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 prioritsation of large capacity DG and load – Allen Davison (Electricity Authority)
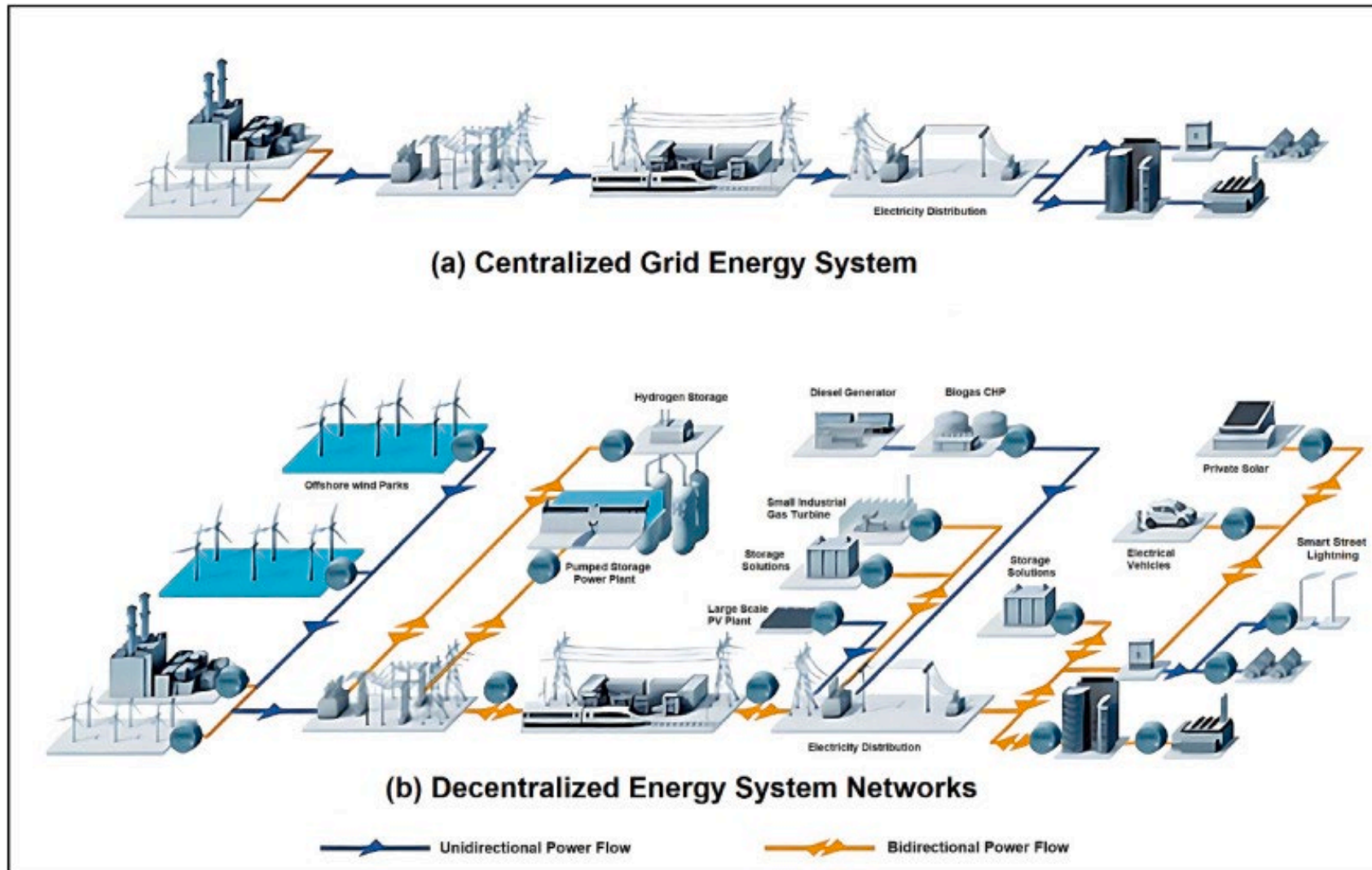
3.00 pm – Afternoon tea

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

(a) Centralized Grid Energy System

(b) Decentralized Energy System Networks

Unidirectional Power Flow · Bidirectional Power Flow

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:

    - o Mitigation of network risks / network costs

    - o 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.
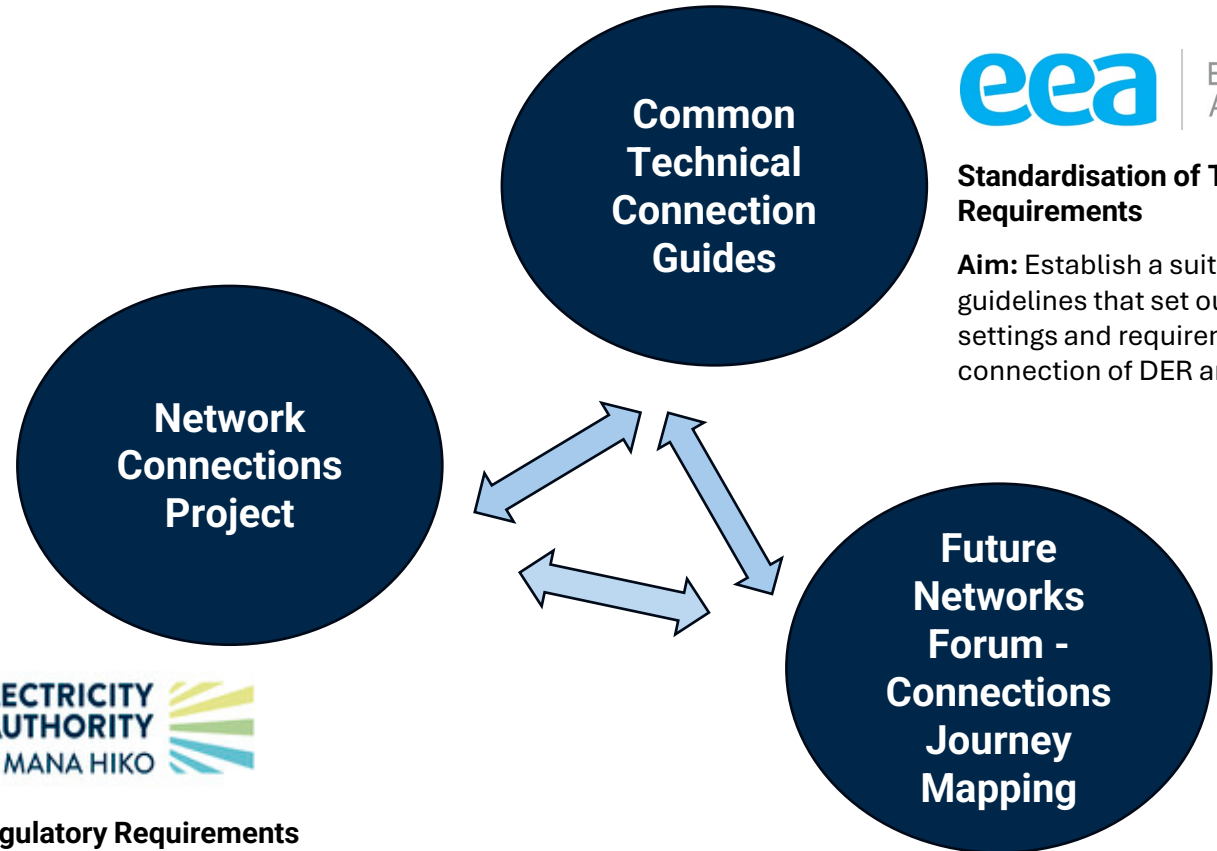
STREAMLINING CONNECTIONS PROGRAMME

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

Common Technical Connection Guides

eea | Electricity Engineers' Association

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.

Network Connections Project

ELECTRICITY AUTHORITY TE MANA HIKO

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)

Future Networks Forum - Connections Journey Mapping

ena electricity networks aotearoa

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

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

EEA workshop – 10 September 2024

Allen Davison (Principal Analyst - Retail & Network Policy)

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NETWORK CONNECTIONS PROJECT OVERVIEW

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

Stage One	Stage Two
Connecting to networks, and amending existing connections, is more efficient (eg, easier, faster, more equitable and more consistent across networks)	*Distribution networks operate efficiently, competitively and reliably by using fit-for-purpose connection and operation standards*
Focus on **connections** – large DG and load applications	Will focus more on **operations** – eg, remaining provisions in Part 6

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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)

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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

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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: 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?

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
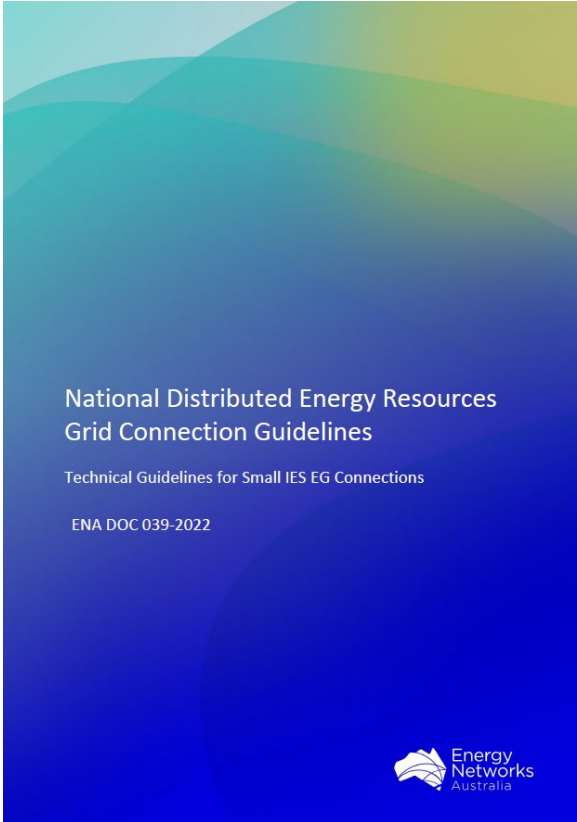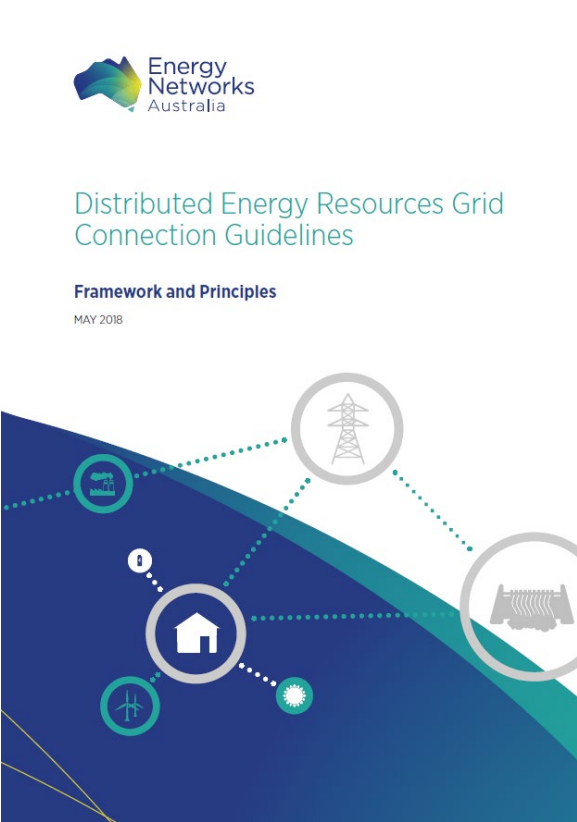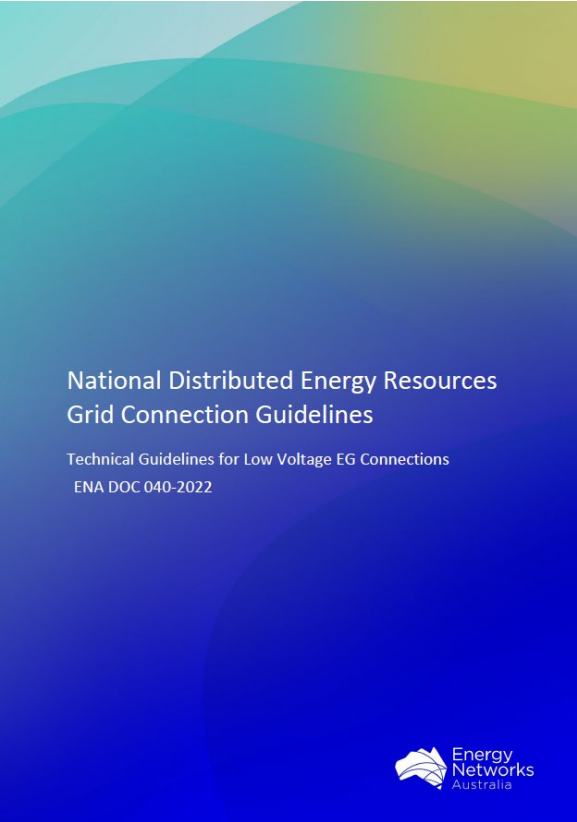
EEA Common Technical Guidelines

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

Electricity Industry Act 2010

↓

Electricity Industry Participation Code 2010

Electricity Act 1992

↓

Electricity (Safety) Regulations 2010

Electrical Code of Practice 36 1992
Based on Limitation of Harmonic Levels Notice 1981

IEC 61000-3-12 2011

IEC 61000-3-11 2000

IEC/TS 61000-3-4 1998

IEC/TS 61000-3-5 2009

IEC 61000-3-2 2009

IEC 61000-3-3 2008
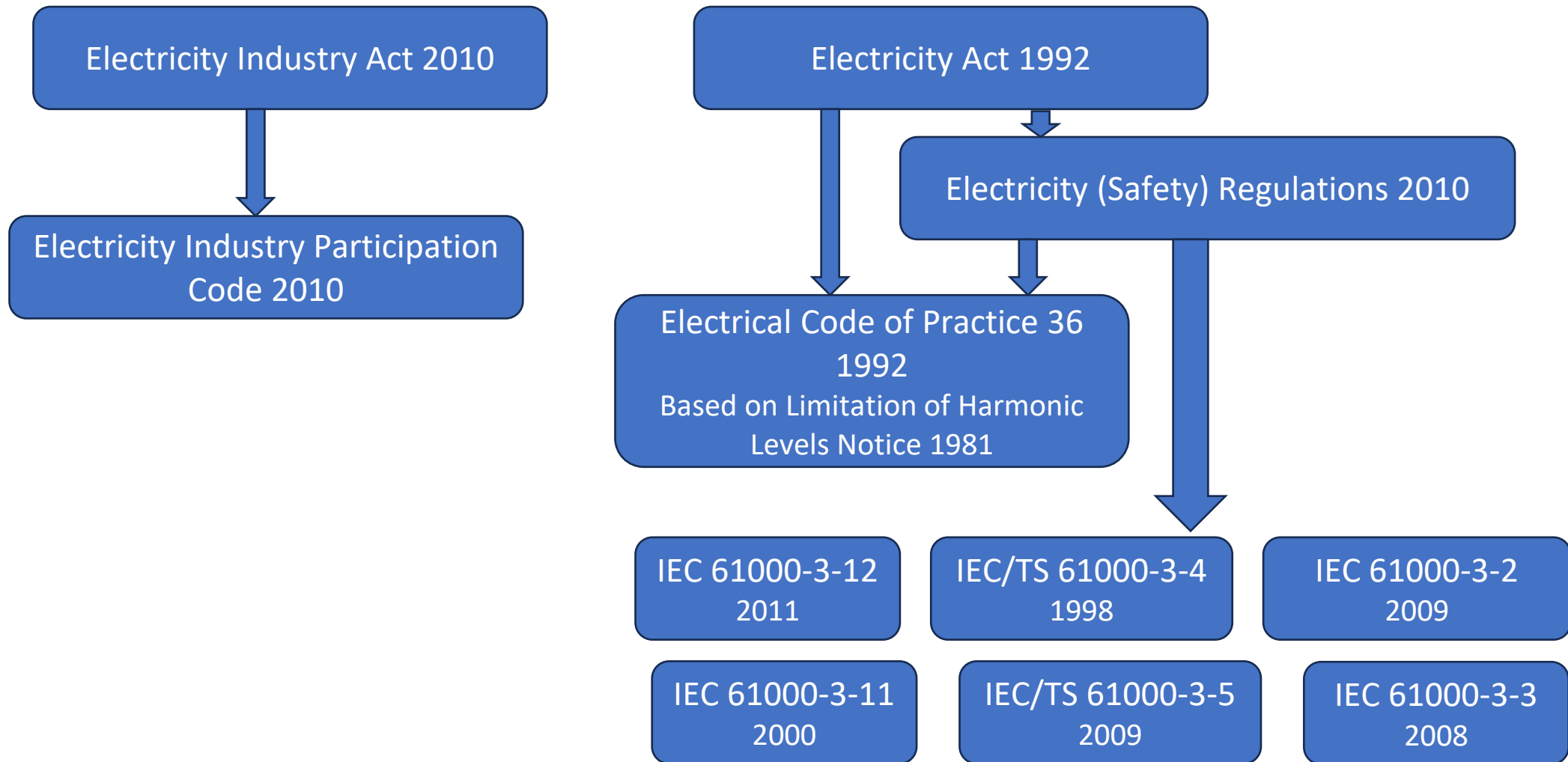
Proposed Technical Guides

CER micro applications (household)	DG applications ≤ 10kW Small	DG applications > Medium	DG applications ≥ Large
Cookie Cutter	Process 1 / Process 1A	Process 2	Process 3

2023

Power Quality (PQ) Guidelines

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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

ENA FNF - Connections Journey Mapping and Connections Process Improvements

Sian Hughes
Orion

Engaged with EDBs (FNF forums, webinars & connections survey)

Engaged with Generation & Charge Point Operators on pain points, wants, needs & ideas

First phase of the overarching customer segmentation framework is now being developed for EDBs to use

Persona report created with end to end Customer Journey Mapping with CPOs & DG highlighting key deliverables

Developing the highest priority deliverables and identifying quick wins
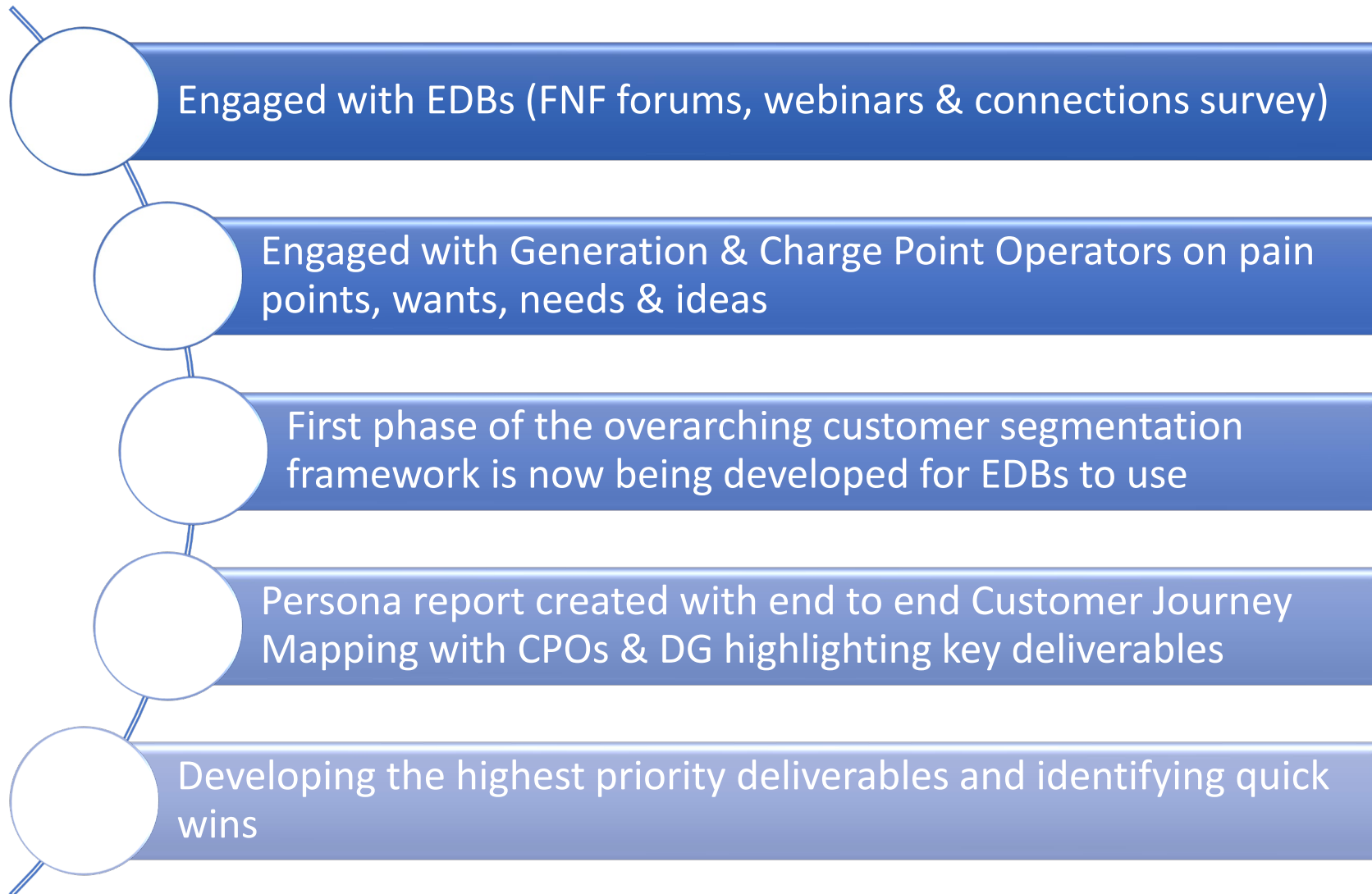
Connections Customer Journey

Pre-application	Application	Conceptual Design	Acceptance	Detailed Design	Delivery
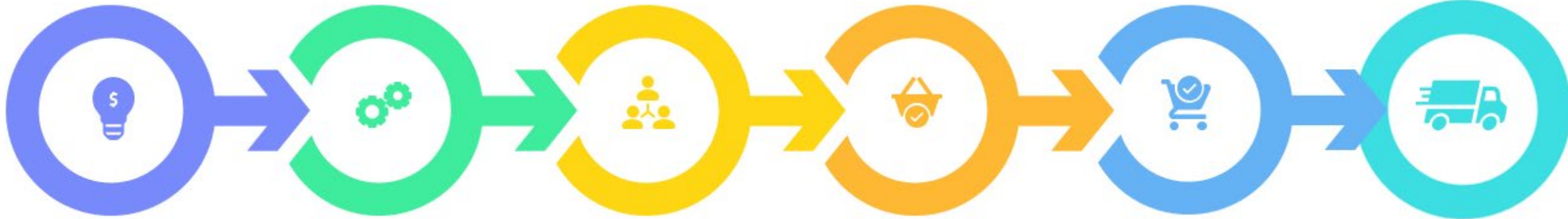
Website self-serve information

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

Large DG

| Pre-application | Application | Conceptual Design | Acceptance | Detailed design | Delivery |

Queue screening, assess criteria and milestones process (poss 2 tier)

Processes to manage order of EDB curtailment (+SO curtail/ despatch)

Common communications equipment standards

Standard EDB forms/ templates (80/20 rule)

ComCom to reduce recovery risk (forecast uncertainty), weight recovery costs later

Template approach to manage risks where control of development changes e.g. developer sells

Shared costs/ information/ cluster studies where multiple connections at GIP/GXP

Change distribution pricing (EA)

Common commissioning and equipment standards incl with transpower & benchmark to international standards.

Reg changes e.g. REZ support or first mover rebate standards

More standardised, common or transparent connection cost approaches

Road access if EDB not own access (NZUAG approved utility)

Flexible fee structures for EDBs to provide service (e.g fund resourcing up)
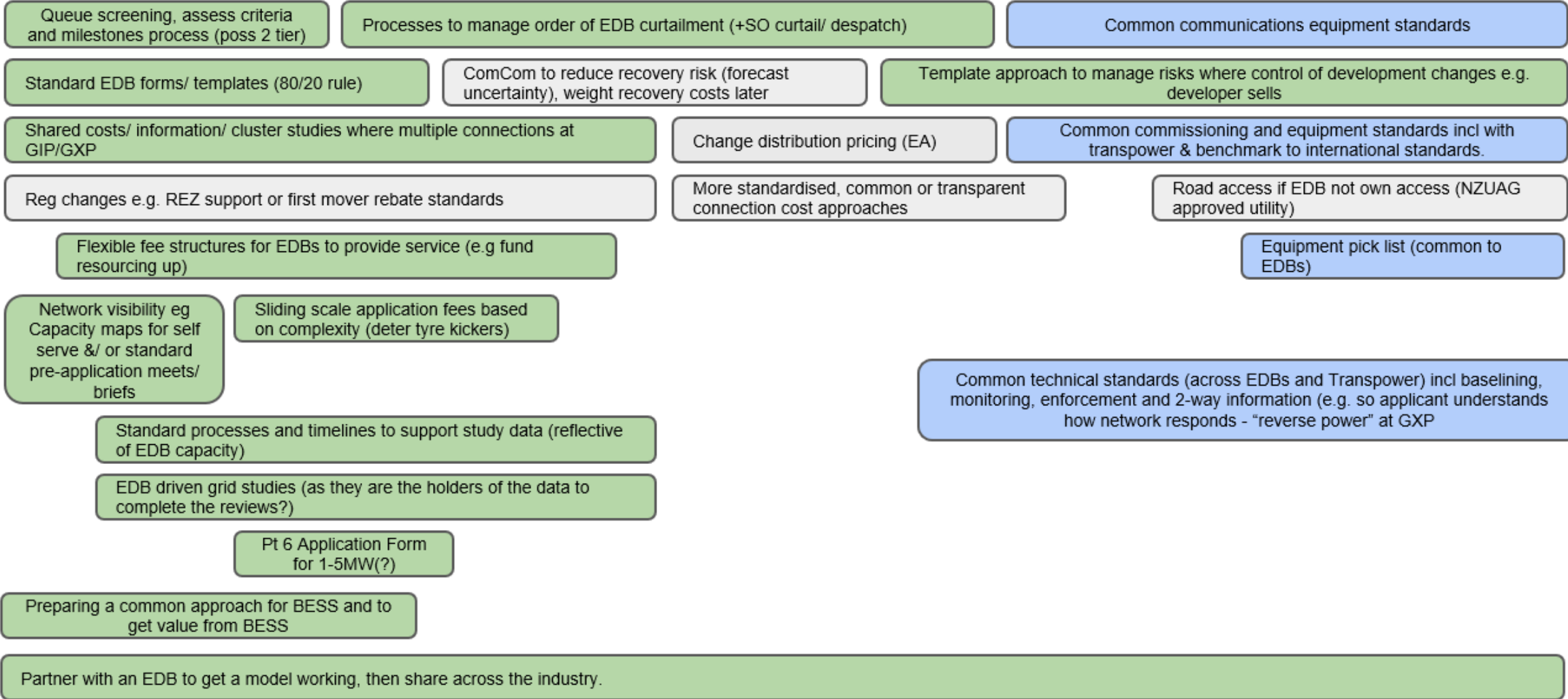
Equipment pick list (common to EDBs)

Network visibility eg Capacity maps for self serve &/ or standard pre-application meets/ briefs

Sliding scale application fees based on complexity (deter tyre kickers)

Common technical standards (across EDBs and Transpower) incl baselining, monitoring, enforcement and 2-way information (e.g. so applicant understands how network responds - "reverse power" at GXP

Standard processes and timelines to support study data (reflective of EDB capacity)

EDB driven grid studies (as they are the holders of the data to complete the reviews?)

Pt 6 Application Form for 1-5MW(?)

Preparing a common approach for BESS and to get value from BESS

Partner with an EDB to get a model working, then share across the industry.
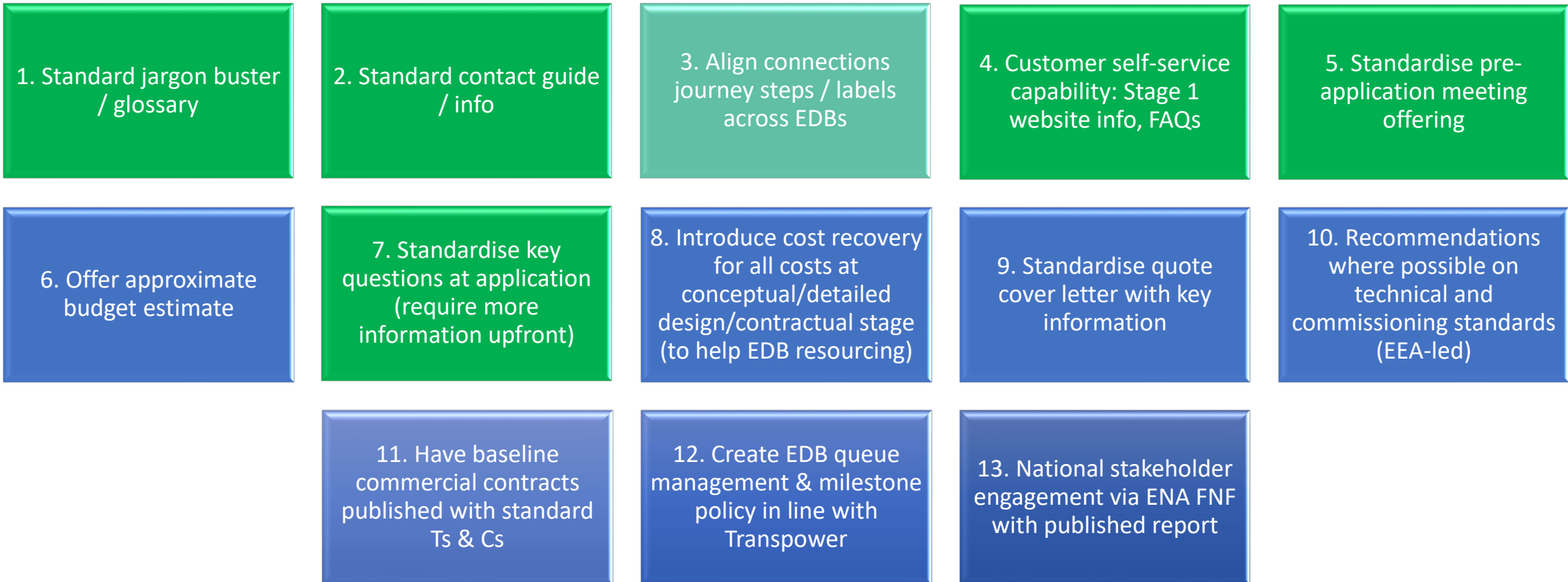
FNF

EA

EEA

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

Connections Journey Deliverables

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?

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

THANK YOU!!!