with either changes to regulations, the code or the establishment of informed industry guidelines.

Supported by: EA's Network Connections Technical Group (NCTG)



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Standardisation of Technical Requirements

Aim: Establish a suite of national guidelines that set out the technical settings and requirements for the connection of DER and load to the grid.



Best practice processes

Aim: To undertake customer journey mapping, capturing and co-designing customer service and commercial improvements for connections to be used by all EDBs.

How do we ensure success?

Key Success Criteria

**Co-creation with
EDBs, Customers
and stakeholders**

**Widespread
EDB
involvement
and adoption**

**Customer and
stakeholder
expectations
met**

**Regulatory
influence**



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Insights on the Current Connection Process from the Stakeholder/Proponent Perspective

Trent Tscheuschler
SEANZ



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EEA Connections Workshop

Trent Tscheuschler - USS Tech Manager



SEANZ 2024
Tomorrow's
Energy Today



SEANZ



Background

SEANZ identified issues with the connections process early. They set about developing a workstream to look at grid connection processes, and setup workshops to develop solutions.

Subsequent to the running of these workshops, the ENA, EA and EEA have started work on standards, processes and code changes to support the industry.

Here are some of the issues identified during the workshops.



Image credit: Lodestone Energy



Image credit: Lightyears Solar

Issue Statements

- Unclear requirements and processes

“The processes followed by EDBs are unclear and not well advertised. Each EDB has a different set of requirements that they ask of each developer. The requirements are changing as the EDB learns new information”

Issue Statements

- Unclear requirements between EDBs and Transpower

“Transpower’s Connection Management Framework set out the requirements where the connection was direct to the grid. If Transpower interactions were required as part of an EDB connection, the lines were blurred.”

Issue Statements

- Part 6 Application Process not fit for purpose

“Part 6 Part 2 application process had unachievable timelines for an EDB, making the connection timeframe an unknown quantity. The lack of a large scale DG specific application process is clearly evident”

Issue Statements

- EDBs under resourced and couldn't recover costs

“The EDBs don't have enough resources to give the service that developers require. Currently the connection fee is capped at \$5000 and this isn't enough for them to get more resource. This is exacerbated by the volume of applications”

Issue Statements

- Pace of connection applications too slow

“The EDBs had a first in first serve policy, allowing some developers to reserve slot in the queue without progressing their applications. The EDB had no mechanism to move applications around based on maturity”

Issue Statements

- Power Quality Requirements are unclear and there is a lack of benchmark data

“The requirement to meet harmonic allocations and reactive power requirements is difficult to model, due to moving targets and a lack of data. It is unclear who will pay for the mitigation of these issues.”

Issue Statements

- EDB Equipement Requirements differ around the country

“Network connections require the developer to install EDB approved equipment for the connection assets. The list of approved equipment is unclear, and changes from EDB to EDB”

Questions?





Network connections project – proposed stage one amendments to Part 6 of the Code

Allen Davison
Electricity Authority



Network connections project – proposed stage one amendments to Part 6 of the Code

EEA workshop – 10 September 2024

Allen Davison (Principal Analyst - Retail & Network Policy)

NETWORK CONNECTIONS PROJECT OVERVIEW

Distribution networks use fit-for-purpose application processes and standards to operate efficiently, competitively and reliably

Stage One

Connecting to networks, and amending existing connections, is more efficient (eg, easier, faster, more equitable and more consistent across networks)

Focus on **connections** – large DG and load applications

Stage Two

Distribution networks operate efficiently, competitively and reliably by using fit-for-purpose connection and operation standards

Will focus more on **operations** – eg, remaining provisions in Part 6

SUMMARY OF ACCESS SEEKER CHALLENGES (DG AND LOAD)

- Little visibility of available network capacity and applications waiting to connect
- Wide variation in distributors' application processes
- Some EDBs do not have the resources or systems to engage well with access seekers
- Poor visibility of the application process and what is required to connect
- Code has weak provisions for the efficient queueing and management of applications, and for competing applications
- EDB approval times can sometimes be slow, with long waits for electricity infrastructure to be installed

DISTRIBUTOR CHALLENGES

- Increasing applications to connect, and to upgrade connections
- Strong competition for capacity (a challenge for applicants too!)
- Connecting larger and more complex DG applications
- Poor but improving visibility of network capacity
- Supporting the transition to electric transport
- Supporting decarbonisation (eg, industrials, commercials, ports)
- Managing power quality in an increasingly flexible environment
- Managing constraints (eg, infrastructure, human resources, supply-chain)

OUR AIMS FOR PART 6 *CONNECTING DISTRIBUTED GENERATION*

- promotes competition, reliability and efficiency
- is consumer-centric
- is complemented by industry processes and guides
- is transparent, understandable and fair
- encourages consistent practice by distributors and applicants
- increases the rate of uptake of network connections and connection upgrades
- focuses resources on projects most likely to connect
- is flexible, but firm where necessary (eg, timelines to approve applications)
- supports an appropriate level of power quality on networks
- aligns with grid connection processes, where possible
- is cost-neutral for distributors
- is technology agnostic
- supports Government goals
- improves investor confidence and decision making
- improves industry productivity
- enables sector performance to be monitored, and
- is periodically reviewed to identify areas for improvement.

KEY STAGE ONE PROPOSALS

Caveat

Proposals are provisional pending agency, legal and EA board review

- 1) Amend large-capacity DG application process
- 2) Add load application processes
- 3) Distributors publish network connections pipeline
- 4) Distributors provide more information on network capacity

The Authority is also working on both non-pricing and network pricing issues

SUMMARY OF PROPOSALS

Easier, faster, more equitable and more consistent processes across networks

Distributor publishes network capacity information quarterly (where known)					
Large applications in network connections pipeline (until 6 months after connection)					
Pre-application	Initial application	Interim application (large DG and load only)	Final application	Post final approval	Post connection
	Maximum export power				
	Mandatory fee				
	Processing deadline	Processing deadlines	Processing deadlines		
	Resubmit application at no cost	Resubmit application at no cost	Resubmit application at no cost		
			Propose external conditions be met for final approval		
			Updated priority requirements + complementary applications encouraged	Meet distributor's queueing and management policy	Updated regulated terms for DG
	Detailed policies and processes – Streamlining Connection Programme (ENA leads) Technical – Streamlining Connections Programme (EEA leads)				

Questions?



QUEUEING AND MANAGEMENT POLICY

What would a best practice queueing and management policy look like?

- It should apply from initial application through to final connection (but ideally also consider the pre-application stage)
- It should prioritise applications that are more connection ready, and in the best long-term interest of consumers
- It should encourage more complementary applications
- Do you think it could replace the proposed external conditions for final approval?

STAGE TWO (STARTS 2025)

Some identified issues:

- small-scale distributed generation application processes
- fees
- congestion and curtailment practices
- connection and operation standards
- unauthorised connections
- disputes resolution processes
- competition for network studies and capital works
- coverage of secondary networks

Question: Besides these issues, what else should the Authority consider in stage two, and why?



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EEA Technical Connection Guides - Technical Requirements and Device functionality

Dr Stuart Johnston
EEA



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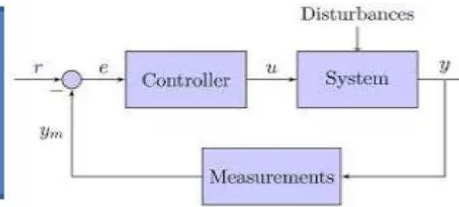
EEA: The development of Common Technical Guidelines

The development of National Connection Guidelines to standardise the connection of DER into the grid has been identified as a critical action to better integrate growing numbers of customer resources into the grid.

EEA is about to commence a program of work towards preparing a nationally consistent set of guidelines for EDB network connection of a range of generation technologies, outlining the technical requirements to facilitate streamlined integration.

Why do we need common Technical Guidelines for Connection?

CONTROL/
DECISION MAKING



COMMUNICATION/
CONNECTED



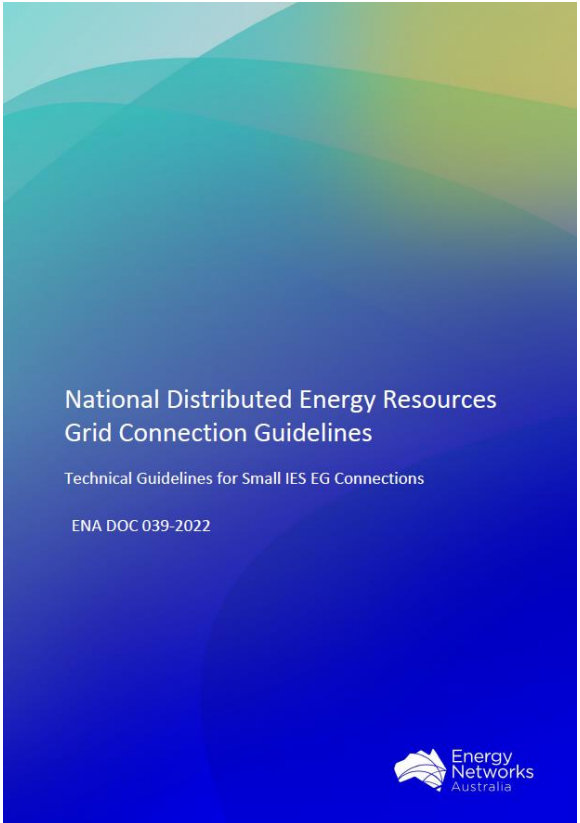
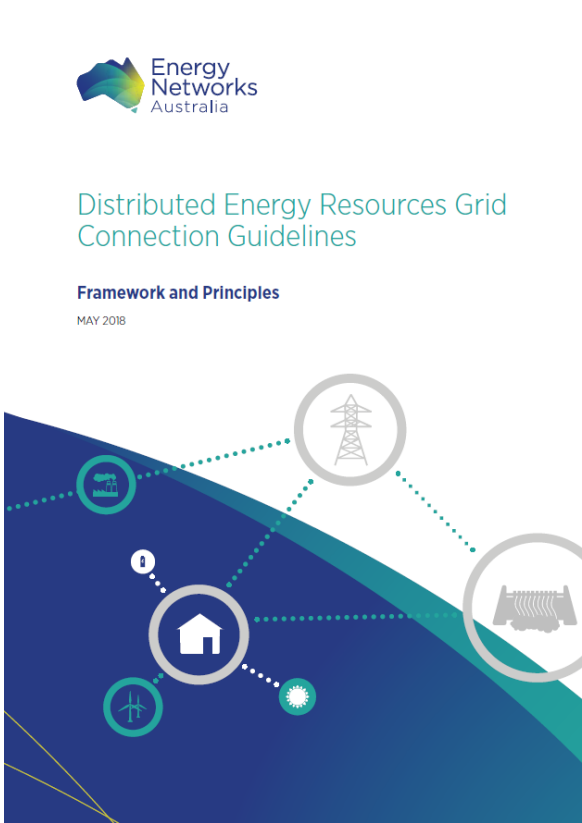
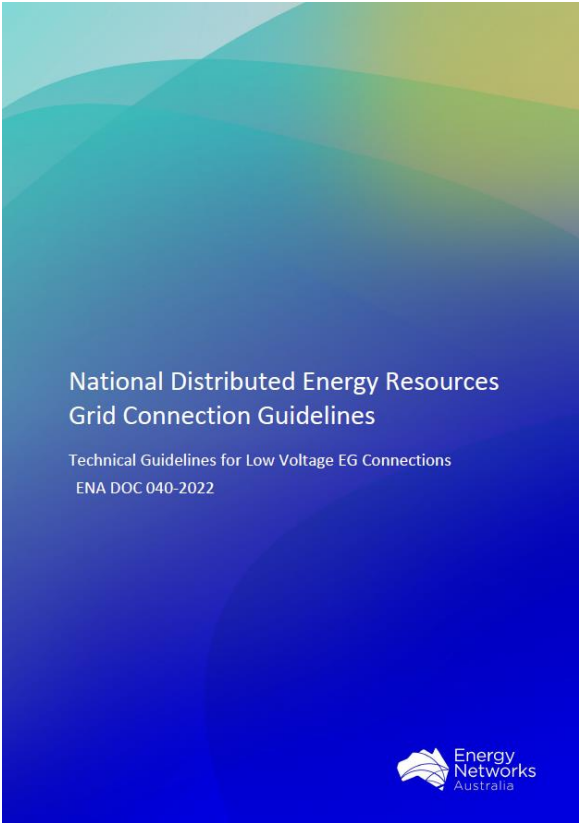
POWER OR ENERGY



Efficient operations are achieved when all the elements operate as one entity in total conjunction

- *Control/Decision Making Element*
- *Communication enabled/ Connected Element*
- *Power or Energy Element*

Technical Guidelines



EEA Common Technical Guidelines

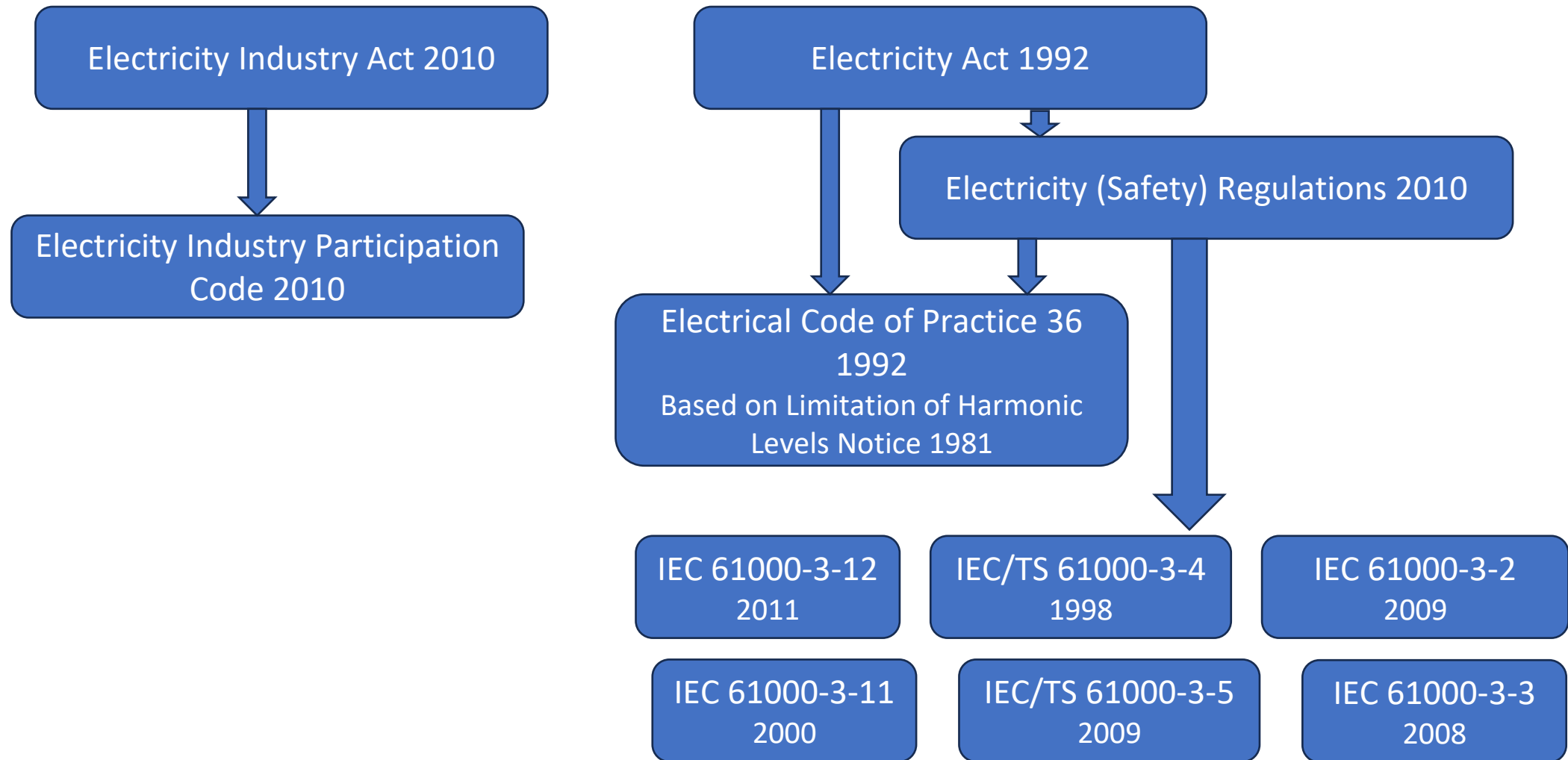
We propose to develop:

- A series of guidelines which set out the structure, definitions and technical settings all Aotearoa NZ, EDBs should adopt in the development and application of their technical requirements for grid connection of distributed energy resources (DER) and potentially large loads.
- The guidelines will use instructional language directed towards EDBs in developing and applying their technical requirements

Note:

- *The guidelines are intended to address current technical requirements, as “point in time” type documents.*
- *Future technical requirements are being identified and described through the Authorities Future Security & Resilience (FSR) work program, Flextalk, Flexforum etc.....*
- *As requirements shift from “future” to “now”, revisions of the guidelines will capture these changes.*

Power Quality Legislation



Proposed Technical Guides

CER micro applications (household)	DG applications \leq 10kW Small	DG applications $>$ Medium	DG applications \geq Large
Cookie Cutter	Process 1 / Process 1A	Process 2	Process 3

2023

Power Quality (PQ) Guidelines



Electricity Engineers' Association in
conjunction with University of Canterbury
and the EPECentre (Revision 6.78

OCTOBER 2023



Proposed Inclusions in the Guides

System requirements	Earthing
Labelling and signage	Metering
Generation control	Power quality
Fault levels and protection impacts	Communications systems
Means of isolation	Communication and data protocols
Operating voltage and frequency	Cybersecurity
Inverter Energy Systems	Technical studies
Non inverter systems	Commissioning and testing
Protection	Operations and maintenance

How will we establish the correct technical settings?

1. Aligned with the Electricity Authority (i.e. NCTG) and ENA – “Streamlining Connections Programme” and inputs from projects like Flextalk
2. Establishment of a steering group – including representatives from across industry including (but not limited to):

EDB's	Transpower
SEANZ/SEANZ members	Manufacturers
Proponents	Regulators – EA, Commerce Commission

1. Direct engagement with primary stakeholders through meetings, workshops and public webinars
2. Draft revision process via email submission from EDBs and stakeholders



Questions?



Activity 1: As a table, please identify what should be included in the EEA Technical Guidelines for each size of DER/load connection and prioritise their importance. (5 min).

Item	Large	Priority	Medium	Priority	Small	Priority	Household	Priority
System requirements								
Labelling and signage								
Generation control								
Fault levels and protection impacts								
Means of isolation								
Operating voltage and frequency								
Inverter Energy Systems								
Non inverter systems								
Earthing								
Metering								
Power quality								
Communications systems								
Communication and data protocols								
Cybersecurity								
Technical studies								
Commissioning and testing								

Scenarios to test the technical connection requirements

Objective: The following audience interactive exercise seeks to test the technical connection requirements for large-scale, medium-scale, small-scale, and household Distributed Energy Resources (DER) connections to the grid. Each scenario is designed to provoke discussion and uncover critical technical and regulatory issues while addressing integration and optimization challenges.

Time: 20 mins

Instructions:

1. In groups (per table) identify a scribe
2. Each group has two scenario's relating to either large-scale, medium-scale, small-scale, and household Distributed Energy Resources (DER) connections to the grid.
3. Please review the scenario and the accompanying visual, as a team discuss the scenario, and document the people, systems and processes would enable that scenario in the real world



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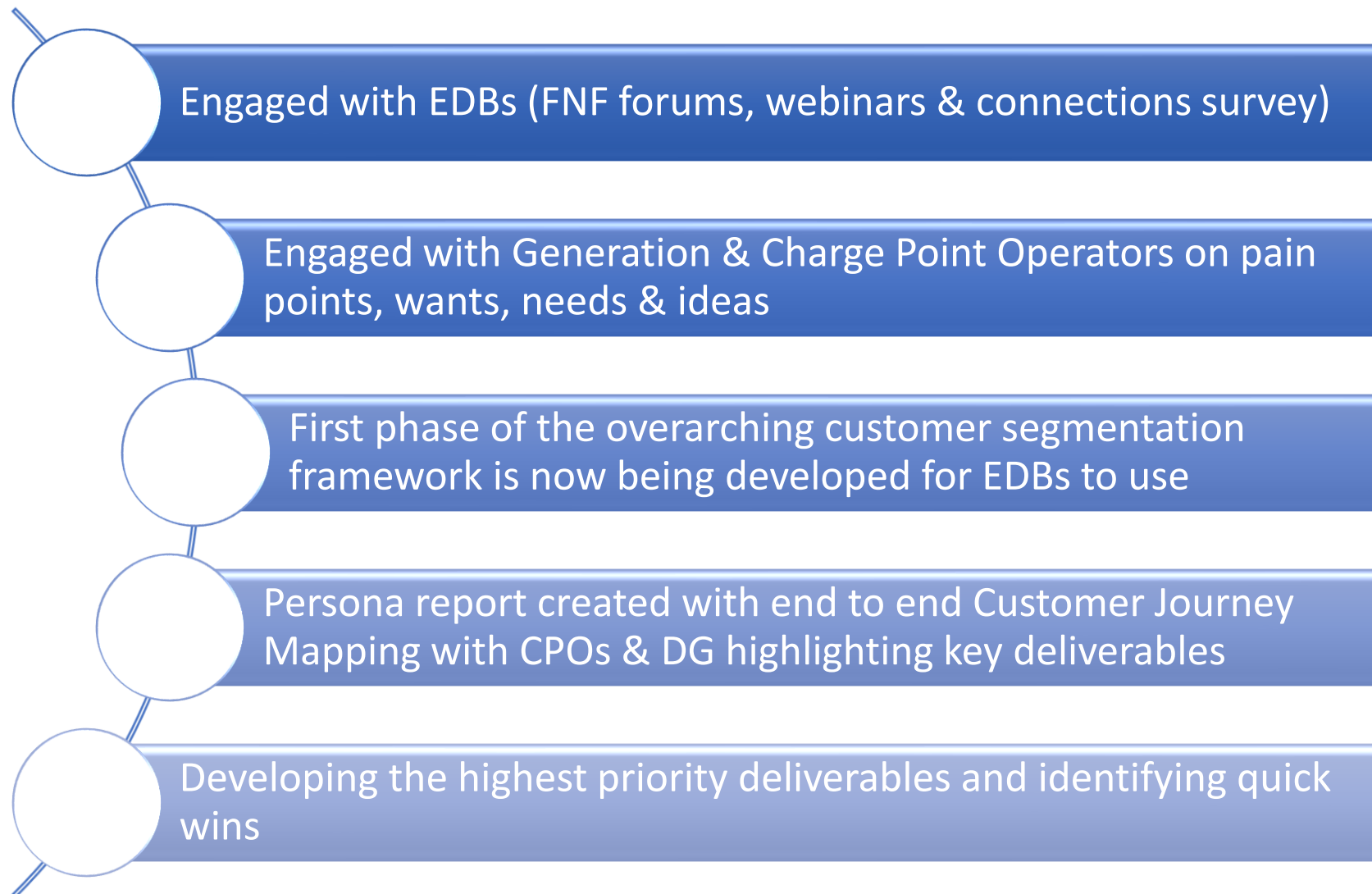
ENA FNF - Connections Journey Mapping and Connections Process Improvements

Sian Hughes
Orion



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Connections Customer Journey

Pre-application

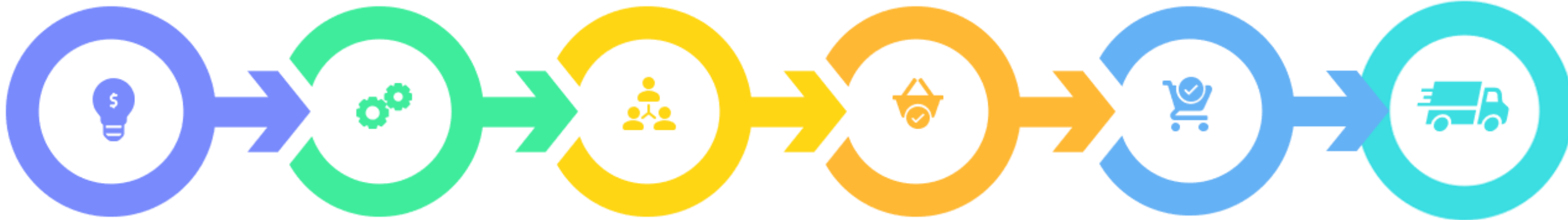
Application

Conceptual Design

Acceptance

Detailed Design

Delivery



Website self-serve
information

Pre-application
meetings

Budget Estimates

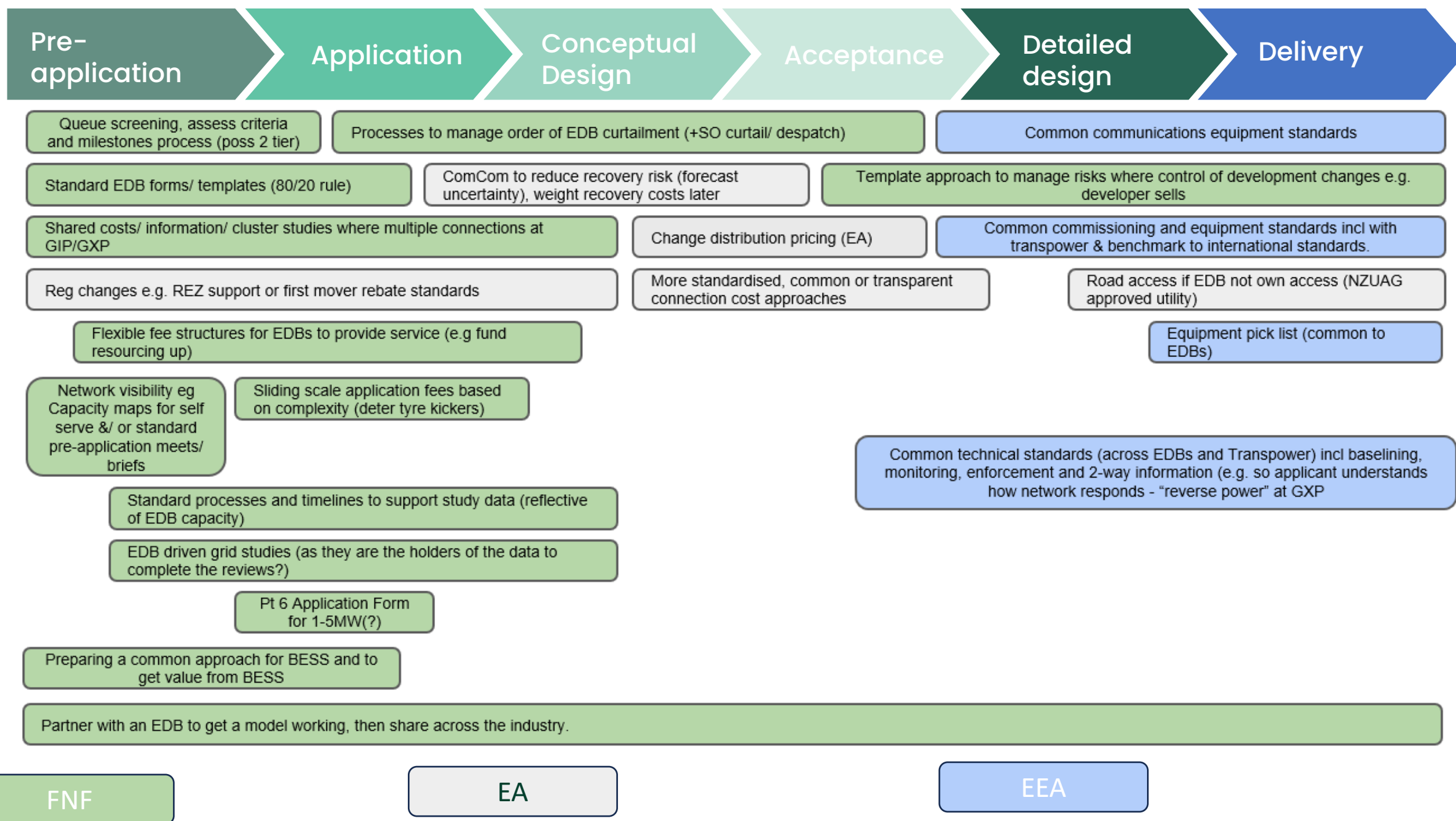
Formal application
submitted

Conceptual non-
detailed design
completed

Customer accepts
and makes
payment to
progress

Detailed design of
the project is
completed

Connection is
delivered and
livened



Access to network capacity data & other self-serve information	Early discussions regarding sites, capacity, flexibility	Too many forms for different EDBs	Inconsistent timings & service levels
Account/relationship manager	Queue Management and milestones	Contestability and performance of contractors	Common technical standards & equipment
Long lead times	Costs unknown	Common approach for BESS	Standardisation towards industry best practice

1. Standard jargon buster
/ glossary

2. Standard contact guide
/ info

3. Align connections
journey steps / labels
across EDBs

4. Customer self-service
capability: Stage 1
website info, FAQs

5. Standardise pre-
application meeting
offering

6. Offer approximate
budget estimate

7. Standardise key
questions at application
(require more
information upfront)

8. Introduce cost recovery
for all costs at
conceptual/detailed
design/contractual stage
(to help EDB resourcing)

9. Standardise quote
cover letter with key
information

10. Recommendations
where possible on
technical and
commissioning standards
(EEA-led)

11. Have baseline
commercial contracts
published with standard
Ts & Cs

12. Create EDB queue
management & milestone
policy in line with
Transpower

13. National stakeholder
engagement via ENA FNF
with published report

Requests

- Our DG & CPO Customer Journey Report completed is soon to be published on ENA website – please take a look!
- Connection Survey response & data – only 5 EDBs yet to respond
- Data & collaboration needed for the segmentation work – this is out currently. Only 2 EDBs have sent data thus far, with 3 other EDBs looking to send data and we are putting NDAs in place. We need this to be able to test our framework and analytical model to ensure it is fit for purpose.

Next Steps

- Begin to deliver our connections journey quick wins with co-creation with EDBs & customers. We will publish a timeline when finalised.
- Customer segmentation webinar to take place in 2 weeks
 - Further analytical model work
 - Framework development
 - Segment deep dives
 - Segment future state envisaging
- FNF innovation forum 12-13th Nov
 - First day external speakers from: Kainga Ora, SEANZ & Community Energy Networks.
 - Second day with update on connections journey deliverables & customer segmentation presentation & workshop

Questions?



Pre-Application & Glossary

On your tables you will see:

- Glossary sheet of paper to note down terminology & high-level description to be captured during the discussion of any jargon used
- UK leaflet & Aus example of info provided at pre-application stage
- Pre-application sheet to note down answers to the 5 questions below

Key discussion points:

1. What info do customers want? (Load and Generation)
2. What info could EDBs provide?
3. Cost – depending on what info/how much time would it take planning teams to review & collate?
4. Which format is best – UK style meeting or Aus formal document?
5. Any other ideas?



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Closing Remarks

Paul Blue
Counties Energy



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Streamlining Connections – Join us on the journey!

- Visit us during the conference at the EEA Stand
- The slides and outcomes of today's workshop will be shared with you after the conference.
- We want you to join us on this journey!!!

Electricity Authority: allen.davison@ea.govt.nz

EEA Principal Advisor: stuart@eea.co.nz

ENA FNF: Sian.Hughes@oriongroup.co.nz



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THANK YOU!!!



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