



Why **Infrastructure Sustainability** is Good for your Business

Published by the Cooperative Research
Centre for Infrastructure and Engineering
Asset Management (CIEAM)
Endorsed by the Australian Green
Infrastructure Council (AGIC)

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September 2012



Acknowledgements

The CRC for Infrastructure and Engineering Asset Management (CIEAM) would like to acknowledge the financial support from the Commonwealth Government's Cooperative Research Centres Program and the contributions from our industry, government and university participants.

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The author would like to thank those who contributed to this research, in particular David Hood, Arun Kumar, Gavin Shaw, Susan Lambe and Mellini Sloan from CIEAM; Rick Walters and Antony Sprigg from AGIC; Caroline Snelling, Piroj Hira, Manjari Kariyawasam, Michael Player, Kathy Jones, Chris McArthur, Mark Rogers, Jane Scanlon, Kristen MacAskill and Andy Harland.

Confidentiality

In accordance with Australian Freedom of Information legislation, all information collected as part of this study will be retained for seven years in a safe and secure environment. Paper-based data will be stored in a locked filing cabinet, and electronic data will be encrypted. Both forms of data will be stored by Queensland University of Technology.

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ISBN:

978-0-9803102-3-8 (e-book)

978-0-9803102-4-5 (Print)

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An Australian Government Initiative



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Preamble

The case for embedding sustainability as a business driver for commercial and residential buildings is now well established. Around the world Green Buildings Councils and their like associations have transformed the property industry. Buildings that have achieved high “Green Star”, BREEAM, or LEED ratings are now demonstrating substantial savings in energy, and water use, waste and emissions reductions, productivity increases and biodiversity improvements.

However, the business case for infrastructure sustainability is less well understood, despite infrastructure being critical in supporting economic security and societal wellbeing. For too long the infrastructure industry has focussed on the economic imperative as the overwhelming driver for infrastructure project planning, delivery and operations. The industry has considered sustainability primarily in terms of environmental legislative requirements, rather than addressing the wider range of social, environmental and economic issues that are so important to achieving full value from infrastructure investment. This guideline demonstrates that embedding a culture of sustainability throughout the infrastructure delivery and management process will not only achieve public good outcomes, but will add bottom line value to your project, your organisation, and to society.

“There can be no sustainable development without infrastructure delivering sustainability outcomes; making sense of sustainability in the context of key infrastructure elements is one the principle objectives of the Australian Green Infrastructure Council [AGIC]. These objectives are a modern expression of the ambition to act responsibly, fairly, effectively, efficiently, sensitively, and with a view to the long term.

AGIC, through the application of the Infrastructure Sustainability Rating Tool [IS], aims to assist with the decision making towards a sustainable future in terms of the provision of roads, railways, ports and airports, in water and wastewater, and in power generation. In other words, in all of the elements which underpin society world-wide.

Infrastructure needs to deliver its service over its lifetime, efficiently and reliably, and it needs to be adaptable and resilient to change and shock. This implies assets with a long useful life, with minimum reliance on non-renewable resources, with maximum benefit to society and the environment and which contribute to, rather than endanger, national prosperity in the long term.

Rather than being one of many competing objectives, sustainability is an underlying philosophy which should guide decision-making throughout infrastructure projects to meet the wider objectives of durability and performance. This is where this “business case” for sustainability is so important. For AGIC and our stakeholders, articulating the business case for sustainability in the context of the design, delivery and operation of infrastructure is a priority. The Guideline produced by CIEAM is a crucial and timely piece of work which sets the scene. We hope that its publication will advance the debate and will assist stakeholders associated with the infrastructure supply chain to identify the tangible and intangible drivers for sustainable development.”

David Singleton
Chairman, Australian Green Infrastructure Council

Endorsement of this guideline...

The 2012 Construction Achievement Awards illustrated how sustainability, both of our Infrastructure Assets themselves, and in the performance outcomes required to ensure improved environmental, social and whole of life asset management and maintenance, have advanced.

Engineers are responding to the sustainability challenge, but greater awareness of the business case is needed to ensure appropriate decisions, and that funding is available to achieve desired outcomes, and also avoid an unfunded maintenance and restoration legacy for future generations.

Extended design life of major structures ranging up to 300 years, offers the cheapest life cycle outcomes. Good stewardship of our national infrastructure assets demands the implementation of sustainability features in design, construction and asset management programs.

The Westgate Bridge Strengthening project in Victoria graphically illustrates the need for sustainable ongoing asset management to minimise disruption and major unfunded liabilities in years to come.

This guideline will assist Asset Managers in putting the business case for seamless integration of sustainability into our major new infrastructure projects ensuring long term ("whole of life") asset management delivers cost savings, and superior performance outcomes.

Martin Albrecht AC, Past Chairman and CEO of Thiess Contractors

There is no question that businesses today face increasing pressure to transform their organisations into more sustainable, viable entities.

With the introduction of regulatory instruments including carbon taxes and emission trading schemes, businesses face increasing governmental pressure to meet minimum standards of carbon abatement. Customers, suppliers, investors and other corporate stakeholders are similarly applying pressure on businesses to account for their social and environmental impact.

Many companies view sustainability as an onerous imposition that will increase the cost of business, yet companies can reduce costs and increase their competitiveness through implementing sustainability initiatives. This guide shows you how to.

Businesses can either be laggards in facing sustainability challenges, or they can proactively manage the inevitable change to create and gain greater business value, and increase competitiveness.

James Kirk, Executive Chairman, Mainpac

Although we have come a long way in a relatively short space of time with regard to sustainability, as a society, we are really only just starting to grasp the necessity of sustainable development and the application of sustainability principles as an integral part of managing assets in a whole-of-life approach. Infrastructure sustainability goes beyond the design of 'green' structures, to adopt a holistic approach to managing our major assets from concept, through design, construction and operation, to decommissioning and divestment. Infrastructure sustainability is about well maintained and operated assets that contribute to our economic and social — as well as environmental — sustainability as a community.

Emerging research shows that, above and beyond its societal benefits, integrated strategic asset management — focussing on the full gamut of sustainability considerations — can deliver tangible business improvements. These results go beyond the perceived 'nice to have' public good outcomes that result from implementing sustainable practices — such as reduced carbon emissions, water consumption reductions, decreased waste production, and protection of ecologically important habitats — to create real value for business. This guideline clearly demonstrates not only how the implementation of sustainability initiatives delivers bottom line results, but how to build a business case to embed sustainability as a key business driver.

Delivering on all aspects of sustainability as part of a strategic approach to infrastructure management is more than acting as a good corporate citizen. It gets back to achieving core business goals.

Prof Joseph Mathew FIEAust, CPEng, FISEAM, MASME, MAAS, CEO, CIEAM.

With society becoming more and more concerned that our activities are seriously damaging the earth's ecosystems to a point where scientists are warning of possible economic collapse, it is imperative that impacts from our built environment do not further exacerbate the problems.

Thus, our built asset managers must include sustainability, in its broad triple bottom line sense, as a driving feature in all their decisions. In the delivery and operation of our infrastructure, and all engineering assets we must consider not only the immediate economic outcomes, but the impacts of these assets on our natural and social capital. This guideline will show you how to include sustainability as a value consideration in developing the business case for your infrastructure and engineering asset proposals, be they at the concept, design, construction, commissioning, operation or end of life phases.

**Adj. Professor David A Hood FIEAust CPEng FIPENZ FISEAM MASCE
National President, Engineers Australia**

The game has changed.
Infrastructure sustainability will let us have it both ways: we can create value for society and contribute to improved environmental outcomes while still increasing total returns to those involved in the delivery and operation of infrastructure.



Executive summary

While Australia's cities struggle with increasing congestion, inadequate transport systems, and ageing underground services, many of our regional areas are either in economic decline, or are under pressure from population influx due to the resources boom — with consequent sky rocketing property values, poor services, and social inequity.

On top of the need to relieve urban congestion, we also need investment in other essential infrastructure. We need new residential areas; infrastructure for indigenous communities; an upgrade of our telecommunications services; increased renewable energy generation; potable water; and the railways, ports and roads that will enable us to better service our own communities and the customers clamouring for our mined resources.

Overriding all of these demands for infrastructure is the need to prepare for the impacts of climate change.

However, we have limited financial capacity to fund all this. At the same time, society is increasingly demanding justification for the use of scarce natural resources and for the social and environmental impacts of major projects. It is therefore critical that those of us involved in the infrastructure industry maximise value for money and demonstrate positive social and environmental outcomes. This dual challenge of striking a balance between public and business value is the essence of infrastructure sustainability and the focus of this industry guideline from the Cooperative Research Centre for Engineering and Asset Management (CIEAM).

Few, if any, businesses – whether in the government or private sector — adopt sustainability simply to perform social good. As David Singleton, a director of engineering consultancy Arup, and Chairman of the Australian Green Infrastructure Council (AGIC), has said, “the mainstream driver for sustainability is unlikely to come from an altruistic client base – there simply isn't one yet”¹. Rather, businesses will adopt sustainability for strategic benefit, or for what has been quaintly called ‘enlightened self-interest’. The benefits claimed for implementing sustainability in business include: lower costs and increased profits; reduced risks; greater community acceptance (social

licence to operate); access to new markets; and strengthened reputation. In short, these benefits contribute to the achievement of competitive advantage and all translate into greater value to those involved in the infrastructure delivery business, as well as adding value to the public good.

There have been a number of studies of, or encompassing, the business case for sustainability in the built environment, ranging across topics including: organisations²⁻⁴; the construction and property development industries⁵; and buildings^{6,7}. However, while many of these studies are relevant to civil infrastructure, a specific business case has not been made for infrastructure sustainability.

In examining the business case for infrastructure sustainability, this guideline seeks to redress this shortfall. It explains the meaning of infrastructure sustainability and how it can contribute to shared public and business value, and shows how organisations can track their value pathways to improved shareholder returns and so demonstrate their own sustainability business case.

Milton Friedman famously wrote in 1970 that “there is one and only one social responsibility of business ... to increase its profits so long as it stays within the rules of the game”⁸. The aim of this guideline is to demonstrate that the game has changed. Infrastructure sustainability will let us have it both ways: we can create value for society and contribute to improved environmental outcomes while still increasing total returns to those involved in the delivery and operation of infrastructure.



About CIEAM

This guideline has been prepared for the Cooperative Research Centre for Infrastructure and Engineering Asset Management (CIEAM). As a leading international research centre, CIEAM is focussed on innovative, industry-directed research and development, education, and commercialisation in an integrated approach to physical asset lifecycle management.

CIEAM works closely with industry partners to develop innovations that meet their needs, and as a result, contributes to improving the engineering asset management industry sector. The Centre's focus is on real-life asset management problems faced by industry today.

CIEAM's research is based on industry's need to address a number of challenges:

- Ageing national engineering infrastructure;
- Under-investment in asset maintenance;
- Cost of maintenance management and the total cost of engineering asset ownership;
- An innovative integrated asset management regime across all industry sectors; and
- Addressing climate change and sustainability issues.

Information about CIEAM is available at: www.cieam.com

As part of the research for this guideline CIEAM conducted an online survey to test industry perceptions of the business case for infrastructure sustainability and whether they accord with the literature discussed in the preceding sections of this guideline. The survey also examined industry perceptions about which aspects of good sustainability performance drive business benefits. The survey and its findings are discussed generally in the guideline and in detail in the Appendix.

Introduction

Sustainability is a hot topic in the infrastructure industry, with businesses trying to manage their environmental, social and governance (ESG) risk; clients requiring increasingly sophisticated responses to sustainability requirements in tenders and demonstrated performance on site; governments generally escalating social and environmental compliance regimes; and communities demanding a say in how they are impacted by construction projects and operating assets.

Despite this, there is a lack of understanding of what sustainability means in infrastructure and a tendency for management to see it as an imposition that will incur costs and delays and damage to market position. Many managers ignore the abundant evidence that corporate social responsibility and sustainability are valuable to business and drivers of market value.

Yet the infrastructure industry continues to commit funds to specialist sustainability staff and consultants, to reporting sustainability performance and to undertaking a wide range of sustainability initiatives. Perhaps this is because of lingering perceptions that sustainability is important for building reputation and for hiring and keeping talented employees — and because clients are increasingly demanding evidence of sustainability performance.

One reason for a lack of adoption of sustainability practices is that infrastructure industry managers find it difficult to link the less immediate dollar outcomes of many sustainability initiatives with their business objectives. This guideline is designed to overcome this difficulty. It explains how outstanding sustainability performance acts on the business drivers of improved total shareholder returns while also contributing to public good.

Structure of this guideline

This guideline explains how integrating infrastructure sustainability into decision-making can indeed deliver those benefits to any organisation involved in the infrastructure business.

The first section explains what infrastructure sustainability actually is; why it is important; and how it is measured, including using the growing range of tools designed to help businesses measure, benchmark and promote their sustainability performance.

The second section looks at the benefits that are available to government, institutional and private clients, financiers, constructors and operators of infrastructure assets and shows how those benefits translate into ‘shared value’ – simultaneously improving market value and ‘public good’. Case studies are provided to illustrate the benefits in practice.

The third section discusses barriers to the take-up of infrastructure sustainability in business case formulation, including obstacles to quantifying sustainability benefits for ‘traditional’ managers who fail to appreciate the contribution of intangible assets to present and future business value.

The fourth and final section of the guideline suggests an approach for managers to follow if they want to build the value of their business for both its shareholders and communities through sustainability.

The results of CIEAM’s on-line survey of industry perceptions of the value drivers of infrastructure sustainability are reported in the **Appendix**.

McKinsey & Company – Valuing social responsibility

“... many companies are creating real value through their environmental, social, and governance activities—through increased sales, decreased costs, or reduced risks—and some have developed hard data to measure even the long-term and indirect value of environmental, social, and governance programs. It’s not surprising that the best of them create financial value in ways the market already assesses—growth, return on capital, risk management, and quality of management.”

Bonini, S., Koller, T.M. & Mirvis, P.H. (2009) Valuing social responsibility programs, McKinsey on Finance, Summer 2009, Number 32.



**Economic Infrastructure:
Transport, Energy,
Communication and Water**



1. Infrastructure sustainability

What is infrastructure?

The current debates about the adequacy or otherwise of our roads, airports, railway systems, energy and water services, and communications networks highlight the central role of infrastructure in Australia. Appropriate and well-managed infrastructure is a key driver of productivity and national wellbeing, with businesses and individuals reliant on its efficient and effective performance.

Indeed, it has been claimed that the built environment “is the fundamental foundation upon which a society exists, develops and survives”⁹. An Australian Government report sees infrastructure as “an essential input to virtually all economic activities ... and contributes directly to people’s wellbeing”¹⁰, while Canada’s CRC Research¹¹ defines infrastructure as “the set of structural elements that supports the day to day function and influences the direction of human society”.

In Australia, major economic infrastructure is classified under four sectors by the Bureau of Infrastructure, Transport and Regional Economics (BITRE): transport, energy, communication and water¹².

In each of these sectors, industry and government share responsibility for planning, financing and operating civil infrastructure systems. They develop new and complex systems and restore degraded ones. They expand, repair and refurbish some that are operational — including those damaged by accident or natural disasters. And they deconstruct, decommission, demolish or adapt those that have reached the end of their useful lives⁹.

The industry embraces diverse asset types and consumes large quantities of human, financial and material resources for both their delivery and use. Its assets have complex delivery and operations methods, may cover large geographic areas of differing topography and occupation, and have wide and varied potential impacts — that may continue and change over decades — on both the environment and stakeholder groups^{13,14,9}.

The financial investment in Australian infrastructure is significant and the major infrastructure sectors are crucial to national GDP and employment performance, contributing just under 10% to GDP and 7.6% of

total employment. With a total value in Australia of \$A58 billion in 2009-10, the construction alone of major infrastructure involves a significant commitment of financial, technical and human resources¹². Further, the rate of infrastructure investment in Australia has continued to increase since 2008¹². It is projected to grow by 128% in emerging markets and 18% in developed markets in the decade to 2020¹⁵. The industry has a responsibility to efficiently and effectively deploy that investment.

Infrastructure and sustainability

In a business sense, the definition of sustainability remains unclear. It is often considered to be synonymous with ‘environmental, social and governance’ (ESG) and ‘corporate social responsibility’ (CSR). All these terms imply that businesses voluntarily integrate social and environmental concerns into their operations and their interactions with stakeholders.

Essentially, there are two terms in common use for sustainability in the infrastructure industry: ‘sustainable infrastructure’ and ‘infrastructure sustainability’.

“Sustainable development is truly about achieving a balance between several objectives (environmental, economic, and social) over dynamic time and spatial horizons”.

Sahely, H.R., Kennedy, C.A. & Adams, B.J. (2005) Developing sustainability criteria for urban infrastructure systems, Canadian Journal of Civil Engineering, vol. 32, no. 1, pp. 72-85.

Sustainable infrastructure is concerned with:

‘fit for purpose assets’, where fitness is a function of an asset’s capacity to be:

- *Continually useful over its entire life;*
- *Resilient and adaptable to changing external circumstances;*
- *An integral and consistent part of the wider infrastructure ‘jigsaw’; and*
- *Fulfilling community expectations by helping to solve sustainability challenges¹⁶.*

This last dot point is often reframed to define 'sustainable infrastructure' as that infrastructure that assists in changing human behaviour to more sustainable lifestyles.

Infrastructure sustainability is the designing, delivery, operation and eventual deconstruction or adaptation of infrastructure assets "in ways that do not diminish the social, economic and ecological processes required to maintain human equity, diversity and the functionality of natural systems"¹¹. Whereas sustainable infrastructure is concerned with the strategic benefit of an asset, infrastructure sustainability involves the implementation of sustainability principles in the procurement and operation of infrastructure, irrespective of whether the infrastructure itself is sustainable. It is based on the very pragmatic principle that all infrastructure can deliver greater sustainability outcomes through better design, construction and operation and this can contribute to the journey towards sustainable development.

This guideline is focussed on the business benefits of infrastructure sustainability.

The American Society of Civil Engineers (ASCE)¹⁷ sees sustainable water systems as "... systems designed and managed to fully contribute to the objectives of society, now and in the future, while maintaining their ecological, environmental and [engineering] integrity". This definition can be applied equally to sustainable infrastructure and to infrastructure sustainability in general. By contrast, a railway built specifically to transport fossil fuels (eg. coal) from a mine to a port for export may be seen to be contributing to an unsustainable practice (the burning of fossil fuels contributing to greenhouse gas emissions), and would thus not be classified as sustainable infrastructure. However, it could well be designed, constructed, and operated in a way that delivers sustainability outcomes and so these processes may therefore qualify as infrastructure sustainability.

Infrastructure sustainability is about balancing triple bottom line trade-offs, and extends beyond just addressing ecological concerns. However, it is "not simply a matter of trading off positive impacts in one area against negative impacts in another. A successful development builds on the three pillars and achieves economic success, social benefit and high environmental quality together".

The Royal Academy of Engineering (2005) Engineering for Sustainable Development: Guiding Principles, London.

Infrastructure sustainability will invariably involve trade-offs. These may include operational versus capital costs, short-term versus long-term planning, and the frequent need for individual pieces of infrastructure to function as an integrated part of a system¹⁴. The challenge for business is to maintain profitability and continuously build value for shareholders while best balancing the economic, environmental and social needs of, and impacts on, its other key stakeholders.

Key stakeholders of any piece of infrastructure may include its owners, employees, customers (or users), impacted communities, regulatory authorities, and suppliers. Importantly, future generations are also key stakeholders because of the expected long useful life of much infrastructure. As the USA's Institute for Sustainable Infrastructure¹⁸ says, "We are building 2050 today"; inefficiencies locked-in now may have long-lasting and expensive consequences, perhaps magnified by the asset being part of a wider system.

Queensland's Department of Transport and Main Roads (TMR) has identified its key stakeholders as:

- *Clients*
- *Partners*
- *Federal, state and local agencies*
- *The community*

TMR (2012) Sustainability in Transport and Main Roads

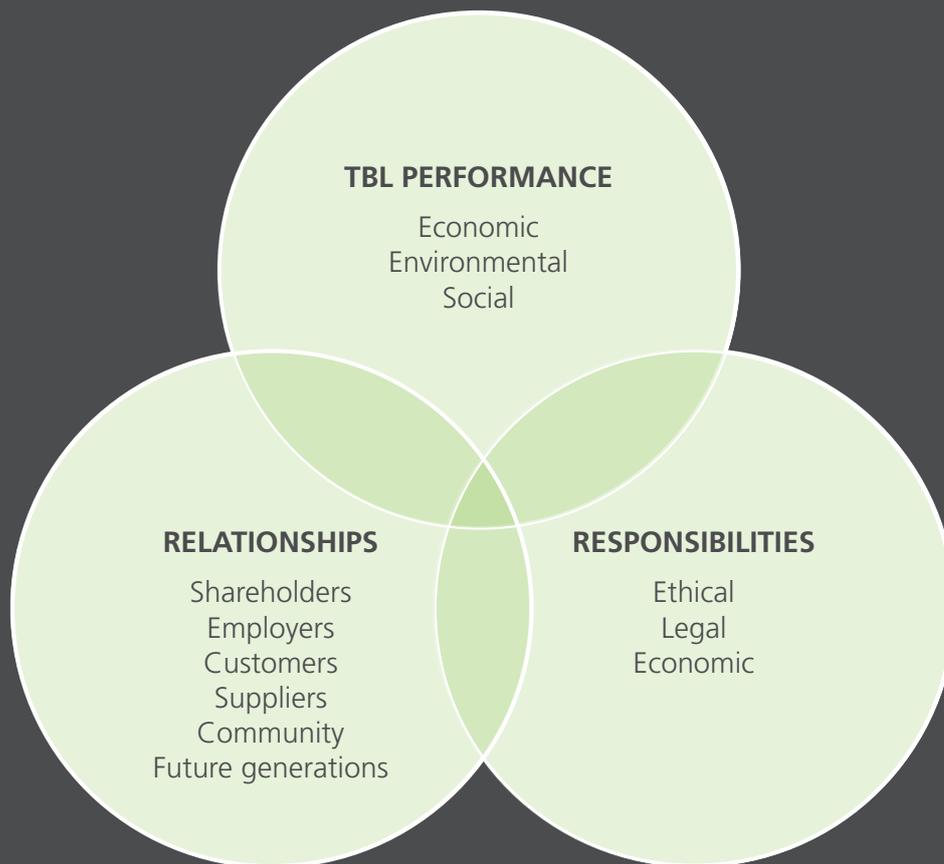


Figure 1 The three dimensions of corporate sustainability

Adapted from Stapledon, T. 2004, *Offices as Tools for Organisational Sustainability*, PhD thesis, The University of Sydney, Sydney

Sustainability in a business context has three dimensions: triple bottom line (TBL) performance¹⁹, key stakeholder relationships^{20,21}, and financial, legal and ethical responsibilities^{22,23} (Figure 1).

Sustainability is often seen to be about the triple bottom line of economy, environment, and society. But the triple bottom line is purely a way of measuring performance and just the first of the three dimensions in Figure 1.

The second involves its relational nature — its focus on those ‘primary’ stakeholders who bear risk through having invested something of value, (for example, their own efforts or financial capital), in the organisation. These stakeholders are an organisation’s eyes and ears to the dynamic business environment; they decide its future, and they determine its reputation.

The third dimension is responsibilities, the most fundamental being economic: If organisations do not make a profit they will not survive, nor be able to contribute to the sustainability of their community or the environment. They also have legislated (compliance) and ethical (‘beyond compliance’) responsibilities, the latter being discretionary within business imperatives but increasingly expected by society.

Together these dimensions define business sustainability as: ***the responsible management of the economic, environmental and social needs of, and impacts on, those stakeholders in a position to influence business success.***

Why is infrastructure sustainability important?

“The value of infrastructure to our nation cannot be underestimated. The effectiveness of current and future infrastructure in meeting economic, environmental and social needs is of critical national importance. When managed well, infrastructure can provide the efficiencies and opportunities needed to meet these needs”.

Infrastructure Australia (2010) Getting the fundamentals right for Australia's infrastructure priorities: An Infrastructure Australia report to the Council of Australian Governments, Australian Government: Infrastructure Australia, Canberra.

Given current and planned future investment and the importance of infrastructure to economic, social and environmental wellbeing, public and private participants in the industry have particular responsibilities to ensure that infrastructure is efficient and effective in serving its public purpose over its life. Further, the design, construction, operation and eventual demolition or adaptation of infrastructure significantly influence the rate of consumption of natural resources and have major impacts on communities and the natural environment.

Australia's former Secretary to the Treasury, Ken Henry, has said that the public policy goal of investment in infrastructure “should be the sustainable enhancement of wellbeing”. He noted that:

Sadly, there have been many failures for well over 100 years in Australia to develop policies to promote sustainable activity. This is strikingly evident in the dramatic loss of native species and biodiversity. This most significant example should motivate us not only to solve the complex and difficult problems associated with the intersection of public infrastructure policy and private endeavour, it should also motivate us to put in place policies and governance structures that are truly focussed on a sustainable future²⁴.

Australian governments are now becoming motivated as Henry suggests, with the gradual introduction of policies aimed at achieving infrastructure sustainability

outcomes. For example, the Australian Government's Infrastructure Australia includes among its seven strategic priorities: developing cities and regions; reducing greenhouse emissions; and improving social equity and quality of life²⁵. The Victorian Transport Integration Act 2010²⁶ is designed to create a paradigm shift from an “efficient transport system” to an “integrated and sustainable” one, with objectives including social and economic inclusion, economic prosperity, environmental sustainability, and safety, health and wellbeing. The introduction of carbon pricing policies will further drive change for sustainability in the infrastructure industry, which is a heavy consumer of diesel fuels and materials with high embodied energy.

There are other important political, social and economic reasons to ensure that infrastructure is delivered and managed to achieve sustainability outcomes, including:

- The highly visible nature of shortfalls in infrastructure adequacy and performance, together with associated political ramifications
- Evolving needs of society through both demographic changes and technological development.
- Disruption and inconvenience caused to individuals and communities during the construction and, in some cases, operation and maintenance of major infrastructure assets.
- Intense competition for access to natural, human and financial resources
- Impacts of coastal erosion on property owners and the finances of affected councils.
- Risks of environmental damage, including consequential damage to business reputation.
- Developing community expectations of the role of business in society, along with demands by the public for more transparent performance on infrastructure projects.
- Evidence that good urban design and infrastructure can improve health outcomes.

What does infrastructure sustainability look like?

One of the challenges for business to integrate sustainability is to imagine an amorphous concept that is different from 'traditional' business thinking. Managers like to see sustainability as a defined 'thing' which can be managed, and which has a clear shape and a single solution. Rather than something that is clearly defined, infrastructure sustainability is the outcome of a systematic way of thinking about a project or an asset that identifies, prioritises, and manages ESG risks within the business environment, beyond the traditional triple project objectives of time, cost and quality.

Accordingly, it involves a governance process that ensures an asset has been constructed or is being operated so that it addresses the spectrum of pertinent environmental, social and governance risks. As such, sustainability and its subset of ESG issues warrant management attention alongside other risks including tax, legal, structuring, operational and demand. Traditionally, ESG risks have been ill-analysed in relation to the financial risk they pose. This is due largely to the fact that financial analysis frameworks have failed to quantify the individual sustainability risk factors in a business case.

However, sustainability risks are highly variable across and within industry sectors, projects and assets. Australia's AGIC⁴⁰, the UK's CEEQUAL⁴¹, and the ISI¹⁸ in the USA have all developed frameworks that managers can use to help them identify and quantify the particular risks and opportunities they and their stakeholders face in the sustainability space. It is likely that a project or asset managed for sustainability will incorporate performance criteria around the types of risks identified in these frameworks and will, for example:

- Have management objectives, processes and people in place to ensure that sustainability issues are managed, measured and reported in a transparent way.
- Educate employees about their role in ensuring successful sustainability outcomes.

- Link project sustainability objectives to individual and team performance through key performance indicators and a focus on continuous improvement.
- Factor sustainability considerations into decision-making.
- Factor climate change impacts into decision-making.
- Use life cycle and whole of life costing to test the long-term value of decisions.
- Select materials that come from renewable sources and look for alternatives to those with significant environmental impacts.
- Minimise waste.
- Adopt measures to optimise energy and water use efficiency and effectiveness.
- Prevent damage or restore past damage to the environment, including from spills and silt run-off.
- Involve local communities affected by the operations in order to best meet their needs and enhance their benefits.
- Have the development of staff and the transfer of knowledge as priorities, so that the experience gained moves beyond individuals to future projects and the infrastructure industry more generally.

Measuring infrastructure sustainability performance

Many businesses measure their sustainability performance, and advertise it publicly, using a number of tools. Rating systems such as the Dow Jones Sustainability Indexes²⁷, the European FTSE4Good Index Series²⁸, and international frameworks such as the GRI's G3²⁹ are gaining traction with infrastructure companies including financiers, constructors and design consultants.

However, these high level indicators are not appropriate for detailed project/asset level performance assessment. In infrastructure, the possible relevant social and environmental variables are many, and project/asset specific. Agreement is lacking as to what they are, "how serious they are,

and how they should be addressed”³⁰. Sustainability performance frameworks and rating tools aim to address this issue.

Sustainability performance frameworks have underlying consistencies that distinguish them from other performance measurement systems common in business: “explicit focus on triple bottom line issues, their emphasis on the linkages between those issues, and their explicit focus on a long-term view of business performance”.

Searcy, C. (2011) Updating corporate sustainability performance measurement systems, *Measuring Business Excellence*, vol. 15, no. 2, pp. 44-56.

At a project/asset level, there are numerous tools designed to help interpret complex information about infrastructure sustainability and which attempt to balance the three dimensions of sustainability performance.

For example: a Canadian framework has been developed for unifying the approach to public infrastructure³¹; the City of Cleveland in the USA has a strategic framework to help measure progress and prioritise initiatives³²; the Chicago Department of Aviation has released its SAM Rating System³³; while in Australia VicRoads uses its Invest tool for assessing the sustainability aspects of Victorian road projects³⁴.

International, industry specific, tools such as the Hydropower Sustainability Assessment Protocol³⁵ and the World Bank Group’s IFC EHS Guidelines³⁶ on environment, health and safety, are being developed and adopted.

Private companies are also adopting sustainability performance tools and reporting their performance. Engineering consultancy Arup has developed SPeAR®, an integrated decision-making tool used to support project development and communicate outcomes³⁷. Energy company, Origin, which has significant renewable energy investments, has a well developed governance framework and reports against the GRI³⁸.

These tools are often bespoke for individual organisations and for particular sectors of the infrastructure industry. This is to be expected: businesses tailor performance measures to target perceived critical variables in areas they believe to be central to their success³⁹.

However, the extent of benefits and costs of both sustainability generally and individual initiatives varies across industries, business units and projects — not only across companies. Consequently, isolating ‘critical variables’ that may apply generically to cross-organisation and cross-asset infrastructure sustainability governance is a challenge, taken up by the Australian Green Infrastructure Council (AGIC) with its Infrastructure Sustainability (IS) rating scheme⁴⁰.

Like its international equivalents — the UK’s CEEQUAL⁴¹ and Envision¹⁸ in the USA — the AGIC tool serves a dual purpose as a generic, flexible performance measurement system and decision-support framework. Each has a set of meaningful indicators, arranged under sections or themes, designed to draw on and/or complement data collected in mainstream business systems.

The Australian Green Infrastructure Council (AGIC)

The Australian Green Infrastructure Council (AGIC) is a member based industry association committed to the delivery of more sustainable outcomes from the design, construction and operation of Australia's infrastructure. Its members are both private and public organisations working in infrastructure engineering, environment, planning, law, finance, construction and operation.

AGIC's IS (infrastructure sustainability) rating scheme has been assembled through rigorous consultation and testing processes with diverse groups of stakeholders in both the private and public sectors. As such, it represents consensus views of the key indicators of operational success in sustainability performance.

AGIC's IS Rating System

AGIC's IS Rating System has five themes, each with a number of categories:

- Management and governance;
- Using resources;
- Emissions, pollution and waste;
- Ecology; and
- People and place.

Two further themes — economic performance and workforce — are planned for future development.

The scheme is designed to apply across Australia's infrastructure industry — with three rating types:

- Design, awarded at the end of planning and design;
- As -built, awarded at construction completion; and
- Operation, awarded after at least 24 months of operation based on performance of the operating asset.

More information is available at www.agic.net.au/ISratingscheme1.htm





Potential benefits to public good value range across a wide spectrum: economic, social and environmental.



2. The benefits of infrastructure sustainability

The relationship between business and sustainability performance continues to be controversial and unclear.

On one hand is the view that “there is one and only one social responsibility of business ... to increase its profits so long as it stays within the rules of the game”⁸. On the other hand is the view that a business’s success is measured by how much value it creates for all its stakeholders^{20,42,21}.

But these views are not mutually exclusive: they meet where beyond-compliance activities undertaken by businesses can be shown to contribute to competitive advantage, profitability and long term shareholder value. This is consistent with the concept of “shared value”⁴³ and offers solutions to the problems Henry identified at “the intersection of public infrastructure policy and private endeavour”²⁴.

Achieving shared value

A successful sustainability initiative — one that offers shared value through value added to both public good and business competitiveness — may be represented as being in the top right hand quadrant in the matrix in Figure 2.

This matrix is dynamic; the aim of businesses that value sustainability is to progress their activities to the quadrant of shared value.

Initiatives that fall in the top left quadrant may be socially or environmentally beneficial, but because they impose costs or competitive penalties on business they are more likely to be one-off or short-lived, or undertaken by governments for public benefit. Those in the bottom left quadrant are unlikely to be adopted and performance here may result in withdrawal of the social licence to operate, as occurred with Heathrow’s planned third runway. Those in the bottom right are where many projects sit today. They are pursued on an understanding that the extent of damage to public good (environmental and societal value) is understood and accepted by both management and the public, perhaps through legislated approval processes.

In the context of this discussion, governments as well as publicly and privately owned businesses are consciously or unconsciously seeking shared value. However, the weight that each organisation attaches to aspects of public and business value will vary according to its stakeholders, strategies and culture.



Figure 2 Shared value from sustainability initiatives

The concept of shared value “recognises that societal needs, not just conventional economic needs, define markets” and that “policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions” have the potential to expand the “total pool of economic and social value”.

Porter, M.E. & Kramer, M.R. (2011) Creating shared value: How to reinvent capitalism - and unleash a wave of innovation and growth, Harvard Business Review, Jan-Feb 2011, pp. 62-77.

A business case for infrastructure sustainability

A business case for infrastructure sustainability that recognises shared value requires:

- An appreciation of the net benefits that may accrue.
- The value of those benefits to the organisation (both monetary and non-monetary value) related to an appreciation of how they leverage into business performance or shareholder value.
- Where those benefits originate, that is, what sustainability initiatives are likely to deliver them.
- The degree of sustainability performance that will make the benefit valuable — there is evidence of diminishing returns for higher performance beyond a certain point^{44,45,3}.

Potential benefits to public good value range across a wide spectrum: economic (for example, employment, local purchasing, reduced demand for electricity generation through improved efficiency); social (for example, Indigenous employment and development, equity of access to public and economic assets); and environmental (for example lower greenhouse gas emissions, reduced use of non-renewable resources and potable water, less waste, enhanced biodiversity).

Some of these benefits have impacts that lie in more than one of the economic, social and environmental areas of public goods.

Sustainability offers six sources of business value⁴⁶⁻⁴⁸ that have the potential to enhance shareholder value:

1. Positive effects on company image, reputation and brand strength.
2. Positive effects on employee engagement — motivation, retention, and recruitment
3. Cost efficiency/savings.
4. New revenue sources, increased revenue from existing sources, and improved market share and pricing power.
5. Risk reduction and management.
6. Confirmation of a firm's ‘social licence to operate’.

Shareholder value (total shareholder returns) is a function of two things: the free cash flow available for distribution and the valuation multiple that the market places on the business over and above its net tangible asset value. Sustainability's business benefits can act on levers of value creation and flow through to total shareholder returns (see Figure 3) by increasing profits through margin improvement and/or revenue growth, and/or varying the valuation multiple through influencing market perceptions of risk and brand strength.

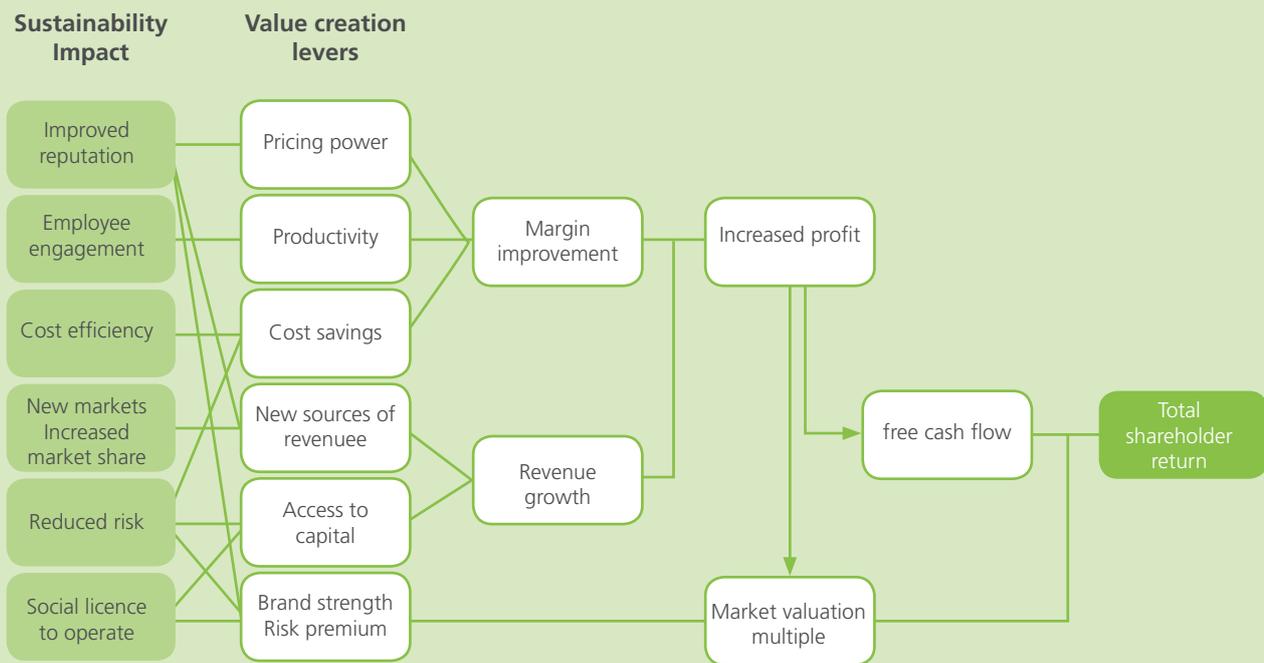


Figure 3 Value flows from infrastructure sustainability to Total Shareholder Returns

Adapted from Berns, M., Townend, A., Khayat, Z., Balagopal, B., Reeves, M., Hopkins, M. & Kruschwitz, N. (2009) *The Business of Sustainability*, MIT Sloan, BCG, North Hollywood

1) Image and reputational benefits

Reputation reflects “a firm’s relative standing, internally with employees and externally with other stakeholders, in its competitive and institutional environment”⁴⁹. Social responsibility, a central driver

of sustainability performance, is a key component of a strong corporate reputation. Alternatively, failing to demonstrate social responsibility can be a source of reputational risk⁵⁰⁻⁵⁴.

The six dimensions of corporate reputation:

- Emotional Appeal: How much the company is liked, admired, and respected.
- Products and Services: Perceptions of the quality, innovation, value, and reliability of the company’s products and services.
- Financial Performance: Perceptions of the company’s profitability, prospects, and risk.
- Vision and Leadership: How much the company demonstrates a clear vision and strong leadership.
- Workplace Environment: Perceptions of how well the company is managed, how it is to work for, and the quality of its employees.
- Social Responsibility: Perceptions of the company as a good citizen in its dealings with communities, employees, and the environment.

Fombrun, C.J. (2001) *Reputations: Measurable, Valuable, and Manageable*, American Banker, pp. 14.A-14A.

A McKinsey survey of 1560 CFOs, investment professionals, and finance executives found they agreed, by a large margin, that improved corporate reputation and image is the most important way sustainability programs create value².

Reputation, brand strength and shareholder value

Reputation and brand strength built off sustainability impacts shareholder value through a number of financially valuable objectives including pricing power, level of perceived risk, talent attraction and retention, and improved access to markets and market share^{55-57,44,58,47,59}.

Reputation and market value

Research that compared groups of companies with similar levels of risk and return, but different average reputation scores, showed that a 60 per cent difference in reputation score was associated with a 7 per cent difference in market value. Another study, which examined reputation scores of companies rated by Fortune between 1983 and 1997, concluded that a one-point difference was associated with \$500m in market value.

Fombrun, C.J. (2000) The value to be found in corporate reputation: The public's view of a company not only acts as a reservoir of goodwill, but also boosts the bottom line, Financial Times 4 Dec 2000.

How infrastructure businesses build reputation from sustainability

Respondents to CIEAM's business case survey believe that sustainability-based reputation is primarily built through good performance in community relations, workforce management and management of emissions, pollution and waste (Figure 4).

Infrastructure businesses pursuing sustainability promote their image, reputation and brand by cultivating relationships with key stakeholders through community relations programs; market briefings; websites and social media; and face-to-face interactions with customers and suppliers.

Other commonly used vehicles include: promoting achievement of project awards like those obtainable through AGIC's IS rating scheme and Engineers Australia's Engineering Excellence Awards; utilisation of rating systems such as the IS rating scheme, Dow Jones Sustainability Indexes²⁷, and the Global Reporting Initiative's G3.1²⁹; adopting labels and standards; active membership of forums; and demonstration of compliance to — or instances of exceeding — national and international codes and legislation.

However, businesses that make elevated and unsubstantiated claims about their sustainability credentials may suffer exposure and damage to their reputation if sceptical stakeholders consider that they are guilty of 'greenwashing' and misleading advertising⁴⁷.

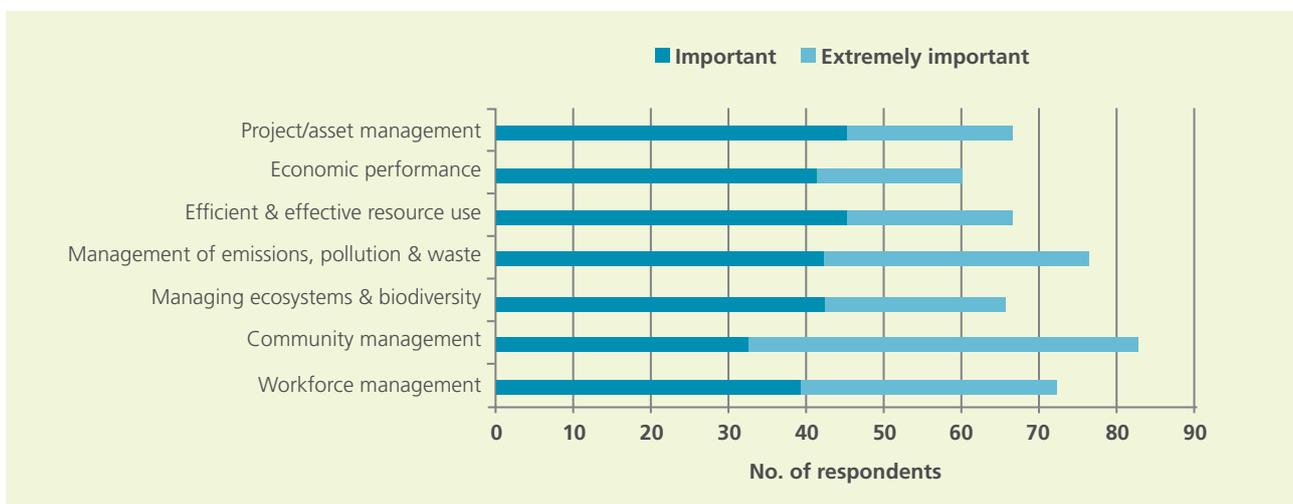


Figure 4 Sources of reputational benefits from infrastructure sustainability

Stockland

Stockland has in place stakeholder engagement plans for all state operations and every project to ensure a coordinated and strategic approach.

- “We engage regularly with all levels of government in Western Australia, New South Wales, Victoria and the Australian Capital Territory directly, and through industry associations.
- Our management regularly meet with institutional investors and we provide investor briefings on our strategy and financial results.
- We regularly seek feedback from customers through surveys and research, and we incorporate feedback into our product design and service offerings.
- Our major suppliers complete a CR&S questionnaire and a comprehensive health, safety and environment questionnaire as part of their response to our tender requests.
- Our engagement with communities includes community and consultation forums, one-to-one meetings with community groups and local leaders, as well as surveys and research.”

Stockland (2012) Corporate Responsibility & Sustainability 2011, Stockland Corporation Limited, available at: <http://www.stockland.com.au/sustainability/2011/about-stockland.htm>

Key Stakeholder Survey

ALPURT B2 project, NZ.

The 7.5km, \$360m motorway, delivered by the Northern Gateway Alliance (NGA), replaced the existing State Highway 1 route north of Auckland that contained winding, narrow sections and was not designed to carry heavy traffic volumes. The project’s key stakeholder survey was distributed annually to a group of 24 key stakeholders including members of the Community Reference Group, Auckland Regional Council, Rodney District Council, Department of Labour and Department of Conservation. The 12 survey questions were designed to test stakeholder perceptions about the adequacy and transparency of project communications, the strength and level of respect of stakeholder/NGA relations, compliance with statutory approvals, and the NGA’s ability to listen and respond to stakeholder concerns.

In the project’s Key Performance Indicators (tied to reward) performance against “wider community” and “key stakeholders” constituted a total of 12% of the total performance framework.

Adapted from Northern Gateway Alliance (2007) Sustainability Report 2007

Measuring reputational performance

Reputation is usually measured at a macro-level through ratings such as Fortune’s annual Most Admired Companies⁶⁰ and the Reputation Institute’s Global RepTrak 100⁶¹, despite questions over the reliability of such ratings, which are often based on private information.

At a project/asset level, infrastructure businesses typically use qualitative attitudinal surveys of stakeholders to understand the impact of their sustainability initiatives on reputation. These surveys test the reaction of clients, the workforce, the users of

the asset and those impacted by its construction and/or operation.

The surveys may be conducted to measure:

- The attitudes of clients, users and communities to the construction and/or operation of the asset;
- Brand awareness — the depth of recognition of the organisation among stakeholders;
- Brand image — whether the business is viewed favourably by stakeholders; and
- Satisfaction rating to test stakeholder perceptions of the quality of products and services.

2) Stronger employee motivation, retention, and recruitment

In today's business environment, the capabilities, commitment and inter-personal skills of employees are increasingly seen as sources of competitive advantage. The ability to attract, retain and develop employees is therefore a fundamental business objective, and one in which sustainability has a role. Australian research has found that, increasingly, employees are seeking to work for firms that "express and activate a commitment to the broader community and society" where their work "has wider meaning"⁶².

It has also been shown that even relatively small amounts of information regarding corporate social responsibility and the business's environmental focus can positively affect reputation and recruitment efforts^{63,54}.

Employee engagement and shareholder value

Employee engagement — the level of commitment of employees to their firms — is the measure of how successful a business is in attracting and retaining employees. As a key driver of productivity it is also an important indicator of business performance⁶⁴. Productivity, in turn, creates value through leveraging into margin improvement and so increased profitability. Improved employee engagement also lowers costs from turnover. Employee turnover results in loss of valuable employees and their corporate

memory, and in the often hidden costs of recruitment, including training, induction, and reduced productivity in the initial months of employment⁶⁵.

How infrastructure businesses enhance employee engagement through sustainability

It is not surprising that respondents to CIEAM's online survey highlighted the important role that good workforce management plays in employee engagement (Figure 5). This includes maintaining workforce health and safety and well-being; equity, including equal opportunity and local employment; building capacity through training and development; and capturing and sharing knowledge about sustainability. They also identified good community management performance and sound project/asset management as being key factors. Economic performance is rated least important.

In line with the survey results, businesses that want to build employee engagement through sustainability pay particular attention to their employees' health, well-being, working conditions, and development⁶⁶. They also take actions to build a positive reputation for social and environmental performance in community and employee relations, their business processes, and in the nature and quality of their products, recognising that this will provide a competitive advantage in attracting and securing applicants for positions⁶⁷.

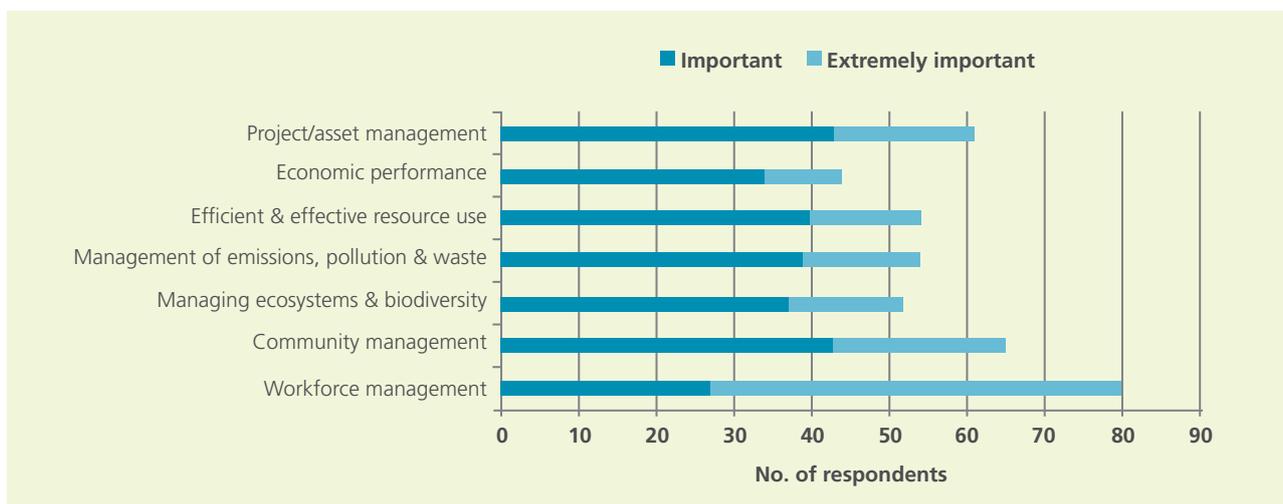


Figure 5 Sources of employee engagement benefits from infrastructure sustainability

Measuring employee engagement

Employee engagement is generally recognised as critical to productivity. As such, it is frequently a focus of infrastructure businesses’ human resource programs and internal surveys. The surveys are typically aimed to test employees’ support for organisational goals, their sense of belonging to the firm, their intention to stay with the organisation and their commitment to work beyond usual expectations. They also try to find out what encourages these behaviours and benchmark results against those from comparable firms.

Leighton Contractor’s most recent periodic employee survey (2010), Your Say, has identified the firm’s four principal drivers of strong employee engagement as:

1. Training and Career Development
2. Company Values
3. Strategy and Direction
4. Sustainability – Corporate and Social Responsibility

3) Cost efficiency/savings

To many managers, cost saving is the single most important and attractive competitive opportunity from sustainability. Committing to sustainability objectives from project inception and ensuring sustainability is integrated throughout design, construction and operation provides the greatest prospect for lowering project costs.

Cost efficiency and shareholder value

Cost efficiency directly relates to increased profitability that in turn translates to free cash flow and so to increased total shareholder returns.

How infrastructure businesses reduce costs through sustainability

It is perhaps self-evident that cost savings will eventuate from managing well and looking for economic value to reduce costs. This is reflected in the perceptions revealed by CIEAM’s survey, which included good project/asset management as an important driver of cost benefits (Figure 6). The ‘soft’ areas of managing ecosystems and biodiversity, community management, and workforce management were considered less important. This may be because these are seen to involve cost expenditure not directly related to constructing or operating an infrastructure asset.

The CIEAM survey also identified efficient and effective resource use as a key driver of cost savings. Typically this is a result of more efficient use of — or improved — equipment and reconsideration of the physical design of an asset to reduce the required resource inputs. To date, much of the industry’s focus during both construction and operation has been on energy efficiency, water use and reuse, and waste reduction, particularly through materials recycling. This is the so-called ‘win-win’ approach that has been shown to deliver significant savings, even ‘premium profits’ from relatively easily made changes^{47,30,68,69}.



Figure 6 Sources of cost benefits from infrastructure sustainability

The industry is a significant user of diesel fuel, steel, concrete and bitumen, all of which are increasing in cost. In addition, because they also have high levels of embedded energy, efficiency in the use of these materials has the added benefit of reducing the costs of carbon emissions.

Beyond these eco-efficiency driven 'low hanging fruit' savings from sustainability initiatives become harder to realise, and management is then forced to look to the whole product life cycle for further savings opportunities^{70,71}. This is particularly important in infrastructure, given the long operational life of many assets. However, the application of life cycle and whole of life costing principles is complicated by split incentives (see following section) that commonly exist in 'traditional' contracting methods. Other contracting forms — for example alliancing and some public-private partnerships that include operation of the asset — offer alternatives that do (or should) encourage consideration of asset life cycle costs.

Further commercial opportunities in the capital-intensive infrastructure industry include better access to capital and reduced cost of finance. These are available because sustainability offers investors and managers valuable insights into the dynamics of a business's operating environment and its specific risks and opportunities. Consequently, financiers are beginning to relate the cost of capital to a business's sustainability rating^{72,58}. The same principle applies to insurance and reinsurance costs, which are escalating, for example, for assets liable to exposure to floods and cyclones.

Measuring cost efficiencies

Cost efficiencies are characterised by savings in capital expenditure and by life cycle and whole of life costs that take into consideration capital expenditure and also factor in financing costs and costs of ownership, including costs of operation and maintenance, refurbishment and ultimate decommissioning and deconstruction. These longer-term savings can be particularly significant in infrastructure due to their repetitive nature and the long life of many assets.

While sustainability governance and economics support the concepts of life cycle and whole of life costing, this is a difficult question for infrastructure for two reasons.

Firstly, infrastructure assets are frequently acquired through typically short-term, competitive contractual relationships. This leads to split incentives: while the developer, contractor and outsourced operator are interested in reducing their capital expenditure, the eventual owner, whether public or private, is concerned with the ongoing costs of ownership and operation. These conflicting agendas can drive the design process and the built solution, and have the potential to work against efficiency and sustainability — the outcomes in buildings are "often appallingly energy-wasteful and unnecessarily costly on a life cycle basis"⁷³, and this is undoubtedly also the case with infrastructure.

Second, the short-term nature of project and corporate performance expectations discourages managers from taking a longer-term view of costs that would include life cycle considerations.

4) Revenue increases from new sources of revenue and improved market share

Infrastructure sustainability offers opportunities to increase revenue through improved market share, new sources of revenue, or enhanced pricing power. Innovative 'green' and socially respected products, processes and management allow firms to penetrate new sectors, enhance market share, bring on new product lines and, in some cases, command price premiums^{74,58}. Price premiums are also closely related to reputation and brand strength.

The renewable energy industry, Calera's new cement technology, and Toronto's Deep Lake Water Cooling are all examples of the opportunities that exist for infrastructure firms to identify new streams of revenue based on sustainability.

Brisbane Airport Corporation (BAC) water efficiency program, Qld

Brisbane Airport is the third busiest and the largest capital city airport by area in Australia.

In 2004, with an annual water consumption of 1,620ML per year, Brisbane Airport was among the top ten water users in Queensland. At the time, this was exacerbated by the worst drought in South East Queensland in over 150 years. It was evident that the continuation of existing practices would result in rapid and unsustainable growth in water consumption.

Implementation of a Sustainable Water Management strategy has involved four related streams of work: greater water use efficiencies, reduction in wastage through leaks, conversion from potable to recycled water use wherever practical, and stakeholder/tenant engagement and education to ensure behavioural change away from a “water will always be there” mentality.

Between 2004/05 to 2008/09, BAC reduced potable water consumption by 78%, despite growth in passenger numbers and increased commercial and construction activities. BAC has set a limit on future potable water use equivalent to the 2006/07 consumption, with projected demand increases to be offset by greater efficiencies and substitution with other water types. The cost saving in 2008/09 was \$2.3M, and the projected annual saving thereafter was \$2.4M. Non-monetary benefits include strengthened reputation through winning an International Water Association Award and improved stakeholder relations, and risk mitigation through weaning off reliance on potable water.

Adapted from BAC (2008), Beyond Tokenism: Sustainable Urban Water Management in a Holistic Framework. Application for the IWA Sustainability Specialist Group Prize for Innovation in the Practical Realisation of Sustainable Urban Water Management, Brisbane Airport Corporation, Brisbane.

“Disastrous year sends insurance premiums higher”

“Insurance premiums are set to jump by double-digit percentage points over the next 18 months, as insurers desperately seek to recoup lost profits after a record year of ruinous and costly natural disasters ... some industry sources have shown The Australian insurance policies that have increased in cost by 100 per cent since last January’s floods ... But insurers contend that rate increases of that magnitude are strictly limited to areas exposed to the greatest risk of disasters.”

The Australian, 21 January 2012

Whole of life cost savings — Equipment Energy Efficiency Program

There are approximately 2.28 million street lighting lamps in service in Australia, with around 33% on main roads and 67% on local roads. The annual energy cost of public lighting in Australia exceeds \$125 million (and more than \$250m including maintenance). Street lighting is the single largest source of greenhouse gas emissions from local government, typically accounting for 30 to 60 per cent of their greenhouse gas emissions. A joint initiative of Australian, State and Territory and New Zealand Governments proposed a strategy to introduce regulatory measures to phase out the use of energy inefficient HID lighting, provide communications support to the sector, deliver replacement programs in each Energy Distribution Business Area, and address financial barriers.

The overall benefits of the program would include annual energy savings of between \$35 and \$52m for public lighting customers and savings of 400,000 to 635,000 tonnes of greenhouse gas emissions.

Adapted from Commonwealth of Australia (2011), Street Lighting Strategy: Draft Strategy Paper Available at: www.energyrating.gov.au



New technology – new business

“New technologies provide start-ups with the ability to challenge conventional wisdom. Calera, a California start-up, has developed technology to extract carbon dioxide from industrial emissions and bubble it through seawater to manufacture cement. If successful, Calera’s technology will solve two problems: removing emissions from power plants and other polluting enterprises, and minimizing emissions during cement production ... The company is toying with a radical business model: It will give away cement to customers while charging polluters a fee for removing their emissions...

“Developing a new business model requires exploring alternatives to current ways of doing business as well as understanding how companies can meet customers’ needs differently. Executives must learn to question existing models and to act entrepreneurially to develop new delivery mechanisms. As companies become more adept at this, the experience will lead them to the final stage of sustainable innovation, where the impact of a new product or process extends beyond a single market.”

Nidumolu, Prahalad, and Rangaswami Why Sustainability is Now the Key Driver of Innovation, Harvard Business Review, September 2009

Toronto, Canada, Deep lake water cooling — New revenue streams from shared value

The City of Toronto entered into a private/public partnership to integrate a district cooling system, fed from Lake Ontario, with its potable water system. The private sector shared in the municipal infrastructure costs, and share capital and debt financing provided start-up funding. The partnership entity, Enwave, receives ongoing revenue by selling the coldness of the water (but not the water itself). The system will generate long-term stable, utility rate returns and cash flow to its shareholders.

The system has reduced energy consumption by up to 90% compared with conventional chillers and is estimated to save over 45,000 MWh/year in electrical production. It uses only water that is destined to meet the city’s domestic water needs and so does not pollute the lake with a plume of waste heat, saves 700 million litres of water p.a., and compared with coal-fired electricity, reduces GHG emissions by an estimated 79,000 tonnes p.a.. Life cycle benefits the system offers to Enwave’s customers include reduced need for major capital investments, massively reduced risk of interruption and downtime, reduced facility management requirements and cost savings in space, maintenance and labour.

Adapted from Enwave Services, available at: <http://www.enwave.com/services.html> and from FCM (2004), Demonstrating the Economic Benefits of Integrated, Green Infrastructure, Federation of Canadian Municipalities, available at: http://www.fcm.ca/Documents/tools/GMF/Demonstrating_the_Economic_Benefits_of_Integrated_Green_Infrastructure_Final_Report_EN.pdf

Revenue increases and shareholder value

Efficient management provides the opportunity to convert the increases of revenue from entry into new markets and increased market share into revenue growth and improved profit performance, so enhancing shareholder value.

How infrastructure businesses increase revenue through sustainability

CIEAM's survey respondents consider that sound economic performance is the major driver of increased revenue (Figure 7). Sustainability in economic management may include demonstrating value for money of sustainability initiatives and designing and operating the asset for a longer economic lifespan. Sound project/asset management and efficient and effective resource use are also key drivers. A number of respondents considered that environmental, community and workforce management had little or an unimportant direct impact on revenue generation.

To increase revenue through sustainability initiatives, infrastructure businesses concentrate on building market share by improving customer loyalty and reputation through demonstration of social and environmental responsibility. They may also find new revenue streams through offering new products and services within their existing markets or diversifying into new markets.

New products and services based on infrastructure sustainability may provide opportunities for advantages for early adopters and set up barriers to entry for competitors, particularly if they arise from innovation. For example, some innovative new technologies and products may be used to improve competitiveness through converting waste products into value, reducing the cost of compliance, improving process consistency, or reducing downtime^{75,30,68}.

Measuring revenue increases

Organisations planning to benchmark revenue performance against competitors and test the success of specific initiatives use a number of market metrics. The most common market metrics employed to measure market revenue position are:

- Market size — ascertains the value of the particular market over a period.
- Market share — the business's revenue as a percentage of the total market revenue.
- Market penetration — the number of clients as a percentage of the total number in the market, and used to determine revenue per client.

These measures may be used in combination with specific quantitative and qualitative studies to determine marketing and business development strategies.

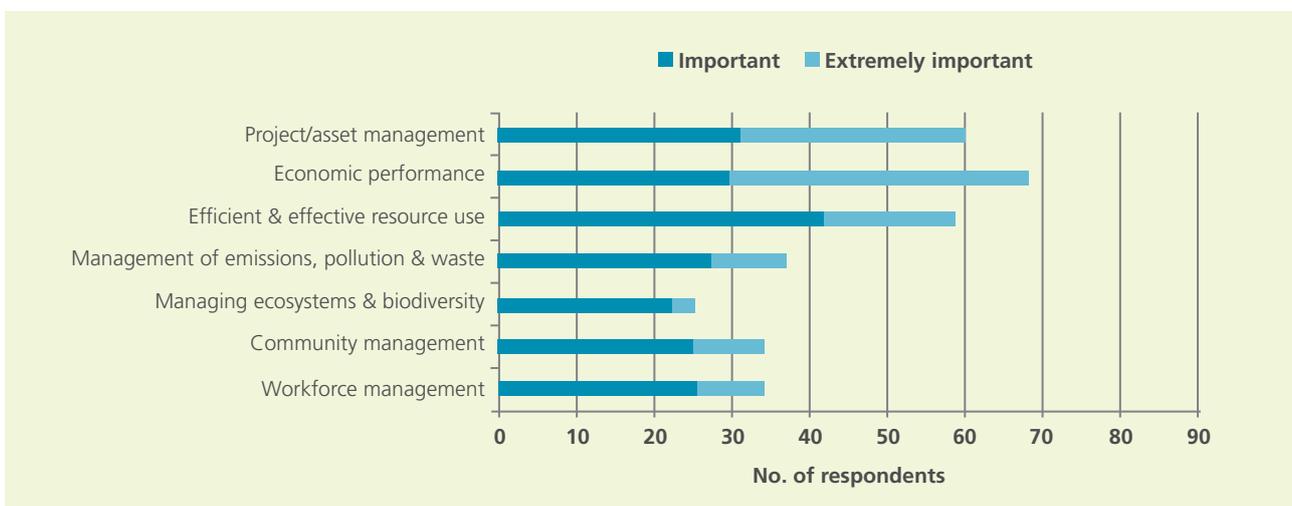


Figure 7 Sources of revenue increases from infrastructure sustainability

5) Risk reduction and management

Risk management is designed to add value through avoiding — or taking advantage of — uncertain events. ISO 31000:2009 Risk Management Principles and Guidelines defines risk as an “effect of uncertainty on objectives”. Increasingly, risk management has come to address not just negative effects but positive ones, or opportunities for achieving objectives⁷⁶.

Of the top 10 business risks identified by Ernst & Young in a survey of more than 70 industry executives, four are sustainability issues for the infrastructure industry:

1. Regulation and compliance
4. Managing talent
8. Radical greening
9. Social acceptance risk and corporate social responsibility

The Ernst & Young Business Risk Report 2010: The top 10 risks for business

A key competitive advantage provided by sustainability is that it extends risk management beyond compliance activities outside the typical infrastructure considerations of time, cost and quality. This allows systematic, early identification and addressing of risks in the operating environment.

Most infrastructure businesses consider — to some degree — environmental and community risks. A sustainability approach to risk management may also identify longer-term strategic issues such as resource shortages, fluctuations in energy costs, product liabilities, and pollution and waste management^{77,58} as well as “macroeconomic, political, social and demographic factors” which can pose significant operating risks, particularly to assets in the transport, energy and mining infrastructure sectors⁷⁸.

Allianz Group — Climate Change Risks

“As global risk managers, we care about climate change because it directly affects our business ... Climate change is one of the greatest challenges facing the insurance industry, which is why financial organisations like Allianz have commissioned some of the most in-depth studies into global warming.

“Every hailstorm, every hurricane, every flood causes damages insurers have to pay for. In the past 30 years there has been a 15-fold increase in weather-related claims and 40% of all damages that Allianz now pays out are due to natural catastrophes. Between 2010 and 2019, average losses for the insurance industry could grow to US\$41 billion per annum.

“But importantly, climate change is not only about managing risks, it is also about tapping markets of the future. Financial institutions are key players in growth markets ranging from renewable energy and energy efficiency, to eco-friendly investments and to carbon trading ...

“These are just a few examples why climate change is one of the issues which are of most concern to our stakeholders, and one of the most important trends that we have to manage.”

Allianz (2012) *Why we care*, accessed 30 March 2012 https://www.allianz.com/en/about_allianz/sustainability/sustainability_old/climate_change_and_environment/index.html

Risk management and shareholder value

By managing sustainability risk businesses can influence time, cost and quality outcomes that can leverage into margin improvement, profit, and consequently shareholder value.

Opportunities identified during risk management processes may translate into revenue growth through improved market share or new revenue streams. Market recognition of competent risk management may reduce risk premiums and the cost of finance that, in turn, can influence the valuation multiple assigned by the market.

Sustainability risks and investment

Investors are increasingly recognising that they must protect and manage their investments for the long-term. They do this through considering ESG risks in their investment decision-making processes and in the management of their investment portfolios. Super funds as investors must therefore monitor how their investee companies manage the ESG impacts of their activities and there are a wide range of ESG issues which may be relevant to Australian companies.

Whilst ACSI recognises that there are indeed barriers to progress on sustainability reporting, such as resource constraints and confidentiality concerns, we do not believe that these are sound justification for excluding the consideration of sustainability risks in corporate reporting. We believe that sustainability reporting is an indicator of the quality of a company's governance, and companies that provide little or no reporting are cause for serious concern.

Adapted from: Australian Council of Super Investors (2012) Sustainability Reporting Practices of the S&P/ASX200: As at March 2012, available at: <http://www.acsi.org.au/>

A more robust business risk assessment framework will provide better value protection opportunities for existing shareholder value. That is, a business that includes sustainability issues in its risk assessment framework is more likely to protect existing shareholder value from erosion over time.

It has also been suggested that, because sustainability offers investors and managers valuable insight into the dynamics of the external business environment and its specific risks and opportunities, it is useful in the attraction of long-term and lower cost capital^{79,58}. As well as financial benefits, better risk management may also have benefits that reflect in strengthened reputation through avoidance of socially unacceptable practices.

How infrastructure businesses manage risk through sustainability

Risk management begins with establishing the context followed by an analysis to determine the nature and severity of risk and the upside of opportunities, typically through use of a risk matrix using both subjective and quantitative factors.

Risk management in infrastructure has traditionally focused on issues that may impact the three objectives of time, cost and quality. The range of such issues, including stakeholder activism, legislative delays and environmental management failures, is broad and aligns with key aspects of sustainability. Consequently, risk managers are able to use tools such as infrastructure sustainability rating schemes to ensure that their processes capture a full range of issues. By doing so they expand the boundaries of typical risk assessment processes to integrate functionality, sustainability and project execution related issues.⁷⁶

Respondents to CIEAM's business case survey considered that the most important sources of reduced risk from sustainability are good performance in project/asset management (which includes attention to sustainability-based risk management issues including climate change adaptation), community and workforce management, and management of emissions, pollution and waste (Figure 8).

Measuring risk (including opportunities)

The ability to measure risk from sustainability performance is extremely important to financial stakeholders. While constructors and owners want a way to diagnose risk so they can manage and reduce it, financiers and buyers, particularly those like governments and superannuation and insurance funds with a longer term outlook, want to know the risks of capital — be that debt or equity.

An obvious difficulty with understanding the outcomes of a good risk management process is that it is specifically designed to avoid adverse consequences; as such quantification of what is actually avoided is not possible.



Figure 8 Sources of risk management benefits from infrastructure sustainability

The principal advantage of using a sustainability framework such as AGIC’s IS rating system in risk assessment is that it “considers interlinked factors and facilitates identification of relationships between risks. This recognises that interconnected risks can create or exacerbate other risks”.

MacAskill, K. (2011) Risk Management as a Framework for Applying Sustainability Concepts on Infrastructure Projects (Dissertation), University of Cambridge.

6) Enhanced social licence to operate

Society grants business owners legitimacy and limited liability — an intangible ‘social licence to operate’ — in exchange for putting their capital at risk, and receives public benefits in return^{46,80}. Originally, the public benefits of this licence — including jobs, taxes, and goods and services — were solely economic. However, as expectations of corporate behaviour and contribution build, increasingly the public benefits are being extended to embrace social and environmental performance. As a result, confirmation of a licence to operate is often argued as a benefit of sustainability^{46,47}.

Maintaining the intangible social licence to operate is particularly relevant to businesses that depend on government consent and/or those that rely on good stakeholder relationships⁸¹. Both these situations frequently apply in the infrastructure industry, where the licence is closely associated with both reputation and risk. An illustration of the association between social licence and risk is afforded by the situation around the third runway proposed for London’s Heathrow Airport.

While under normal circumstances a social licence to operate is usually a given when the project or asset has the necessary government approvals, it must be maintained. An organisation risks damaging or even losing it through poor social, environmental or economic performance.

Risk management in Ausgrid's network upgrade, King Street, Newtown, NSW

Ausgrid is a State Owned Corporation of the New South Wales Government. The company is delivering one of Australia's largest infrastructure programs – an \$8 billion upgrade of the electricity network including 50 new major substations and hundreds of kilometres of new electricity cables.

The principal drivers of the upgrade project were Ausgrid's duty of care to provide a safe and reliable electricity network in one of Sydney's busiest retail precincts. Over its 18 months life, the project directly impacts 130 mostly small businesses. The owners/operators take any disruption to their business extremely seriously and often personally as it may have severe negative financial consequences.

The potential risks of poor community/business relations were identified in a procurement plan prepared at the project outset; it was clear that intense community liaison was critical to project success. Ausgrid appointed an external consultant to plan and deliver project communications and community liaison. An issues/risk analysis was conducted which, together with a set of protocols and procedures and a structured measurement and reporting process, has served as a management framework.

Risk management was a key rationale behind this community liaison program, leading to avoided potential costs through delays and additional non-monetary benefits of better reputation and stronger social licence to operate. These benefits are evidenced through a lower level of complaints, less local media attention and lack of local political interest when compared with a similar completed Ausgrid project that did not have such a program in place.

From Ausgrid and project consultant interviews and Ausgrid data (2012)

What does it look like when a company has a social licence?

First of all, there's low and infrequent conflict between stakeholders and the company. The company or the project is seen as an inextricable and valued component of the social and economic fabric of the community. Its employees and managers will be socially well accepted in the community because they're part of the community. ... These companies will easily be able to attract good talent. They will have few or no problems in obtaining the necessary regulatory licences that they need. Basically, they will be treated as a valued member of the community.

Black, L. & Bice, S. (2012) Defining the elusive and essential social licence to operate, available at: <http://www.csrconnected.com.au/2011/08/defining-the-elusive-and-essential-social-licence-to-operate/>

Social licence to operate and risk – Heathrow's third runway

Heathrow's projected third runway provides an example of investors factoring in future growth into their investment model, but being unable to achieve a social licence for the project to proceed because of a strong campaign by communities that would be affected by the increased airport activity.

BBC News 12 May, 2012 Heathrow runway plans scrapped by new government, available at: http://news.bbc.co.uk/2/hi/uk_news/england/london/8678282.stm

Despite earlier decisions, ultimately the anticipated level of growth may be such that government overrides social concerns and approves the project.

FT.com 13 June, 2012 Cameron clears way for Heathrow U-turn, available at: <http://www.ft.com/cms/s/0/5a0b7cd0-b578-11e1-b8d0-00144feabdc0.html#axzz1y1m14n72>

Social licence to operate has three components:

- *Social legitimacy based on established norms... of the community that may be legal, social and cultural and both formal and informal in nature...*
- *Credibility ... created by consistently providing true and clear information with any and all commitments made to the community ...*
- *Trust (which) comes from shared experiences ...*

Boutilier, R. & Thomson, I. (2012) The Social License to Operate, available at: <http://sociallicense.com/index.html>

“But remember that conduct – people’s conduct and societal conduct – is largely driven by societal norms, not by law. ... So we should be earning our social licence through fitting in and adapting to the prevailing social norms and acceptable social norms and the legal requirements are simply a complementary element to that.”

Harvey, B., Global Practice Leader - Communities and Social Performance, Rio Tinto (2011) <http://www.skmconsulting.com/Knowledge-and-Insights/Achieve-Magazine/Issue4-2011/cover.aspx>

Social licence to operate and shareholder value

A strong social licence to operate influences perceptions of risk premiums and, through its close relationship with reputation and image, it also impacts brand strength. Both of these factors drive the market’s valuation multiple and so can translate into shareholder value.

How infrastructure businesses strengthen their social licence through sustainability

By its very nature, infrastructure sustainability is intimately related to the strength of a business’s social licence to operate. Outstanding performance against AGIC’s IS rating scheme (or similar) provides the first step in maintaining a licence. The key performance indicators of rating systems cross the spectrum of economic, social and environmental issues valued by stakeholders. In particular, good community and environmental performance and sound project/asset management are considered to be central to business’s social licence to operate by the respondents to CIEAM’s survey (Figure 9).

Communicating that performance at overall and stakeholder-specific levels through the whole range of available marketing tactics is central to building and changing stakeholder perceptions and reinforcing the licence to operate.

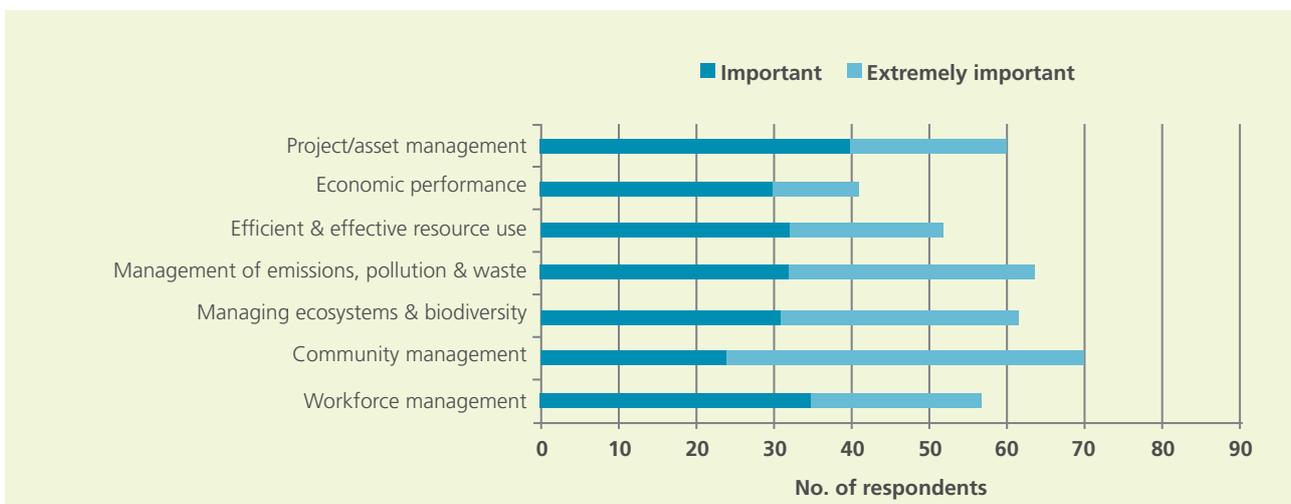


Figure 9 Sources of social licence to operate benefits

Measuring social licence to operate

As with most intangible business assets, the social licence to operate is usually measured qualitatively, for example using surveys that test stakeholder perceptions of the business. This may be measured across four levels of performance⁸²:

- **Withheld/withdrawn** — the rejection level indicated by shutdowns, blockades, boycotts and legal challenges
- **Tolerance**, where there may be lingering issues and threats, the presence of NGOs and watchful monitoring

- **Support**, where the business is considered a good neighbour and the community approves of the project and those involved
- **Co-ownership**, where the community becomes an advocate for the project and the business.

It is important to recognise that an organisation's licence to operate may be project or asset specific. In other words, poor social, environmental or governance performance on a project or asset operation may damage the reputation of the whole business.

The Visy Tumut Pulp Mill, NSW

Following community concerns over the level of organic effluent discharges to waterways and logging of old-growth native forests, the planned construction of a pulp mill in northern Tasmania was halted and an "investment strike" in new mills followed, evidencing withdrawal of the industry's social licence to operate. In 2001, Visy Industries opened a new unbleached kraft pulp and paper mill at Tumut, NSW, regarded as a showcase of innovative environmental and sustainable energy, water and waste technologies. The go ahead to the project was only given after the establishment of a social licence to operate through a process of public and community engagement and commitment to meeting or exceeding regulatory compliance and, in some cases, world best practice.

Adapted from AusCID (2003) Sustainability Framework for the Future of Australia's Infrastructure



The integration of sustainability into risk management, project objectives, and performance setting and reward structures may help businesses see sustainability as a value proposition rather than a value imposition.



3. Barriers to acceptance of the business case for infrastructure sustainability

The question must be asked: if there are so many benefits, why don't all managers believe the evidence? The reasons are related to the prevailing industry culture — including its highly competitive nature, a lack of appreciation of how stakeholder value is created, and accounting practices.

Infrastructure industry culture

The industry culture holds back acceptance of the sustainability business case because it is short-term results focused, relies largely on confrontational contractual relationships, and is highly competitive and financially intensive.

Firstly, given the widespread view that the role of business is to maximise profits, and the nature of the reporting cycle, it is not surprising that a majority of managers are focussed on delivering short-term profits. However, what is surprising is reluctance to embrace a wider perspective of risk given the industry's high level of potential immediate and longer-term social and environmental impact and the increasing scrutiny that projects and assets face from stakeholders and NGOs. This reluctance ignores the environmental and social risks which need to be factored into mainstream thinking and the mounting evidence that creating value for stakeholders beyond just shareholders is the key to building short-term profits into longer-term success.

Similarly, governments, the major funders of public infrastructure in Australia, are also often focused on delivering short-term outcomes, in their case driven by the electoral cycle, and so are less inclined to take the long-term view that infrastructure demands.

Second, and as discussed earlier, the culture of the industry is also characterised by typically short-term, confrontational contractual relationships between financiers, developers, consultants, contractors, and extending to owners and operators, with split responsibilities and leading to split incentives.

Finally, the infrastructure industry is competitive and financially intensive. There is a view that adopting sustainability will impose cost penalties and create competitive disadvantages where others operate at business as usual levels. Further, the 'transparency' requirement of sustainability requires companies to

"share such information as their carbon footprint and the specifics of their manufacturing [construction or operating] practices", information often considered to be commercially sensitive². This is exacerbated by beliefs that suppliers cannot meet demand for sustainable inputs or transparency, that there will be a need for reinvention of processes and equipment, and that clients will not pay for improved sustainability performance.

The integration of sustainability into risk management, project objectives, and performance setting and reward structures aligned with business strategy (similar to the way some alliance contracts function) may help businesses see sustainability as a value proposition rather than a value imposition.

Lack of appreciation of value pathways

Proving that particular sustainability initiatives translate into enhanced market value is problematical. Causal links are indirect and ill-defined and may have ambiguous direction. Reputation, for example, is a complex concept, the sum of a number of actions across its six dimensions. In addition, what adds to market value in one firm may not in another depending on individual company strategy, culture and operational methods.

Further, sustainability drivers are highly unpredictable and so the necessity of planning in a dynamic and uncertain business environment "potentially [requires] companies to adopt entirely new concepts and frameworks"². The lack of a common language of sustainability, even within individual infrastructure industry sectors, exacerbates this problem.

It is also evident that benefits from sustainability activities are non-linear and returns may diminish as the intensity of sustainability actions increase, perhaps following an inverted u-shape^{44,45,3}. Accordingly 'excessive' actions (a zero emissions goal has been cited as an example⁸³) are likely to be costly and damaging to financial performance.

Despite these complications, the model discussed in this guideline provides a guide to how businesses may approach understanding their own pathways to value.

Accounting practices

The most fundamental obstacle to quantifying costs and benefits of sustainability initiatives is the nature of accounting practices, which commonly hold the view that what cannot be empirically measured is “typically viewed as unimportant or even non-existent”⁸⁴. As a result, ecological and social resources, and the often-intangible benefits of integrating sustainability into strategy and operations, are frequently considered to have no intrinsic economic value and to be unimportant to business performance.

Even though — as this guideline demonstrates — some non-monetary (intangible) assets can be leveraged into competitive advantage and shareholder value, “in practice, investors and managers don’t know how to play in a space that expands the framework to include other than strictly financial metrics”⁸⁵.

Many of these intangible assets are valued by the market but overlooked by management, meaning that “management is prone to under-manage or even ignore what might ... be the most significant portion of their company’s (market) valuation”⁸⁶ given that, in today’s knowledge economy, ‘traditional’ accounting assets explain only about one quarter of market value⁸⁷. Calculating the economic value of such benefits using traditional accounting discounted cash flow methods will almost invariably count against sustainability actions that result in intangible benefits.

Given these factors, quantifying the business benefits of infrastructure sustainability requires businesses to adopt a different approach to measuring shareholder value, encompassing both operational and investment perspectives so that management has measures that “reflect the way organisations create value and ... [are] sensitive to differences in business models”⁸⁸. McKinsey & Company believe that it is possible to directly value the financial benefits using traditional business metrics such as cost efficiency, provided managers understand the path to, and drivers of, value⁵⁵.

The approach discussed in this guideline offers a way to do this. It demonstrates that intangible assets such as brand strength, the social licence to operate, ability to attract and retain employees, and risk premiums all influence shareholder value.

Finally, many organisations lack the knowledge, expertise or will to collect and analyse data on social and environmental issues and performance — particularly complex system-wide ones — and so are unable to adequately test their sustainability business case or to measure the costs and benefits of action. The AGIC IS rating system, and its related international tools, offer businesses a framework for supplementing their existing data to better track their sustainability performance and so better understand how sustainability initiatives can contribute to shareholder value.



The problem with current accounting practices: Seattle Public Utilities

In 1889 Seattle Public Utilities (SPU) was established to provide water to the city. It subsequently purchased the forested Cedar River watershed to provide and filter the community's water. Although a radical and expensive idea at the time, this has proven to be a successful long-term investment. If the forest did not filter the city's water supply it is likely SPU would have had to construct three or four filtration plants at a cost today of \$200 million with annual operating and maintenance costs of \$3.6 million.

From both an economic and ecological standpoint, however, a fundamental dilemma is faced by SPU and other watershed-filtered water utilities. Under the United States' Governmental Accounting Standards Board accounting standards, the watershed, which provides and protects the purity of the water supply and is intuitively the utility's greatest asset, does not count as an economic asset in the utility's financial books beyond its price of purchase.

Simply put, the accounting rules, with their sole focus on historical cost accounting and man-made assets, do not provide an accurate or meaningful picture of SPU's assets. Because accounting rules have been developed for built capital, which depreciates, they are historically cost based, meaning the value of the watershed is the original amount paid for the land. These rules do not permit a water utility to adequately account for its greatest asset: the watershed itself.

A couple of interesting ironies of current accounting practice are worth mentioning. First, if a watershed becomes polluted, cleanup costs must be immediately recognized as an expense and recorded as a liability on the utility's financial statements, even though the value of the watershed is not shown on the statements beyond the, typically, very low historical costs of its purchase. Second, if an old logging road in the watershed needs to be decommissioned to prevent sediment and runoff from entering the reservoir and degrading water quality, the utility's assets will take a write-down. The road is counted as an asset because it was originally an 'improvement' to the watershed, even though, in reality, it is an economic liability.

Adapted from: Cosman et al. (2012) How Water Utilities Can Spearhead Natural Capital Accounting, available at: <http://www.thesolutionsjournal.com/node/1018>



For infrastructure businesses to embrace sustainability, the initiatives they adopt must be seen to be valuable within the context of usual industry practice.

4. Selling the business case for infrastructure sustainability

This section outlines some steps to help overcome the barriers to management acceptance of the business case for infrastructure sustainability so that your organisation can share in the benefits sustainability offers.

Demonstrate the business case

It is self-evident that for infrastructure businesses and their managers to embrace sustainability, the initiatives they adopt must be seen to be valuable within the context of usual industry practice. Businesses are generally not altruistic; they must see that sustainability will contribute to their continuing prosperity and development before moving beyond business as usual.

... businesses have a responsibility to be prosperous and to make the world a better place. CFOs have traditionally focussed on the first part of that mandate. To get them interested in the second part, it's important to show them the link between prosperity and sustainability.

Kurt Kuehn, CFO UPS, (2010) <http://www.greenbiz.com/blog/2010/04/13/five-ways-convince-your-cfo-sustainability-pays>

A survey of 1,560 business leaders found that “almost 70 per cent said that their company did not have a strong business case for sustainability. Of these respondents, 22 per cent claimed that the lack of a business case presented their company with its primary barrier to pursuing sustainability initiatives”². If managers do not understand the value they stand to gain from infrastructure sustainability they are unlikely to change the way they think about what they do.

Cost savings, strengthened reputation, and better risk management were considered by respondents to CIEAM’s infrastructure sustainability business case survey as being the benefits most likely to motivate integration of sustainability into their businesses (see Figure 10).

Based on these perceptions, it may be reasonable to focus business case development on these three primary motivating benefits. However, as shown by the value flows in Figure 3, the full range of benefits from infrastructure sustainability can influence the levers that have financial impact and act directly or indirectly on the two drivers of shareholder value: profit, which releases free cash flow; and the valuation multiple the market places over the business’s net tangible asset value⁵⁵.

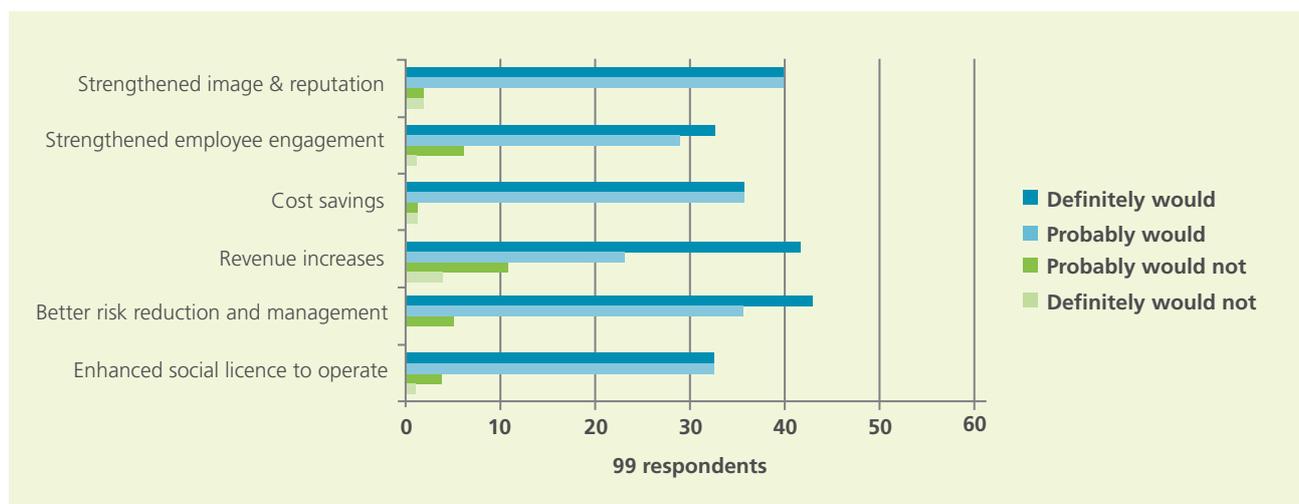


Figure 10 Motivating benefits for business integration of infrastructure sustainability

Consider alternative accounting approaches

Managers in infrastructure, as in the majority of other sectors, have accounting practices that conflate profit and value.

AS 4183:2007, the Australian Value Management standard, defines value as “An attribute of an entity determined by the entity’s perceived usefulness, benefits and importance” — considerations beyond monetary cost and subjective, personal, and not easily monetised.

Value and profit are not the same, although profit is a factor in determining value. Value is a more complex equation of monetised and non-monetised benefits. It is why some companies rent expensive space in the CBD rather than cheaper space in the suburbs: they see value — usefulness and importance — in such things as access to transport, better amenities for their staff, being closer to their clients, and the prestige of a CBD address.

These things are not readily monetised but, consciously or unconsciously, they become part of the value equation for decision-makers, their shareholders and other key stakeholders. Similarly, issues such as reputation, risk management, environmental management and employee engagement, while intangible, are all important in making decisions about infrastructure sustainability.

Incorporate experience into the business case

Many businesses are investing significant funds in infrastructure sustainability resources and initiatives at both organisational and project/asset level. They frequently report their sustainability performance — the public good value — internally and publicly. Yet often they do not measure the business benefits (or costs) of this investment.

By mining the data available from their experiences, organisations would be able to get a more rounded set of inputs to business and project planning, as well as being better informed in valuing, improving and promoting their project outcomes to stakeholders.

Conclusion

At the very least, all organisations seek to improve their value (as interpreted by their owners and stakeholders) while avoiding environmental and social harm that may damage their value. This guideline is written to support those organisations that want more than this. It is for those seeking opportunities to enhance their value through good environmental, social and governance performance, but who are uncertain about how such performance supports a business case.

The guideline identifies six primary benefits of sustainability: strengthened image and reputation; enhanced employee engagement; cost savings; improved revenue from both product and service enhancements or new revenue sources; better risk management; and strengthened social licence to operate. These benefits are both tangible and intangible, and are likely to accrue differently to each organisation according to its situation and strategy.

The guideline has also explained the value pathways by which infrastructure sustainability performance can translate those benefits, either directly or indirectly, into one or both of the drivers of shareholder value — increased profit and an enhanced valuation multiple applied by the financial markets.

The same principles of value pathways apply equally to listed and non-listed businesses, to governments and NGOs: all have 'shareholders', owners of the organisation; and 'stakeholders', those with an investment in the organisation — be it physical or emotional. The essential difference between organisations is the relative weighting they put on the components of shared value — organisational value and public good value — and the strategies they pursue to achieve them.

The guideline provides an approach for linking benefits to the AGIC IS rating system (or its international equivalents) so that organisations can better understand how, and which, infrastructure sustainability initiatives contribute to improved shareholder value.

Finally, the guideline discusses some of the barriers that discourage organisations from pursuing infrastructure sustainability and offers some suggestions to overcome them.

We hope that you find the guideline useful in your organisation and that it helps to clarify your own business case for infrastructure sustainability.

Appendix: Industry perceptions of infrastructure sustainability benefits from the CIEAM survey

As part of the research for this guideline the Cooperative Research Centre for Infrastructure and Engineering Asset Management (CIEAM) conducted an online survey to test industry perceptions of the business case for infrastructure sustainability and whether they accord with the literature discussed in the preceding sections of this guideline.

The survey also examined industry perceptions about which aspects of good sustainability performance drive each of the six benefits. This section discusses the survey and its findings.

Survey structure

The survey tested the six generic benefits of sustainability against the themes of the (then draft) AGIC infrastructure sustainability rating scheme:

- **Project/asset management:** including dedicated sustainability policy, structure and resources, the management system used, the use of multi-criteria decision support, approach to procurement and purchasing, knowledge sharing, and processes for managing climate change adaptation. This theme aligns with AGIC IS rating scheme's Management and Governance theme.
- **Economic performance:** including demonstrating value for money of sustainability initiatives, designing and operating the asset for longer economic life (for example using life cycle costing and life cycle analysis), and contributing to the strength of the local economy. AGIC IS does not yet have an equivalent theme.
- **Efficient and effective use of resources:** including the use of energy, water and construction materials, and reduction of carbon emissions. Aligns with the AGIC IS theme of Using Resources.
- **Management of emissions, pollution and waste:** including discharges to land, air and water, land disturbance and waste reduction and handling. Similar to AGIC IS Emissions, Pollution and Waste theme.

- **Managing ecosystems and biodiversity.** Aligns with the AGIC IS Ecology theme.
- **Community management:** including maintaining community safety, health and well-being, having active stakeholder participation in decision-making, and respecting natural and cultural heritage. Aligns with People and Place in the AGIC IS.
- **Workforce management:** including maintaining the safety, health and well-being of the workforce, building capacity through training and development and through capturing and sharing knowledge about sustainability, and equity, including equal opportunity and local employment. AGIC IS does not yet have an equivalent theme.

While those themes have been modified in the release version of the IS rating scheme, their overall key result areas and the categories they describe, are largely the same. For the purposes of this survey, the themes as used embrace the range of infrastructure sustainability topics most likely to be encountered by businesses.

The survey first gathered data on the ownership, size, and industry role of respondents' organisations. It then asked for respondents to nominate their functional role/position in their organisation. These questions were designed to inform the researcher about potential biases in the respondent group and to allow filtering of the responses if required.

Respondents were then asked to identify which of the six sustainability benefits would encourage their organisation to pursue sustainability in their infrastructure business and/or projects.

Following on from this were seven questions that asked respondents to rate how important they considered good performance in each of the themes to be to delivering each of the sustainability benefits, using a Likert scale ranging from "has no impact on this benefit" to "extremely important". For the purposes of reporting the results, the centre values in the scale have been omitted.

Survey participants

Participants were invited with email requests to the researcher’s list of contacts and to CIEAM partner organisations and with an invitation placed on AGIC’s website homepage. Responses were received from 99 participants.

Organisational profile

The majority of respondents were from privately owned organisations — companies or registered businesses (see Figure 11). The respondents who nominated “other” identified their organisations as researchers or NGOs.

Respondents’ organisations were reasonably evenly distributed across the range of sizes nominated (Figure 12).

The respondents’ organisations carried out a range of roles across the infrastructure industry with the largest participation from design and sustainability consultants (Figure 13). “Other” respondents identified their organisations as involved in finance, community relations, management consultancy, and sustainability assessment.

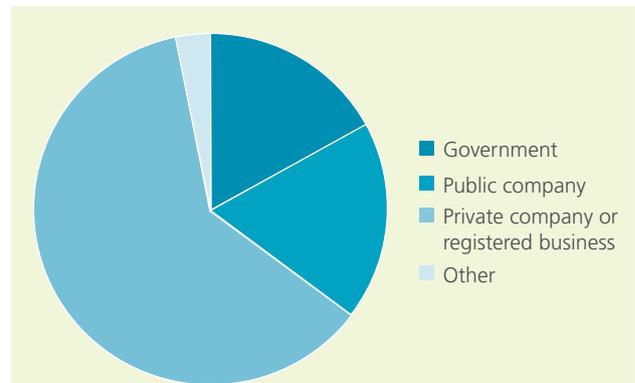


Figure 11 Respondents' organisation ownership

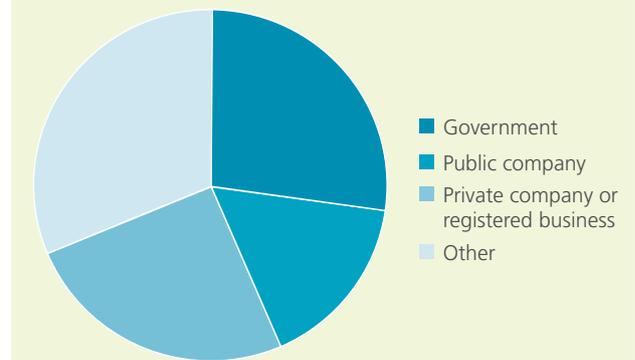


Figure 12 Respondents' organisation size

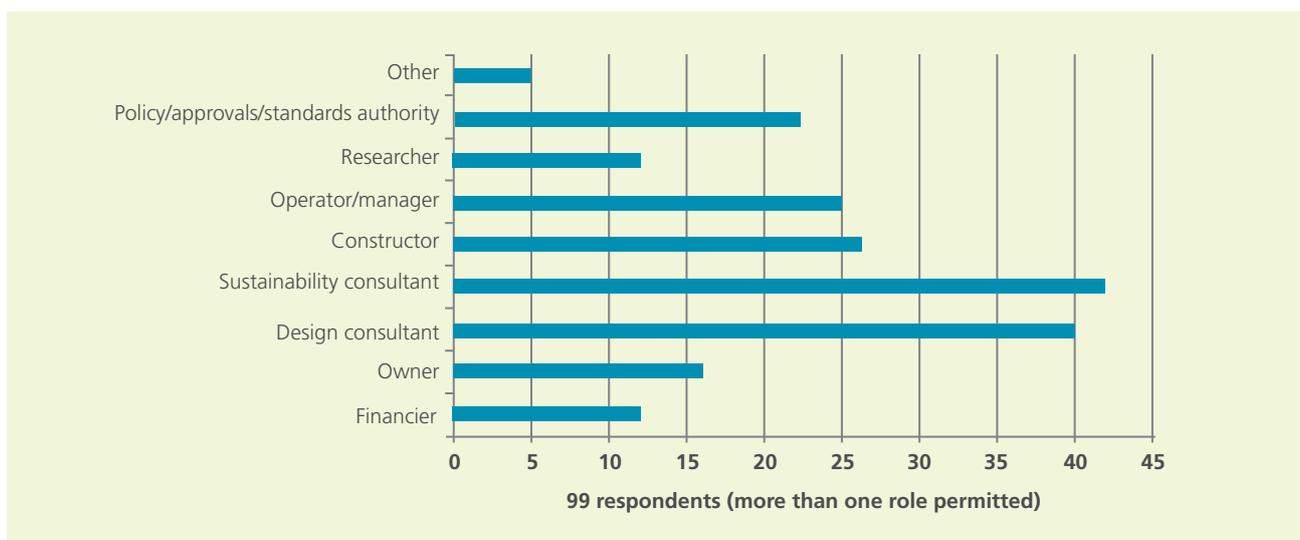


Figure 13 The industry roles of respondents' organisations

Respondents' functional roles/positions within their organisations

The range of functional roles was broad (Figure 14) and have been categorised by the researcher according to the following:

- **Executive** includes those who self-identified as VP, CEO, GM, MD or owner
- **Sustainability** includes all respondents with sustainability, environment or community in their titles. (While these latter two groups are not the same as sustainability they are related within an ESG context).
- **Engineer** includes all those with engineer in their title

- **Project Manager** includes program manager
- **Other** includes business analysts, business development managers, and researchers.

The high proportion of executives is relevant given the strategic role of business cases.

Findings: Motivating benefits for pursuing sustainability in infrastructure businesses

Reputation, cost savings and risk management were considered by respondents as being the benefits most likely to encourage integration of sustainability into their businesses (see Figure 15).

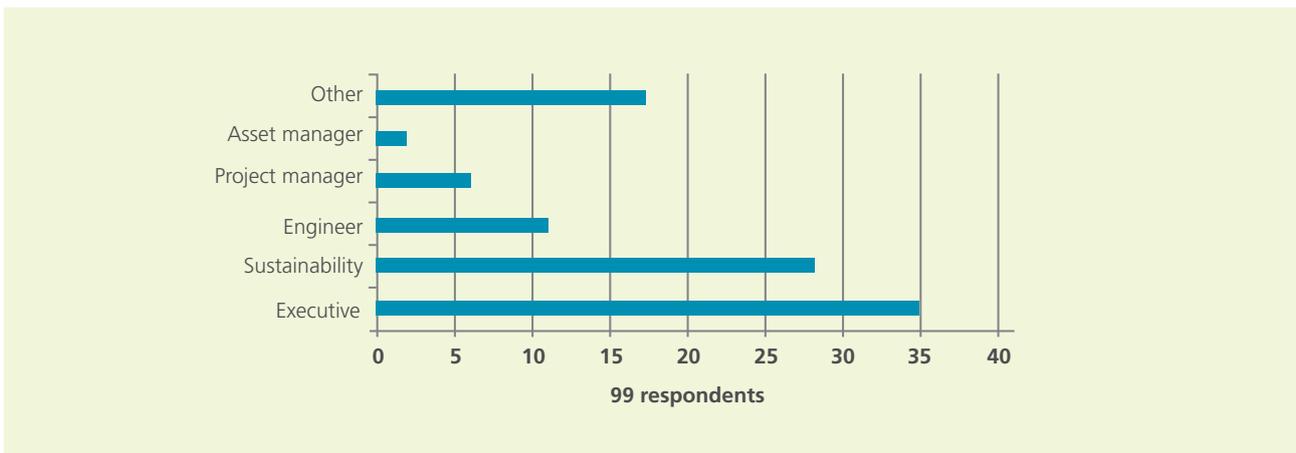


Figure 14 Respondents' functional roles/positions

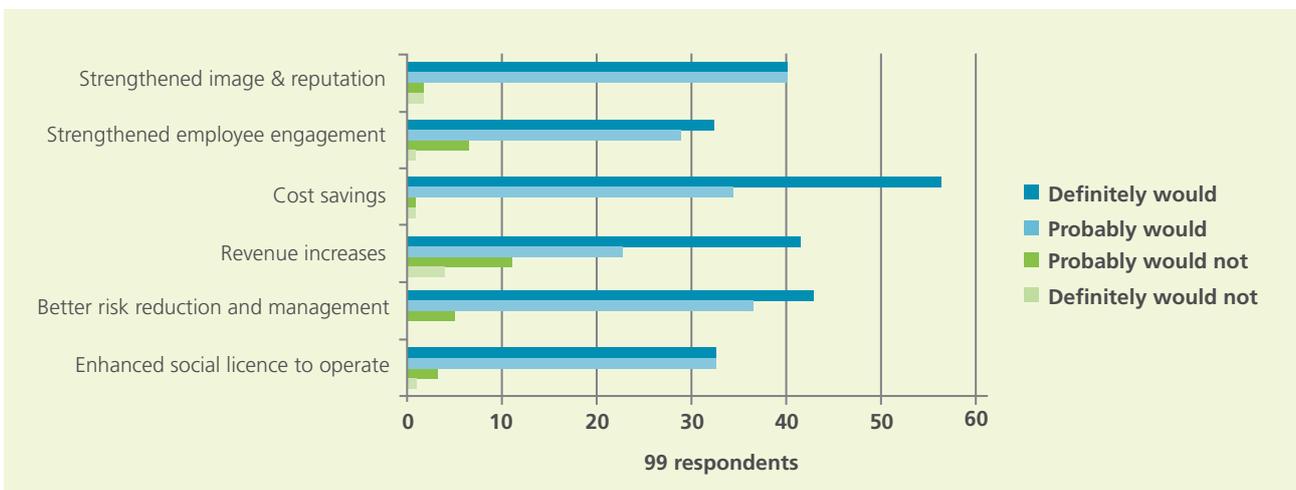


Figure 15 Motivating benefits for pursuing sustainability in infrastructure

Findings: How infrastructure sustainability performance impacts benefits

The survey asked respondents to rate the importance of good performance in each of the AGIC themes in delivering each of the six benefits of infrastructure sustainability.

Project/asset management

As shown in Figure 16, a high percentage of survey respondents considered that the primary benefits of good sustainability performance in project or asset management are cost savings and risk reduction and management. This is to be expected, as these, along with time and quality, are a major focus of project management

Respondents also identified that good performance in this area has important impacts across all benefits.

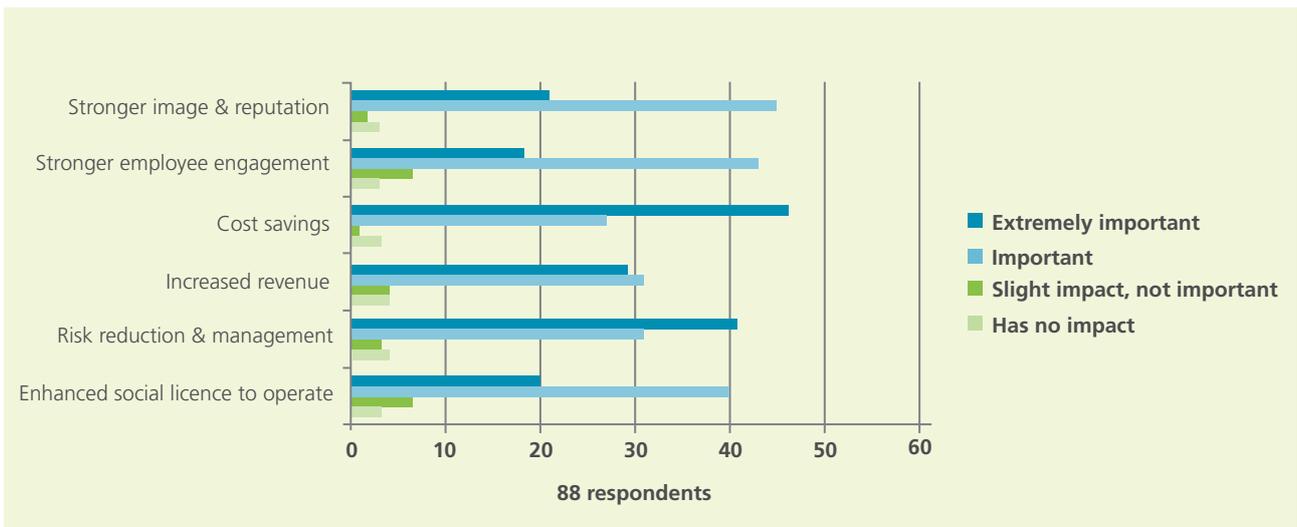


Figure 16 Impact of project/asset management on sustainability benefits

Economic performance

As may be expected, good economic performance reflects primarily in cost and revenue benefits and is also considered to be important across all benefits. It was seen as being a less important factor in enhancing employee engagement and the social licence to operate (Figure 17).

Efficient and effective use of resources

Respondents identified the efficient and effective use of resources as impacting all benefits, and having particular importance in cost reduction, risk reduction and management and to a lesser extent, influencing reputation and social licence to operate. It was considered of least importance in strengthening employee engagement (Figure 18).

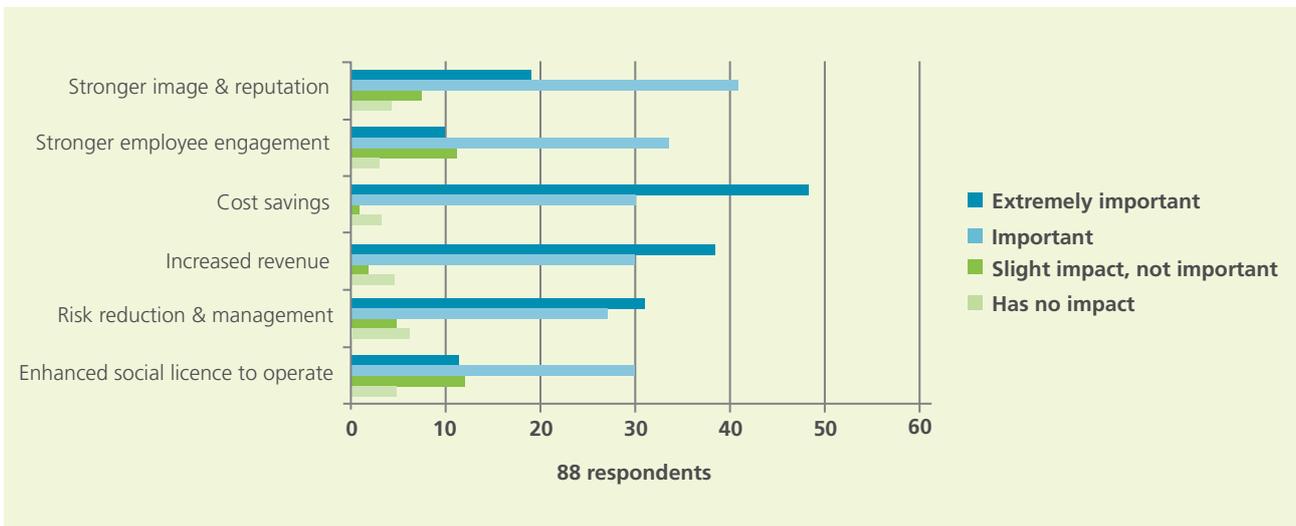


Figure 17 Impact of economic performance on sustainability benefits

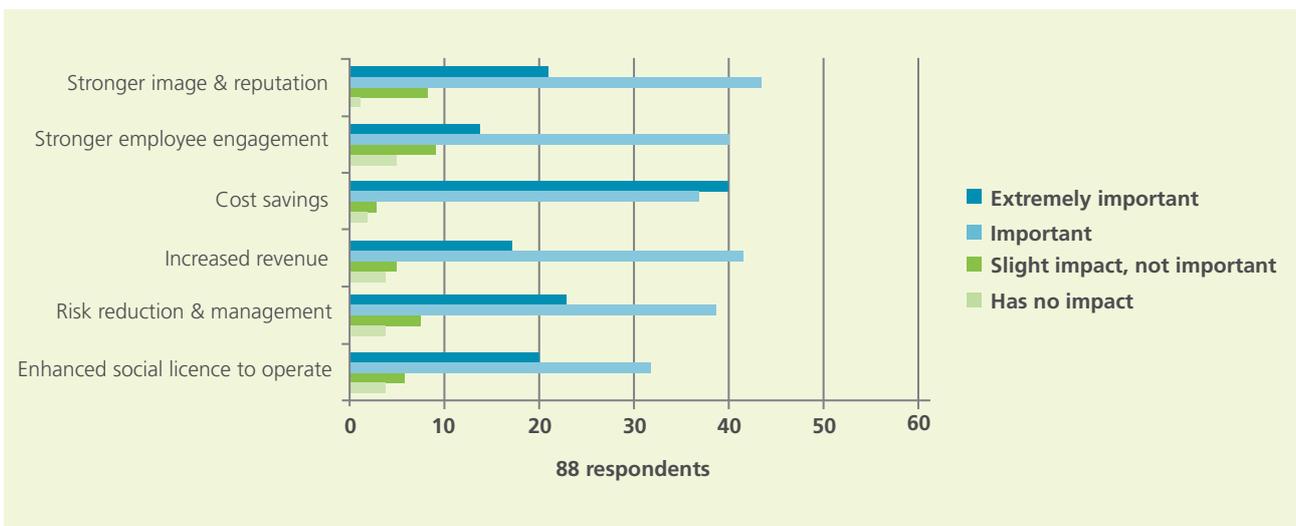


Figure 18 Impact of efficient and effective resource use on sustainability benefits

Management of emissions, pollution and waste

Survey respondents identified that good performance in managing emissions, pollution and waste was a key risk management issue with benefits flowing to reputation and image and to the social licence to operate. It was seen by a considerable number of respondents as having unimportant or no impact on revenue and employee engagement (Figure 19).

Management of ecosystems and biodiversity

Good performance in managing ecosystems and biodiversity was considered to be the most important factor in enhancing the social licence to operate, while also being important to reputation, risk reduction and employee engagement. It has very low recognition as a factor in delivering financial benefit through cost savings and increased revenue; it may be that the industry perceives ecological management to be a source of imposed costs (Figure 20).

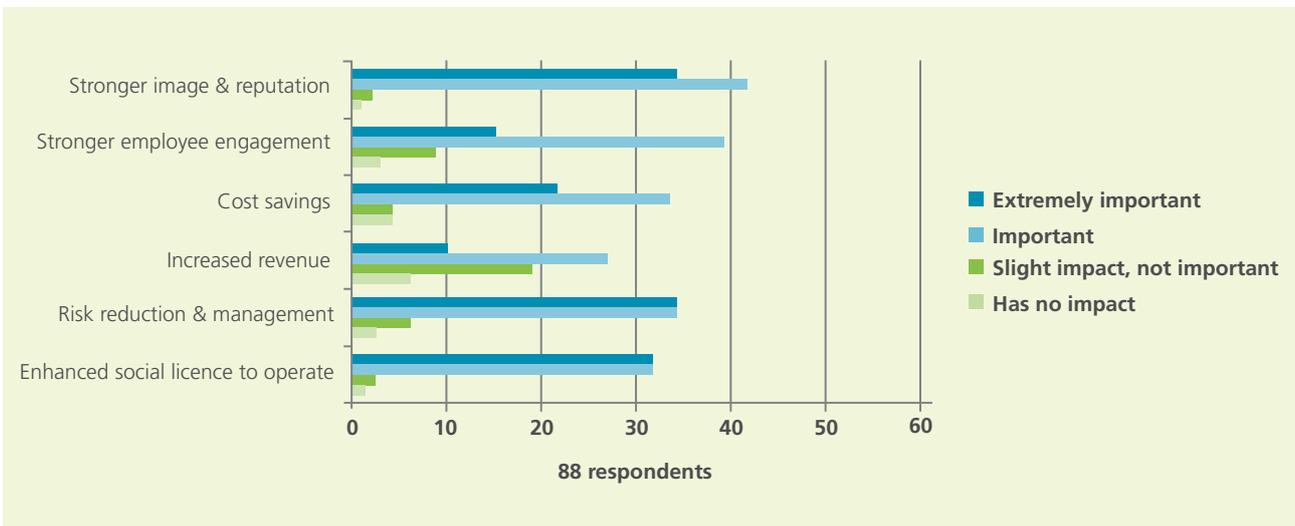


Figure 19 Impact of emissions management on sustainability benefits

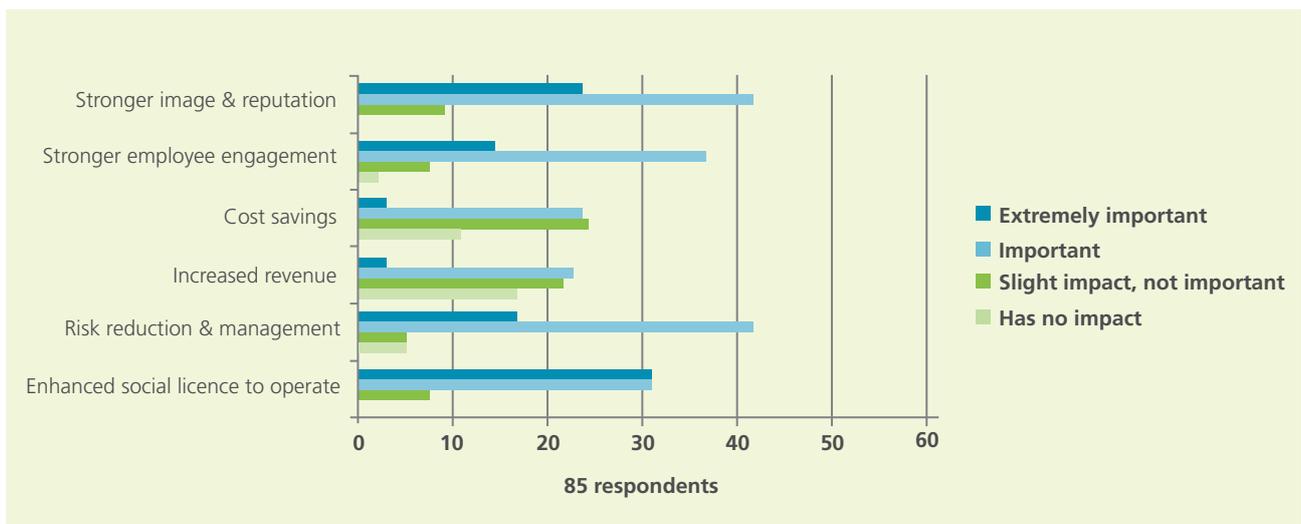


Figure 20 Impact of ecosystems and biodiversity management on sustainability benefits

Community management

As may be expected, good community management was considered by survey respondents to be most important in areas related to external stakeholders: image and reputation and social licence to operate. It is also seen as an important factor in risk reduction and management and employee engagement. However, it was seen to have a low impact relationship to costs and revenue (Figure 21).

Workforce management

Figure 22 shows that good performance in workforce management is primarily considered to reflect in stronger engagement with those most affected — the business’s employees. Respondents also recognised the role that workforce management plays in reducing risk and reinforcing reputation. It was considered to have low direct impact on costs and revenue.

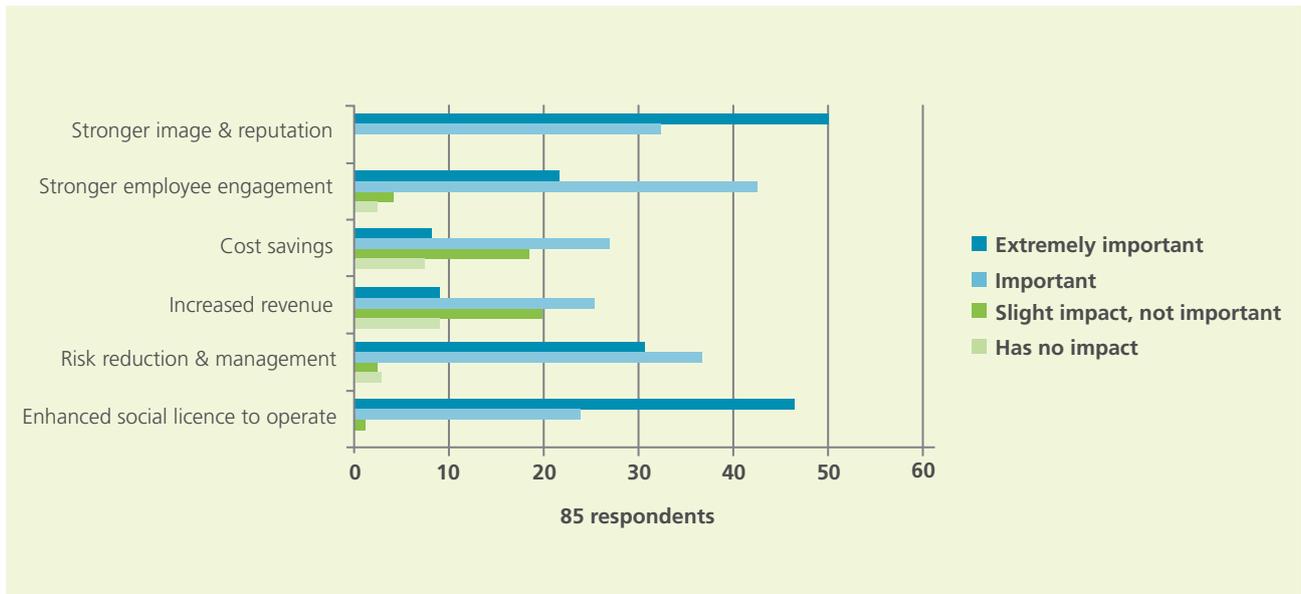


Figure 21 Impact of community management on sustainability benefits

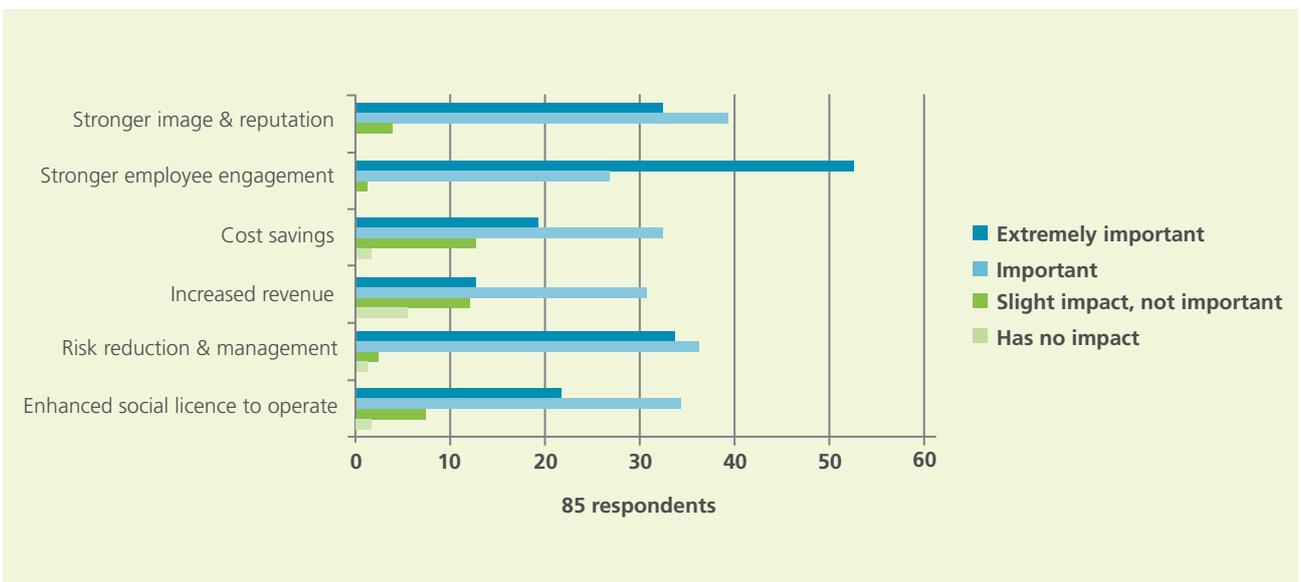


Figure 22 Impact of workforce management on sustainability benefits

Findings: Sources of business benefits from infrastructure sustainability

Strengthened business image and reputation

Respondents to CIEAM’s business case survey considered that reputation is strengthened by good performance across the spectrum of sustainability themes. Good performance in community management, management of emissions, pollution and waste, and workforce management was seen to be particularly important. Conversely, this suggests that poor performance in these areas is particularly likely to lead to reputational damage (Figure 23).

Strengthened employee engagement — motivation, retention, and recruitment

Respondents to CIEAM’s business case survey said that employee engagement is strengthened primarily by good performance within the themes of workforce and community management, while effective Project/Asset management was also considered an important factor (Figure 24).

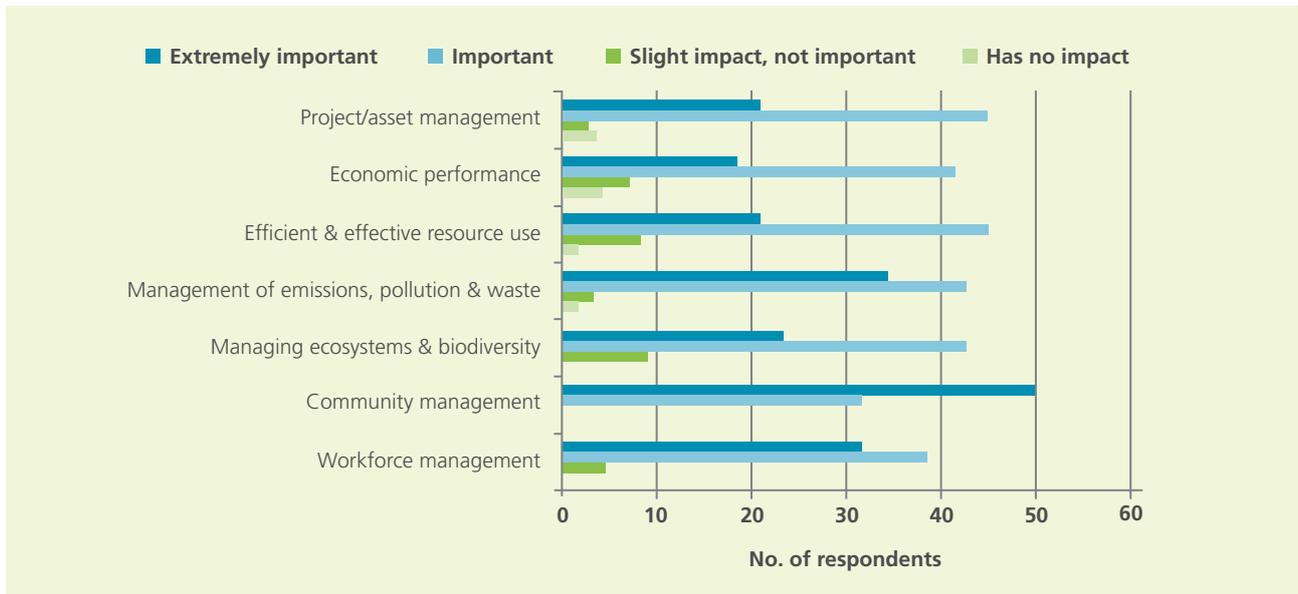


Figure 23 Sources of reputational benefits from infrastructure sustainability



Figure 24 Sources of employee engagement benefits from infrastructure sustainability

Cost efficiency/savings

As shown in Figure 25, survey respondents identified the main sources of cost savings from infrastructure sustainability as good performance in project/asset management and economic performance. They also highlighted the role of efficient and effective resource use.

Cost savings attracted a high negative response — evidenced by “has some impact, not important” and “no impact” — in the ‘soft’ areas of managing ecosystems and biodiversity, community management, and workforce management. This may be because these are seen to involve cost expenditure not directly related to constructing or operating an infrastructure asset. However, they are all seen to be important to reducing risk and/or to enhancing the social licence to

operate, suggesting that any cost imposition may well be outweighed by risk considerations in deciding the extent of sustainability initiatives.

New revenue sources including increased revenue from existing sources

Project/asset management, economic performance and efficient and effective resource use were considered to be the main sources of new revenue, while the other four themes were deemed by a relatively high number of respondents to have unimportant or no impact (Figure 26). As with cost savings, perhaps this is because these latter themes are considered by the respondents to be cost impositions on infrastructure asset construction and operations. In the case of emissions, pollution and

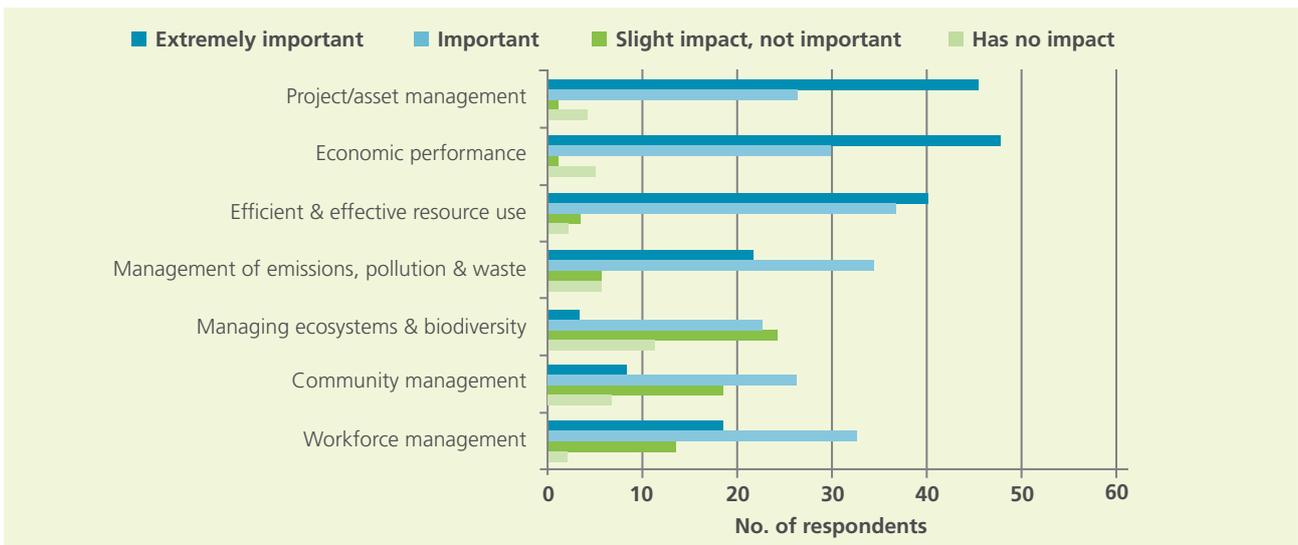


Figure 25 Sources of cost savings from infrastructure sustainability

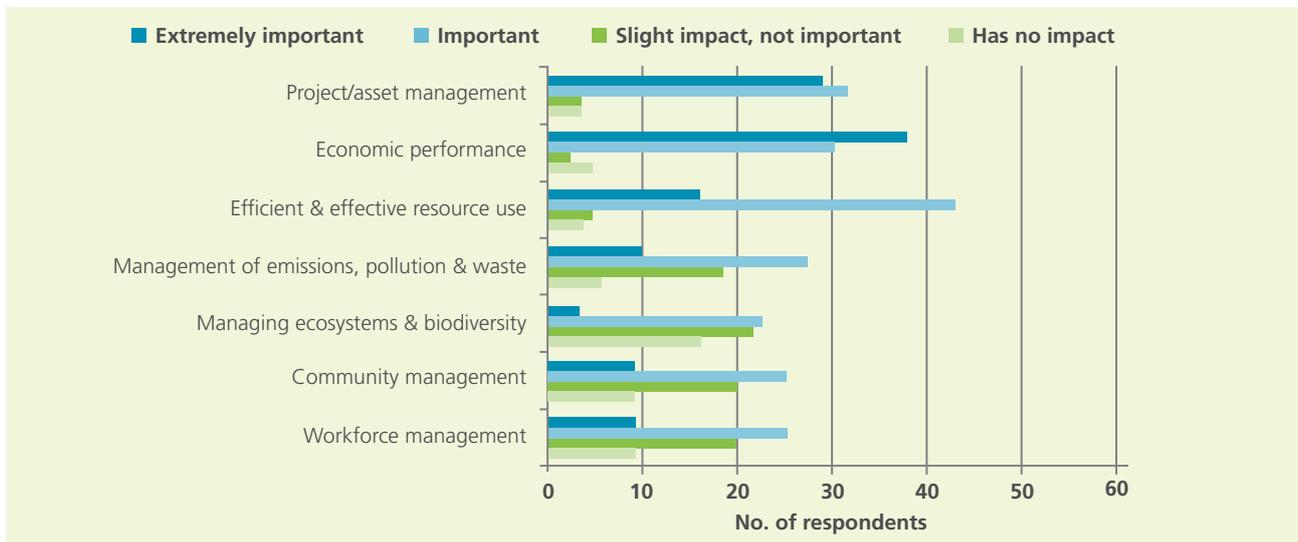


Figure 26 Sources of increased revenues from infrastructure sustainability

waste management at least, the survey results appear to conflict with the evidence of businesses that have created new revenue streams from, for example, recycling of waste and reuse of materials.

Risk reduction and improved risk management

As discussed earlier, risk reduction and management was identified by survey respondents as one of the main motivating drivers of infrastructure sustainability. Respondents considered that all the sustainability themes were factors in achieving this benefit (Figure 27). This supports the guideline’s contention that sustainability provides a useful extension to the usual risk management considerations in infrastructure businesses.

Confirmation of a business’s social licence to operate

The social licence benefits, while deriving from across the spectrum of infrastructure sustainability themes, were considered to arise from good management performance in community, emissions, pollution and waste, and ecosystems and biodiversity (Figure 28). These are areas of high visibility in both construction and operation of infrastructure assets and so susceptible to community and activist actions that may impact the social licence. Economic performance was considered the least important theme in confirming the social licence to operate.

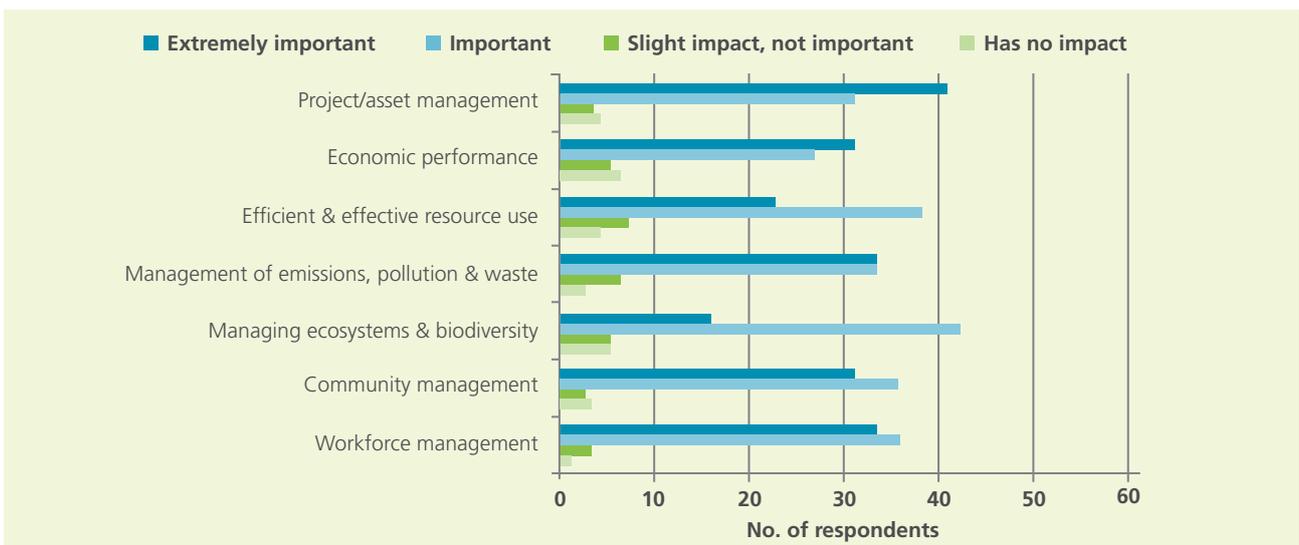


Figure 27 Sources of risk management benefits

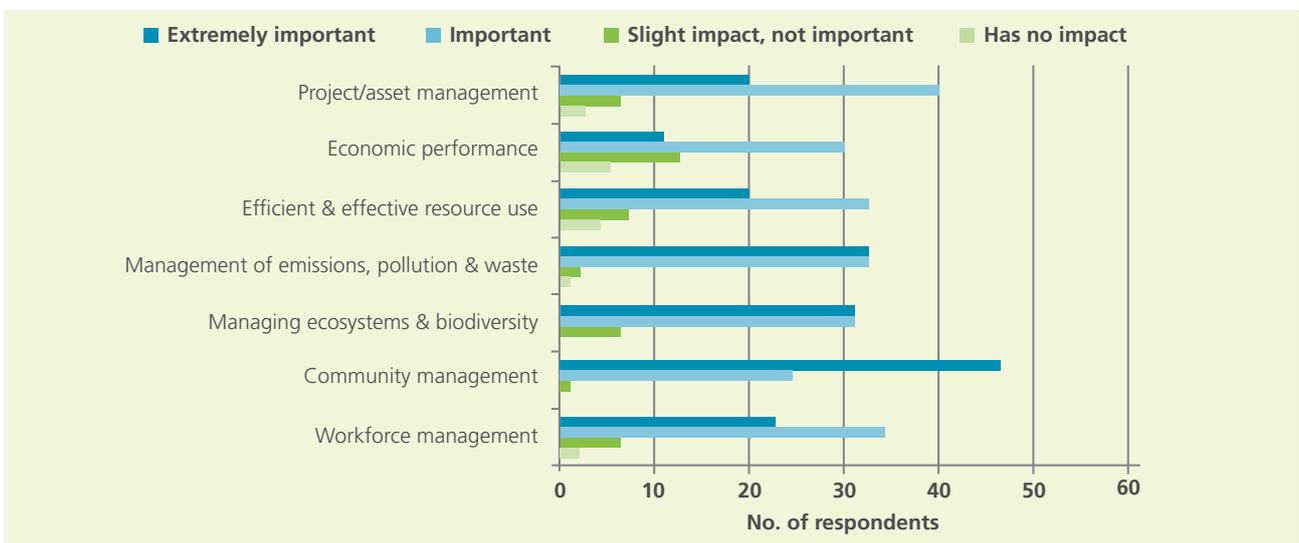


Figure 28 Sources of social licence to operate benefits from infrastructure sustainability

Conclusions

The survey findings were generally consistent with the growing body of literature on the business benefits of sustainability and infrastructure sustainability in particular.

The relatively small number of respondents to the survey suggests that the findings cannot be generalised across the infrastructure industry. Further, the high percentage of respondents with functional roles in sustainability is likely to have biased the results towards favourable perceptions of the business benefits. However, this may also mean that the respondents are well aware of the factors that are at play in infrastructure sustainability and of the issues that concern business's strategic decision makers.

Using the principles of Figure 3 *Value flows from infrastructure sustainability to Total Shareholder Returns*, and the findings of the CIEAM on-line survey, it is now possible to set out how business benefits derived from outstanding infrastructure sustainability performance within particular themes act on the levers of improved total shareholder returns (Table 1). These benefits may have direct or indirect financial impact, and may result in improved shareholder returns through increased profit or an enhanced valuation multiple applied by the financial markets.

Table 1 Infrastructure sustainability benefits and financial impact on total shareholder returns

Business benefit	Perceived primary source (infrastructure sustainability themes)	Financial impact		Key driver of shareholder returns
		Direct	Indirect	
Reputation & brand	Community management Emissions, Pollution & Waste Workforce management	Margin improvement	Pricing power, risk premiums	Profit
Employee engagement	Workforce management Community management Emissions, pollution and waste	Margin improvement	Productivity	Profit
Cost savings	Project/asset management Economic Efficient and effective resource use	Margin improvement		Profit
New revenue	Economic Project/asset management Efficient and effective resource use	Revenue growth		Profit
Risk management	All themes important	Margin improvement	Risk premiums	Valuation multiple
Social licence to operate	Community management Emissions, Pollution & Waste Ecosystems and biodiversity	Access to and cost of capital	Risk premiums Brand strength	Valuation multiple

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Notes





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ISBN:

978-0-9803102-3-8 (e-book)

978-0-9803102-4-5 (Print)