

Sustainable Asset Investment Planning

Endeavour Energy



Speaker

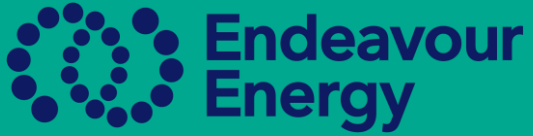


**Keryn
Foreman**

Head of Enterprise
Portfolio Management
Office

Endeavour Energy





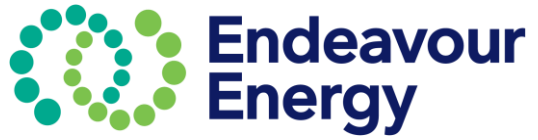
Sustainable Asset Investment Planning

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Agenda

- Who we are
- Our journey so far
- Unlocking further Value



Who we are

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Endeavour Energy

Electricity Distributor

206 major substations

20,000+ new customers per year

430,000+ power poles

225,000 customers with renewable energy

2.7m people

1m+ customers

>25,000 km²

60,000+ km of powerlines

225,000 streetlights

32,000 life support customers

85% of our area is bushfire prone

The numbers - Greater Western Sydney (GWS)



8%

contribution to Australia's GRP in 2016



\$138b

The fourth largest economic region in Australia



\$41b

currently committed to infrastructure projects



45%

of Sydney residents call GWS home



37%

of all new jobs in Sydney will be created in GWS



50%

of Sydney's population will reside in the GWS by 2036



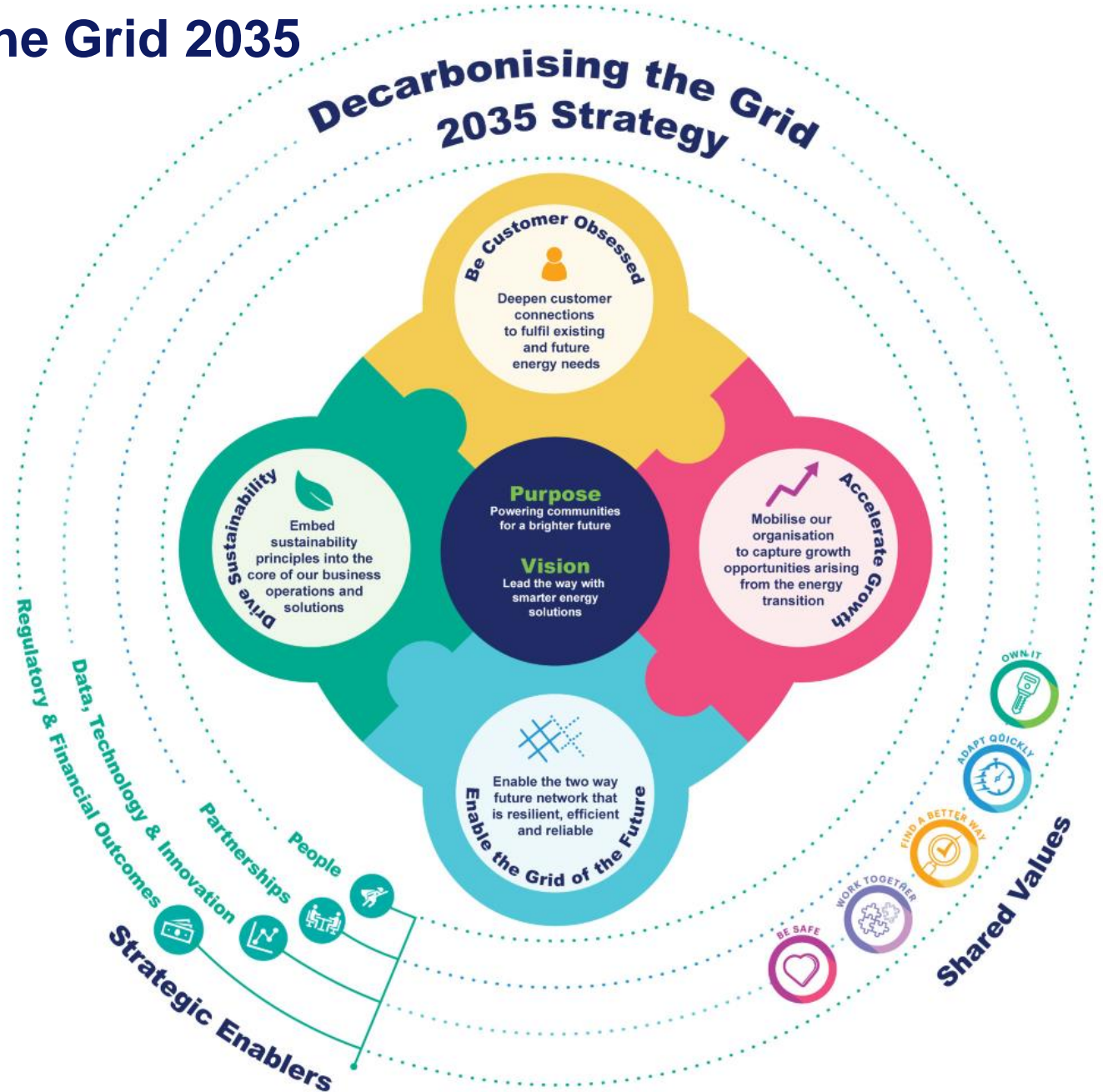
Our Strategy – Decarbonising the Grid 2035

In 2023 Endeavour launched our new strategy to deliver on our purpose of

Powering communities for a brighter future

while achieving our vision to

Lead the way with smarter energy solutions



Endeavour Energy's Enterprise Portfolio Management Office

Our Purpose

To drive realisation of EE's DTG 2035 strategy through value-driven enterprise-wide portfolio optimisation, project management excellence and delivery leadership.

Our Vision

International leader in enterprise value-driven investment planning and delivery, unlocking growth and customer participation throughout the energy transition.



Our Strategic Objectives

**Uplift
Productivity**



**Transform
strategic partnership**



**Unlock project
lifecycle efficiency**



**Create and
deliver value**

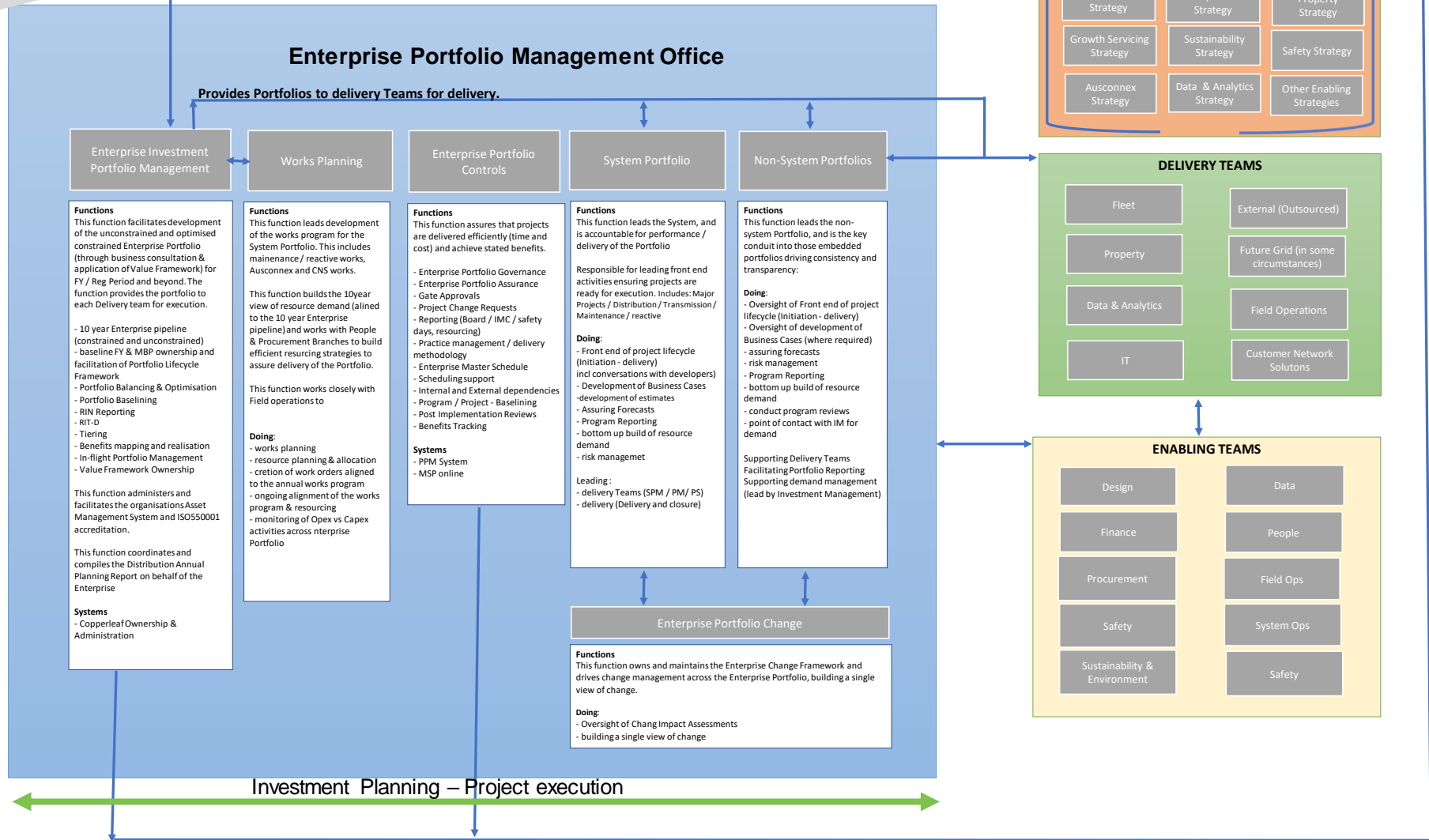


EPMO Functional Model

Demand driven by Strategies & Plans Built IN the Business BY the Business under guidance of Strategy
 Proposed Investments entered into Copperleaf and base CFI's established by Investment Proponent

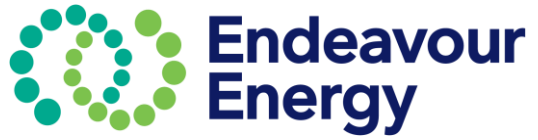
Investments entered into Copperleaf by the business

Investments driven by strategy



This is not an organisational Structure

Investments Delivered and benefits realised fed back to Business to inform annual Business Planning Cycle



Our journey so far

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The National Electricity Rules and the Australian Energy Regulator

NER clause 5.17:

...identify the credible option that maximises the present value of the net economic benefit to all those who produce, consume and transport electricity in the National Electricity Market (the preferred option).

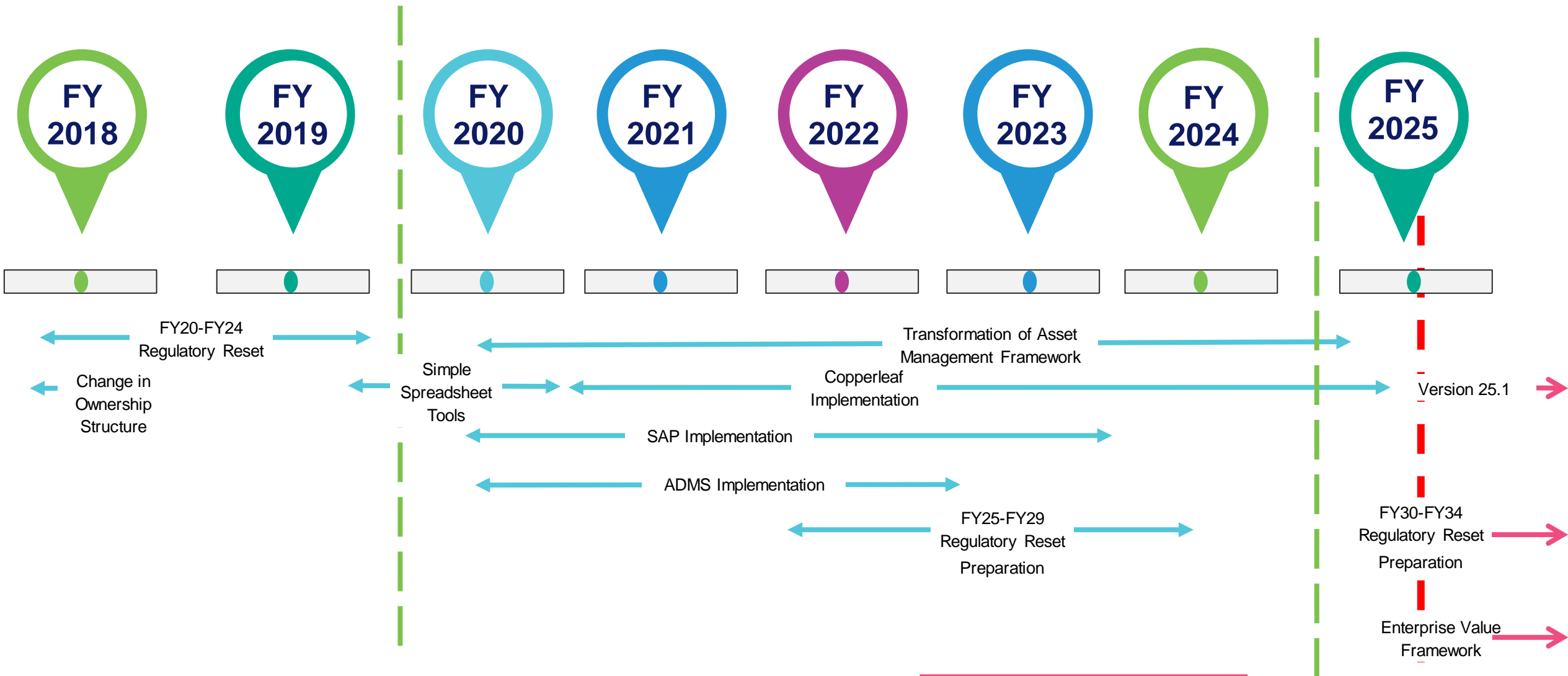
AER/EMCa review (2018):

Endeavour's portfolio-level risk assessment does not reflect Endeavour's stated risk framework and does not provide risk metrics (including linkages to a defined risk appetite) that would allow assessment of the appropriate level or mix of expenditure;

We consider that the weaknesses we have observed with Endeavour's expenditure governance and management process and its forecasting methodologies render it unlikely that its RP (Revised Proposal - ed) is a reasonable forecast of its prudent and efficient requirements.



Our Copperleaf implementation project



What we have implemented

- Copperleaf Portfolio - Investment Decision Support Tool (IDST)
- Portfolio implemented with a fundamental set of value measures as first phase
- Copperleaf Asset available for inclusion within investments
- Implemented Capture with different instances for each portfolio group (ICT / Network)
- Created workflows for techno-economic and financial approval of investments
- Expanded value framework to broaden and deepen value measures
- Next phase looking to implement Resources and Unit Cost models

Copperleaf Value
Development and continual refinement of a Customer Value Framework that aligns with Endeavour Energy's Strategic Objectives

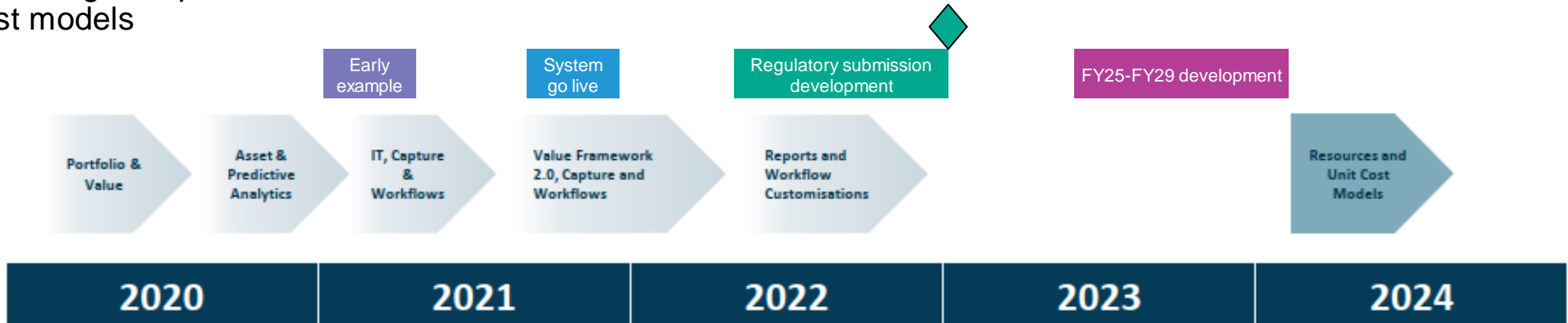
Phase 1: Investment Decision Optimisation and Asset Aware
Ability to optimise a selection of investments (alternatives) to create an optimised portfolio that results in the highest value for Endeavour Energy whilst respecting constraints

Phase 2: Predictive Analytics
Ability to develop the optimal replacement and maintenance programs based on the recommended intervention dates of each existing asset.

Phase 3: Capture, Workflows, Customer Value Framework Review
Ability for investment owners in the organisation to develop and seek approval of Case For Investments (CFIs)

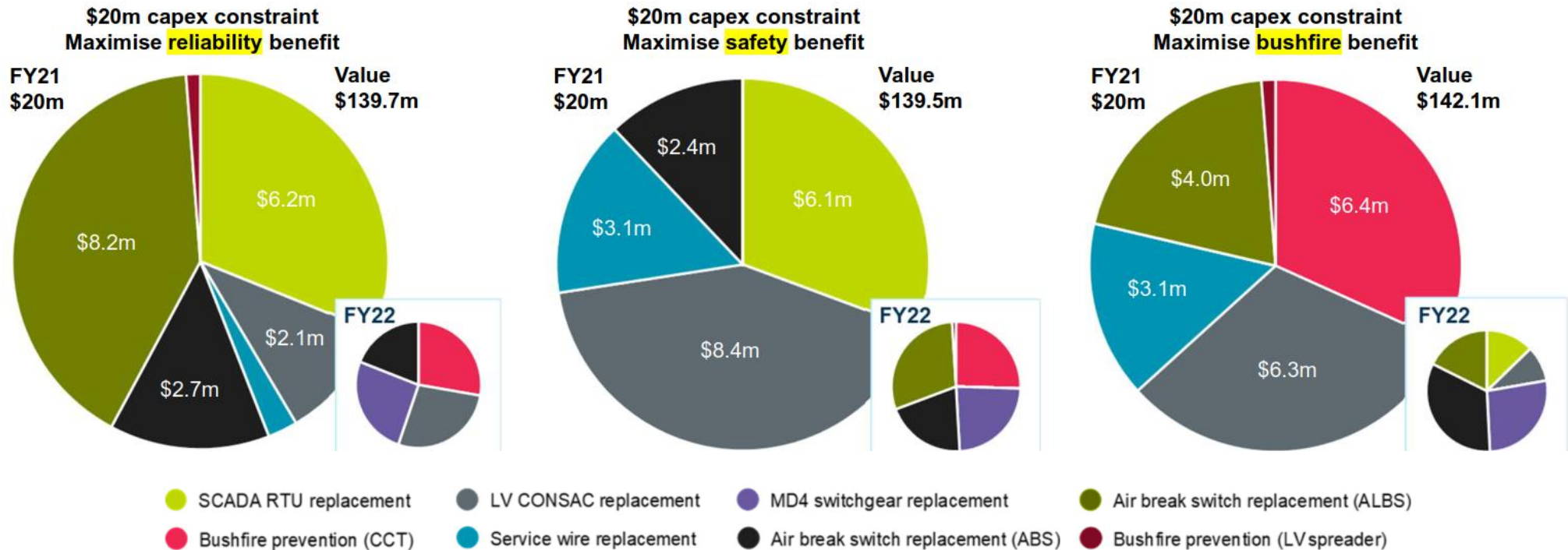
Phase 4: Unit Cost & Resources Models
Ability to use unit costs and types for materials, labour and contractors to further standardise estimation in the planning phase.

Optimisation of the portfolio will also take into consideration resource types.



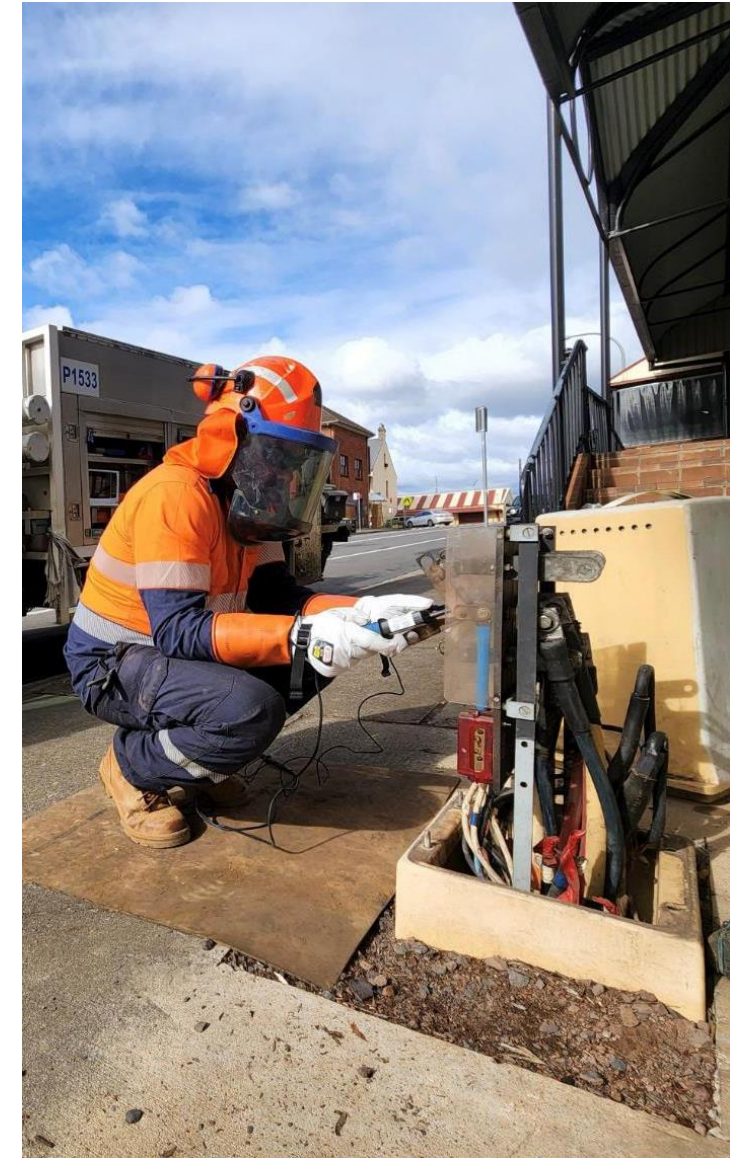
What we have implemented – Early example

- Started journey in FY20, continually maturing
- Portfolio, Assets, Value, Capture/Workflows
- Value Framework – Quantification of cost, risk and benefits into \$
- Initial optimisation proof of concept - selection of \$20m from \$40m
- Demonstration that optimisation could be used to achieve different objectives



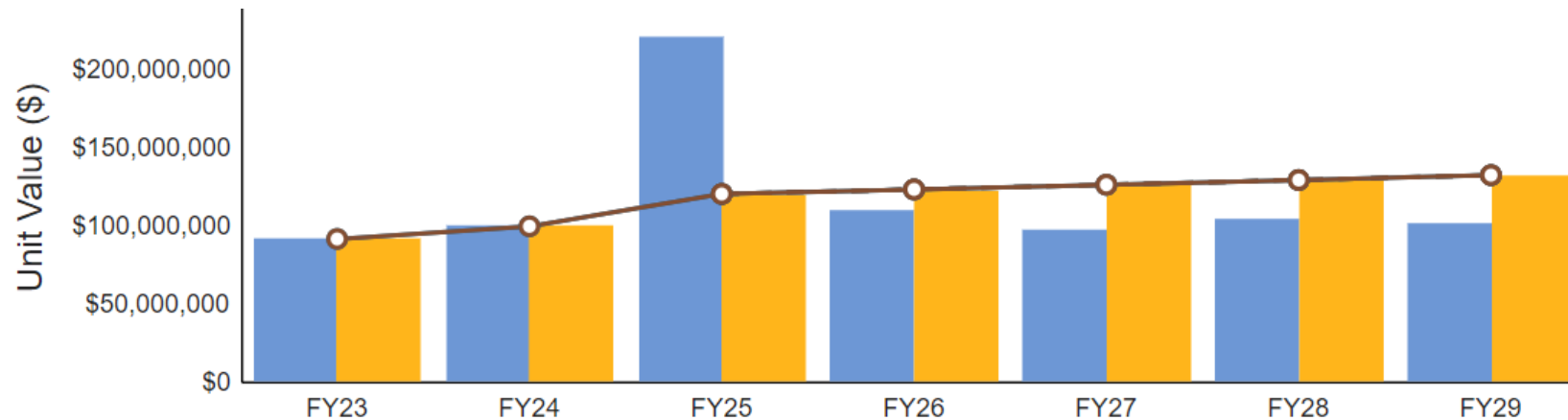
Value Framework Evolution

- Started simple, aligned with regulatory guidance.
- Evolved with organisation understanding and acceptance of the concept.
- Reflected / aligned with corporate goals, objectives and risk framework.
- Sessions with ELT and Board.
- Update to corporate risk appetite statement and risk matrix
- Aimed to quantify all benefits in \$. We have not weighted benefits.
- Organisation wide workshops to establish Value Framework 2.0.
- As the framework expanded, we looked to include all possible benefits within framework – even if benefit likely to be immaterial compared to others within the framework.
- The true benefit came from the discussion, not the mathematics.
- Distinguishing between shareholder value and customer value was, and continues to be, a challenge.
- We have stated to use the term “customer value framework”, which works well and helps improve understanding.
- Ownership of the framework can be challenging, as it applies to all parts of the organisation, however predominately driven by system investment team.
- Concept of establishing a value council is good.....however ours was not successful



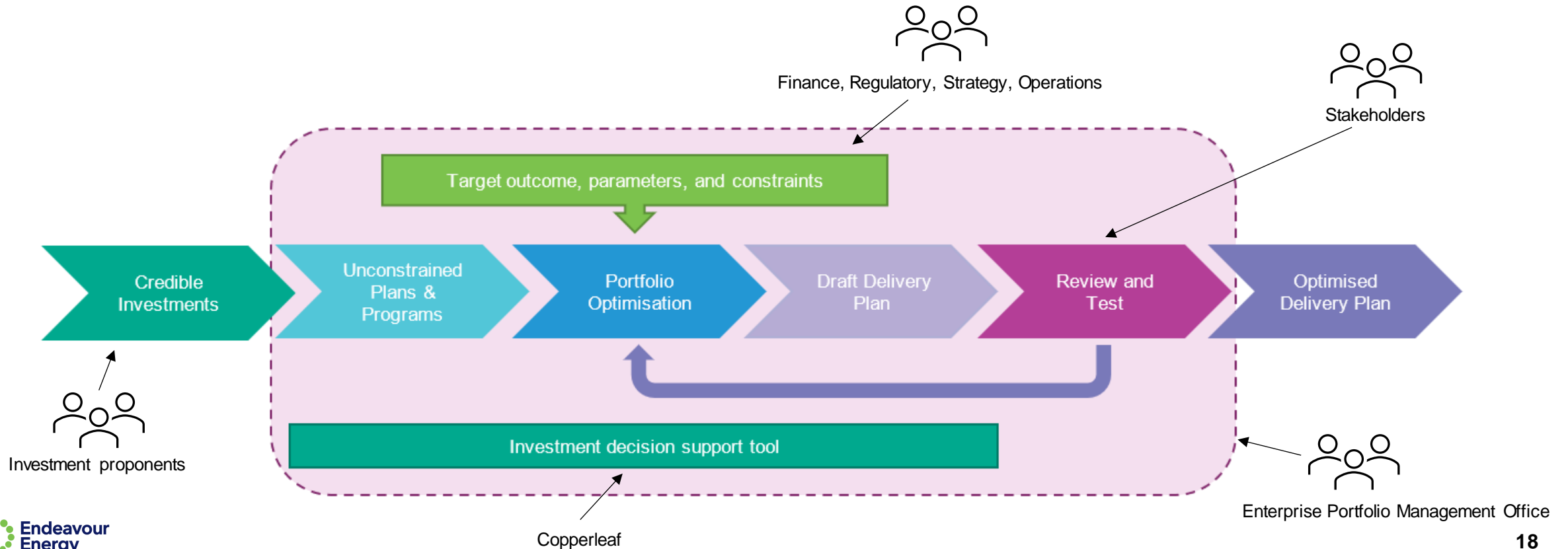
How we have used Portfolio

- Initial optimisation on small subset of investments for proof of concept
- All capital system and non-system investments entered into the tool (~40,000 investments)
- Investments must be entered into the IDST prior to creation of project in SAP
- Investments created using individual Assets for future planning
- Functionality added to include Asset intervention cost as forecast in optimisation
- Optimisation for FY25-FY29 regulatory submission
- Utilised constraints on regulatory categories
- Updates to investment summary report and automated record capture in Content Server
- Integration of RDS output into reporting using tools such as Power BI



How we have used optimisation

- Use of optimisation to support our FY25-29 regulatory proposal
- Changed from top down asset category placeholders to bottom up asset specific investments
- Approx. 3 million assets in Copperleaf, created 40,000 individual asset investments
- Optimisation of portfolio within top down capital constraints



What has gone well

- Starting a conversation early regarding value, starting with a simple value framework and committing to continually evolve the value framework
- Our general approach, including taking a staged and reasonably agile approach
- Using the tool early for proof of concept mini-portfolios to demonstrate capability
- Linking major milestones with regulatory determination, and locking in use of the tool to support our submission
- Using the tool as a trojan horse for considerable changes to investment decision making
- Linking outputs to dashboards, RIN regulatory reporting, etc



“Endeavour has provided a high-quality proposal...”

“We have accepted much of Endeavour’s proposal, including its total capex and opex forecasts.”

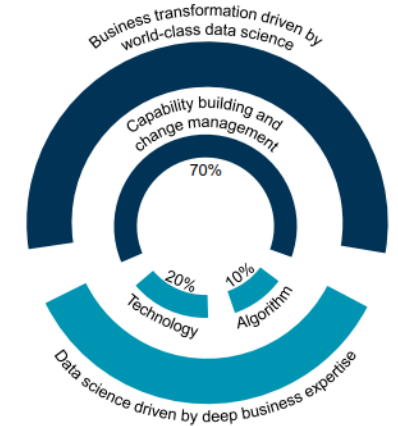
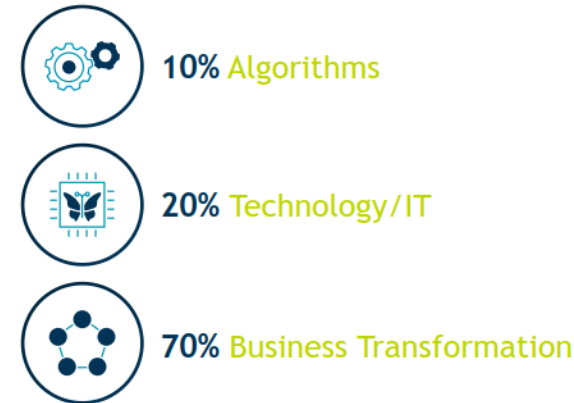
“...we could be confident that the majority of its expenditure forecast was likely to be prudent and efficient.”

AER - Draft Decision Endeavour Energy Electricity Distribution Determination 2024 to 2029

What could have been done better

- Tighter project management of stage delivery. Some implementation delays (multiple reasons), with corresponding loss of momentum
- Some rework – assets in particular, but also some elements of workflow
- More buy-in across the organisation and continued engagement. Copperleaf seen by many as a burden, only for hard core asset managers, not appropriate for all investments etc
- Overall better change management including earlier adoption of the tool, rationale for its use, benefits etc.

Change management is crucial to the project's overall success and should be given twice as much attention as algorithms and tech



Challenges

Value Framework

- Different value lenses - Shareholder vs regulatory/customer view
- Changing strategy – re-alignment of the Value Framework
- Strategic investments – can be difficult to quantify, unlocking future benefit – continual review of Value Framework

System data / use of system

- Getting all investments in system with value
- Inflight investments – what can be re-optimised
- Data quality for optimisation

Optimisation



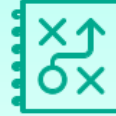




- Optimisation horizon – 2 year Delivery Plan, 7-10 year Planning view
- Optimising on resources as well as dollars – factors not modelled – can't just push a button
- Optimisation between investment categories – e.g. Growth vs Replacement vs IT
- Relationships and dependencies between investments – e.g. Land and Substation build
- When and how we re-optimize – changes to the Delivery Plan

Enterprise Support

- Changing Executive – need for continued engagement

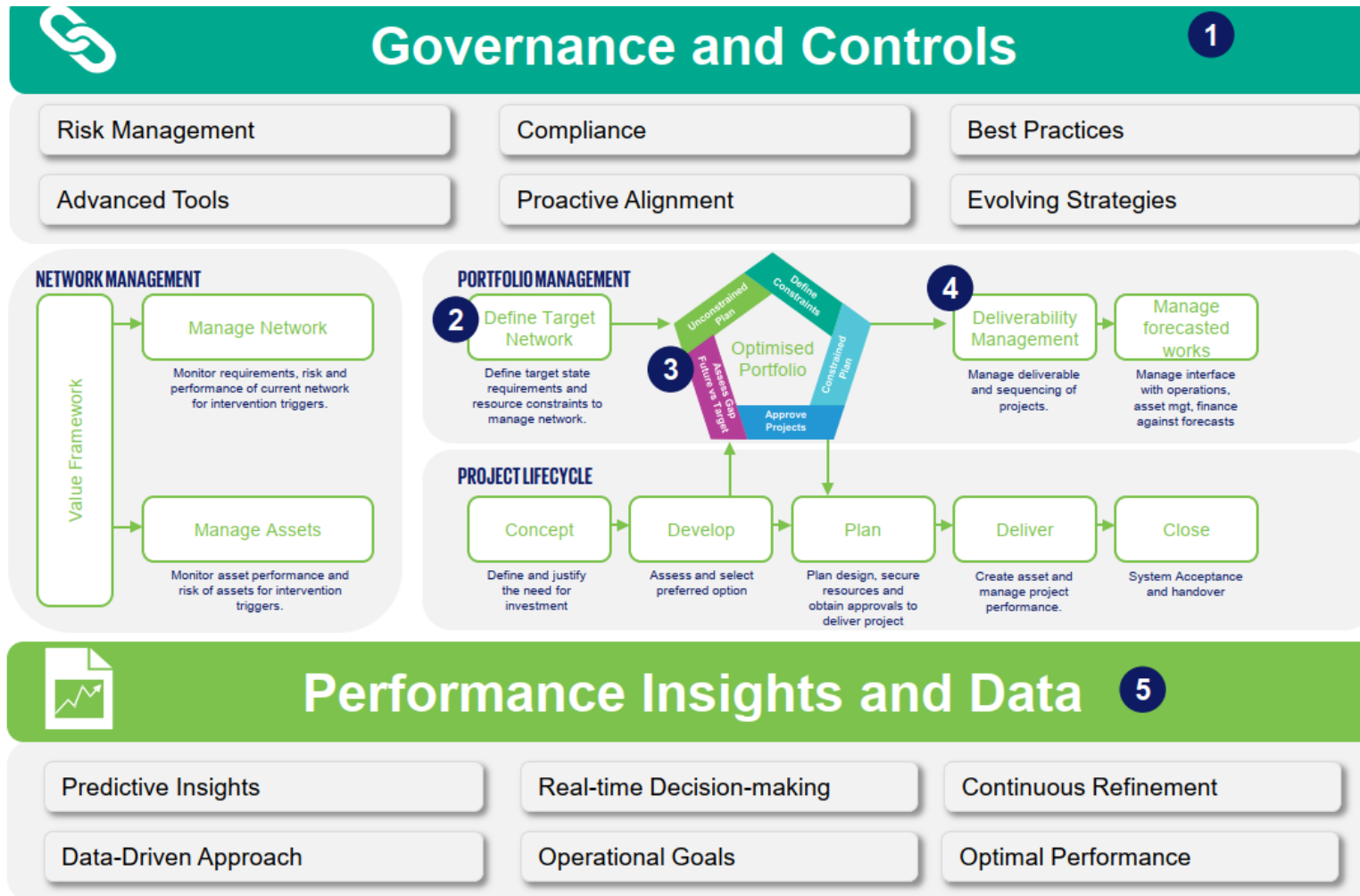
Unlocking further Value...

Our plan is to unlock further value across the Enterprise...

| | Transparency in decision-making | Standardisation and Consistency | Strategic Alignment | Effective Risk Assessment | Valuation of Intangible Benefits | Enhanced Data Quality and Integration | Cross Functional Collaboration |
|-----------------|--|---|---|--|---|--|--|
| Portfolio Needs |  <ul style="list-style-type: none"> • Better visibility and shared understanding around implications of decisions. • Justified investment decisions based on clear value metrics. |  <ul style="list-style-type: none"> • Standardised value models and guidelines for project valuation. • Consistency in applying the Value Framework across all portfolios. • Clear and structured processes for project evaluation and prioritisation. |  <ul style="list-style-type: none"> • Better alignment of projects with corporate strategy and long-term goals. • Integration of strategic targets and key performance indicators into the Value Framework. • Clarity in how each project contributes to broader objectives like sustainability, customer satisfaction, and financial performance. |  <ul style="list-style-type: none"> • Nuanced understanding and application of risk appetite and residual risk. • Comprehensive consideration of risks and their impacts on investment decisions. • Clear guidelines and metrics for evaluating risk-related projects. |  <ul style="list-style-type: none"> • Effective quantification and justification of intangible benefits (e.g., customer experience, technological advancements). • Holistic consideration of the broader impacts, including environmental, community, sustainability, resilience and innovation. |  <ul style="list-style-type: none"> • Improved data quality and consistency in project records and evaluations. • Seamless integration of various data sources and systems for comprehensive analysis. • Clear and accurate reporting of project data and performance metrics. |  <ul style="list-style-type: none"> • Increased awareness and understanding of the Value Framework across all teams and portfolios. • Better communication and collaboration between different functional groups. • Clear ownership and roles in project evaluation and decision-making processes. |
| Outcomes | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Clear understanding and communication of the rationale behind investment decisions. • Improved trust in the decision-making process and stakeholder confidence. • Improved accountability. | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Consistent and reliable decision-making across portfolios. • Equal and fair consideration of all projects, mitigating biases and ensuring uniformity. • Streamlined and efficient project evaluation, reducing confusion and complexity. | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Projects that support and drive organisational strategy forward. • Improved strategic focus and resource allocation towards high-impact projects. • Enhanced ability to demonstrate the strategic value of investments to stakeholders. | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Informed risk-based decision-making. • Optimised balance of risk and reward, ensuring projects are aligned with risk appetite. • Reduced uncertainties and improved confidence in project outcomes. | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Demonstrated value of intangible and non-monetary benefits. • Balanced investment decisions that account for both tangible and intangible impacts. • Projects that contribute to long-term sustainability and resilience goals. | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Reliable and accurate data supporting investment decisions. • Improved data-driven insights and analyses for better prioritisation and resource allocation. • Enhanced tracking and validation of project performance and value realisation. | <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> • Improved cross-team collaboration and knowledge sharing. • Aligned and coordinated efforts towards common goals and strategic objectives. • Enhanced efficiency and effectiveness in project execution and stakeholder engagement. |

And address emerging portfolio management challenges that impact

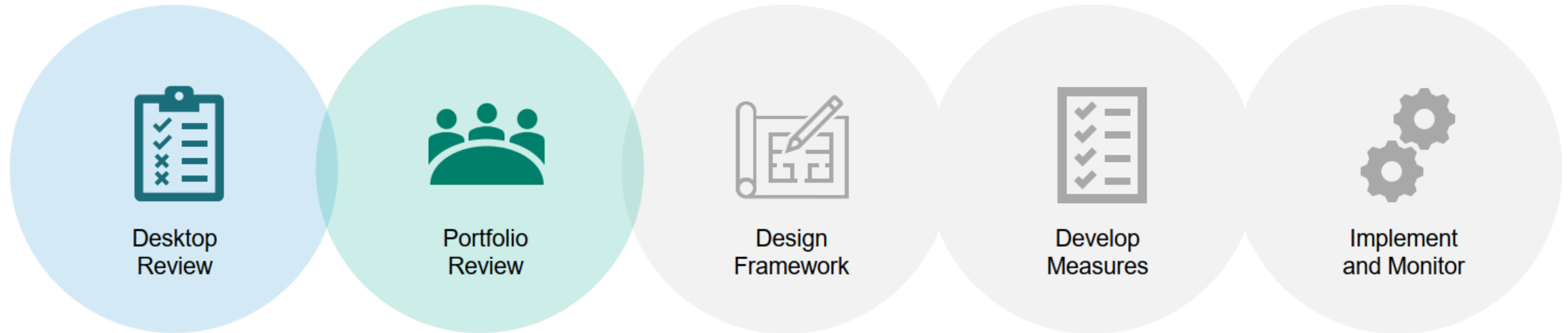
Several portfolio management challenges that extend beyond the Value Framework are emerging. These challenges directly impact how value is assessed, managed and delivered.



Key Challenges

- 1 A lack of trust in the analysis drives subjective decision-making (captain's calls)** in the prioritisation process. Executives rely on personal judgement, leading to biased, inconsistent investment decisions that may not align with strategic goals or consider broader implications.
- 2 While targets are well-defined, challenges arise in translating them into measurable value metrics** to demonstrate how investment options contribute to strategic objectives. This leads to deprioritisation of projects that align with strategic goals but have lower economic value, leading to missed opportunities for innovation and long-term strategic growth.
- 3 Inconsistent methods for evaluating different portfolio scenarios** along with underutilisation of Copperleaf for dynamic prioritisation, result in fragmented decision-making, misaligned investments, and suboptimal resource allocation, limiting Endeavour's ability to optimise portfolio value.
- 4 The lack of visibility into shared resource needs** across the unregulated and regulated sides of the business coupled with limited maturity in resource utilisation processes results in suboptimal resource allocation, prioritisation challenges, increased costs and delayed project execution.
- 5 The absence of robust benefit management process and formal feedback loops**, leads to inconsistent and inaccurate performance measurement which undermines future investment decisions.

Our Approach has started with internal review and stakeholder conversations which have produced valuable insights to support our Enterprise Value Framework



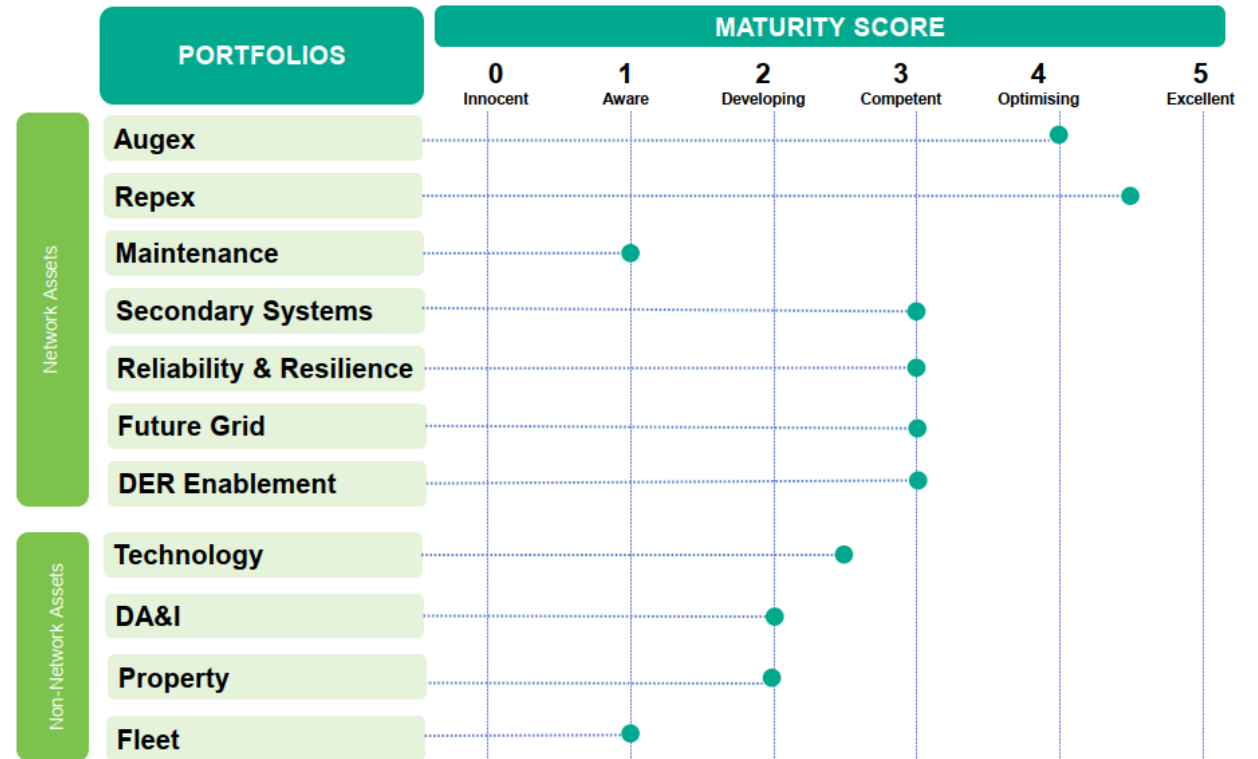
| | Completed Phases | | Next Phases | | |
|------------|---|---|--|---|---|
| Outcomes | Initial review and high-level capture of current usage of the Value Framework | Listen to stakeholders and understand how the Value Framework will support their needs | Agree value principles and develop the infrastructure to support the Value Framework | Target uplift of value so all investment proponents can consistently execute value | Improved portfolio management needs to turn theories and frameworks into action |
| Activities | <ul style="list-style-type: none"> Understand DTG Strategy Review Copperleaf Extracts | <ul style="list-style-type: none"> Review EPMO Objectives Review Value Coverage Understand Deferred Investments Understand Aspirational Investments | <ul style="list-style-type: none"> Use Cases Workshop Expand Value Framework Develop Value Hub Enhance Governance (Optional) | <ul style="list-style-type: none"> Develop Assumptions Develop Value Measures Incorporate Uncertainty Estimates (Optional) Develop Demo Models (Optional) | <ul style="list-style-type: none"> Forecast Performance Develop KPIs for Investment Compliance Scenario Analysis Establish Reporting for Portfolio Benefits |

We have found differences in maturity across Portfolio's

Our Value Framework was developed with an Asset focus which has lead to some portfolios being more mature in adopting the value framework...

Currently each Portfolio is at a different stage of the journey in establishing and adopting standardised quantitative measures for cost risk, performance and aligning these with strategic objectives.

In addition to further developing existing value measures, a more adaptable inclusive Value Framework is required to capture both tangible and intangible benefits, ensuring stronger alignment to the DTG 3025 Strategy and Corporate Objectives

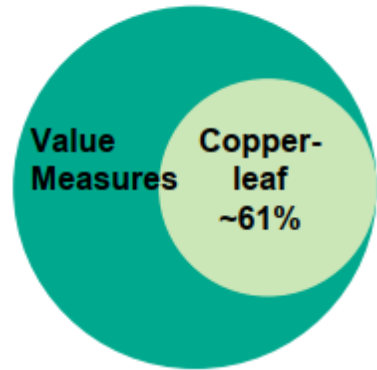


| Maturity | Value Measure Description | Reality |
|-------------------|--|--|
| Innocent | No recognised need for value measures and/or there is no evidence of commitment to put into place. | <i>Nobody knows or cares about it</i> |
| Aware | The need for value measures have been identified and there is evidence of intent to progress it. | <i>It's on a roadmap</i> |
| Developing | Qualitative performance measures are widely used to describe the benefits. | <i>It's good for customer safety</i> |
| Competent | Quantitative value measures are used but they can't easily be aggregated. | <i>It saves 0.3 injuries</i> |
| Optimising | Quantitative value measures have been converted to cost to support Net Present Value calculations and investment timing. | <i>It avoids \$37,000 of safety risk</i> |
| Excellent | Quantitate value measures for cost, risk and performance are in use, aligned to corporate objectives and drive portfolio management. | <i>We can swap \$2m in safety risk for \$1m in community batteries</i> |

We have discovered that Copperleaf is underutilised driven by ineffective application and Enterprise-wide adoption....

Even for Portfolios where both the Value Framework and Copperleaf meets their needs, only 61% of the value measures are being used, reflecting an ineffective use of Copperleaf.

The limited adoption is largely due to a lack of sufficient guidance and awareness on how to effectively apply the models in the system.



Of the 64 Value Measures, only 39 of them feature in Copperleaf extracts; leaving 25 of them unused.

88% of projects account for only 5% of the value measures; and 2% accounts for the remaining implying value leakage.

| Portfolio | Customer Observed | CSAT | Annual Normalised SAIDI | % reduction of customers' total energy spend | \$ Opex spend reduction | % of customer complaints resolved within 10 days | Stakeholder reputation score | Community reputation score | # of life support breaches | % of customer connection points in acceptable | Improvement on EZE connection times (to be tracked by customer segment) | Annual Normalised SAIFI | Annual Normalised SAIDI | Accelerate Growth | Forecast energy saved | Contracted asset base | Regulated asset base | Load of new C&I / HV customers | \$ assets managed under REZ | % increase in unregulated EBITDA | Enable Grid of the Future | Average solar customer curtailment % (target vs do nothing) | Battery storage capacity deployed | % clean energy in multi-dwelling residential storage | # EV chargers enrolled into community battery | # of EV chargers connected to the network | # of automated switch gear | Drive Sustainability | Emissions reduction (scope 1 and 2) | Total tonnes of carbon avoided | % non-ICE fleet conversion | Landfill waste diversion | % increase of habitat regeneration | | | |
|--------------------------|-------------------|------|-------------------------|--|-------------------------|--|------------------------------|----------------------------|----------------------------|---|---|-------------------------|-------------------------|-------------------|-----------------------|-----------------------|----------------------|--------------------------------|-----------------------------|----------------------------------|---------------------------|---|-----------------------------------|--|---|---|----------------------------|----------------------|-------------------------------------|--------------------------------|----------------------------|--------------------------|------------------------------------|--|--|--|
| Augex | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Repex | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maintenance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Secondary Systems | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reliability & Resilience | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Future Grid | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DER Enablement | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DA&I | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Property | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fleet | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

An assessment of the Value Measures featuring in Copperleaf and its alignment to the DTG strategy objectives has revealed the below insights:

- The objectives highlighted in **dark green** indicate where value is most being captured across portfolios based on the count of aligned Value Measures within Copperleaf.
- Objectives highlighted in **light green** indicate where value is captured to some degree across portfolios based on the count of aligned Value Measures within Copperleaf.
- Objectives left empty in **grey** indicate a lack of evidence of value being captured by the portfolio within Copperleaf due to ineffective application and lack of enterprise-wide adoption.

Our stakeholders support a refreshed Value Framework with some key themes emerging...

Themes

Major gaps identified between DTG Strategy and Value Framework linkage

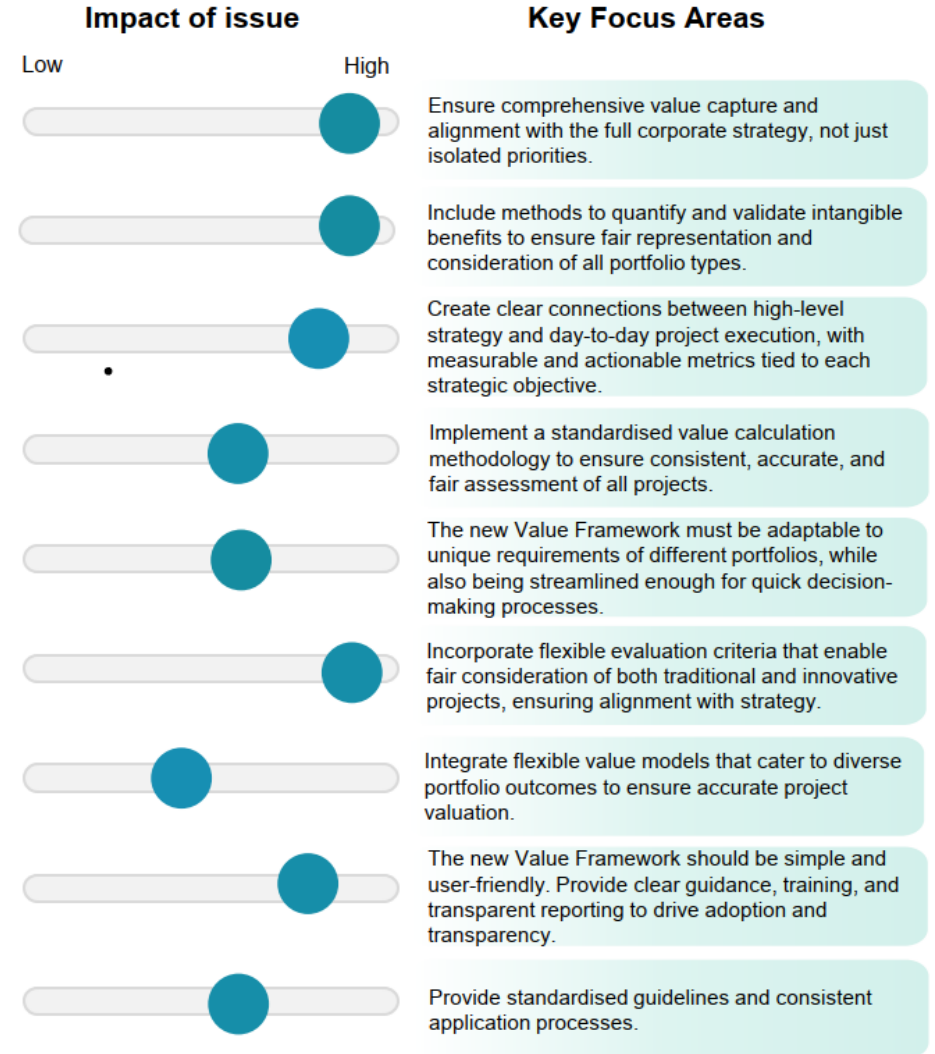
- Breadth of coverage across strategic objectives** Portfolios often focus on capturing value against a few strategic objectives with minimal coverage across the wider corporate strategy. This is especially true for mature portfolios that consistently secure approval for their projects.
- Value of intangible benefits** Portfolios with intangible benefits or "non-harvestable" productivity struggle to capture project value and are often overlooked compared to projects with tangible, easily measurable economic metrics like NPV.
- Disconnect between strategic and tactical levels** The current Value Framework is seen as outdated and ineffective in linking strategic objectives to day-to-day operations, due to unclear guidance on its use and lack of quantifiable metrics for each corporate objective.

Value Framework does not adequately address non-network asset portfolio needs

- Subjectivity in value calculation** A lack of common understanding and standardised methodology across portfolios for calculating project value. This results in misrepresented value, discrepancies, and rework.
- Bespoke prioritisation frameworks** Several portfolios (e.g. Technology, Property) use their own prioritisation criteria and frameworks because the Value Framework does not address their unique requirements or is seen as too onerous for quick or minor decisions.
- Bias towards traditional asset portfolios** The current Value Framework favours traditional portfolios (e.g. Repex, Augex), limiting the ability to fairly evaluate and prioritise innovative and unique projects.

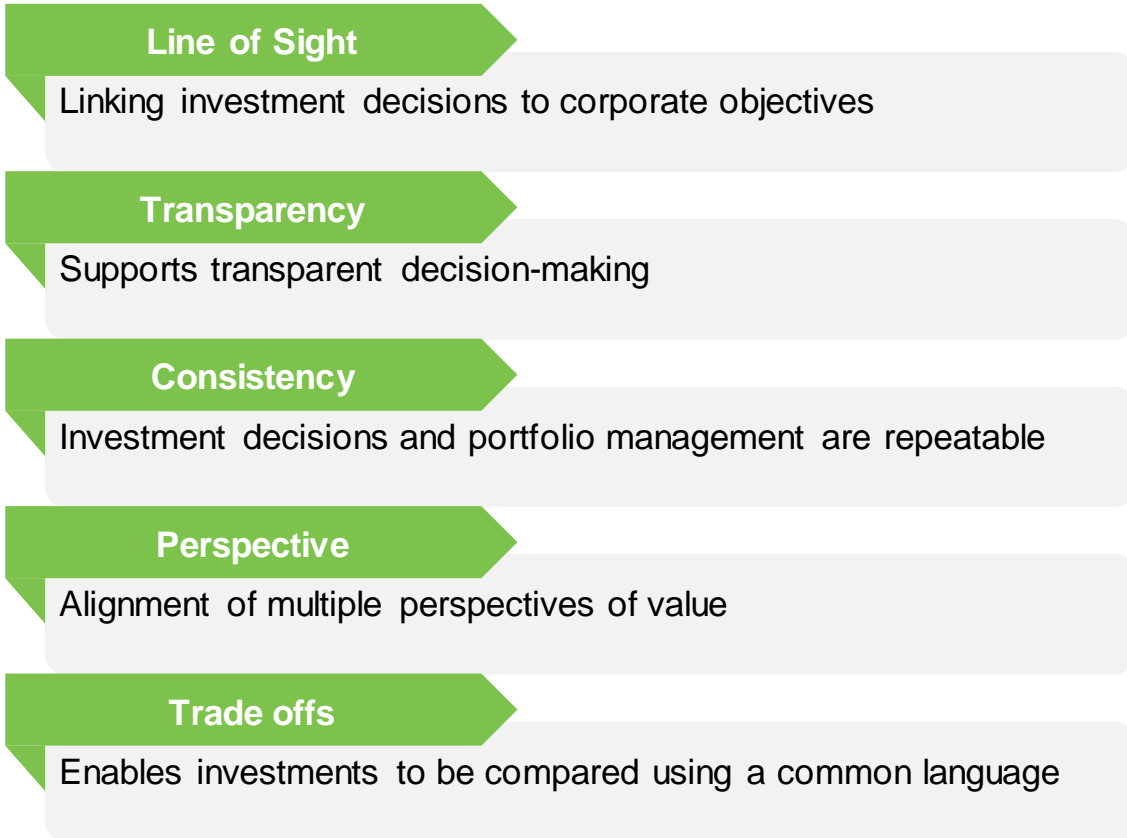
Copperleaf is underutilised due to ineffective application and a lack of enterprise-wide adoption

- Rigid value models** The value models in Copperleaf are not suited for technology outcomes, requiring creative and flexible approaches to align them with the value models designed for asset and infrastructure projects.
- Limited system adoption** The system is cumbersome to use due to its complex interface, stakeholders feel like they have not had sufficient training and they do not have visibility on how their data inputs affect decision-making at the enterprise level.
- Inconsistent approach to system use** The absence of standardised guidance on category selection, application of value models and questionnaire assumptions lead to confusion, subjectivity and inconsistent outputs.



Developing an Enterprise Value Framework - Principles

The Value Framework will enable effective and efficient portfolio management of all investments across Endeavour Energy, and strive to achieve 5 principles.



The 5 principles selected reflect the long term vision for the Value Framework and capture the need to continually evolve the value framework. They were iteratively developed and refined over several workshops with key stakeholders.

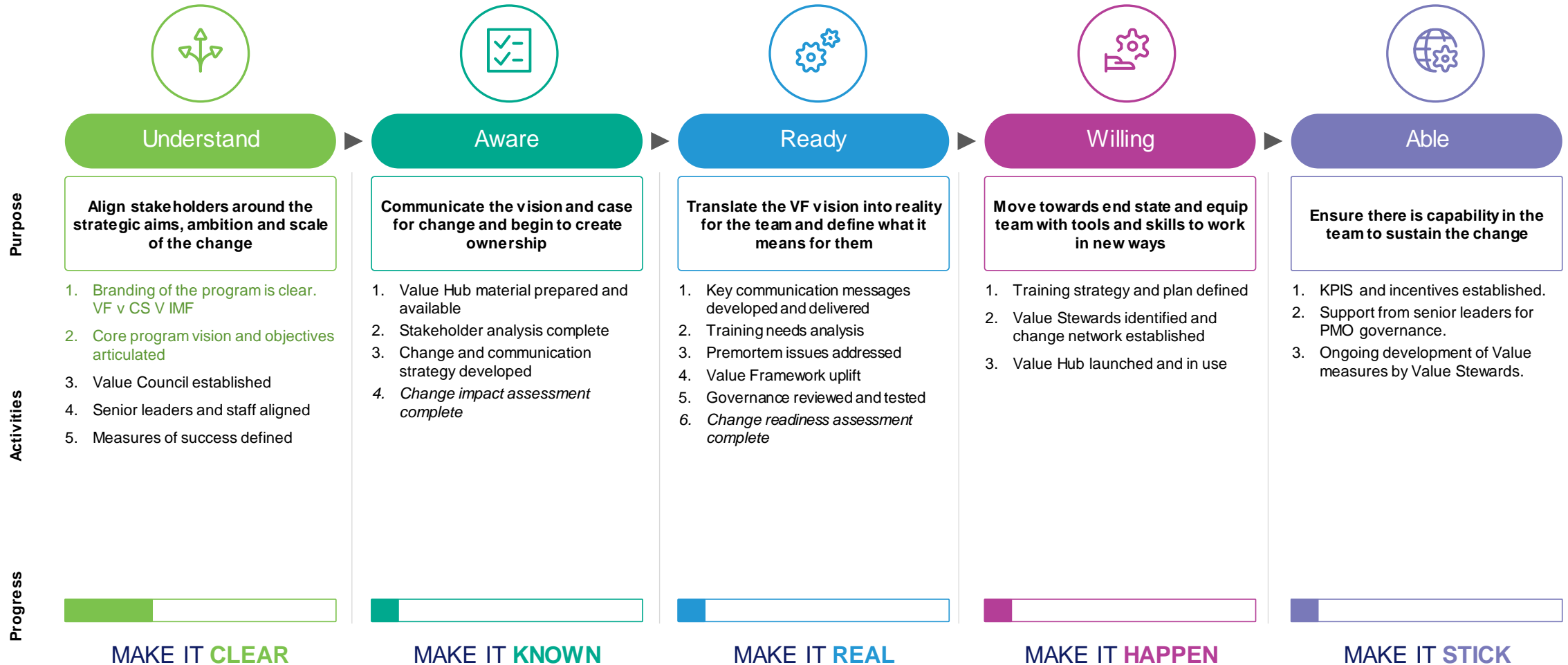
What does success look like?

- **Line of Sight** is successful when all investments can be described in terms of performance outcomes and impact on objectives. It will be bi-directional, helping forecast network performance at a portfolio level and determine the likelihood of meeting corporate objectives for a given level of investment.
- **Transparency** means that all stakeholders have the ability to unpack the value of another investment and understand the level of confidence of the current investment value. It requires a commitment to knowledge sharing and capability uplift so the Value Framework is accessible for all users.
- **Consistency** occurs when different stakeholders, given the same set of inputs and guidance, would value an investment the same. This includes the process of optimising the unconstrained portfolio and the generating a cost, risk and performance forecast.
- **Perspective** has been realised when stakeholder are able to clearly express the outcome of an investment decision in terms of the impact it has on another stakeholder.
- **Trade offs** have been achieved when investment decision makers can discuss different investments with full visibility their financial value and their impact on corporate objectives. Difficult decisions are made easier with an as close to apples to apples comparison as possible.

While the 5 principles discussed support good Portfolio Management, they primarily relate to the Value Framework.

Learning from our past – focussing on change

Engaging with stakeholders throughout the development of the Enterprise Value Framework will be essential to its successful adoption.



Our Timeline



Refreshed Value Measures for All Portfolios

Enterprise Adoption



Ability to apply Value Measures to optimise each portfolio

Trade Off's within each portfolio



Trade Off's at Enterprise Portfolio

Consideration of unregulated Portfolio



**Endeavour
Energy**



**POWER
together**