Appendix A: Enhancement and Development Planning Process

The System Planning function ensures that we have a system view of the problems and opportunities across the grid. This system view is important for all grid problems and opportunities, including across asset portfolios, but is particularly relevant to those that enhance or reduce the capability of the grid.

The Enhancement and Development Planning (E&D) process is the primary mechanism for addressing these problems and opportunities.

This Appendix describes at a high level how the E&D process operates, utilising existing Transpower processes, including our Decision Framework.

A.1 E&D process overview

The E&D process consists of four inter-related processes:

- Annual Transmission Planning
- Customer Technical Requests (CTR) including High Level Responses (HLRs)
- Asset Feedback
- Asset Planning Decision Framework (Decision Framework)

The first three processes provide information on the capability of the grid to provide the system capacity, reliability and security required to meet future customer and grid needs. Where the capability of the grid is insufficient, or changes in load or generation require a reassessment of system requirements, a problem or opportunity is passed to the Decision Framework for further investigation. This becomes an E&D System Need (System Need).

The Decision Framework provides a mechanism for grouping System and Asset Needs to prioritise and collectively consider them. System Needs are considered alongside the Needs identified in all other asset portfolios.

The Decision Framework incorporates the Options Assessment Approach (OAA), which specifies how Needs are investigated, the level of analysis being commensurate with the complexity of the issue, likely level of expenditure and timing of the Need. The outcome of the delivery-level OAA is selection of a preferred solution.

The Grid Enhancement Approach (GEA) as detailed in this TPR comprises both current System Planning knowledge relating to System Needs and the progress of System Needs through the Decision Framework. The GEA discusses investment drivers, investment uncertainties, collective Needs, options for resolution and indicative investment costs. The accuracy of information in the GEA is commensurate with level of certainty of investment, timing of the System Need and level of OAA investigation completed.

Figure A-1 presents a high-level overview of the inter-related processes and information flows that comprise the E&D process.
A.2 E&D process inputs: grid and asset capability

The inputs to the E&D process come from three processes that inform us about the existing capability of the grid both now and in the future (the three boxes on the left hand side of Figure A-1). Each process is described in more detail in the section below, with a specific focus on problems and opportunities within the E&D portfolio.

A.2.1 Annual Transmission Planning Process

The Annual Transmission Planning Process assesses the existing grid for potential capacity and service level problems and opportunities over a 15 year planning period, in accordance with the Grid Reliability Standards\(^1\) and our Transmission System Planning Criteria.

This process uses load forecasts, generation forecasts and the current power system configuration (modelled in DigSilent Powerfactory) to identify the problems and opportunities relating to grid capability over the forecast period. Other environmental information that can impact the need for changes in grid capability is considered, such as customer development plans and step increases or decreases in load or generation connections.

There are several outputs from the Annual Transmission Planning Process:

\(^1\) https://www.ea.govt.nz/code-and-compliance/the-code/part-12-transport/
Appendix A: Enhancement and Development Planning Process

- Regulatory reporting through the Grid Reliability Report (GRR), Grid Economic Investment Report (GEIR) and publication of 10 year forecast fault levels.
- The publication of current and forecast grid capability through the TPR.
- Identification of problems and opportunities that may result in Major Capital Projects (MCPs). This information is shared with the Commerce Commission.
- Where problems or opportunities impact connection assets that are paid for by customers, we share the information with those customers.
- Information relating to the problem or opportunity is passed to the Decision Framework. The System Need is confirmed, collected with other relevant System and Asset Needs and prioritised for investigation. The Asset Management Planning System (AMPS) will record and track the progress of all System Needs through the Decision Framework.

The Annual Transmission Planning Process is repeated on an annual basis with updated inputs and provides the main input to the Decision Framework for E&D System Needs.

A.2.2 Customer Investment Process

Customer initiated investments are identified through three broad areas:

- Customer’s requesting connection or changes to existing connections (changes to their connection assets, grid configuration, protection settings or metering). Customers raise problems and opportunities with us through Customer Technical Requests (CTRs). These projects progress to the Decision Framework when there is a high level of certainty they will proceed.
- The Annual Transmission Planning Process may identify problems or opportunities associated with connection assets. If the customer elects to invest it initiates this process using a CTR. If the customer chooses not to progress an investment we must ensure the customer understands the risks associated with this course of action.
- When System Needs involving interconnection assets are being investigated through the OAA, options for resolving the problem or opportunity may include customer funded, or partially customer funded investment options. If a preferred solution is a customer funded investment, and the customer agrees to invest, a contract is signed by the customer and the investment is prioritised for delivery in the Decision Framework.

Information on customer initiated investments is passed to the Decision Framework through the CTR process, and to the Annual Transmission Planning Process as inputs to assessments of grid capability.

A.2.3 Asset Feedback Process

The E&D Planning Process utilises our Asset Feedback Process to capture and record information from around the business relating to the performance and operation of the system and existing grid assets. This information is appropriately tagged to identify its source and who should act on it.

The Asset Feedback Process provides a central location for information to be recorded, stored and shared, ensuring visibility of the issues raised across the business. The issues entered are reviewed regularly, with those requiring further investigation being passed to the Decision Framework for consideration. The initiator of the entry in the Asset Feedback register is informed of the action taken.
A.3 E&D process: Decision Framework

The Decision Framework allows us to make effective, consistent, repeatable asset planning decisions that balance risk, service levels and investment. It is used to justify and prioritise all grid expenditure within our Asset Management Plan (AMP) including both capex and opex expenditure across the following:

- Asset replacements and refurbishments
- Grid enhancement and development
- Customer projects
- Maintenance activities
- Investigations required to deliver the Asset Management Plan.

The Decision Framework has four decision steps:

- Identify and prioritise Needs
- OAA for each Need
- Prioritise Solutions
- Develop Asset Management Plan.

E&D problems and opportunities are inputs to the Decision Framework, transitioning to a System Need once the Need is confirmed.

Assessing E&D System Needs through the Decision Framework allows for related Needs to be grouped together. This ensures that expenditure on asset replacement, refurbishment and maintenance costs are appropriately considered alongside grid capability requirements and expenditure. It also allows System Needs to be considered together where resolution of one issue may impact decisions made for another.

A.3.1 Options Assessment Approach

The Decision Framework incorporates the Options Assessment Approach (OAA) which specifies how problems and opportunities are investigated, the level of analysis being commensurate with the complexity of the issue, level of expenditure and timing of the Need. The outcome of the OAA is selection of a preferred solution.

The OAA has four sequential stages as shown in Figure A-2:

- Verify Need and Determine Assessment Level
- Identify Options
- Assess Options
- Identify Solution.
Appendix A: Enhancement and Development Planning Process

Figure A-2: Steps in Options Assessment Approach

OAA involves undertaking analysis commensurate with the certainty of the System Need and the complexity of the issue. As a result, E&D System Needs may progress through the OAA process more than once, with higher level investigations informing the timing and prioritisation of future delivery level investigations, as well as increasing our knowledge of the System Need, its associated risk, and credible options and costs to resolve. Higher level OAA planning assessments also inform our capex forecasting and regulatory reset proposals.

If the outcome of a high level OAA planning assessment is to undertake a delivery level OAA at a future point in time, this information will be recorded in the Asset Management Planning System and work picked up again at the appropriate point in time.

Detailed delivery level OAA investigations result in a preferred solution being identified. All preferred solutions are prioritised according to the principles of the Decision Framework. The preferred solution will also be used to inform our capex forecasting and regulatory processes. It will also become an input to the assessment of future grid capability in the Annual Transmission Planning Process.

A.3.2 Grid Enhancement Approach

The Grid Enhancement Approach (GEA) is presented in this TPR to illustrate the progress of System Needs through the Decision Framework at a point in time. The GEA also discusses how investment drivers, uncertainties and interactions between System Needs impact our decision making and options analysis.

The GEA provides insight into decision making on E&D System Needs and proposals to address them. The accuracy of information in the GEA around options, costs and timing is commensurate with the OAA assessment level that has been completed. More detailed information with a higher degree of analysis will be available for System Needs that are more certain, or occur in the immediate and short term.

The cost and timing information for investment proposals in the GEA inform the bottom up forecasting of expenditure in the E&D portfolio. The discussion presented in the GEA regarding investment uncertainty provides context to a top down review of the forecast E&D expenditure. The portfolio information is presented in Chapter 4 of this TPR and is summarised in our Integrated Transmission Plan (ITP).
Appendix A: Enhancement and Development Planning Process

A.4 A3 Process diagram

The processes & tools that enable us to plan, prioritise & deliver the E&D Portfolio (detailed view)

[Diagram showing the A3 Process diagram]