

SEPTEMBER 2022

ISSUE  
03

Volume 16

THE  
ASSET  
JOURNAL



ASSET MANAGEMENT COUNCIL

How much does an underrun cost? Empirical evidence from utility renewals

An asset management system can deliver ESG outcomes

Value through asset management: Defining the real ROI

Data-driven decision-making: Using optimisation to prioritise asset investments via a common value framework

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**Publisher:** The Asset Management Council

**Chief Editor:** Ernst Krauss

**Publication Design:** Heidi Robinson

ISSN: 1834-3864

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## THE ASSET, SEPTEMBER 2022

**This edition of “The Asset” deals with a high profile topic, the influence of economics on Asset Management. Much has been written about economic influences, going back as far as Adam Smith when he was talking about the “Wealth of Nations”. His views no doubt inspired many an Investor and Factory owner over the centuries to invest in Assets, either human or machinery for producing the goods sought.**

It stands to reason that the notion of ‘Sweating the Assets’ has influenced many who consciously or unconsciously engage in Asset Management. One question undoubtedly arises though: “When should we stop sweating the Assets” – if at all? Many factors will influence such a decision, least of all the ‘economics’ of Business. Is it reasonable to continue spending on Assets that are delivering but need a lot of attention and therefore precious resources? When does the market situation dictate that we produce more efficiently? Is the way we manage our Assets still viable? What is the competition doing? Many questions are imperative inputs to decision making and especially managing our Assets. Is the workforce still competent to deal with new technology? How well do we really understand the condition of our Assets and hence the `Business? Ageing plants everywhere require renewal in a more societal acceptable manner that will bring out more questions about economics and economic use of Assets.

In the changing world of Energy Transition and reducing Carbon footprints, it is my view that the economics of Asset Management will play a significant role. It is further complicated with the drive to utilise more and more computing power to aid us in decision making. Which leads to the central question of Value. Economics in principle are driven by value – a key objective of Asset Management as defined in ISO 55001. A further part of the equation is efficiency. How efficient are our Assets utilised in the delivery of the good or service they are there to produce. Each organisation will have its own view on this and therefore create inputs to the decision processes in Business and Asset Management.

I believe that we will see more and more focus on the economic use of Assets. The ever increasing spiral of ‘more profit, more production, more utilisation’ will have to be adjusted to something we can manage into the future. Some thoughts and ideas on what we can do to slow down escalation of the ‘more – more -more’ thinking no doubt will also influence the way we manage our Assets. Perhaps you find some inspiration on the topic in this edition of “The Asset”. We are certainly interested to hear your views on this important subject.



# FROM MY DESK: CHAIR'S LETTER

**NATIONAL CHAIR,  
TOBY HORSTEAD**

**I must start by recognising the announcement of our partnership with Rio Tinto. Our members are set to benefit from the collaboration and sharing opportunities the partnership creates. It is great recognition that global organisations such as Rio Tinto see value in perspectives, tools and insights that the Asset Management Council can provide.**

Our representation and participation in the Global Forum for Maintenance and Asset Management and TC251 will provide our active members opportunity to influence asset management principles and thinking in coming months.

It is concerning hearing that current reviews of global standards and publications might be focusing on the narrower management of assets. This risks losing some of the perspective of the broader picture of asset management. The appropriate maintenance practices are critical and should be supported with standard approaches, however at a time where resilience and sustainability are forefront of society we should not drift away from value and outcome focused alignment.

As an industry let's ensure that social and economic considerations continue to drive the approach to management of assets.

Recent relentless weather events along the east coast of Australia reinforces that we must be preparing our assets to be resilient, sustainable and capable of continuing to deliver value and outcomes into the future.

It has again been a busy time over recent months with some of the highlights being:

- the Research and Industry Day (RAID) where University students tested their papers with Asset Management professionals,

- the launch of the next Asset Management Mentoring program,
- the Asset Management in Action webinar series, and
- local Chapter and Special Interest Group events

Our leadership continues to engage with industry partners such as JAS-ANZ, Engineers Australia and also internationally with the Asset Management Society, India and the Coalition for Disaster Resilient Infrastructure (CDRI).

Looking ahead we have two significant symposiums to look forward to. Our New Zealand chapter has a one day event in September focusing on realising value in New Zealand's changing environment. The annual Asset Management in Government symposium is to be held in Sydney in October with speakers responding to the theme of "Shifting the dial: Today's Decisions for Tomorrow's Outcomes"

The Sydney symposium precedes our Leadership Exchange weekend that will provide an opportunity for volunteers to come together. The Exchange will focus on ongoing development of the Chapter and Special Interest Group Technical Programs and contributions to the current global standards and publication reviews.

Partnerships, events, mentoring, global reviews and sharing across our region; I encourage members to be involved and support each other to engage, empower and influence.

**Toby Horstead**

National Chair, Asset Management Council.

# ARTICLE 1 – How much does an underrun cost? Empirical evidence from utility renewals

Michael Lesnie & Luke Hughes

## SUMMARY

There are compelling commercial and behavioural drivers that drive conservatism when setting project budgets. This study uses data from more than 2,000 utility renewal projects from two organisations using a variety of delivery methods to understand the impact to cost efficiency from setting conservative budgets. The paper gives quantitative data to

support the case to change those behavioural drivers that caused conservatism in the first place.

## KEYWORDS

Cost predictability, cost efficiency, budget setting behaviours.

## INTRODUCTION

For a long time, project professionals have believed that

setting conservative project budgets results in project outcomes that are not as efficient as they could be. This belief comes from observations of human behaviour - our own behaviour and that of our peers. In projects and life more generally, when setting targets for 'future you', it seems prudent to set expectations at a level that affords a little breathing room

for lower efficiency and/or reduces the chances of disappointing those whose expectations we have set. This conservative approach to setting expectations is made even easier when the person whose expectations are being set knows less about the 'true' cost than you do or is a participant in the systems that reward 'exceeding expectations'.

This paper considers empirical evidence that supports project professionals' beliefs in relation to conservative budget setting. The empirical evidence

comes from more than 2,000 small asset renewal projects in the utilities industries. The paper presents an overview of a method to measure cost efficiency and quantifies the relationship between budget cost efficiency, actual cost efficiency and cost predictability. These terms are defined in Table 1.

**Table 1 – Cost efficiency and cost predictability terminology**

<b>Term</b>	<b>Description</b>	<b>Metric</b>
<b>Budget Cost Efficiency</b>	A measure of budget cost relative to a historical benchmark	$\frac{\text{Budget Cost}}{\text{Historical Benchmark}}$
<b>Actual Cost Efficiency</b>	A measure of actual cost relative to a historical benchmark	$\frac{\text{Actual Cost}}{\text{Historical Benchmark}}$
<b>Cost Predictability</b>	A measure of actual cost deviation from a budget	$\frac{\text{Actual} - \text{Budget}}{\text{Budget}} \times 100\%$

Using the definitions above, the budget cost efficiency is said to be conservative if it is >1.0. In other words, the budget cost for a given project exceeds the historical norms for a similar project. The budget cost efficiency is said to be aggressive if it is <1.0 i.e. the budget cost for a given project is less than the historical norms for a similar project.

**CONTEXT AND DATA**

In aggregate, small asset renewal projects in utility networks can account for more than half of the capital program. The projects could include: • Renewal of small diameter pipes for water / gas distribution; • Valve or meter replacements; • Replacement of electricity poles; and • Replacement of electricity distribution wires or small substations.

The high value spend for these programs usually attracts a keen interest from managers concerned with the organisation's cashflow. There is often a high focus on achieving predictable monthly cashflows and management of overrun and underrun at a program level usually cascades down

to a project level. Manifestations of the desire for cost predictability can be evident in career and reputational incentives, onerous governance processes and financial incentives.

The most obvious and simplest way to deliver cost predictability is to set a conservative budget. Setting a conservative budget provides a cushion that enables good project cost predictability even if the project delivery is not as efficient as we might like. In the event of a budget surplus, scope can be expanded to consume that surplus.

However, the prospect of conservative budgets raises an important question:

What is the impact of conservative/aggressive budgets on project efficiency?

Despite the high aggregate spend on small projects the authors were not able to find publicly available research to quantify the impact of conservative/aggressive budgets on project cost efficiency. This analysis seeks to address the research gap, at least for the case of utility renewal small projects.

Research presented here is based on empirical data from asset renewal programs from two unrelated Australian utility companies, each with a large portfolio of small renewal projects.

Each organisation has more than 500,000 customers and spends more than \$200 million on asset renewals each year across a variety of asset classes. The projects in this sample could be described as small replacement-in-kind projects, typically with total cost per project under \$0.2 million and delivered in both suburban and metropolitan areas. The projects typically have low engineering component and involve only one or two construction trades. The projects were delivered in the period 2009 to 2017. The delivery approach of each portfolio is described in greater detail below.

The first case study portfolio (Portfolio 1) was delivered through alliance contracts. Under this delivery arrangement all parties, the owner and non-owner participants (i.e. contractors) shared the risks. It included an 'open book' approach to cost management where the non-owner participants were incentivized using Key Performance Indicators (KPIs) including a gain/pain share arrangement that was primarily driven by cost predictability metrics. The non-owner participants increased or decreased profit depending on actual cost performance relative to the projects' budgeted cost. The budget costs were prepared by the non-owner participants and could be validated by an independent estimator hired by the owner. Where underruns occurred, the contractors were awarded 50% of the underrun (gainshare), subject to satisfaction of other minimum conditions. Similarly, in the event of cost overrun, 50% of the overrun was deducted from the contractor's fee. Other KPIs measured use of value engineering practices and expenditure avoidance, however there was no direct measure of cost efficiency of works delivered. Field works were executed under a mix of reimbursable and schedule of rates subcontracts.

The second case study portfolio (Portfolio 2) was delivered by a utility with its own direct hire workforce (i.e. self-performing organisation) with some limited use of specialised external contractors. In this organisation, there are both career incentives as well as administration expediencies to be gained by avoiding supplemental funding requests caused by poor cost predictability.

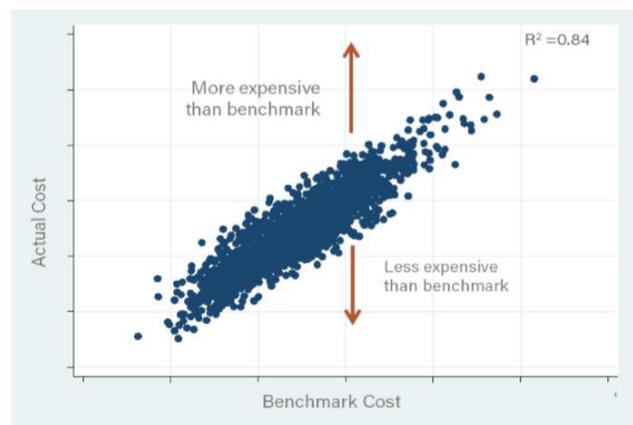
Although the two portfolios are from different

types of utility (e.g. electricity, water, gas), both are regulated by an independent government authorities.

## METHOD

As noted in Table 1, cost efficiency is measured relative to a historical benchmark. The authors established the historical benchmark by using multivariate linear regression techniques. This technique is also sometimes referred to as a parametric cost model. The dependent variable of the regression is actual cost which is escalated to constant dollars (e.g. January 2020). The independent variables fall into two categories: (1) scope and; (2) execution environment.

The construction of the parametric cost model is more easily understood by example, such as a program of pipe renewal projects such as gas or water reticulation. For each project we have scope data for the length, diameter, length of pipe under road/nature strip and materials of construction of the pipe. We also have data for execution environment variables including some characterisation of land use (residential, industrial, retail) as well as the number of customer connection per 100m of pipe (indicator of population density). The authors used regression to relate the scope and execution environment data to the actual cost of the projects. Using the technique the authors created a model that found more than 84% of the variability of the actual cost could be explained by variability in the independent variables. An example of the model for one of the portfolios is shown in Figure 1.



**Figure 1** – Example of utility renewal cost model accuracy

As an aside, there is a third category of independent variable: delivery practices. Delivery practices are of great interest and could be added to the model. Delivery practice variables may include factors such as contract method, delivery agent, amount of field investigation prior to construction, staffing of the job, construction techniques used and indeed, budget aggressiveness. Identification and quantification of the contribution of these variables is fundamental to the continuous improvement efforts. However, for the purposes of this analysis, we did not include these practices in the model and thus the historical benchmark did not control for their use.

Using the regression model described above, the authors had a robust method to establish the historical benchmark cost for each of the case study portfolios. For each project in the sample, the project specific independent variables were used in the model to produce a project historical benchmark and thus budget and actual cost efficiency metrics.

Cost predictability measures are self-evident and explained in the definitions in Table 1. or each portfolio are set out below.

### OBSERVATIONS

The relationship between budget and outcomes for each portfolio are set out below.

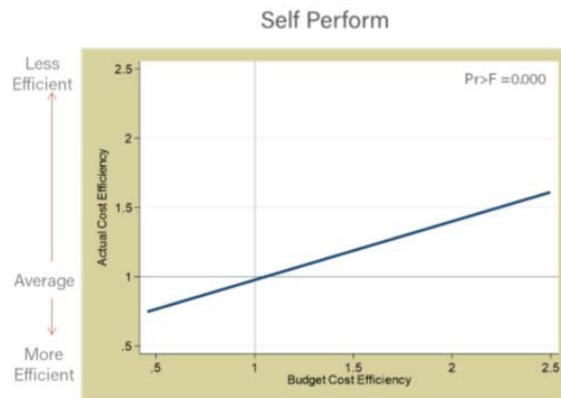


Figure 2 – Self perform organisation

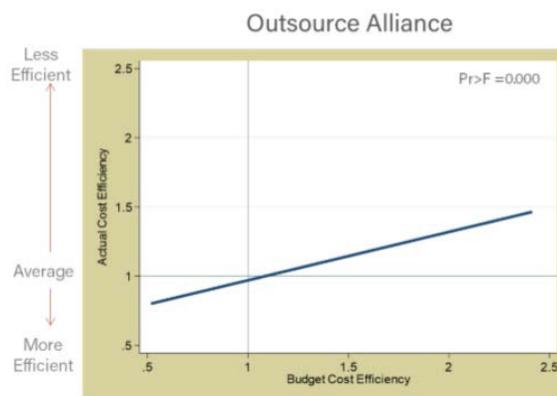


Figure 3 – Alliance contract

It is immediately observable that the relationship between budget cost efficiency and actual cost efficiency are very similar for both the portfolios, with the self-perform organisation having a slightly steeper slope. As both figures are similar, Figure 3 is reviewed in detail, on the understanding that Figure 2 is not materially different.

The x-axis in Figure 3 is the budget cost efficiency. The y-axis shows actual cost efficiency attained. The blue line shows the relationship between budget cost efficiency and actual cost efficiency. If the reader imagines a diagonal line at 45 degrees (southwest to northeast), where the blue line is below the diagonal, this signifies an underrun. Where the blue line is above the diagonal, this signifies an overrun. This interpretation of the figure is explained by example below.

Assume for a given project the historical actual cost benchmark is \$100 after adjustment for scope and execution environment and escalation to money of the day. Now assume for the same project the budget has been set \$200, which we could describe as a conservative budget relative to historical norms. The budget cost efficiency can be calculated to be 2.00 ( $\$200/\$100$ ). This project is delivered and follows the pattern of other projects in the portfolio. The actual cost efficiency obtained is expected to be 1.30. The actual is expected to be \$130 ( $1.30 \times \$100$ ). In these circumstances, the project manager can expect to report a deviation from budget cost of -\$70 ( $\$130 - \$200$ ) which is an underrun of 35% ( $100\% \times \$70/\$200$ ). So, for this example the project has underrun by 35% and is 30% less efficient than historical norms.

Using the same Figure 3 we can see what happens when the project budget is set to be aggressive relative to historical norms. Assume for a given project the historical actual cost benchmark is \$300 after adjustment for scope and execution environment and escalation to money of the day. Now assume for the same project the budget has been set \$150. The budget cost efficiency can be calculated to be 0.50 ( $\$150/\$300$ ). This project is delivered and follows the pattern of other projects in the portfolio and the actual cost efficiency is expected to be 0.80. The actual cost is expected to be \$240 ( $0.8 \times \$300$ ). In these circumstances, the project manager can expect to report an overrun of \$90 ( $\$240 - \$150$ ) or 60% ( $100\% \times \$90/\$150$ ). So in this

example, the project has overrun by 60% and is 20% more efficient than historical norms. Even though the project with an aggressive budget did overrun its actual cost, the cost efficiency was better than achieved by the project with a conservative budget.

Finally, in preparing Figure 2 and Figure 3 the authors have validated the slope of the line is consistent throughout its length. Statistical testing found the relationships shown here meet stringent levels of confidence. There is less than 1% likelihood that these relationships are due to random chance.

## CONCLUSIONS AND RECOMMENDATIONS

Our intuition on conservative target setting is supported by data. By setting conservative project budgets we are likely to deliver underruns at the expense of efficient outcomes. On the flip side, by setting aggressive project budgets we are likely to be more cost efficient but will suffer overruns, which in percentage terms could be quite large.

That two independent organisations with portfolios of small asset renewal projects using different delivery models have produced a similar relationship between budget cost efficiency actual cost efficiency and project cost predictability is interesting. The authors hypothesize that cultural and behavioural norms common to both organisations maybe driving the same pattern of results.

Having confirmed the presence of the relationship between budget setting behaviours, cost predictability and cost efficiency outcomes, the next question is what do we do about it. What should be changed to shift the budget setting behaviours so that the project outcomes are aligned with the corporate objectives?

In most cases, organisations will seek both project cost predictability and efficiency. It is unfortunate that this approach leads directly to the middle of the cross hairs shown in Figure 2 and Figure 3 where the target efficiency is average and the deviation between estimate and actual cost is low. But there are few organisations that have stated objectives of targeting the historical average efficiency so that cost predictability can be achieved. This data suggests organisations may have to choose between predictability and efficiency. The following recommendations are offered in the context of large portfolios of small asset renewal projects.

Assuming the corporate objectives is for high predictability, some approaches currently used by industry include:

- Set personal KPIs for Project Managers on project budget predictability targets;
- Use visual communications on project predictability as the primary means of measuring success;
- Create a governance system that requires significant effort to access additional funds in the event of overrun; and
- Make budget setting the sole responsibility of the delivery agent.

If we take the alternative where an organisation is primarily interested in efficiency, some options include:

- The asset owners and delivery agents jointly develop a deeper understanding of the true cost drivers through analysis of empirical data;

- Develop methods of calculating credible historic norms and use those norms to influence budget setting practices;
- Use visual communications on actual cost efficiency as a primary means of measuring success; and
- Create a governance system that is tolerant and designed to accommodate overruns as means to recognising striving for efficiency (at least 1 in 2 projects should be coming back for surplus funding).

Note that simply slicing X% off all future budgets was deliberately excluded from the list of methods to improve efficiency. This method will have no lasting effect on budget setting behaviours other than to drive increased lack of trust and initiate new and more cunning ways to hide the conservative targets. There may be plenty more methods to improve efficiency, and the efficacy of these methods should be carefully monitored and demonstrated against the historical norms.



# ARTICLE 2 – An Asset Management System Can Deliver ESG Outcomes

Aneurin Hughes and Stephen Walker, Cardno now Stantec

**ABSTRACT**

ESG is the acronym for Environmental, Social, and (Corporate) Governance. ESG is an umbrella that brings together consideration of a range of factors

in these three areas. ESG has arisen from increased community concern and belief that the daily operations of business to maximise profit while doing the minimum for compliance with regulatory requirements is not

compatible with the long-term wellbeing of human society and the earth.

Investors, insurers and financial asset managers are recognising that climate-change is real and

there are significant associated investment risks. Financial reporting is now being extended beyond its traditional scope with organisations required to provide climate-related financial disclosures in their financial statements. Integrated reporting covering the six capitals is gradually gaining acceptance.

Both asset management and ESG fields share the concept of value, whole-of-life or life cycle thinking, and the notion of intergenerational equity – i.e. not leaving future generations with liabilities or other unwanted legacies. For capital intensive organisations, it is considered that the asset management system can be used as a major contributor to achieving ESG outcomes through, for example, aligning asset management objectives with the organisation’s ESG objectives, managing service and asset resilience and sustainability, developing a better understanding of how the activities associated with the asset management system contribute to improving ESG outcomes, and implementing these activities. If this is not done in a holistic manner then the approach to ESG by asset intensive organisations will be siloed, piecemeal and reactive.

The paper will view ISO55001 requirements through an ESG lens and show how through the ISO 55001 framework an organisation can make real gains in delivering ESG outcomes. This paper will also outline some of the risks that might arise if an asset intensive organisation pursues an ESG agenda without using

asset management to guide its activities.

## KEYWORDS

Asset management system, ISO55001, ESG, environmental, social, corporate governance, sustainability

## INTRODUCTION

ESG is the acronym for Environmental, Social, and (Corporate) Governance. ESG is an umbrella that brings together consideration of a range of factors in these three areas. There is a growing recognition that the daily operations of business are destroying the planet and human societies because they are governed by profit maximisation and minimum compliance with existing regulatory requirements. Governments continue to encourage this with a primary focus on GDP and economic growth. Over recent years the community, and in particular the millennial generation, is seeing the long-term results of current practices as evidenced by climate change, (severe droughts, floods, heatwaves and bushfires), as well as social problems (growing gap between rich and poor, casualisation of the workforce, jobs exported to cheaper locations using poorly paid or slave labour working in unsafe conditions, COVID-19 impacts etc).

Both asset management and ESG fields share the concept of value, whole-of-life or life cycle thinking, and the notion of intergenerational equity – i.e. not leaving future generations with liabilities or other

unwanted legacies (adapted from Adams 2010). For capital intensive organisations, it is considered that the asset management system can be used as a major contributor to achieving ESG outcomes.

## WHAT IS ESG?

There is not a common, agreed reference for what is within the scope of ESG, its definition is evolving. Table 1 outlines some of the components of ESG.

Note: This table was developed with the contribution of members of the Asset Management Council Sustainability Working Group, Definitions Sub-Group.

## WHO IS INTERESTED IN ESG?

As previously mentioned, the community is starting to take a greater interest in ESG. Customers are also making choices in the marketplace based on purpose and sustainability. Millennials and Gen Z have very different attitudes to purpose than baby boomers do and are much more favourable toward sustainable businesses. The idea that one stakeholder, the shareholder, is all you need to focus on as a manager and board director is being overturned by a global movement challenging that assumption. We are now seeing a return to the idea that business needs to serve the interests of multiple stakeholder groups to achieve the outcomes that it seeks (McKinsey 2022).

Financial/investment groups (aka asset managers) are also seeing the potential risks posed by

<b>Environment</b> – how an organisation treats the natural environment as our most critical asset	<ul style="list-style-type: none"> <li>&gt; Going well beyond environmental compliance</li> <li>&gt; Climate change-adaptation, vulnerability and resilience</li> <li>&gt; Carbon emissions/ energy use</li> <li>&gt; Carbon footprint</li> <li>&gt; Biodiversity and natural resource conservation</li> <li>&gt; Pollution and waste management</li> <li>&gt; Water security</li> <li>&gt; Raw material sourcing</li> <li>&gt; Circular economy</li> </ul>
<b>Social</b> describes how an organisation and its activities impacts on society	<ul style="list-style-type: none"> <li>&gt; Economic and social contribution</li> <li>&gt; Labour standards</li> <li>&gt; Supply chain labour standards</li> <li>&gt; Employee relationship</li> <li>&gt; Developing the workforce and its skills for the future</li> <li>&gt; Supplier relationship</li> <li>&gt; Customer relationship</li> <li>&gt; Health and safety of employees and the community</li> <li>&gt; Gender inclusion and diversity</li> <li>&gt; Cultural awareness and sensitivity</li> <li>&gt; Privacy and data security</li> </ul>
<b>Governance</b> describes an organisation’s accountability and management framework including its leadership structure, internal controls and shareholder rights	<ul style="list-style-type: none"> <li>&gt; Corporate governance</li> <li>&gt; Financial and tax transparency</li> <li>&gt; Financial reporting - climate change risk</li> <li>&gt; Risk and opportunity oversight</li> <li>&gt; Anti- corruption</li> <li>&gt; Ethical behaviour</li> <li>&gt; Executive pay, fairness and linkage to and achieving ESG objectives</li> </ul>

**Table 1** – Some ESG components

the impacts of climate change, reputational risks associated with perceived deficient social and governance behaviour and require reliable metrics to enable them to measure their potential risk profile.

BlackRock, the world’s largest investor and asset manager, managing approximately US\$9 trillion in assets, publicly stated, in letters to public company CEOs and directors in 2021, that the time had come for companies to disclose details related to their exposure to the financial risks and opportunities they face from factors such as global warming, extreme weather events and increasing levels of pollution. ‘No

issue ranks higher than climate change on our clients’ lists of priorities. They ask us about it nearly every day,’ explained Larry Fink, Chairman and CEO of BlackRock (Harvard Law School Forum on Corporate Governance 2021).

Leading frameworks such as the Taskforce on Climate-related Financial Disclosures (TCFD) recommendations, and the Sustainability Accounting Standards Board (SASB) are promoting public disclosure of climate-related risks in financial statements. In response the IFRS (International Financial Reporting Standards) Foundation issued a Climate-

related Disclosures Prototype in November 2021 which sets out the requirements for the identification, measurement and disclosure of climate-related financial information. The objective is to require entities to provide information about their exposure to climate-related risks and opportunities. The document includes the following statement, among others (IFRS Foundation 2021):

*Climate change affects all economic sectors. However, the level and type of exposure and the current and anticipated effects of climate-related risks and opportunities on the assessment of enterprise value*

*are likely to differ by sector, industry, geography, size and entity. In assessing an entity's financial and operating results, investors and other capital market participants want insight into the governance, risk management and strategic context in which such results are derived as well as the targets and the metrics the entity uses to measure progress toward the targets.*

Ethical and socially responsible investor movements require more transparency on the impacts of their investments. In July 2021, the Global Sustainable Investment Alliance (GSIA), released its biennial Global Sustainable Investment Review 2020, revealing an industry that has grown to US\$35.3 trillion, and is up 15% since 2018. Sustainable Investment comprised 36% of all professionally managed assets globally at the start of 2020 (based on assets reported by the United States, EU, Australia/New Zealand, Canada and Japan) (Environmental Business Journal, 2021).

In recent years ESG rating agencies have been set up. One such agency is the Morgan Stanley Capital International, (MSCI) rating agency. An MSCI ESG Rating measures a company's resilience to long-term, industry material, environmental, social and governance (ESG) risks. MSCI uses a rules-based methodology to identify industry leaders and laggards according to their exposure to ESG risks and how well they manage those risks relative to peers. MSCI ESG Ratings range from leader (AAA, AA), average (A, BBB, BB) to laggard (B, CCC). MSCI also rates equity and fixed income securities, loans, mutual funds and countries. (Environmental Business Journal, 2021 and MSCI, 2020).

Measurement of value is developing beyond the dollar. For instance, the six capitals approach considers financial, manufactured, human, intellectual, social/relationship and natural capitals. A Task Force on Nature-related Financial Disclosure (TNFD) was set up in mid-2020 with a mission *to develop and deliver a risk management and disclosure framework for organisations to report and act on evolving nature-related risks, which aims to support a shift in global financial flows away from nature-negative outcomes and toward nature-positive outcomes (TNFD).*

## WHAT HAS ASSET MANAGEMENT GOT TO DO WITH THIS?

Asset management is defined (ISO55000) as the *coordinated activity of an organisation to deliver value from its assets*. The determination of what value is will be different for each stakeholder. However, from the previous discussion there is an increasing community and investor/financial institution interest in ESG. As a result, it is likely that organisational strategies will place greater emphasis, and value, on ESG rather than the previous superficial adoption of Corporate Social Responsibility (CSR) goals that often resulted in greenwashing or marketing promotion rather than resulting in clear benefits. Asset management strategies will therefore need to be designed to deliver on ESG initiatives.

There is a growing recognition that the natural environment is a critical asset for the survival of the human race and can no longer be considered as having zero value in the decision-making process and being outside of asset management. Asset managers need to critically reevaluate the scope of their asset management system and understand where the natural environment should be within its asset management approach of what the critical interfaces are.

Asset management considers long term sustainability of value to stakeholders and inter-generational equity. This directly supports ESG objectives and this existing strength of asset management should be relied upon by businesses in pursuing these goals.

Assets exist to deliver services. Most of these assets are essential for the health, wellbeing and prosperity of our communities (i.e. they already provide social and economic value). Climate change is real and will have impacts on assets that provide services. These assets need to be sustainable and resilient to enable the delivery of services.

Assets have a huge impact on the environment. Decisions at the planning and design stage can have environmental impacts for decades. Construction and demolition waste accounts for 44% of all waste (DAWE, 2020), cement manufacture accounts for 8% of all greenhouse gas emissions (CHG) (Zero Carbon Australia 2017), asset operation requires resources such as energy and water. Initiative such as Infrastructure Sustainability (IS) ratings, Green Star Ratings, and National Australian Built Environment Rating System (NABERS) have been

developed in recent years in an effort to reduce the carbon footprint of infrastructure. For businesses that are serious about protecting and enhancing the environmental, design criteria and standards need to be assessed and consider the whole asset lifecycle.

Asset management has a huge potential for contributing to the achievement of an organisation's ESG objectives in any asset-intensive organisation. Asset managers need to proactively contribute at strategic, tactical and operational levels to cost-effectively deliver ESG benefits to the organisation and the wider community.

## HOW CAN AN ASSET MANAGEMENT SYSTEM CONTRIBUTE TO THE ACHIEVEMENT OF ESG OUTCOMES?

The ISO55000 and ISO55001 asset management standards are currently under review. The current draft version, as recently issued by ISO/TC251/WG4, proposes the evolution of clause 2.4.2 (previously titled Fundamentals) into Principles and the addition of three new principles, Integration, Adaptability and Sustainability, to the existing principles of Value, Alignment, Leadership and Assurance.

As noted in the draft document, these principles reflect the purpose of asset management and should be the heart of asset management thinking. The following text discusses how these principles can be used to guide the integration of ESG into the asset management system:

**Value:** *Assets exist to provide value to the organisation and its stakeholders. To meet stakeholder ESG requirements:*

- Stakeholder (i.e. the community) concern about environmental, social and organisational behaviour and accountability needs to be given greater recognition.
- Environmental and social impact considerations require greater consideration in the asset investment decision-making process.
- In balancing costs, risk and performance in an ESG-focussed environment, cost will need to be measured on social and environmental as well as financial criteria.
- The impact of climate change on the organisation's long-term financial value and

its risk profile will need to be quantified and publicly reported. Most of this information will come from the asset management system. Lifecycle decisions will need to be made to ensure asset useful life is not diminished through environmental and climate impacts.

- Capital investment decisions are made based on at least a triple bottom line basis rather than just on financial criteria. It would be preferable that social and environmental criteria are more quantitative than a qualitative Multi-Criteria Assessment (MCA) approach. There may be potential for the use of a six-capitals approach.
- Demand management for water and energy, water loss management and energy efficiency are given a high priority to defer capital investment and minimise lifecycle costs.
- The organisation will have processes in place that enable functional services, infrastructure and supply chains in the event of extreme climate, pandemic or other events.

**Alignment:** *Asset management translates the organisational objectives into technical and financial decisions, plans and activities. As a result:*

- Asset management objectives will need to further align with the organisation's ESG objectives. It will no longer be acceptable for organisational strategy documents to have ambitious environmental objectives while assets are planned, designed and operated to meet minimum environmental compliance.
- To achieve alignment, it will be necessary for the asset management team to be more proactive in engaging with the environmental/sustainability teams and outline the opportunities that the asset management system can provide to contribute to the meeting of environmental objectives in the short, medium and long terms.
- There will also be greater horizontal alignment with human resources to facilitate the development and retention of asset management capability. This requires recognition within the organisation that asset management is a critical business function requiring the development and retention of employees and intellectual capital through the provision of meaningful and purposeful work and career opportunities through

collaboration in multi-disciplinary teams.

- The Asset Management Policy will need to be compatible with the organisation's ESG objectives and the Strategic Asset Management Plan (SAMP) will need to document the role of the asset management system in supporting the achievement of the organisation's ESG objectives.
- The asset lifecycle processes (planning, design, construction, operation, maintenance, renewal and disposal) will need to proactively contribute to the achievement of the organisation's ESG objectives.

**Leadership:** *Leadership and workplace culture are determinants of realisation of value.* As noted in the current draft standard, leadership and commitment from all managerial levels is essential for successfully establishing, operating and improving asset management within the organisation. In relation to ESG this will extend to:

- Raising the awareness of all employees on asset management and how it contributes to the achievement of the organisation's ESG objectives.
- Active participation in change management processes to achieve greater horizontal alignment of the asset system with other strategies, management systems and groups within the organisation so that ESG objectives can be achieved in a coordinated, optimal and cost-effective manner.
- Consulting with the asset management teams and stakeholders on continual improvement opportunities for asset management to achieve organisational objectives particularly ESG outcomes.
- Assigning roles and responsibilities within the Asset Management System to the achievement of ESG objectives.

**Integration:** *Asset management provides a means to integrate activities to achieve stated objectives.* This principle aims to incorporate all relevant disciplines within the organisation into an overall business management framework instead of establishing separate siloed management systems. Integration, or alignment of asset management, quality, environmental, social responsibility, occupational health and safety, risk management

and energy management systems, or at least the principles within these systems will contribute to the achievement of ESG objectives. This will require:

- Developing, maintaining and enhancing meaningful long-term relationships and collaboration with external and internal stakeholders to achieve ESG outcomes.
- Ensuring that the organisation has the financial capacity to deliver sustained value from its assets. There is considerable benefit in pursuing and relying on integration through asset management as the consequence is that ESG does not need to be pursued as an additional layer to existing business processes – much of ESG can be pursued through a coordinated and more sharply focused approach to what is existing.

**Assurance:** *Asset management gives assurance that assets will fulfil their required purpose.* Having a rigorous asset management assurance process for asset management contributes to the organisation's governance process. This will require that:

- ESG-related asset service and performance risks over time are clearly understood and management has assurance that these risks are being adequately managed.
- The organisation has the competence and resources to identify and address asset/service related ESG risks and issues.
- Relevant ESG performance targets are documented for asset construction, operation, maintenance and disposal. Monitoring and reporting of relevant asset-related ESG performance such as GHG emissions, achievement of carbon reduction etc are in place
- A process exists for continual improvement of asset-related ESG processes and performance.
- Assurance exists (through audits and management reviews) that the asset management system is meeting the organisation's requirements in relation to ESG. This would also include assurance that asset-related greenhouse gas (GHG) emissions, carbon reduction calculations and long-term financial impacts of climate change are reliable and accurate.

**Adaptability:** *Asset management facilitates an organisation's ability to adapt to change.* These changes include, for instance, responding to the impacts of climate change, meeting the requirements for financial reporting on climate change risk, addressing increasing community and investor expectations regarding ESG. This requires asset intensive organisations to be agile which can be a challenge as many have long-lived assets with the risk of having stranded assets in the future. Organisations will need to continually manage and adapt the asset portfolio to meet stakeholder requirements. This will require:

- Greater investment in the planning and design phases, which are implemented with a more strategic systems thinking mindset.
- Having asset-related information systems in place that provide relevant and timely trends to enable informed long-term decision making, address ESG risks including assessing vulnerability of assets, supply chains and services.

**Sustainability:** *Asset management requires consideration of sustainability in relation to the delivery of objectives.* Sustainability needs to be a critical requirement for asset management, starting with the recognition that the natural environment is a critical asset that requires far more than just compliance and greenwashing. As such, an asset management plan for natural assets may be appropriate with a scope that extends well beyond the scope of the asset management system.

## ESG WITHOUT ASSET MANAGEMENT

ESG issues can generate a lot of emotion and enthusiasm which may result in implementation of sub-optimal solutions driven by inappropriate KPIs, pet projects, flavour-of-the-month issues, opportunities for political and management ribbon-cutting and the need to be 'seen to be doing something'. An asset management system provides a framework for logical decision-making that aims to balance cost (financial, social and environmental), risk and service and provides a holistic, whole-of-business approach. If this is not done in a holistic manner then the approach to ESG by asset intensive organisations will be siloed, piecemeal and reactive.

## CONCLUSION

ESG is here to stay because:

- The community is seeing that current practices are resulting in huge detrimental impacts on the environment and are not delivering benefits equitably to people.
- The financial/ investment community see the risks ahead and require reliable metrics to enable them to measure their potential risk profile.

Financial asset managers are now at the vanguard of addressing ESG. Physical and natural asset managers also need to play their part. An appropriately developed and implemented asset management system will be a great starting point.

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# ARTICLE 3 – Value through Asset Management: Defining the real ROI

Michael Van Doornik and Jamie Maslen, WSP

## ABSTRACT

Any management system comes at a financial, reputational and resource cost and the TransGrid Executive rightly posed the question “if we are exceeding the minimum ISO55001 standards, what is the return on our investment in Asset Management?”

Our review investigated the links

between the mechanisms and processes that were identified as driving TransGrid’s maturity above the minimum requirements of ISO 55001 and how that materialised as quantifiable or demonstrable value to TransGrid, now and into the future. The assessment was based on the definitions of value as set out in ISO 55002:2018; namely, Value Generation which relates to value derived in the current or short-term timeframe,

Value Determination which relates to future value that the asset management system will enable, and Values which relate to culture and behaviours that enable the realisation of value to the business.

The analysis demonstrated asset management activity aligned and supported all strategic themes and derived the financial return, the actual ROI, TransGrid is



receiving for every dollar invested in AM.

**KEYWORDS**

Value; ISO 55002:2018; TransGrid; Value Generation; Value Determination; Values; ROI

**INTRODUCTION**

A common issue we have observed across many industries is that parts of a business often recognise the need for improving asset management practices, but they are not able to demonstrate, in a quantitative manner, the value it actually provides to the business.

Establishing an asset management system (AMS) is a long-term endeavour – generally measured in years

– which also means it has a real cost to the business. To be able to obtain the funding and commitment necessary to implement an AMS, it helps significantly to be able to demonstrate benefits in financial terms to the executive or board.

In this presentation we will look at the value derived from asset management, based on definitions in ISO 55002, using TransGrid as a case study.

**Context**

TransGrid is the electricity transmission business that supplies all of NSW. Its primary role is to connect the major generators to the three electricity distribution business that then supply commercial and residential customers.

TransGrid is required to comply with ISO 55000 under its electricity Transmission Licence and was originally certified to ISO 55001 in 2014. Since certification, TransGrid has constantly strived to develop and improve the system to exceed the minimum requirements of the standards in key areas.

There is a real cost in continual improvement and building an AMS to a maturity that exceeds what is required by the standard for compliance. So, it is natural that once compliance has been established and maintained for a period of time, that the executive and the board want to understand the value – in addition to compliance – that is being achieved by the AMS and improvement initiatives.

**MATURITY ASSESSMENT AND MEANING OF VALUE**

Our review of TransGrid investigated the links between the mechanisms and processes that were identified as driving the asset management maturity above the minimum requirements of the standard, and to identify where this is likely to materialise as quantifiable or demonstrable value to TransGrid.

The first phase of the review was to undertake an assessment of TransGrid against ISO 55001. We identified 11 certifiable areas (out of 27) for which we were able to substantiate that TransGrid’s AMS exceeds the minimum requirements set out in ISO 55001:2014. These are shown in Table 1 mapped against TransGrid’s six strategic objectives.

CLAUSE	SAFE	EFFICIENT	CONSUMER	BUSINESS	FUTURE	TECHNOLOGY
Context of the Organisation	Minor	Minor	Minor	Minor	Minor	Minor
Leadership	Moderate	Moderate	Minor	Minor	Minor	Minor
Planning	Strong	Minor	Minor	Minor	Minor	Minor
Support	Strong	Minor	Minor	Minor	Minor	Minor
Operations	Strong	Strong	Minor	Minor	Minor	Minor
Performance Evaluation	Minor	Minor	Minor	Minor	Minor	Minor
Improvement	Minor	Minor	Minor	Minor	Minor	Minor

Strong
  Moderate
  Minor
  Comply

**Table 1** – Outcome of the maturity assessment

TransGrid is regulated by the Australian Energy Regulator, which is an economic regulator, so it is focused on prudent and efficient investment. They are also regulated by IPART on safety. It was therefore no surprise, that we found the areas with the strongest demonstration of asset management were those that linked most directly to the safe and efficient strategic objectives.

To demonstrate and guide our assessment of value, we applied the latest revision of ISO 55002 that was released in 2018.

ISO55002:2018 acknowledges that the suite of standards talks about value but does not clearly define what value is. The 2018 revision defines value to an organisation as being achieved through three mechanisms:

1. Value Generation: benefits derived from the use of the assets in the short term
2. Value Determination: the market value of the asset or value if sold, considering potential future benefits
3. Values: the culture and behaviours that enable the realisation of value to the business

These three areas of value realisation measure different attributes that are required for a business to operate sustainably. By applying these three lenses, we were able to quantify the value achieved by TransGrid to calculate a Return On Investment (ROI), demonstrate how asset management is helping business growth and demonstrate that the culture of the business supports asset management.

Our review relied upon published

financial and non-financial data, supplemented by some internal data regarding culture. We approached this using the following principles:

1. We applied the recent revision of ISO55002:2018 as the basis for defining and assessing the value under the categories Value Generation, Value Determination and Values.
2. We quantified the information in financial terms as far as possible so we could determine the ROI and identified other trends or behaviours that demonstrated benefits to the business.
3. Based our assessment on comparison of performance since certification in 2014 and comparison to other similar businesses.

## VALUE GENERATION

Value generation relates to the short-term benefits or revenues created from the use of the assets. This category is largely quantifiable and recent historical data can be used to show the financial return to the business that can be achieved through effective asset management. Key metrics for this may include maximising business revenues, minimising the lifecycle cost of owning the assets, and meeting performance requirements such as reliability or availability.

Since our task was to find the benefits of exceeding minimum compliance, we assessed Value Generation relative to 2014, when TransGrid achieved compliance. Historical data in terms of asset performance, financial benefits and expenditure are available from

annual regulatory information disclosures.

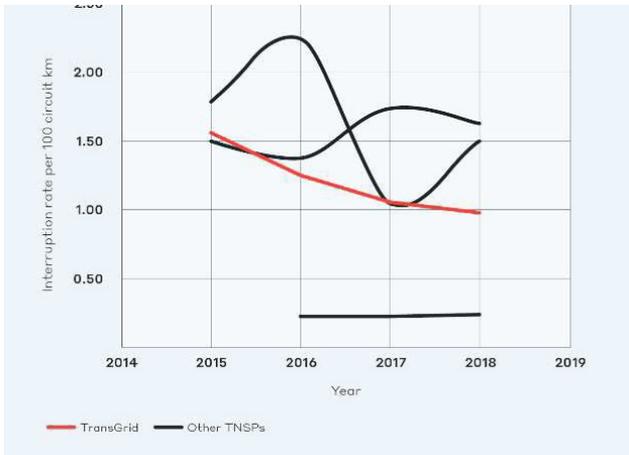
The key areas where we focused and were able to quantify financial benefits to calculate the ROI, were:

As mentioned earlier, TransGrid owns the transmission network in NSW, so they have a large asset fleet. By improving their understanding of their assets TransGrid has been able to more efficiently plan and allocate maintenance to reduce their network maintenance expenditure. Figure 1a. shows the 28% reduction in expenditure achieved.

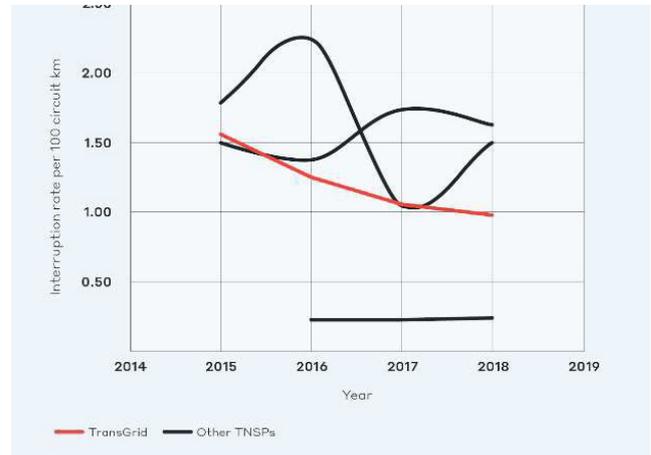
Figure 1b shows the improving (decreasing) trend in the interruption rate on TransGrid's network. The interruption rate has decreased more steadily than peer business, providing value to their customers and it is also reflected in financial returns from their incentive schemes.

The AER administers the service target performance incentive scheme which rewards businesses for performance above the targets and penalises for performance below the targets. The targets are reset every five years based on the average of the performance of the preceding five years. Hence, continual improvement is required to benefit from the scheme. Therefore, this metric demonstrates the incremental improvement of the network performance. Figure 1c compares the performance of TransGrid to the average performance of NZ businesses which have a lower level of asset management maturity. The data demonstrated improved performance under the incentive

**Figure 1** – Demonstration of value achieved through asset management



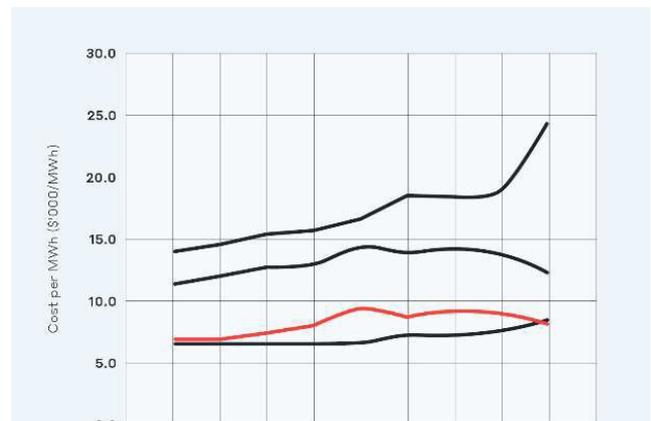
**Figure 1a**



**Figure 1b**



**Figure 1c**



**Figure 1d**

schemes with a higher level of asset management maturity.

Figure 1d shows TransGrid’s cost to customers has decreased slightly during the past few years while it has increased for peer businesses. This indicates improved efficiency of the business.

TransGrid’s prescribed maximum allowance is based on a program of works and there is also an incentive component of individually specified project. TransGrid

has continued to deliver the complete capital work program as well as all the specific identified projects. The benefit of this is three-fold: it minimises risk to the network as the required investment is being undertaken; maximises the return from their incentive schemes; and, ensure their investors receive the expected returns.

## VALUE DETERMINATION

Value Determination relates to the market value of

the assets or value if sold. This takes into account the future revenue that can be expected to be derived from the assets, the value of the assets themselves and financial factors (tax, depreciation etc). Hence, this category of value is forward looking.

The importance of asset management to the category of Value Determination is that it will enable the future revenue to be derived from the assets, maintain existing performance and ensure that the business remains sustainable. Our review did not value the entire business, instead we focused on how TransGrid applied asset management to ensure business sustainability (maintaining the benefits of Value Generation in the long term), and growth of the business.

Our assessment of sustainability came from our review of asset management maturity which included re- viewing documentation and interviewing staff. We found that TransGrid has promoted asset management across the business and implemented the AMS as part of an integrated business system, rather than operating separately. Each business unit and functional team, not just operational areas, demonstrated an under- standing of how their role contributed to the overall business asset objectives.

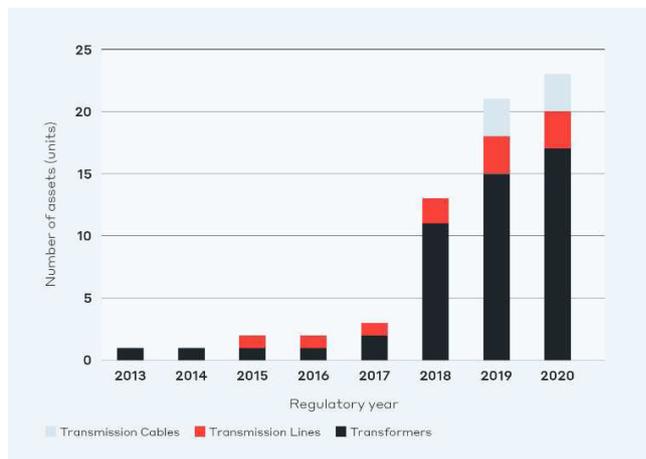
For example, the review found that TransGrid had conducted stakeholder analysis activities and identified its internal and external stakeholders for its operations, which formed the basis for their strategic planning instruments for operational activities. Additionally, the data team was found to have engaged with the operators and planners to identify asset management data needs in order to increase planning and control of routine activities. This activity sought to provide greater clarity on data requirements for operations, as well as opportunities for business improvement with other organisational business units.

While this is a qualitative finding, it indicates how well asset management is embedded across the business and is essential for ensuring long-term functioning and sustainability.

An area where we were able to quantify Value Determination was the ability to demonstrate growth. For TransGrid, this is done by delivering the full capital works program on the regulated network and maximising the volume of non-regulated assets they are engaged to build.

We have already discussed how TransGrid has generated value through its regulated network via the incentive schemes. While doing so, it has also been able to capitalise on the once in a lifetime opportunity presented by the growth in renewable energy. As shown in Figure 2, the amount of non-regulated works they have been able to win and deliver has significantly increased. The growth in these assets is a clear indication of increasing value of the business and is a quantifiable outcome of the asset management systems and practices that have been established.

**Figure 2 – Demonstration of of growth enabled by asset management**



## VALUES

Values relates to the culture and behaviours that underpin the business that enable it to achieve its objectives, remain sustainable and grow. It is often considered as the additional value that can be attributed to an organisation from the level of confidence that the organisation’s culture imparts on the community and how it impacts internal workings of the business. This includes the behaviours internal to the business and the perception by its external stakeholders including customers and government organisations such as regulators.

In TransGrid’s case, the external component relates to the ability to garner support from a community that may be affected by the construction of new infrastructure. This includes the perception of the environmental and societal performance of the business. Surveys completed by TransGrid demonstrate an increase in trust and reputation

amongst their customers from 70% up to almost 80% in three years, with an increasing trend. The improving perception and social licence to undertake the construction is critical – and adds value to the business – due to the increase in construction required for renewable energy and major interconnectors between NSW and other states that is currently being undertaken.

The internal component relates to the benefits that are derived from the organisational culture and the understanding of the asset management system throughout the organisation and everyone's role within the system. For the purpose of Asset Management, the importance is the ability to establish behaviours and culture that will enable the long term sustainability of the assets to ensure that they will at least retain, if not grow, the value of the organization. Internal surveys undertaken by TransGrid demonstrate an increasing level of engagement by the staff in the Asset Management Group from 50% in 2018 to 68% in 2020. The level of engagement and support for asset management was notable in our interactions with the staff across the business. As a semi qualitative assessment, this isn't included in our ROI calculation, but is essential for maintaining long term value.

## RETURN ON INVESTMENT

Based on the value generation component of our assessment, we calculated the benefits obtained based on the improved performance of TransGrid from 2014 to 2020. This included savings in capital and operational expenditure, and benefits derived

from the incentive schemes.

We also were able to identify the costs of the asset management functions across the same period which encompasses the period of time where TransGrid increased its focus on asset management to drive business and performance improvement. The total cost of asset management was extracted from the Maintenance Operations and Asset Management expenditure from the Economic Benchmarking RIN.

WSP calculated that TransGrid has achieved an ROI of 3.2 across the six-year period, or on an annualized basis, that equates to a 20% return each year.

Supporting this return, WSP found evidence that a strong culture had been embedded into the business which provides confidence that the benefits of the asset management system will be sustainable for the long term.

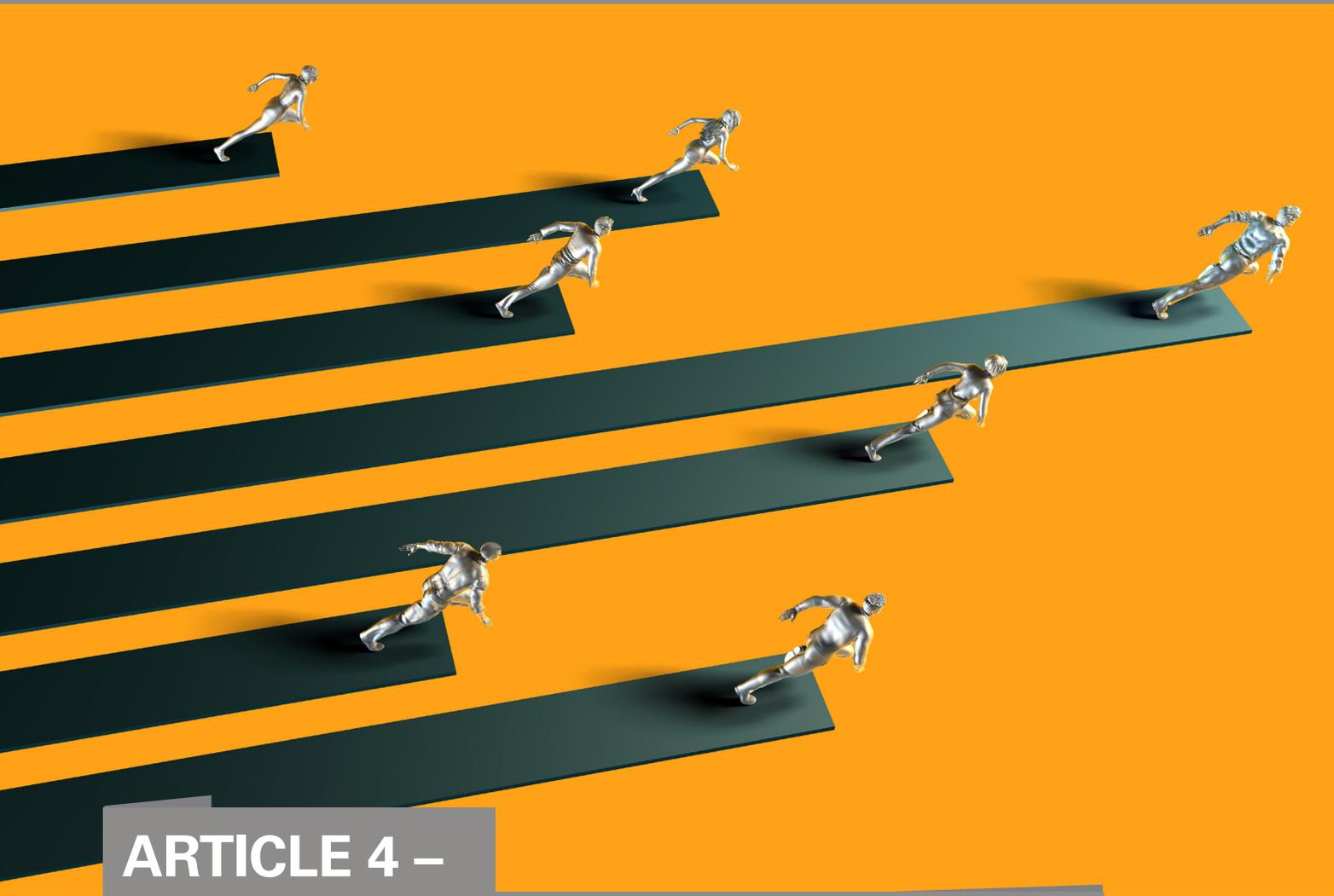
## CONCLUSION

Our case study of TransGrid identified 11 certifiable areas (out of 27) that we were able to substantiate that TransGrid's asset management system exceeds the minimum requirements set out in ISO 55001:2014. The benefits of this were an ROI of 3.2 across the 5-year assessment period, or an annualised return of 20%. This value was demonstrated by:

- Improving network performance and efficiency resulting in financial benefits and improved customer experience.
- Behaviours that underpin business sustainability that are embedded across the business

- Growth in the business demonstrated by the growth in non-regulated assets
- A positive perception by external stakeholders

We found that the definitions of value provided in ISO55002:2018 could be applied to a business to determine a quantified return on investment as well as to clearly identify how the business will maintain or increase value in the future through sustainability, growth and culture.



## ARTICLE 4 – Data-Driven Decision-Making ...

Using optimisation to prioritise asset investments via a common value framework at TasNetworks

Rhys Browning, Mohammad Jafari Bahramabadi, TasNetworks  
Phil Keong, Saad Mahmood, Nikita Sardesai, Copperleaf

**Summary:** For asset intensive industries, making decisions to maximise return on investment is complex and challenging. Hundreds or thousands of individual projects are required, where each address different business needs: some relating to sustaining the existing asset

base, others concerning efficiency or expansion. In addition to this, the value that projects generate are either financial (revenue generation, cost reduction, or even quantified risk reduction) or non-financial (compliance, achieving corporate strategic goals, or reducing carbon

emissions), or a blend of both. No business has unlimited resources and critical decisions need to be made on when to execute projects, and how to prioritise them. This paper examines this complex environment for TasNetworks – the owner, operator, and maintainer of

Tasmania's electrical transmission and distribution network. With hundreds of investments across network transmission and distribution (each delivering vastly different outcomes and value) a digital solution is essential to establish a common economic scale, and optimise to prioritise investments that will deliver the most value across their network, and ultimately, their customers. TasNetworks have employed such a solution, where all investments are assessed against a common value framework (which incorporates the business's corporate risk framework). Using advanced algorithms, investments and asset interventions are optimised based on this framework such that an end-of-life transformer replacement can be accurately compared to a network technology improvement. Risk reduction, revenue generation, environmental impact (and other elements of the value framework) can be numerically assessed, and each investment rescheduled and reprioritised based on the outcome. This paper presents the tailored value framework that TasNetworks employed, along with outcomes of this optimisation via this value framework. Via a detailed trial considering a sample set of investments, this paper quantifies a benefit of 50-90% reduction in analytical resources required and an 8% increase in portfolio value when compared to traditional manual prioritisation methods of investment optimisation.

## KEYWORDS

Decision-making, Value framework, Prioritisation

## INTRODUCTION

TasNetworks manages a multi-million-dollar work program to maintain a sufficient level of supply to connected customers, which from project initiation to project completion can present many different challenges, including resource, environmental and logistical constraints. The repercussions of a network which exhibits a higher level of perceived risk through the inefficiencies of capital investment, has the potential to increase the risk to public safety, the environment, and the overall performance of the network. TasNetworks is taking a data-driven approach to optimise the work program, to allow informed decisions to be made on business risk, when faced with business constraints causing budgets to fluctuate.

As a regulated network service provider, TasNetworks is obligated by the National Electricity Rules (NER) (Australian Energy Market Commission, 2022) to adhere to all revenue submission requirements for capital expenditure proposals. To do so, TasNetworks will display the preferred options for the network and non-network investments which represent the lowest long run cost to customers (Australian Energy Regulator, 2019).

Options analysis has always been a hot topic for discussion between subject matter experts where factors of different natures influence the final decision. For an option to be selected as preferred, it has to fulfil the requirements put forth by the AER and also the internal standards and specifications, whilst maintaining the outcome risk at an acceptable level within

the business risk appetite. All of this is expected to happen whilst trying to minimise the capital and operational expenditure of the targeted investments.

As part of the regulation requirement subjected by the AER, TasNetworks undergoes a revenue reset process where an internally endorsed pricing proposal is submitted to the Australian Energy Regulator (AER) for each regulatory control period of 5 years. The proposal consists of investments with a set of feasible options, each with the same driver but differing risk profiles and expenditure forecasts. Each investment goes through a stringent cost benefit analysis (CBA) to determine the most economical solution to mitigate the baseline risk that most benefits the end customer.

For TasNetworks, the most recent completed revenue reset process was in 2019. After the reset process, TasNetworks undertook a Post Implementation Review (PIR) to identify any potential bottlenecks to overcome in the upcoming revenue submission.

## Journey of Decision-Making at TasNetworks

The PIR identified areas of success and improvement. While the reset process was an overall success from securing a satisfactory revenue and customer pricing outcome, it was acknowledged that TasNetworks is on an asset management maturity road which signifies the need for improved systems, processes and data quality. The review strongly stressed the necessity of revisiting the way risk is being assessed and quantified to further strengthen

the future proposals. A lowlight of the submission was that not all investments had been assessed based on a common value framework, which made the comparison of options efficiency difficult for the AER to assess. This was particularly important as the outcome of these assessments was utilised as inputs for economic analysis.

As another outcome of the reset process, TasNetworks approach for optimising the proposal was not well-structured and mature enough to pass the AER’s requirements. Similar to individual investments, the portfolio optimisation was identified as an area for improvement in the hope of shining more light on to the total portfolio value. For example, a preferred option for an investment considered in isolation may not provide the highest overall value when considered across an entire portfolio of investments. Capital could be redirected to another investment to provide a higher overall benefit to the organisation when a broader portfolio view is considered. By improving the optimisation process, TasNetworks seeks for visibility over specific efficiencies in overall program value and benefits returned.

Since then, TasNetworks has made extensive improvements to the asset management system, especially in the underlying foundations in data quality improvement and consistency of value framework application - to progress towards being more risk-intelligent and to enable TasNetworks to adopt value-based asset management practices (Figure 1). This ensures the outcomes are achieved by using risk to evaluate the operation of assets over the course of their respective asset life cycle, under various investment options. Similar to many other energy and infrastructure industry peers, TasNetworks recognises the aging of assets as one of the highest contributing risks. This underpins the need for better, more robust economic analysis and program of work optimisation processes.

In the previous regulatory period, TasNetworks’ asset maturity level was mainly considering age and condition-based assessments. Using a common value framework approach for decision making increases TasNetworks’ maturity level towards value-based decision making, and as a result, addresses a key component of the AER’s feedback and PIR from the last revenue proposal.

**Figure 1 – Asset sustainment maturity**



## METHODOLOGY

### Data Cleansing

The uplift in asset data quality was carried out in a targeted manner and involved the collation of information from an array of sources into a single repository. Although large amounts of data already existed, doubt regarding its discovery and authenticity was evident as it was buried under multiple layers of documentation and reports, collected via several different methods over previous years.

Data cleansing was prioritised based on revenue contribution of the asset type, and the importance of the data required for decision-making. This included static data such as asset characteristics (e.g. in-service date), as well as dynamic information, including condition data (e.g. health scores). The work needed to be carefully executed to ensure maximum value is captured by carefully selecting the assets to target and data points to capture, special attention needed to be given to the cost/benefit ratio of a data point, i.e., to have a balanced approach to ensure resources are not over exhausted for a data point. This work involved iterative steps of physically validating and reading information, detective work of collecting information from nearby assets and tribal knowledge where documents were scarce for all asset types.

The results were an impressive increase in data completeness from 30%-60% in 2019 to 97.7% in 2022. This increase in completeness came along with a jump in quality from 60% to 80%, and work continues to be executed to further increase to over 95% data quality. As described in 2.2, TasNetworks Value Framework approach includes asset life modelling, so the quality of asset data is critical when driving data-driven decision making for asset-based investments.

### The Value Framework

The concept of value can vary depending on differing points of view. Figure 2 illustrates this point where people in different roles hold different ideas of what they consider as value. However, all these differing perceptions of value can be equally valid.

### What is "Value"?

Depends Who You Ask...

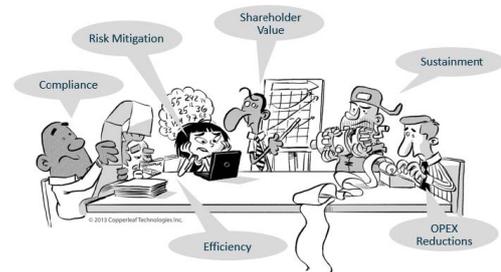


Figure 2 – What is value?

A value framework provides a consistent structured approach to capture all the different measures of value that are important for an organisation, such as the diverse examples above. Equally important in this framework is the quantification for each of these measures of value, so that they can all be compared back to a common economic value (\$). This allows multiple dissimilar investments to be objectively assessed and compared against each other during the investment decision making process. For example, a project which reduces the impact to local endangered species can be compared against an asset sustainment project which increases reliability and reduces safety risk.

TasNetworks value framework encompasses multiple categories of value, such as:

- Risk mitigation – primary driver of value with multiple subcategories such as safety, environmental, network performance, etc.
- Financial benefits – cost savings, cost avoidance, future asset scrap value, etc.
- Costs – contribute negative value as the capital or operating expenditure offsets value gained through risk mitigation and other financial benefits

And is built based on risk cost Equation 1 in (Australian Energy Regulator, 2019).

$$\begin{aligned} \text{Annual asset risk cost (\$)} &= \text{Probability of asset failure} \times \text{Asset units (No)} \\ &\times \text{Likelihood of consequence of failure event} \\ &\times \text{Consequence cost of failure event} \end{aligned}$$

Equation 1

Quantification of these measures of value have been considered and aligned back to a common value (\$). For example:

- Value of risk of oil release can be quantified using:

$$[Oil\ capacity] \times [\$ \text{ Cost per L}] \times [\% \text{ oil escaped}] \times [likelihood\ of\ failure]$$

- Value for risk of network performance can be quantified using:

$$[Outage\ duration] \times [Load\ impacted] \times [Value\ of\ customer\ reliability]$$

The quantified measures of value are then also aligned back to the TasNetworks corporate risk framework categories, likelihood, and consequence levels as shown below in Figure 3.

**Figure 3 – TasNetworks risk matrix (TasNetworks, 2020)**

LIKELIHOOD		CONSEQUENCE				
		1 NEGLECTIBLE	2 MINOR	3 MODERATE	4 MAJOR	5 SEVERE
<ul style="list-style-type: none"> <li>≥ 99% probability</li> <li>Impact occurring now</li> <li>Could occur within “days to weeks”</li> </ul>	5 ALMOST CERTAIN	MEDIUM	MEDIUM	HIGH	VERY HIGH	VERY HIGH
<ul style="list-style-type: none"> <li>50% - 98% probability</li> <li>Balance of probability will occur</li> <li>Could occur within “weeks to months”</li> </ul>	4 LIKELY	LOW	MEDIUM	HIGH	HIGH	VERY HIGH
<ul style="list-style-type: none"> <li>20% - 49% probability</li> <li>May occur shortly but a distinct probability it won't</li> <li>Could occur within “months to years”</li> </ul>	3 POSSIBLE	LOW	LOW	MEDIUM	HIGH	HIGH
<ul style="list-style-type: none"> <li>1% - 19% probability</li> <li>May occur but not anticipated</li> <li>Could occur in “years to decades”</li> </ul>	2 UNLIKELY	LOW	LOW	MEDIUM	MEDIUM	HIGH
<ul style="list-style-type: none"> <li>≤1% probability</li> <li>Occurrence requires exceptional circumstances</li> </ul>	1 RARE	LOW	LOW	LOW	MEDIUM	MEDIUM

The TasNetworks value framework also considers asset modelling using condition decay curves, probability of failure curves, risk consequences and condition monitoring inputs. This part of the value framework provides risk modelling over large asset populations and is driven entirely off asset data (in-service dates, condition monitoring inputs, etc.). Hence, good data quality and the data cleansing discussed in Section 2.1 provides significant benefits to asset modelling.

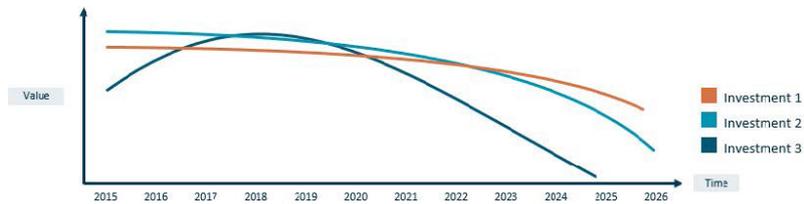
Another key component of the Value Framework is the consideration of time with regards to overall investment value. The timing of an investment could increase or decrease its overall value due to:

- Changes in cost (both capital and operating expenditure)
- Changes in risk mitigation (deferral can lead to changes in exposure to risk)
- Changes to other benefits (e.g. realisation of cost savings is deferred)
- Shape of asset curves and current asset condition (condition decay and probability of failure)
- Time value of money (inflation and discounting applied to all the above)

Different investments will behave differently over time, so consideration of investment timing can have a significant impact on total overall value. This is demonstrated in Figure 4.

In the TasNetworks value framework, this changing value over time and realisation of future cash flows and benefits are represented as Net Present Value (NPV), to allow for assessment back to current value.

**Figure 4 – Effect of time on value-based decision making**



**The value an investment delivers changes depending on the timing of that investment**

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### Optimisation

The digital solution adopted and implemented to apply TasNetworks value framework to the investment decision making process is the Copperleaf software suite (Copperleaf, 2022). Copperleaf incorporates all aspects of the TasNetworks value framework discussed above, and considers the time-variant nature of cost, value, and risk.

Also incorporated within Copperleaf is a mathematical optimisation algorithm which can consider the following (Copperleaf, 2016):

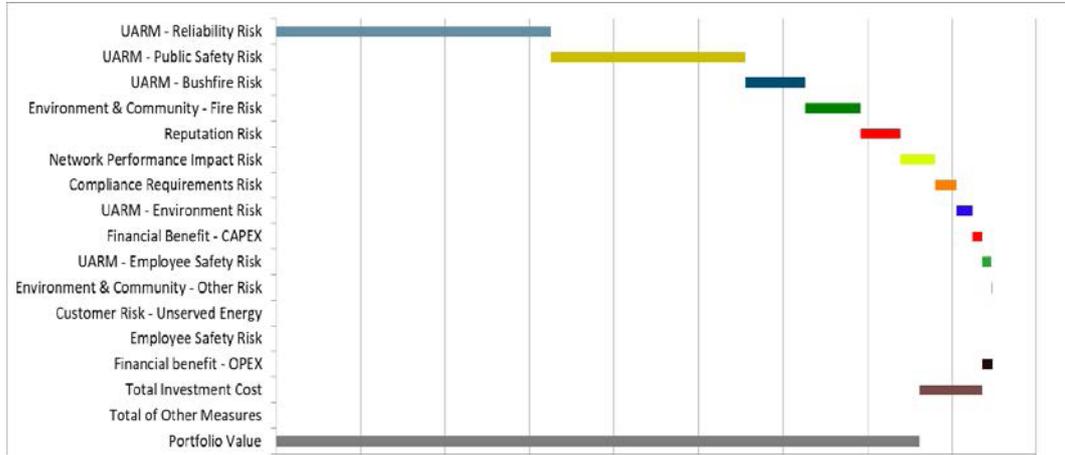
- Asset modelling including:
  - o condition decay & probability of failure curves
  - o condition monitoring inputs
  - o risk consequence values
- Multiple dissimilar investments, with multiple options for each (hundreds of thousands / millions)
- Individual investment limitations (must do, project start/finish boundaries, recommended options, dependencies, etc.)
- Multiple measures of value aligned to a common economic scale (\$)
- Multiple constraint criteria (min/max, capital cost, operating cost, risk, resources, service level metrics, etc.)
- Effect of time on investments (deferrals, change in risk, inflation, discounting, etc.)
- Multiple scenario analysis (change in constraints, sensitivity analysis, etc.)

The mathematical algorithm iterates through each possible combination of investment, alternative and investment timing whilst respecting all applied limitations and constraints to find the optimum solution which provides the highest overall value to the portfolio (\$ common economic scale) whilst meeting all constraints and limitations. This level of mathematical analysis would be effectively impossible to conduct without a digital solution. Effectively providing significant efficiency and quality gains for team members undertaking this analysis.

Individual optimised investment plans are stored in scenarios. These can then be compared against different scenarios (e.g. changes in constraints) which provide different optimised investment plans. These comparisons provide visibility of changes to options, overall risk, value and timing of investments in response to varying constraints. Figure 5 provides an example of a waterfall comparison chart between different scenarios. It displays the change in total portfolio value along with the individual measures of value and their individual contributions to the change in total value.

This digital solution meets TasNetworks' requirements to objectively make data driven decisions on dis-similar asset investments using the TasNetworks value framework.

**Figure 5** – Example scenario comparison chart



## TRIAL ANALYSIS: TASNETWORKS PORTFOLIO OPTIMISATION

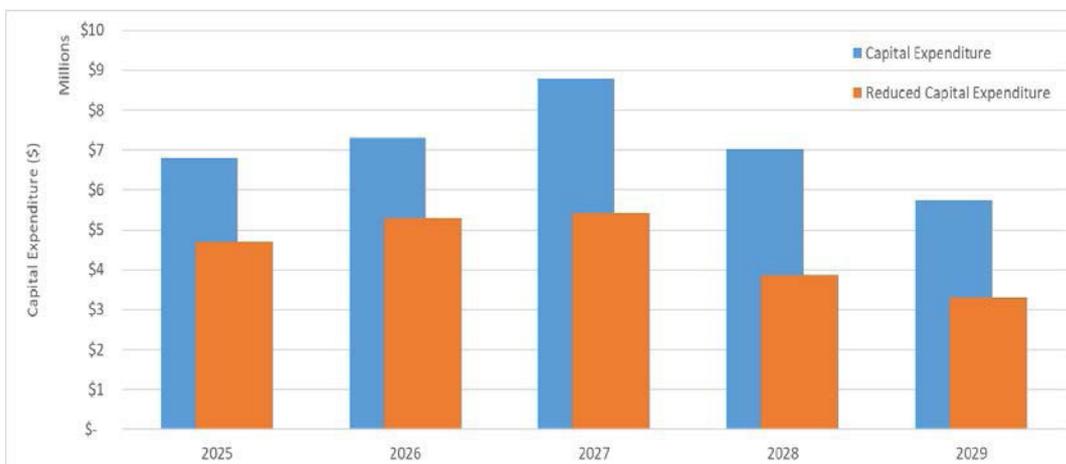
### Background

The intent of this trial was to analyse two (2) different optimisation methods to determine the best approach for including investments in a work program that mitigates an adequate level of risk at the most affordable cost. The optimisation methods will consider the two (2) investment scenarios; the initial capital expenditure and, based on the relevant business drivers, the capital expenditure reduction. The methods will be applied to the common value framework over the upcoming regulatory control period.

### Parameters and Constraints

This trial analysed a 10% sample set of investments from TasNetworks’ current distribution revenue submission portfolio. For each optimisation method the initial capital expenditure across the investment sample is approximately \$35 million over a five (5) year period. The budget constraint applied to the capital expenditure over this period is set at \$22 million to analyse the resultant value outcome, with this reduced investment. Figure 6 illustrates the trial parameters.

**Figure 6** – Proposed capital expenditure profiles before and after constraints are applied



The first optimisation method was a manual investment reduction approach, looking purely at the capital expenditure. This approach aimed to reduce the proposed work program capital expenditure to achieve the business constraint of a reduced budget. The second method looked at the work program capital expenditure and total quantified risk to determine 1) the best option for the investment and 2) the optimal time to complete the investment that provides the best outcome to the business and the end consumer within the same budget constraint.

The optimisation methods both looked at either deferring the investment out by a maximum of 10 years or selecting an alternative option for the investment to achieve the desired budget. No constraints were applied outside of the nominated time frame and no investment start dates were shifted earlier into the current regulatory control period.

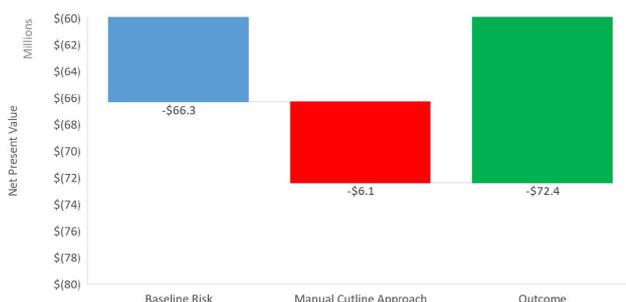
### Optimisation Results

The objective for using optimisation methods when justifying network investments is to ensure adequate levels of risk are maintained so our customers are receiving the best service at the most economical cost. The baseline risk is determined from the preferred options in the initial submission which was calculated using CBA.

#### Manual Cutline Optimisation Method

The manual cutline optimisation method reviewed each investment and reduced the capital expenditure for specific investments to achieve the business constraint of \$22 million; this required reducing the capital expenditure by \$13 million across the 5 years; as shown in Figure 6.

**Figure 7 – Proposed changes to risk following the reduction in overall capital expenditure**



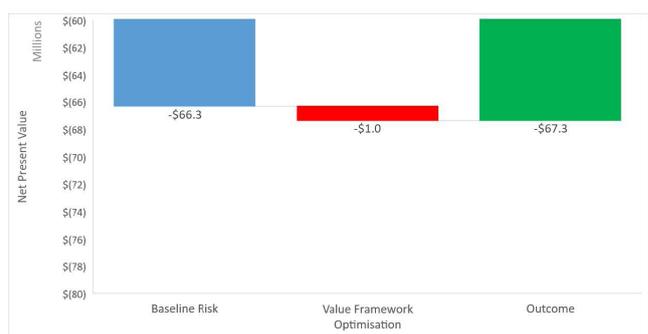
This approach focused on reducing the capital expenditure of investments based on their individual allocated capital. Investments were either deferred into the next regulatory period or an alternative option was selected for that investment; which usually consisted of a reduced scope option. Once the budget constraint was met using this method the resultant risk was calculated. This resulted in a net decrease in net present value (NPV) of \$6.1M due to the increase in risk exposure.

#### Value Framework Optimisation Method

The value framework optimisation method is performed in the Portfolio module of the Copperleaf application. Similar to the first method, this approach took the entire portfolio of investments and found the optimal investment outcome for the business based on the constraints applied to the capital expenditure. The difference with this method was the optimisation process also took into account the associated value (or risk) with each investment and determined from a portfolio level what combination of investments during the specified time frame provided the business with the highest investment value (i.e. mitigate the most risk over the five (5) year period with the designated budget (Figure 8).

By understanding what quantified value each investment added to the portfolio, the optimisation process determined the best combination of investment alternatives to be implemented to give the business the optimal investment outcome over the nominated timeframe (given the constraints). This resulted in a net decrease in NPV of \$1M due to the increase in risk exposure.

**Figure 8 – Proposed changes to risk following the reduction in overall capital expenditure**



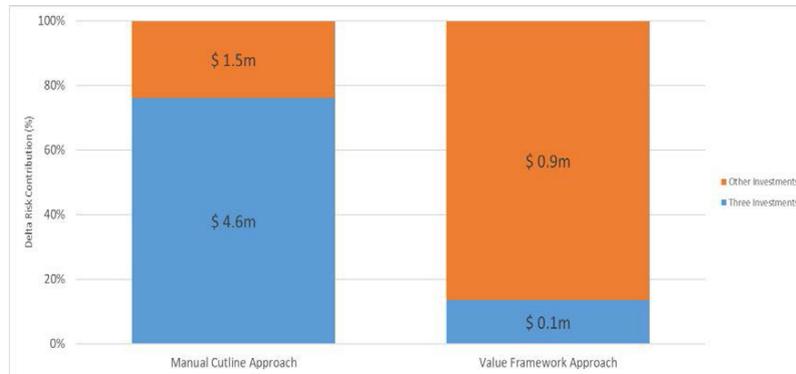
### Discussion

The results from the manual cutline optimisation method show a 9% increase in risk (\$6.1 million) with a 37% reduction in the capital expenditure over the five (5) year timeframe, whilst the value framework method shows only a 2% (\$1.0 million) increase in risk.

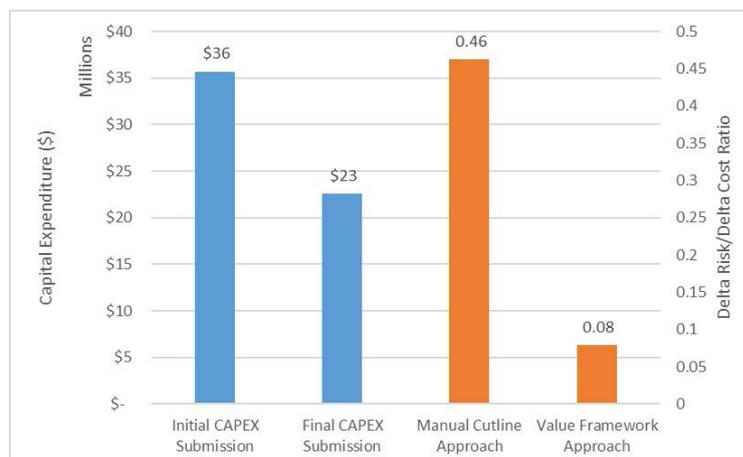
The major difference was the deferral of three (3) investments in the manual cutline approach which unknowingly had a significant impact on the risk profile of the investment portfolio; the value framework method changed the option for only one (1) of these investments and selected alternative investments to optimise in the portfolio to achieve the desired budget. Figure 9 shows 76% of the \$6.1 million increase was contributed to by the deferral of the three (3) mentioned investments whilst in the value framework approach the risk contribution of these three (3) investments was only 14%.

Although there was a difference in risk profiles between each optimisation method, the magnitude of the risk-to-cost ratio for both methods produced a value less than 1 (Figure 10). These results show that even with a significant reduction in capital expenditure over the specified time frame, the incremental risk is insignificant and validates the decision to reduce the capital for this portfolio of investments. In saying that, this trial only analysed a sample set of investments across our total network capital revenue submission. It is anticipated that the risk profile would significantly increase with a larger sample set of diverse investments across both the distribution and transmission network.

**Figure 9 – Risk contribution for each optimisation method across three (3) major investments**



**Figure 10 – Risk-cost ratios between each optimisation method based on the reduction in capital expenditure**



## Benefit Realisation

The benefits of using the common value framework optimisation method for the determination of investments in a work program is clearly shown in the previous sections. Through the analysis there were some key areas of real value gain from using the value framework method. These key areas are outlined below.

### *Time Saving and Maximising Value*

The manual cutline approach is a relatively quick optimisation method as it is only looking at reducing the overall capital expenditure to achieve the desired budget. It has been estimated to complete the manual cutline approach across the 20 investments in the trial would take approximately 1 hour. Based on running the common value framework method in the Copperleaf platform, the time saving is estimated to be up to 50% across the portfolio of investments; with a larger sample size the time saving is expected to be even greater as the manual approach would take longer to analyse with an increase in the number of investments.

In addition to the time savings benefits of the value framework method, there is also quantified benefits in achieving the most value out of your investments. Although the manual approach is relatively quick in terms of optimisation against capital expenditure, if the method extended to investigate the impacts on risk, it is estimated to take approximately 90% longer than the value framework method to identify. This is based on the fact that the manual cutline approach requires a review of each individual investment separately compared to the common value framework method which optimises the entire investment portfolio. In the case of TasNetworks this represents approximately 200 investments with a minimum of three (3) options each.

### *Visibility and Evaluation Consistency*

Some qualitative benefits from using the value framework method over the manual cutline approach consist of:

- The common value framework being consistent across different expenditure categories as well as across network and non-network investments. The benefits of a single source of truth gives the business the ability to assess the business risk through a consistent approach and have an

informed understanding on the risk impact when adjusting overall capital expenditure – the manual cutline approach requires optimisation and sensitivity analysis to be done at the individual investment level, in separate asset expenditure categories across network and non-network.

- A clearer understanding of specific risk impact for each investment (or portfolio) that aligns with the common value framework and enables the business to target certain value measures in the value framework to increase or decrease the risk appetite. The manual cutline approach would require extensive analysis on the existing quantified risk tools to determine 1) the current risk profile for each risk category and 2) the treated risk profile for each investment across each risk category, and 3) the impact of investment timing on the risk profile of the entire portfolio.

## RECOMMENDATIONS

When economically justifying investment for large capital projects, based on the results from the trial, it is beneficial to evaluate the optimal value of an investment based on a common value framework to ensure a well-informed, data driven decision is being made. Whilst in some cases a manual cutline approach can provide a high-level solution to optimising work programs, the common value framework method will give a more defined outcome to managing risk and ensuring the business is getting the most value out of their investment.

Benefits have also been realised through the optimisation approach at the portfolio level rather than analysing individual investments, as this approach can give a holistic view of your risk profile rather than disseminating your risk at each individual investment which may conceal potential investment value. The benefit of using the common value framework is correlated to the size of the capital investment and will provide large private sector industries or regulated businesses a data-informed method for justifying investment.

This discussion and trial analysis have focussed on TasNetworks – a public utility managing a large fleet of electrical transmission and distribution assets. However, the concept of a Value Framework to measure and assess multiple dissimilar measures of value to a common economic scale, deployed

alongside a digital solution to optimise investments based on this value framework to provide data-driven decision making is industry agnostic. This approach of applying a common Value Framework can be applied to any asset intensive organisation to achieve similar benefits and value realisation.

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# STAR PROFILE – James Eyre CPAM

## 1. Why Asset Management?

Its always been a passion of mine to strive for more efficient and sustainable methods to maintain asset towards greater reliability. I always remember being told once that you want to achieve improved asset reliability but also improved asset predictability.



## 2. How long have you been working in the asset management sector?

It will be 20 years in December of this year.

## 3. What is your speciality?

I like to delve in to master data improvements and identify some areas whereby we can make it easier for our planners and schedulers to capture all assets in their endeavours.

## 4. What drew you to explore more about this particular speciality?

I worked in the Oil & Gas sector and learned how powerful SAP could be when all of its functions are accessible and utilized.

## 5. What's the best career advice you've ever received and who gave it to you?

Don't be afraid to get completely out of your comfort zone.

## 6. What makes a great asset manager?

Someone who takes the time to assess all information presented and not just a limited sample size.

## 7. What is the most exciting trend that you've noticed in asset management today?

The advancements in technology in how maintenance is conducted. Examples such as using drones to inspect assets as well as our maintenance teams using tablets to complete work and create work requests in the field.

## 8. What is the biggest challenge facing up-and-coming asset managers today?

I think sticking with being an asset manager away from all the pressures and challenges.

## 9. What advice would you give to an up-and-coming asset manager today?

That there is a massive amount of information to assist you in places such as the Asset Management Council as well as great companies such as RTIO in having collaboration with other asset managers with the same passion.

## 10. What is your proudest career achievement?

Being involved in the start up of both a LNG Plant (Santos GLNG) and an Iron Ore Operation (RTiO Gudai-Darri).

## 11. What's next for you?

Currently working towards Gudai-Darri reaching steady-state operation and then Gudai-Darri Phase 2.

## 12. When you're not busy at work, what do you enjoy doing to unwind/relax/explore?

Whatever my wife and kids tell me and after that cycling.

# STAR PROFILE – Carlos Maurício CPAM

## 1. Why Asset Management?

Asset Management aims to support companies to achieve their business outputs by focusing on getting the stated capabilities from their physical assets and generating more predictable and sustainable cash flows from them. As a mechanical engineer, I have always been involved in managing projects and initiatives to support business operations, initially as an individual contributor and after leading brownfield improvements. So, moving my attention to Asset Management frameworks came almost naturally due to the benefits I can get from using Asset Management concepts to help me successfully deliver better and more assertive brownfield projects.

## 2. How long have you been working in the asset management sector?

I've been working in this sector for 17 years now. During this time, I had the opportunity to lead Asset management initiatives in Brazil, Australia and Chile for various business sectors such as mining, manufacturing goods and oil & gas.

## 3. What is your speciality?

I specialise in sustaining Capex portfolio management. I support customers by delivering end-to-end improvements with a focus on value creation. As part of this process, I support organisations to shift from just project metric targets to getting strategic value from the portfolio. I also help them to clearly and consistently define the benefits to be delivered in line with the business strategy.

## 4. What drew you to explore more about this particular speciality?

Managing brownfield improvement could be challenging due to the variety of projects that can come into the portfolio. So, deciding where to spend time and money can be problematic if an unclear framework is in place. The Asset Management model is a perfect fit to help in this process due to its "output focus" to guarantee deliveries that match the organisation's objectives. That's why I am investing more and more time in exploring Asset management concepts.

## 5. What is the most exciting trend that you've noticed in asset management today?

I believe the massive use of data analytics to support the decision-making process is revolutionary.

So, combining a solid Asset Management methodology with the current data capability may lead organisations to a game-change in terms of efficiency in capital allocation maximizing their NPV per \$ invested.

## 6. What is the biggest challenge facing the asset management sector today?

Balancing short-term results with long-term asset management strategies are one of the biggest challenges. The wrong approach may lead to fast results but higher investments in the future due to unplanned stoppages. To tackle this challenge, the AM framework is a good partner, mainly because it helps organisations continually focus on their business outputs.

## 7. What's next for you?

Keeping investing in my pathway to becoming a CFAM and delivering better results for the organisation I am working for.

## 8. When you're not busy at work, what do you enjoy doing to unwind/relax/explore?

I like to listen to music, play guitar and study data analytics tools. I love data modelling, and I have spent more and more time on that. It will for sure help me in my future endeavours.



# STAR PROFILE – Julie Saunders CSAM

## 1. Why Asset Management?

I like the variety that asset management provides. It enables you to develop technical skills as well as leadership skills that can be applied across a diverse range of industries and infrastructure assets.



## 2. How long have you been working in the asset management sector?

12 years, with the first 11 years in the water industry and the last year has been in the electrical industry.

## 3. What is your speciality?

Being a multi-disciplined Senior Asset Manager in the utility sector when I have experience working with mechanical, electrical, civil and chemical assets. I have a successful history of achieving results in a regulated environment by driving future planning, cost savings, safety improvements and optimising performance through – growth modelling, risk assessment, continuous improvement and technology implementation.

## 4. What drew you to explore more about this particular speciality?

I enjoy working on essential services as they provide an important service to the community. The utility sector offers a wide range of experiences and the ability to continuously develop new skills.

## 5. What's the best career advice you've ever received and who gave it to you?

When I was a graduate a consultant told me that sometimes you have to go outside your comfort zone to get the experience you need, and he was right!

## 6. What makes a great asset manager?

Someone who can manage the conflicting priorities between asset management and other business departments such as operations, future planning and finance. As well as being able to focus on the present issues and maintain a strategic outlook.

## 7. What is the most exciting trend that you've noticed in asset management today?

A greater importance on data capture, accuracy and integration. The data output is only as good as the data input!

## 8. What is the biggest challenge facing the asset management sector today/your particular field of asset management today?

Today, utility providers are faced with tough challenges – increased demand, diminishing resources, and changing climate. Moreover, an ageing infrastructure combined with the push toward sustainability requires suitable infrastructure investments and an efficient operating budget. This combined with lack of data, resources and budget can make asset management rather challenging.

## 9. What is your proudest career achievement?

Mitigating late delivery of key projects and successfully managing an emergency asset replacement program for 5 years where I directed all program requirements including establishment of structure, processes, metrics, and reporting. I built a solid reputation as someone who drove forward project goals to deliver 95% of program budget.

## 10. When you're not busy at work, what do you enjoy doing to unwind/relax/explore?

Apart from catching up with family and friends, I enjoy travelling, hiking, baking and sewing.

# STAR PROFILE – Phil Sunderland CSAM

## 1. Why Asset Management?

I have always worked in asset-centric operations. As my career developed, I took on assignments that both addressed business needs and continued to grow my experience and competencies within the asset management landscape. I didn't set an objective at the beginning of my career to become an asset management practitioner and leader, but I have thoroughly enjoyed the challenges and achievements that it has provided. When I first read the ISO 5500x series of standards a few years ago, I realised that "this is what I do".

## 2. How long have you been working in the asset management sector?

40 years and counting. Although I didn't know it at the time, all the jobs I have undertaken through my career fit somewhere within the scope of Asset Management. My roles have included design engineer, maintenance & reliability supervisor, business information systems implementation coordinator, maintenance superintendent, and many more. Along the way I have spent a lot of time working on the development and implementation best-practice maintenance processes, training and development, organisation design and staffing, and financial management. I have now retired from full time work and am working part time delivering Asset Management training on behalf of the Asset Management College.

## 3. What's your speciality?

The end-to-end Maintenance Business Process. Optimisation of the maintenance program, organisation design & staffing/contracting, work management, maintenance planning & scheduling processes, CMMS configuration and management, KPI's & reporting, financial controls, and of course safe work execution.

## 4. What's the best career advice you've ever received, and who gave it to you?

"Ask the right questions". This advice came from my first boss, very early in my career when I was working as a design engineer. I've found real value in spending time to think about what the key issues are, what I do and don't know about them, and



then liaising with the right people to ask those right questions and determine the best way forward.

## 5. What makes a great asset manager?

It starts with developing all the skills of an excellent leader and manager, including interpersonal skills, analytical capability, and judgement. Add to that a deep understanding of each of the business, the asset(s), and management systems. Finally, being willing and able to work across organisational boundaries to deliver optimal long-term value for the stakeholders.

## 6. What's your proudest career achievement?

I had a multi-year assignment in an operation (overseas) that was challenged on many fronts, and where business performance was not acceptable. I was a key part of the team that facilitated re-build and re-focus of both the systems and organisation. It was gratifying to see the improvements, and restoration to a level of performance we could be proud of.

## 7. What's the most exciting trend that you've noticed in asset management today?

I think it's great to see the growing commitment to the ISO5500x standards across both government and industry. It builds understanding of how the various engineering, financial and support functions need to work together to deliver value and helps to break down organisational silos.

The ever-growing ability to access data, and more importantly to efficiently synthesise it into useful information for decision making is another trend that is valuable for everyone involved in asset management.

**8. What is the biggest challenge facing up-and-coming asset managers today?**

I concur with Camilo Londono's answer in his profile in the June issue of the Asset Journal. I think it will continue to be hard work to avoid the "tick-a-box" approach to asset management so as to meet a regulatory mandate or desire for certification. Asset management requires documentation, but it is much more about value-focussed business systems, engaged and competent people, and a positive working culture.

**9. What's next for you?**

Sharing my experience with others. I have always enjoyed coaching and training, and I now have the

opportunity to provide training and consulting in Asset Management on a part-time basis. Of course, I plan to continue to enjoy the more relaxed lifestyle that retirement from full-time work provides.

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- Digital Twins in NSW and VIC (WSP)
- How to approach being informed for the future (Department of Transport VIC)
- Government's journey; lifecycle planning; optimised decision making and balancing service delivery with ROI (Brightly)
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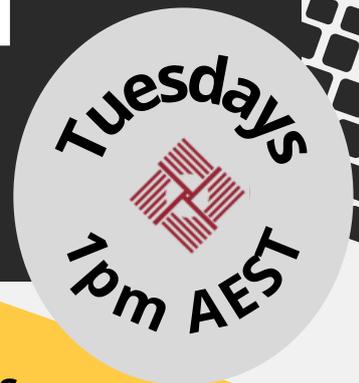
## Program cost

To join as a Mentee, it requires an investment in your future of just \$350 for AMCouncil members (\$500 for non-members) for each pairing. This includes support within a dedicated specialised mentoring platform and training to get the most out of your mentoring partnership.

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NEW CPD TECHNICAL WEBINAR SERIES

# ASSET MANAGEMENT *in Action*



*The Asset Management Council is pleased to present this series showcasing submissions from the*

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# GLOBAL PASSPORT

FOR AMCOUNCIL MEMBERS



## What does the Global Passport offer me?

If you are a member of the Asset Management Council, then you are entitled to your AMCouncil global passport. This is your ticket to connect to the Global Asset Management Community to tap into global asset management best practice, trends, information and an opportunity to expand your personal networks.

The AMCouncil Global Passport offers AMCouncil members access to special discounts to attend GFMAM member organisations events at reduced prices and access to global certification for CPAM and CSAM levels, as well as other special member only offers as become available from time-to-time. To be eligible for these benefits you must be a financial member of Asset Management Council Australia and not reside within the country you are claiming benefits from.

**Log in to start your global journey:**

**[www.amcouncil.com.au/PASSPORT](http://www.amcouncil.com.au/PASSPORT)**

# CHAPTER NEWS

## BRISBANE

Brisbane Chapter have worked hard behind the scenes to bring a monthly series of technical events. The first month of this quarter began with a hybrid event, where in person and online delegates met to discuss the theme of sustainability meets reality. It was a unique session with a hypothetical 'CEO' who had brought together a panel of sustainability specialists to provide answers and suggestions so that they could then prepare pragmatic and realistic approaches for their board to consider. Participants provided some examples and suggestions as to how sustainability can be implemented within an organisation, what challenges could be encountered and how these can be overcome.

It was back to webinar for July with a technical session broadcast locally, nationally (and internationally) from the Chapter for their event on the benefits of good operations and maintenance practices for asset management. Ken Chapman and Lachlan Maclean, seasoned operations and maintenance professionals, explored the role of operations and maintenance in asset management frameworks and the benefits that good operations and maintenance practices can provide. The presenters also discussed worked examples showing the cascading of organisational context and objectives down to targeted operations and maintenance activities.

This session was followed up in September with an in person workshop on the same topic, with a series of roundtable discussions centred around key themes such as considerations for assessing existing O&M approaches and practices, with particular emphasis on their cost and accuracy, alignment with the risk tolerance of the organisation, and how they can be underpinned by a robust governance framework; importance of key asset management framework documentation in determining the organisation's O&M philosophy and their effectiveness in creating a line of sight from strategy to on-ground practices; strategies to achieve the O&M objectives identified in the organisation's asset management framework; continuous improvement of O&M practices to

increase the efficiency, effectiveness and reliability of service delivery, as well as to improve decisions relating to assets; and building sustainability within O&M practices to mitigate the impacts of an uncertain and changing environment on asset expectations and outcomes.

## GIPPSLAND

The Asset Management Council, in collaboration with Federation University (Fed Uni), held its annual RAID (Research and Industry Day) event in July. Virtual delegates were treated to the latest in asset management from post-graduate research students and industry leaders over a jam packed two day line up. The RAID presentations were a fine way to demonstrate the collaboration and importance to knowledge-sharing within the asset management community.

# CHAPTER NEWS

## MELBOURNE

Melbourne Chapter continued with monthly technical events, starting off the quarter in July with an update of ISOTC251 from Martin Kerr, the Asset Management Council's members representative on the TC251. TC251 has commenced the second phase of the review of various standards including 55000 and 55001 and it was an opportunity to see where things were up to and ask questions.

August was time for an interactive discussion to talk about shared accountability facilitated by Nick Phillips who explored how an understanding of accountability drives business success.

Members hit the road in September with a site visit to the Toyota Hydrogen Demonstration Centre in for a guided tour of the education centre, learned about the technology that powers the Toyota Mirai vehicle, a hydrogen fuel cell vehicle, and viewed a demonstration of the hydrogen refuelling station.

An extra session will be squeezed in towards the end of September to talk about finance and asset management, in a two part presentation over a luncheon, with talks on physical asset depreciation and the non-financial value of asset valuations.



## NEW ZEALAND

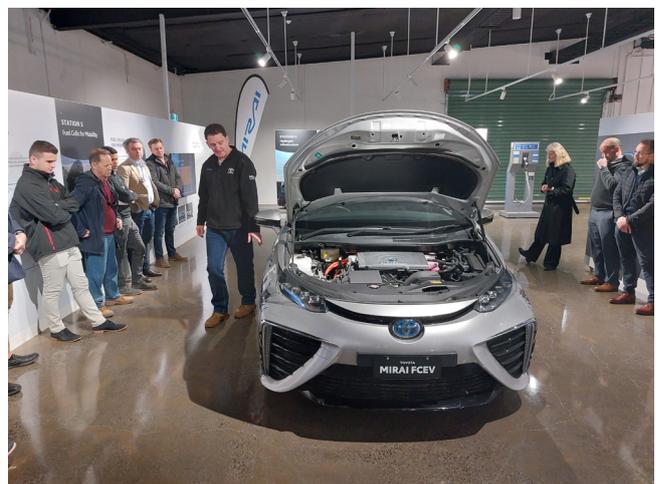
New Zealand held its annual asset management symposium on the 15 September, a hybrid event with in person delegates enjoying a day at Butterfly Creek in Auckland, and a captive online audience to explore the theme of realising value in New Zealand's changing environment. The event brought representatives from a variety of industries together to share asset management experiences and challenges, and provided an ideal forum for networking & information sharing to talk about emerging trends in asset management.

## SYDNEY

Sydney started off the quarter with their annual session dedicated to YAMPs to dispel some myths around some features of good Asset Management practice, from the fresh perspective of two young Asset Management practitioners.

In August they looked at the pathway to net zero with a leaders in infrastructure discussion to explore the context surrounding net zero targets and establish alignment on key terminology.

Finally, the quarter was rounded off with hot or not: planning for a cool green Western Sydney where Sydney Water showed how we can realise a once-in-a-generation opportunity to create a resilient and sustainable city where people want to live, work and visit.



# CHAPTER NEWS



# New Members

Martin	Boettcher
Ben	Ready
Edmond	Babela
Jason	Yu
Jim	Mahood
Julie	Bevan
John	Gorman
Neda	Abed khojasteh
Christian	Lancer
Phillip	Jackson
Claire	Picking
Stephanie	Hastings
Ashley	Hulsman
Bevin	Watts
Hongtao	Cao
Karen	Strozycki
Dante	De Thomasis
Chika	Onyeogaziri
Manoj	Bhattarai
Leena	Wood
Eduardo	Agnoletti
Chris	Butt
Weibin	Gu
Michael	Dunne
Stephen	Thomson
Gabriel	Gonzalez
Sam	Burke
Arman	Kianpour
Donny	Yap
Vic	Hensley
Navin	Bhatnagar
Primesh	Jassa
Farshid	Hormozi Nejad
Alisha	Koirala
Moira	McClean
Defence Estate Infrastructure, NZDF	
David	Mubayiwa
Salem	Talib
Leighton	Taylor
Jason	King
Paul	O'Docherty
Ekaterina	Ivicheva
Martin	McCurry

Rahul	Sud
Callan	Camilleri
Amos	Fox
Andrew	Sugden
Andrew	McArthur
Aed	Mac Phaidin
Jobince	Joseph
Shashidhar	Rao
Arash	Daemi
Adam	Taylor
Peter	Nastasi
Alex	Meacco
Brent	Hadaway
Dean	Miller
Hui	Chen
Melanie	Field
George	Wu
Bruno	Reato
Christopher	Hall
Luke	McDonald
Maria	Peterson
Ryan	Luck
Stephen	Vick
Avidan	Manmothe
Erdem	Boncukcu
Sophie	Spyrellis
Boris	Kirigin
Raunak	Pinto
Micheal	Morris
Simon	Phillips
James	Gorman
Thomas	Bourke
Md	Islam
David	Edge
Holly	Grand-Court
Syman	Nand
James	Eyre
Johann	Visser
Benjamin	Chitiyo
Sarah	Sultani
Ahmed	Mohamed
Rohan	Brittain
Gerard	Battye
Kate	Gray

# New Members

Adam	Shannon
Peter	Threlfall
Alan	Prizmic
Ricardo	Alcala
Thabani	Ndabandaba
Marius	Van Deventer
David	Kennington
Luke	Fonseka
Melissa	Winnel
Emily	Lee
Tania	Broadley
Felipe	Chaves
John	Robertson
Kula	Murugiah
Batisani	Tshuma
Michael	Hopp
Siebe	van Oorschot
Jamie	Hartnack
John	Nesbit
Millie	Fulton
Michael	Turk
Natalie	Revie
Nikhil	Saurabh
Katherine	Holliday
Roоз	Darestani
Cherie	Silvestri
Gregory	Herbert
Anni	Toivonen
Davood	Mosaddar
Kevin	Gunasekara
Emmi	Zhao
Emily	Carrick
Fiona	Flint
Robert	Read
Clara	Reyes-Carcach
Sam	Ortisi
Ramachandran	Nanjappagounder
Greg	Middleton
Craig	Wilson
Bradley	Duck
Manjeet	Singh
Misheck	Chisaga
Dean	Thomas
Josh	Phillips

Olivia	Li
Bikash	Mohanty
Marcus	Tutt
Belinda	Chatwin
Daniel	Copson
Tony	Foster
Haydon	Heilmann
Brett	Dowsett
Paul	Davis
Owen	Patterson
Daniel	Knowles
Jarrett	Younger
Jason	King
Eleni	Cosa
Edward	Bullen
Chris	Smith
William	Hannemann
Derik	Belanger
Chris	Pines
Phillip	Savage
Joanne	Koehne
Michael	Truter
Nicola	Gough
Pallavi	Babu
Roney	Mathew
Gerard	Montafia
Benjamin	Clarke
Talia	Henderson
Nishant	Garg
Scott	Kaye
Carmelo	Cristaldi
Brett	North
Jordan	Horwood
Elmarie	Duvenhage
Aaron	Morrow
Christian	Venero
Craig	Birmingham
Steve	Khan
Aira	Carrero
Sophie	Jones
Colin	Read
Viktor	Santesson
Sushilkumar	Bhonsle
Adam	Harris

# New Members

John	Hendry
Rasika	Bellanage
Digveejay	Bagde
Warren	Mann
Bayden	Botha
Li Seang Joseph	Chua
Andrew	Barrow
Chris	Goodwin
Nick	Corfield
Ross	Gapuzan
David	Algama
Asha	Bauch
Francois	St-Arnault
Inas	Dastghaib
Mihir	Mukerji
Aman	Genna
Alexander	Badger
Henri	Baz
Bernadette	Finglas-watson
Kim	Busfield
Richard	Kingsford
Christopher	Stevens
Danny	Miles
Gavin	Thorley
Henry	Adarighofua
Marcus	Steyn
Helaana	Ali
Mark	Johnson
Colin	Gerrard
Lucy	Gardiner
Matthew	Bowerman
Dave	Hinchliffe
Suzanne	McKell
Maria	Takos
Joanne	Reid
Benjamin	Sharpe
Shanil	Singh
Lisa	De Vries
Andrew	O'Neill
Ehihebolo	Oseghale
Christine	Smith
Maggie	Soliman
Jennifer	Dale
Muhammad Adil	khattak
Ian	Peisley

Miles	Wyatt
Nick	Sitzler
Chamara	Wellana Hewawasam
Andrew	Power
Nyssa	MacManus
Chrys	Perera
Vish	Karegowda
Krish	Chattopadhyay
Richard	Darlow
James	Esler
Josh	Kade
Sam	Wilson
Steward	Leung
Craig	Crawley
Brendon	Dacey
Jan	Pelser
Owen	McCull
Caitlin	Leane
Leah	King
Scott	Barlow
Dean	Jarvis
Steven	Hearne
Christopher	Nulty
Ciaran	Bredenmann
Dominic	Ceolin
KevinMarc	Huot
Michael	Ward
Heather	Thompson
Himanshi	Satnani
Martin	Harding
Matthew	Fazzolari
Vishnu	Seelan
Richard	Glass
Nandana	Boteju
Nigel	King
Grant	Rice
Vikas	Kumar
Mahsa	Mayel
Ram	Parihar
Kade	O'Brien
Trace	Gramlick

# Corporate Partners and Corporate Members

## CORPORATE PARTNER

Rio Tinto

## PLATINUM

ASC Pty Ltd

Ausgrid

BAE Systems

BGIS

Downer Group

Pacific National

Rio Tinto

Serco AsPac

South32

Sydney Metro

Transdev

Transport for NSW

Ventia Pty Limited

## GOLD

Airservices Australia

Alstom

Aurecon Australia Pty Ltd

Austal Ships Pty Ltd

Boeing Australia

Capability by Design

Copperleaf Technologies

Department of Defence CASG

Department of Families, Fairness and Housing

Department of Fire and Emergency Services (WA)

Department of Health

Department of Transport - Network Planning Group

Energy Queensland Limited

Essential Energy

Evoenergy

GE Digital

GHD Pty Ltd

HATCH Ltd.

Health Infrastructure

Infor Global Solutions (ANZ) Pty Ltd

Infrastructure NSW

Innovyze

Jacobs

KPMG

Naval Ship Management (Australia)

Northrop Grumman Integrated Defence Services Pty Ltd

NSW Telco Authority

Parks Victoria

Port of Newcastle

Power and Water Corporation

Service Stream

Southern Ports

Stanwell Corporation Limited

Sydney Water Corporation

Territory Generation

Thales Australia Limited

TransGrid

Transurban Ltd

V/Line

Warship Asset Management Agreement Alliance

Western Australia Police Force

Western Power

Wood Plc (Australia)

WSP Australia Pty Limited

Xenco Pty Ltd

## SILVER

AECOM Australia

AMCL

Anglo American Metallurgical Coal

Armidale Regional Council

AssetFuture Pty Ltd

Aurizon Network

Australian Rail Track Corporation Ltd (ARTC)

Babcock International Group

City of Gold Coast

Comfort Delgro NSW

Court Services Victoria

Department of Transport

Fire and Rescue NSW

GHD NZ

Greater Western Water

ISS Facility Services

Jemena

John Holland Group Pty Ltd

Kellogg Brown and Root Pty Ltd (KBR)

KiwiRail

Lycopodium Infrastructure Pty Ltd

Melbourne & Olympic Parks

Minset

New Zealand Defence Force (Defence Equipment Management Organisation)

Norship

Northern Territory Government Dept. of Infrastructure, Planning & Logistics

Nova Systems

Origin Energy

Programmed Facility Management

Public Transport Authority

PwC Australia

RES Australia

Sodexo Australia Pty

Stantec Australia Pty Ltd

Sutherland Shire Council

Sydney Trains

Tasports

Unitywater

Water Corporation

## BRONZE

ANSTO

APP Corporation Pty Ltd

Arup

Assetivity Pty Ltd

Atos (Australia) Pty Ltd

Baker Hughes Digital Solutions Australia Pty Ltd

Ballance Agr-Nutrients

Beca

Brightly Software Pty Ltd

Brisbane Airport Corporation

CBC Facilities Maintenance

City of Port Adelaide Enfield

Covaris Pty Ltd

Cushman and Wakefield

DAS Consulting

Defence Estate Infrastructure, NZDF

Delta Facilities Management Pty Ltd

Department of Jobs, Precincts & Regions

Department of Planning, Industry & Environment

Department of Transport ITS Asset Management Section

Department of Treasury and Finance

Egis Oceania Pty Ltd

Fremantle Ports

Gladstone Area Water Board

Gladstone Regional Council

Global-Mark Pty Ltd

Goulburn Valley Health

Goulburn Valley Water

Hardcat Pty Ltd

Harvey Water

Horizon Power

Hunter Water Corporation

Innovative Thinking IT

Ipswich City Council

Lake Maintenance Corporate Pty Ltd

Landcom

LogiCamms

Logsys Power Services

Lucid Consulting Australia

LYB Operations & Maintenance Pty Ltd

Maca Infrastructure

Melbourne Water

Meridian Energy

Monash University

Nexus Global Australia

North East Water

Northern Territory Government Dept. of Infrastructure, Planning & Logistics

NRG Gladstone Operating Services

Office of Sport

Onto Global Pty Ltd

OpenMove

Orica

Oropesa Port Management Pty Ltd

Pacific Hydro

Port Botany Operations Pty Ltd as trustee for the Port Botany Unit Trust

Powerlink Queensland

Professional Construction

Strategies Group Ltd

QENOS

Quarterbac

Queensland Rail

Reeves Group Services Pty Ltd

Refining NZ

Retriever Communications

Rockfield Technologies Australia Pty Ltd

SA Water Corporation

School Infrastructure NSW

SEQWATER

Shoalhaven Water

Silver Edge Technologies Pty Ltd

SMEC Australia Pty Ltd

SPM Assets

SPM Assets Ltd

STRUCTURED CHANGE PTY LIMITED

Strukton Rail Australia Pty Ltd

Talis Consultants

Taronga Conservation Society Australia

TasWater

TATWEER MIDDLE EAST AND AFRICA L.L.C.

Terotek (NZ) Limited

Townsville City Council

Unison Networks Limited

United Energy Services Pty Ltd

Valmec Limited

Victoria State Emergency Service WaterNSW

Wesfarmers Chemical Energy and Fertilisers

Windlab

Worley Power Service

Yarra Ranges Council

# Membership Application



ASSET MANAGEMENT COUNCIL

## ASSET MANAGEMENT COUNCIL LTD

A Technical Society of Engineers Australia

ABN: 15 141 532 747 [www.amcouncil.com.au](http://www.amcouncil.com.au)

Phone: +613 9819 2515 Email: [accounts@amcouncil.com.au](mailto:accounts@amcouncil.com.au)

Thank you for joining the Asset Management Council. Please complete all sections. Phone or email with any queries.

### PERSONAL DETAILS (Please print in BLOCK CAPITALS)

Title (Please circle) Dr Mr Mrs Ms Miss Other (Please specify) Sex (Please circle) F M

Family Name Given Names (in full)

Date of Birth Engineers Australia Membership No

### CONTACT DETAILS (Please print in BLOCK CAPITALS)

Preferred Address:  Private Address or  Business Address

Position

Organisation

Postal Address

City State

Country Postcode

Phone Fax

Mobile

E-mail

### AREAS OF INTEREST (Please tick)

#### Technical Topics

- Reliability
- Availability
- Maintainability
- Performance
- Spares Planning
- Maintenance Planning and Scheduling
- Maintenance Plan development and implementation
- Maintenance Policy/Strategy development
- Logistics
- Shutdown planning and the maintenance interface
- Asset Management
- Other:

#### Issues

- Skills development
- Training
- Other:

#### Industries

- Facility Management
- Consulting
- Power
- Transport
- Defence
- Oil and Gas
- Mining and Industry
- Water and Utilities
- Infrastructure
- Other:

Return completed Membership Application with payment to:  
Asset Management Council  
PO Box 2004, Oakleigh Vic 3166

### GROUP AFFILIATION

Young Asset Management Practitioners (18-35 year olds)

### CHAPTER AFFILIATION (Please tick one)

Newcastle       Canberra       Sydney       Illawarra       Mackay  
 Melbourne       Adelaide       Brisbane       Hobart  
 Darwin       Overseas       Gippsland       Perth

### MEMBERSHIP FEES Effective Jan 2015 (Please tick one membership type only)

Individual Annual Fee (including GST)

Member \$154.00

Student \$33.00

Corporate Annual Fee (including GST)

Platinum \$9,570.00

Silver \$1,804.00

Gold \$3,608.00

Bronze \$957.00

GST (10%) does not apply to overseas memberships.

### CORPORATE MEMBER NOMINEES

Platinum – 30 nominees, Gold – 10 nominees, Silver – 10 nominees, Bronze – 5 nominees

Name	Email	Date of Birth (Mandatory)	AM Council Chapter
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Contact Asset Management Council to provide more corporate nominee details.

### PAYMENT

Method of Payment (please tick one and enclose payment)

Cash

Money Order or Cheque drawn in AUD from an Australian bank payable to **Asset Management Council Ltd**

International Money Order

Credit Card  
(Australian or New Zealand Bankcard only acceptable)

Credit Card Details Please charge my card (tick one card type)

Visa

Bankcard

Mastercard

Diners

American Express

Card no

Expiry

Amount \$

Name on card

Signature

Date



ASSET MANAGEMENT COUNCIL

THE  
**ASSET**  
JOURNAL

Asset Management Council

PO Box 2004  
Oakleigh Vic 3166

Tel 03 9819 2515

[www.amcouncil.com.au](http://www.amcouncil.com.au)