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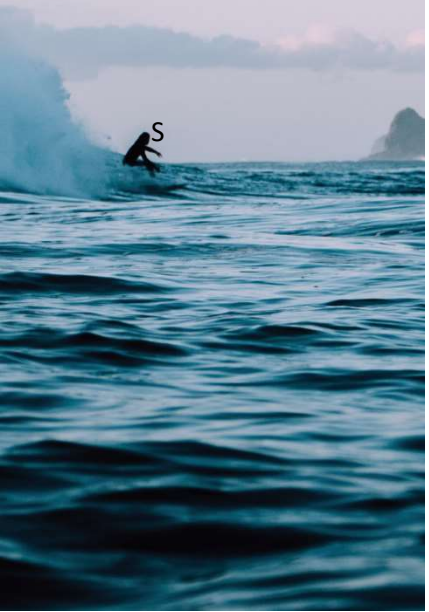

Construction sector performance measurement

Learning lessons and finding opportunities

CASE STUDY
Australian construction sector

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purpose | **strategy** | impact

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Project background

This case study is part of a BRANZ-funded project which aims to inform the development of a performance measurement framework for the New Zealand construction sector. In this research we analyse a number of international and cross-sectoral performance measurement systems. In each case study we seek to understand why performance is measured, how and what is measured, how the system is implemented, and how effective the system is at monitoring and driving performance improvement in the sector. We have synthesised lessons from across the case studies to develop guidance for the New Zealand construction sector on how to curate and implement an effective construction sector performance management system.

This is one of the case studies that contributes to this project.

The full report is available at https://www.branz.co.nz/pubs/research-reports/er55/.

Acknowledgements

We would like to thank BRANZ for co-developing this project and funding it through the Building Research Levy. This project demonstrates the Building Levy being applied to better support not only the safety of our buildings but to enhance the wellbeing of the construction sector and the community the sector serves.

We are also grateful for the time and insight offered by industry practitioners, peak body representatives, government officials, and researchers that have contributed to this research. We hope that this project contributes toward a more sustainable and resilient future for the construction sector.

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Case study: Australian construction sector

1. Introduction

This case study focuses on the Australian construction sector and the various performance measurement frameworks being developed or used within the sector. The review reveals a number of industry and government organisations concerned with various aspects of performance and sustainability.

The first section of the report gives an indicative, rather than exhaustive, overview of the measurement systems found within the sector and, if known, their merits, effectiveness and challenges. The second section looks specifically at sustainability-focused performance measurement systems. The third section draws on these findings and the insights of interviewed industry stakeholders, and discusses what lessons can be learned.

2. Overview of sector measurement systems

The Australian construction sector has a wide variety of peak organisations concerned with the performance and sustainable development of the sector. Some organisations focus on information provision for government and industry, while others promote policy agendas. Some seek to progress the sector through research, while others develop 'best practice' rating systems for professionals, projects, materials or assets.

The majority of these organisations are not concerned with measuring, or reporting on, the performance of the sector themselves. In fact, there appears to be a lack of industry level performance frameworks. Frameworks tend to be either focussed on organisation or project performance. The following discusses a number of frameworks that do, to an extent, focus on performance measurement. They are organised by the aim of the framework: sector performance (trends), sector forecasting and performance ratings.

Sector performance

Department of Infrastructure, Transport, Regional Development and Communications' construction dashboard

At national government level, the Bureau of Infrastructure, Transport and Regional Economics (BITRE) provides economic analysis, research and statistics on infrastructure, transport and regional development issues. BITRE is part of the Policy and Research Division of the Department of Infrastructure, Regional Development and Cities. BITRE's role is to gather information on trends, with the purpose of informing Australian Government policy development and wider community understanding. In terms of construction, specifically, they provide an infrastructure construction dashboard (BITRE, 2020), which is publicly available online. The dashboard allows users to look at multi-year trends in different areas of construction: transport infrastructure construction, communications engineering construction, energy and water engineering construction, total infrastructure engineering construction, resources engineering construction, other engineering construction and total engineering construction. The indicators reported relate to *work done* (in $) and *work underway/remaining* (in $), and the data are sourced from Australian Bureau of Statistics (ABS). Indicator data can be shown on national or state level.

Sector forecasting

Australian Constructors Association (ACA)'s construction outlook

The ACA is a peak industry organisation representing leading construction and infrastructure contracting companies. ACA is dedicated to promoting a sustainable construction industry for Australia (ACA, 2020). The ACA, in collaboration with the Australian Industry Group (a peak employer organisation representing various Australian industry sectors), delivers a report on the sector called 'Construction Outlook' (*ACA,* 2018). The Outlook aims to provide the construction industry with a barometer on the state of the engineering and non-residential building sector. The main focus of the Outlook is to provide forecasts (in annual % change) of measures such as:

- Turnover from major construction work (annual percentage change in dollars)
- Financial year forecasts (per construction area, e.g. civil projects, housing, road projects)
- Levels of activity (how busy or slow business is)
- Employment (levels of employment)
- Supply constraints (labour and capital)
- Input costs (construction materials, direct labour, sub-contractor rates).

These forecasts are based on estimates made by major construction companies, which are collected through a bi-annual survey.

As a performance measurement tool, the Outlook was not given much weight by some interviewees. "The ACA is not doing much when it comes to measuring, or reporting on, the performance of the industry", one interviewee said. "While there may be some objective measures, it does not offer much hard and fast insights into the industry." The feeling was that the Outlook was not a reliable barometer as respondents' answers would likely depend on how their business is doing on that particular day.

Australian Construction Industry Forum (ACIF)'s forecasts

ACIF is a peak industry body whose purpose is to increase productivity, efficiency, research and innovation within the sector (ACIF, 2020a). They facilitate and support an active dialogue between key players in construction, other industry groups, and government agencies, and have 16 member associations. ACIF identifies issues and then advocate on those issues. They also review industry performance in order to "provide forecasts of activity and demand in the construction sector … which provide decision makers with information about the direction in which building and construction activity is heading" (ACIF, 2019, p. 6). These ACIF Forecasts provide rolling ten year forecasts of building and construction activity and are updated twice a year to ensure that the outlook reflects the most recent information (ACIF, 2020c). The forecasts are reported on through, for instance, Australian Construction Market Reports but they also inform ACIF's Customised Forecasts Dashboard (ACIF, 2020b). By enabling access to local and national data about upcoming demand for work across all sectors, as well as what is happening with construction costs and labour requirements, this Dashboard allows ACIF members to plan more effectively. Through the Dashboard members can build their own forecasts, sector by sector, postcode by postcode.

The forecasts are prepared using 'top down' and 'bottom up' analytical frameworks of the industry (see Figure 1 below). The top down part focuses on economic forecast through an 'AUS-M' model, a structural model of the Australian economy incorporating input-output based demand and other industry detail. This includes information about policy, supply and demand, investment, trade, capital and labour markets, demographic changes and changes in prices. Examples of measures are: economic growth in Australia's major trading partners; real long-term interest rates and world inflation; growth in GDP and employment; unemployment rate and wages growth; population growth and immigration; growth in employment by

industry. Actual and historical data are sourced from predominantly ABS, and is then reviewed and moderated by ACIF's Construction Forecasting Council (ACIF CFC) - a panel of economists and industry leaders whose role is to review and provide input to the data that form the ACIF Forecasts.

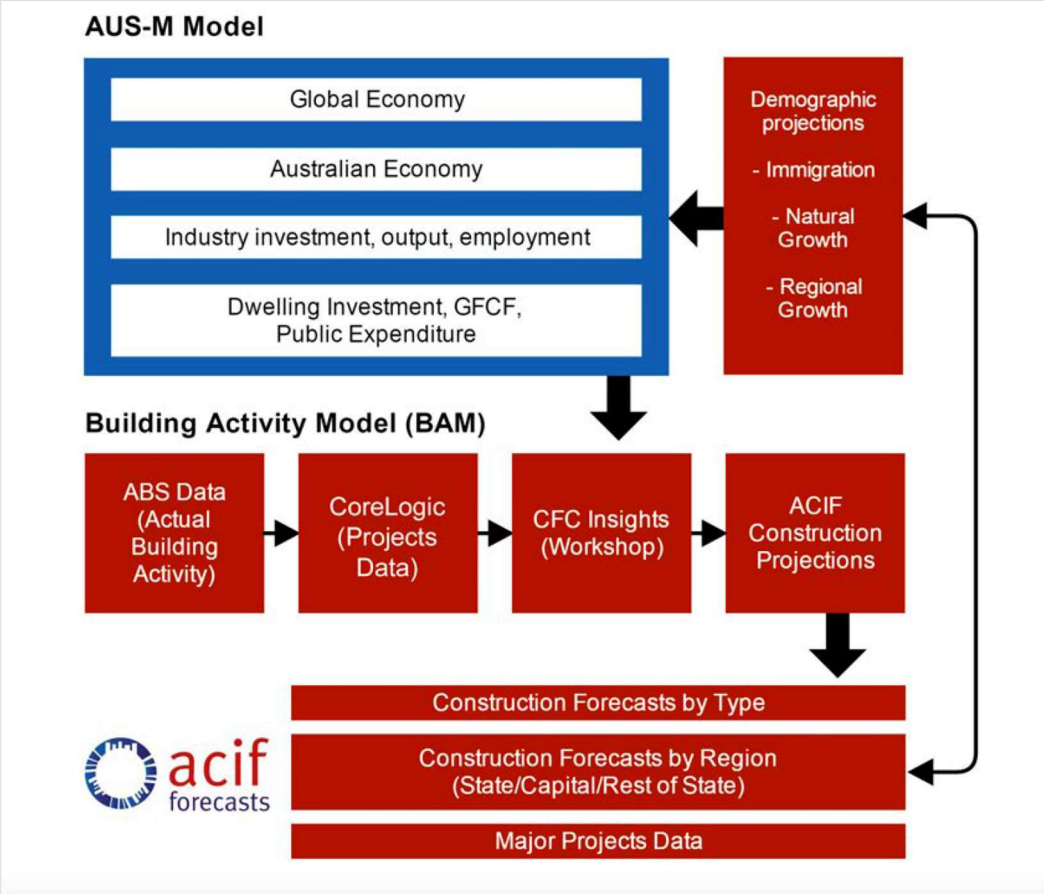

Figure 1: AUS-M model (ACIF, 2019)

The Building Activity Model (BAM) is used to draw together 'bottom up' information, tracking actual construction projects and actual construction spending and employment over the recent past in considerable industry and geographic detail.

Leading BAM indicators include:

- Building and construction work done by category (source: Australia Bureau of Statistics (ABS) and ACIF CFC)
- Construction industry employment by skill (source: ABS and ACIF CFC)
- House prices (Source: ABS)
- Residential real estate approvals (source: Foreign Investment Review Board)
- Changes in bank lending (source: Reserve Bank Australia)
- Approvals and commencements (source: ABS)
- Dwelling completions (source: ABS and ACIF CFC).

Additional information about major construction projects (20 million AUD and up), which are seen as a leading indicator of what is happening in the construction market, is obtained from Cordell Connect (an online database of construction, infrastructure and building project information operated by CoreLogic). The value, number of major projects, and project stages are included in this database. The BAM identifies the share of investment in each asset type (e.g. housing, non-residential, entertainment) that make up the construction sector and has subcategories by state, by capital city, and by the rest of state. Further bottom

up information is factored into the ACIF forecasting methodology through the involvement of the Construction Forecasting Council. The ACIF CFC reviews and adjusts the initial results of the BAM through forecasting workshops. This provides flexibility to respond to cyclical and industry specific factors while also preserving the overall integrity of the agreed macro-economic projections.

While there were no data from end users on how effective these forecasts have proven for industry, it does appear from other peak industry websites that the forecasts are seen as robust and reliable. ACIF reported receiving positive feedback on the Forecasts from end users and they see the volume of sales of the Forecasts as an indicator or how appreciated they are.

Organisation performance rating system

New South Wales' Six Pillars iCIRT rating system

Regional governments tend to have their own construction performance measurement frameworks and some of these are being actively developed. The New South Wales government, for instance, is currently developing a new rating system for professionals in the construction sector as part of the Six Pillars reform. While the performance rating system is focused on the performance of construction players and not on the sector as a whole, this reform is intended to improve transparency, accountability and quality of work within the NSW building industry. It forms part of the NSW Building Commissioner's work plan to overhaul the State's building and construction industry. The Six Pillar reform is specifically targeted to prevent repeats of a number of high profile instances of defects in newly built developments and help develop a customer focused industry. Before the reform can be introduced, NSW Parliament needs to pass the Design and Building Practitioners Bill, and at the time of writing it has not been passed yet.

The Six Reform Pillars cover: legislation and regulations changes, ratings systems, improving skills within the industry, ensuring contracts meet standards, digitising the industry and establishing NSW as a leader in modern construction methods – see Figure 2.

Pillar	Actions	Outcomes
Building a better regulatory framework	Implementing legislation and regulation and transforming the focus of the regulator	Ensure that NSW has a strong customer focussed regulatory framework
Building ratings systems	Work with ratings agencies, insurers and financiers to assist in better selection of industry participants	Move away from one-size-fits-all participant recognition and better identify risky players
Building skills and capabilities	Improve accreditation of construction related programs through improved standard modules	Shared minimum learning content and open source resources for all institutions
Building better procurement methods	Establish clear standards for engagement and outputs	Viable risk allocation and performance accountability
Building a digital future	Digitise the NSW Building Industry and move away from analogue record keeping	Shared industry wide platforms that build confidence
Building the reputation for quality research	Evidence based approach to accessing and closing the gap via case studies and other research	Baseline and measurement against our ability to improve confidence in the industry

Figure 2: The Six Pillars (Anderson, 2020)

The core of the six reform pillars features a new independent construction industry ratings tool (iCIRT) under which developers, contractors, practitioners, and supply chains are rated and awarded an overall score. This score will be based on a range of metrics focused on technical, operational, and financial capability and capacity, such as: workplace safety record; financial data and credibility; age of business; and whether there are any suspicions of phoenixing.[1] iCIRT will provide a repository of both accredited and risk-rated sector players. Outputs such as scores and flags are made available to users. If that user is a government entity, for instance, they can use that information to identify poor players and buildings, and put subsequent measures or interventions in place.

The rating system is currently in development. An external credit ratings agency, Equifax, has been attracted to lead the tool development and engage in industry consultation with consumers, financiers, insurers, government and regulators, contractors, industry associations, lawyers, and accounting professionals. Through workshops, these stakeholders are being consulted on design and data priorities, opportunities and risks, and will also assess the iCIRT prototype and guide its further development. Equifax envisages that iCIRT will be developed as a multi-jurisdictional tool, which is piloted in NSW, before a broader delivery across Australia and New Zealand. See Appendix 1 for an infographic on iCIRT (Equifax, 2020).

While the reform is being seen as important and as having merit, questions have been raised around the process of development and the successful implementation of the ratings framework. These questions relate to: whether enough resourcing is (made) available for implementation; whether the suggested approach is too light on legislative support; and whether there is enough support from downstream regulators (Harley, 2019). In addition, some commented that it would have been preferable if this was a national rather than a regional initiative.

Past measurement attempts

As a final note to this section, the case study did find reference to a past, collaborative attempt to develop a national construction performance framework in a conference/discussion paper by Furneaux, Hampson, Scuderi, and Kajewski (2010). The paper discussed different considerations when designing a national performance framework focused on lifting industry performance. The paper refers to a set of national goals and KPIs for the Australian construction sector jointly prepared by ACIF and the Australian Procurement and Construction Council (APCC), a peak government body[2]. While there were to be subsequent papers, this project was not progressed further reportedly due to a lack of funding and engagement. An interviewee closely involved with this paper, explained:

> *One of the challenges is that when you think of the construction sector there are many different representative groups who all represent different stakeholders (owners, funders, builders, workers, apprentices and various trades). At the same time, some of the advocates for specific measures (e.g. various green buildings measurement ratings) are vying for market valence. So while it was … a great start, gaining agreement on what should be measured and how, plus sourcing ongoing funding … it didn't quite get there.*

[1] Phoenixing is where a new company is created to continue the business of another company that was deliberately liquidated to avoid paying debts

[2] The APCC (formerly the National Public Works Council) is the peak government organisation responsible for procurement, construction and asset management policy for the Australian, State and Territory governments and the New Zealand Government.

Going forward, he suggested, there is a need for "engaging stakeholders, gaining agreement on what should be measured and how, and how this might be done in a sustainable manner."

3. Sustainability-focused performance measurement

While there is currently not a comprehensive nationally aggregated framework for sustainability performance for the Australian construction sector, several organisations are concerned with sustainability performance in construction. Some of these focus on sustainability-related research and influencing policy development, like the Sustainable Built Environment National Research Centre (SBEnrc).

Other organisations are focused on promoting industry standards and best practice through assessment-rating-certification frameworks. The focus of the latter tends to be limited to asset or project level. In addition, ratings and certifications can be focused on one element of an asset or development, e.g. energy star ratings for a building, rather than a holistic approach including several aspects of sustainability performance.

This section discusses an example of an accreditation-based performance system: the Infrastructure Sustainability Council of Australia (ISCA)'s Infrastructure Sustainability (IS) rating scheme. ISCA adopts a holistic approach to sustainability (taking the economic, social and environmental into account) and the rating system is getting increasing interest in the New Zealand and Australian construction and infrastructure sectors. In this case study the focus is on ISCA's IS rating scheme as a performance measurement framework and a driver of positive behaviour change.

Infrastructure Sustainability Council of Australia's IS rating scheme

ISCA is a peak industry body operating in Australia and New Zealand with the purpose of enabling sustainability outcomes in infrastructure. ISCA is a member-based, not-for-profit industry council (public and private). ISCA's mission is to enhance "the liveability and productivity of our major cities and our regional communities through advancing sustainability in infrastructure planning, procurement, delivery and operation" (ISCA, 2020c). ISCA pursues this mission through an Infrastructure Sustainability (IS) rating scheme; education, training and capacity building; and connecting suppliers of sustainable products/services with projects. ISCA was founded in 2007 and since then over $80 billion AUD in infrastructure and civil works projects have become engaged with the IS rating program[3].

Context and objective of framework

The IS rating tool was developed in collaboration with industry to drive and measure sustainability within infrastructure projects and assets. ISCA defines 'Infrastructure Sustainability' as infrastructure that is designed, constructed and operated to optimise environmental, social and economic outcomes of the long term. More specifically, the IS rating scheme aims to:

- Provide a common national language for sustainability in infrastructure
- Provide a framework for increased awareness of sustainability issues
- Foster innovation and continuous improvement in sustainability outcomes
- Provide a framework for consistent sustainability evaluation in tendering processes
- Scope whole-of-life sustainability risks for projects and assets
- Foster efficiency, waste reduction, and reduced costs.

[3] Within New Zealand, ISCA has been applied to projects at Auckland Airport, the Cardrona Alpine Resort, and City Rail Link (CRL). It is also being used on Watercare's Central Interceptor project and Auckland Council's Scott Point Sustainable Sports Park.

- Build an organisation’s credentials and reputation in its approach to sustainability.

The tool can be applied to built infrastructure but also to the planning, design, and operation of infrastructure (see Figure 3). The scheme claims to be Australia and New Zealand's only comprehensive rating system for evaluating sustainability across these four phases. ISCA are concerned with all types of infrastructure, including but not limited to airports, rail road, ports, telecommunications, waste, utilities, water.

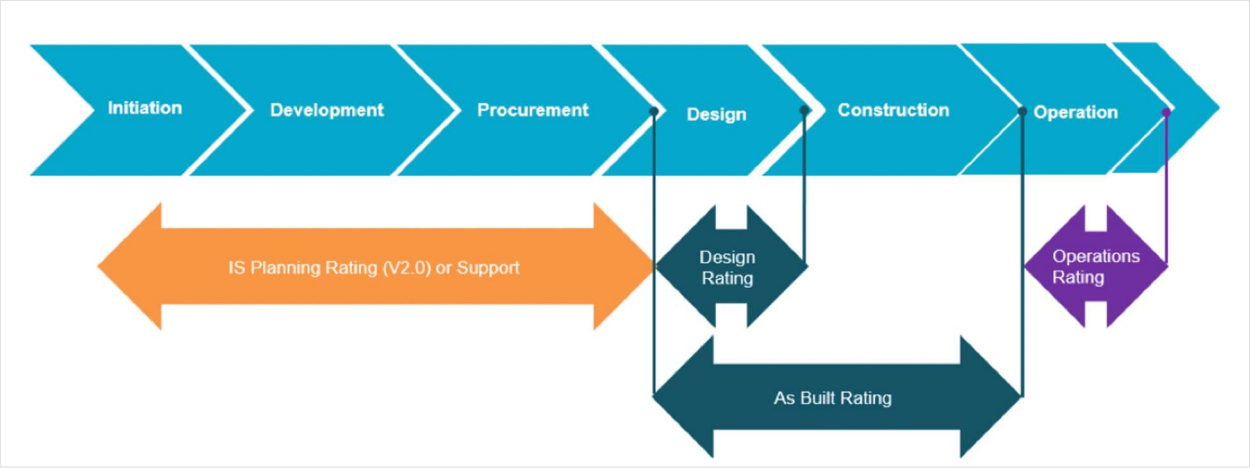

Figure 3: IS Ratings (ISCA, 2020a)

Measures and indicators

The IS rating tool evaluates the sustainability performance and quadruple bottom line of infrastructure development: governance, economic, environmental and social. Projects or built assets will be awarded an IS rating based on an overall score across these four areas. The rating tool reviews the lifecycle impacts of the project or asset, which includes planning, construction, operation, and maintenance of the asset. For instance, the rating tool looks at design (e.g. stakeholder involvement and whether the urban and landscape context has been taken into account); procurement (e.g. sustainable procurement through supplier assessment and selection); and construction (e.g. management of air quality, noise and vibration during construction; carbon and energy intensity during all phases of the project; sustainable management of waste). There is a materiality assessment at the project/asset level and a base case design is developed to measure reductions/improvements against. For a full list of IS categories see Table 1 below (ISCA, 2020a). These categories and associated indicators are always in development, and the emphasis on different categories depend on the project or asset that is being reviewed and the project development phase.

Table 1: IS rating categories (ISCA, 2020a)

	Category	Overview
Governance	Context	Includes urban and landscape design topic areas and focuses on how the project has been considered as part of its surroundings, its purpose and how it enhances liveability.
	Leadership & management	Encourages projects to align sustainability strategy/policy/program with Sustainable Development Goals, assesses the risk/opportunity process for the project and rewards knowledge and data sharing.
	Sustainable procurement	Includes social and environmental risks/opportunities within supply chains and rewards social outcomes (e.g. engaging social enterprises). Is aligned with ISO20400.
	Resilience	This category promotes the broader definition of resilience and looks at how infrastructure is contributing towards city, regional and community resilience.
	Innovation	Pioneering initiatives in sustainable design, process or advocacy.
Economic	Options assessment and business case	Rewards the selection of sustainable initiatives using non-financial elements in decision-making.
	Benefits	Encourages projects to track the costs and benefits outlined in the business case and compares them to the real outcomes though whole life of a project.
Environment	Energy and carbon	Rewards a reduction in energy and emissions.
	Green infrastructure	Rewards the inclusion of green infrastructure, such as water sensitive urban design, green roofs, and all other living solutions.
	Environmental impacts	This category addresses water discharges, noise, vibration, air quality and light pollution.
	Resource efficiency	Focuses on a circular economy approach to resource management and resourcing by reusing resources on site to finding new and innovative used for 'waste' products.
	Water	Rewards water efficiency as well as considering and using appropriate water sources.
	Ecology	Rewards the maintenance or enhancement of ecological value.
Social	Stakeholder engagement	The Stakeholder category rewards effective stakeholder engagement.
	Legacy	Reward projects that leave a positive legacy for the community and/or environment.
	Heritage	Rewards the monitoring a management of European and Indigenous heritage.
	Workforce sustainability	Includes education and training; wellbeing; diversity and inclusion; workplace culture; workforce planning and encourages thinking about skills needed for the future.

Reporting on these measures happens through score cards, which include open questions (e.g. what is the contamination risk of a project or asset?); ratings on a scale (e.g. the ability of an asset to withstand future scenarios as a result of climate changes on a scale 1-10); or hard metrics (e.g. CO_2 emissions, level of material intensity in construction or maintenance phase, or proximity of noise receivers to a project). For score card examples, refer to ICSA (2020b). Projects or assets are awarded an IS Rating based on the overall score.

Implementation

The process of undertaking an IS rating includes registration, assessment, verification, certification, and can be undertaken by ISCA members and non-members. The project teams or asset owners collect data and submit these against benchmarks set by ISCA, which are updated over time to reflect current and emerging practice. Independent verifiers, who have to be Infrastructure Sustainability Accredited Professionals, review the project/asset performance submission against the ISCA standards. Project teams or asset owners may also assess their own projects using the various performance metrics, although these cannot claim to be independently verified.

Users reflected that implementation requires management involvement, resourcing and commitment. It is an involved process that cannot simply be 'bolted on' to a tender application to make the company look good (Hunter, 2019). Several interviewees mentioned that starting early on in the project is key as many of the credits are difficult to achieve unless addressed early in the project planning (Nolan, 2016). The IS rating process ideally starts with the design stage of a project, and by involving everyone in the project team as soon as they come on board (Nolan, 2016). Implementation is reported as costly and difficult; it needs a committed project team and designated resources. Ideally help is provided through an ISCA professional, but users mentioned that high calibre ISCA professionals are scarce (Hunter, 2019). Since data collection and accreditation is resource intensive, the feasibility of using a tool like this will depend on the overall project budget. Also, it is worth noting that cost and time drive many of the decisions in the industry. This means that for organisations to adopt a sustainability framework like ISCA for a project or asset, the client needs to require or demand it. While some companies may take a leadership role in sustainability and adopt minimum sustainability requirements without clients requesting it, this is unusual.

Effectiveness

Various conditions for the success of the tool were mentioned. This 'success' referred primarily to how effective the framework is in driving sustainability behaviour and integrating sustainability into infrastructure practice, like improving the organisation's reputation or credentials or continuous improvement. Reducing costs was also mentioned as an outcome of the tool, through resource efficiency and waste reduction. But participants also highlighted the ability of the tool to influence practice in more subtle ways, for instance: how it promotes conversations around sustainability and helps create a common language around sustainability (Hunter, 2019). While the latter tends to be less tangible in measuring the effectiveness of a framework or tool, it was found to be strong in its influence. One observation was that a tool like this operates best in the context in which it has been developed. Industry involvement in the initial development of the tool but also maintaining close feedback loops and ties with the community of practice is key in keeping the tool relevant and effective.

One interviewee, who had done extensive international research into sustainability focused frameworks, emphasised the following as enabling conditions for success of the framework:

- **Client's engagement and commitment.** For effective implementation the client's motivation for requesting the application of a sustainability framework needs to go beyond compliance alone and be part of the wider goal of the project. The client needs to have a mature understanding of what sustainability is about, communicate regularly and guide the direction of the project
- **Project leadership.** Effectiveness is linked to how the framework is applied by asset or project managers, their understanding of sustainability and the importance the application of the tool is given. Clear sustainability outcomes for the project need to be defined
- **Wider sustainability practice.** The tool is only one part of the sustainability practice, and cannot be seen separate from the other elements that ISCA promotes: working groups, training, webinars, events – these are all part of effectively implementing the tool
- **Resourcing.** If not enough time and resources have been assigned to the application of the framework from the beginning to the end, the effectiveness will be diminished
- **From activity to service.** ISCA's process and tool is about making a shift from seeing infrastructure purely as 'an activity' to seeing infrastructure as 'a service to community'. The effectiveness of the tool is not only about 'ticking boxes' on an activity level, but also actively asking 'what is the impact of our activity on communities.'

Scalability of the IS rating tool to sector level

While tools like the IS rating tool do not primarily focus on sector level performance measurement, they can help provide input into sector level performance measurement. Reflecting on whether the ISCA tool could be useful on, or be aggregated to, sector level, the following observations were made:

- Data from various elements of the rating scheme may be useful to aggregate to a national level, like material sourcing or energy use. ISCA does already aggregate some data in their ISCA Impacts Report (*ISCA*, 2019). For instance, they report on the total waste diverted from landfill, reduction in material use, total energy reduction (in CO_2) and water reduction in ISCA accredited projects or assets throughout Australia and increasingly New Zealand. For more examples of aggregated impacts, see Appendix 2. It may be possible to aggregate other elements too, but that would require working through privacy issues with individual organisations and/or ISCA.
- Creating 'bottom up' measures and data through a tool like ISCA can provide high granularity data but can also end up in creating a big analytical system, which would be resource intensive to maintain and may not necessarily deliver sector outcomes.
- The ISCA tool provides a 'whole of life' perspective, taking waste, supply chain, environmental effects, etc. into account. This is relevant and important in the context of a holistic measurement approach to construction sector performance, as it shifts the conversation and attention beyond a focus on productivity and profitability.
- The ISCA tool is versatile: it can be applied pre and post project, at different phases and can be applied to a wide range of projects and assets.
- The upfront cost related to information gathering, as well as the resource intensive nature of auditing and accreditation, can create a barrier for wider sector implementation, and makes it not necessarily suitable for smaller projects.
- The notion that what is best for a project, as measured by the IS tool, is not always best for the sector or system as a whole. Applying 'best management practices' that create the best outcome for a project or asset, is not the same as delivering infrastructure as a service to society.

4. Discussion – insights and lessons learned

The discussion section draws on the findings above and additional insights from interviewees. Interviewees included people from a large construction business, peak industry organisations, a sustainability research organisation and academia.

Whether the focus is addressing quality issues, re-building customer trust or improving sustainability in construction, there is a common opinion among industry stakeholders that industry needs to do better. Despite this shared sector performance improvement objective and apparent collaboration between peak organisations, there seems to be no coordinated approach to measuring the performance of the sector. While an initial look gives the impression that industry produces various indices and forecasts to measure and predict sector performance, a closer look reveals that not much is happening in terms of performance measurement to create reliable sector insights. As one respondent reflected, "a lot of blanket statements are made about the health and state of the industry but what are the measures for that? Can people back that up?".

Interviewees offered several reasons why a national approach to performance measurement is challenging:

- **Lack of aligned objectives.** There are no aligned objectives for the industry or a shared understanding of what is success. There is a lack of shared goals and KPIs: the sector compromises many organisations and stakeholders, all with their own focus and everyone 'doing their own thing'

and their own measurement. “There are so many different views on what is ‘value’ in the industry, what is productivity, etc.,” one interviewee said, “so what do you decide to measure as an industry. Cost or productivity or values?”

- **Industry distrust.** There is historical distrust between industry and government, which makes collaboration on improving industry performance (measurement) both time-consuming and hard. As an illustration, an interviewee mentioned the Construction Industry Leadership Forum[4] (CILF), a collaboration between peak industry body ACA and regional governments. The shared focus is addressing dilemmas and struggles in three key industry areas (Capability and Capacity Building, Culture and Commercial). The lack of trust between government and industry is such that both are doing their *own* gap assessments and surveys across organisations around these three areas, because they don’t trust the other. When each comes back with similar results, there may be an opening to do a joint survey.
- **Competing interests.** Related to the previous, interviewees mentioned competing interests between industry stakeholders that make it hard to move forward smoothly or quickly. As an example: the abovementioned CILF believes it is important to move away from the 6/7 day workweek culture in construction. Not only is this a barrier to attracting a new generation of construction staff, but it is also not aligned with an industry that values health, safety and wellbeing. CILF invited the input from the unions in this, as they represent the workers. However, the unions indicated that their members *want* the 6/7-day weeks because they get paid more because of penalty clauses. This kind of conflict makes it hard to move towards a ‘better’ industry without spending time reaching agreement or addressing embedded organisational/governmental practices (e.g. nature of penalty clauses).
- **Challenging industry context.** It is important to understand the industry context. The industry is struggling: there is a lot of struggle ‘to make a buck'. This means that the primary focus within industry is on survival rather than pursuing industry wide agreement around performance measurement and improvement. And unless the client demands it (and that client is often Government), there is little incentive right now to improve non-financial performance, like health and safety practices or community engagement.
- **Measurement consistency.** Consistency around measuring productivity and performance in one business is a problem (e.g. applying performance measures consistently over different projects, and aggregating performance measures from project to company level), let alone collaborating with others on finding consistency across a range of organisations.
- **Data sharing challenges.** Within the industry, companies do not want to share performance or productivity data that could impact on their competitive advantage. “It’s just not going to happen,” said one interviewee, “unless the client wants it and requests it.” The only area in which companies *do* share data is Safety: “We do all share data around this, and this gets aggregated from project level, to industry level. And it gets reported on.” When asked why, the response was “because there are compelling reasons to do so. It’s morally right and also, its legislated.”

To address or overcome these challenges the following was mentioned as important:

- **Shared vision for sector.** Creating agreement among sector stakeholders around a vision for the sector and what the sector sees as ‘success’ was mentioned as the single most important first step

[4] The CILF aims to drive improved collaboration and action around procurement and delivery of major government infrastructure projects, including by addressing capability and capacity constraints.
The CILF was established due to commercial, and capability and capacity pressures caused by the significant pipeline of current and future government infrastructure projects in NSW, Victoria and other states.

in developing an effective and coordinated approach to measuring the performance of the industry. This is a large and disparate industry, so it requires a compelling reason to do the work together and create positive change. This includes:

  - Creating a shared understanding of success, key outcomes and challenges through stakeholder discussion and consultation
  - Getting all players involved, including representatives from SMEs. Smaller construction companies form a significant part of the industry but they do not have the same platforms on which they can be heard as bigger companies. For instance, the ACA represents only the few large organisations
  - Focus on establishing trust between industry players
  - Having enough resources and funding available to reach agreement. Lack of agreement between various representative groups seemed to be as much the result of a lack of time and money for consultation as the result of differing perspectives or objective
  - Not rushing the process of gaining shared understanding and trust.

- **The power of demand.** The client has the power to drive positive sector change but can also hold it back. If the client wants sustainable building materials, wants information (e.g. data the companies would otherwise not share) or values community engagement practices - it will happen. At the moment, creating positive sector change is held back in part because the client mostly cares about cost and how long construction will take. So while a construction company may value employee wellbeing and sustainable procurement practices, if the client mostly cares about the lowest price cost, implementing and sustaining such practices will be hard. Interviewees pointed out that one of the main clients in the industry is Government, and that they too mostly care about cost and time. If the performance measurement systems aims to create positive change (environmental/social), there is a wider system's challenge of educating or incentivising clients in what they ask for from industry.
- **Government role.** The role of government was repeatedly highlighted. There is a role for government, *both as client and as regulator*, to lead:
  - As major client to the construction industry, government can demand the changes they want to see (e.g. as set out in the LSF) in their contracts with industry – as mentioned above, the demands of clients have the power to lead positive change on industry level
  - As regulator, government can request accreditation and data provison. It was mentioned various times that the disaggregation of the construction sector is such that unless government takes a proactive leadership role, the private industry won't have the impetus to do it. Within the Australian sector, the Australian Building and Construction Commission (ABCC), an independent, statutory authority of the Australian Government, has strong legislative power. Organisations are required their accreditation to win projects, and in this way ABCC has driven industry improvements.

More specifically, in relation to the development of an effective performance measurement framework and KPIs, the following was mentioned as important:

- **Agreement on the purpose of the performance measurement framework.** Finding agreement between industry stakeholders on the purpose of the performance measurement framework is important: is it quality management, continuous learning, improving sustainability? The purpose will guide the different elements of the framework (e.g. measurement processes, level of data collection, kind of indicators chosen). This is less about 'buy in' and more about 'ownership'.

Without this sense of ownership, challenges related to data collection (e.g. why would we give those data) or the framework becoming 'tokenistic' (a political or hierarchical 'tool') can occur.

- **Beyond 'activity' towards 'service'.** When defining KPIs and measures, it is important to include KPIs and measures around what the sector wants to achieve for its customers or beneficiaries. Traditionally, a common tendency is to focus KPIs on the construction activity (e.g. the how of building something) rather than the service/outcome that it is creating for individuals and communities (e.g. healthy and stress-free living). When KPIs are created around activity, they tend to overemphasise technical measures of a house rather than how the house is perceived by the customer.
- **Guard quality of indicators**:
    - KPIs need to be relevant for the outcomes of the sector, and the list of KPIs used needs to be flexible. This means that KPIs need to be reviewed regularly in light of the desired outcomes of the sector or activity. In other words, asking the question: are we measuring what is important to us? But also: are our KPIs creating the outcomes that we want? And adjust as needed.
    - Ensure there are positive performance measures in addition to negative ones. 'Traditional' measures tend to look at reducing negative 'cases', e.g. near misses on a construction site. But since objectives tend to be positive impact related (e.g. feeling supported at work; good quality housing) positive indicators create a better alignment with the objective. The service focus, mentioned above, encourages this development of positive performance indicators too, as a service is often positively defined.

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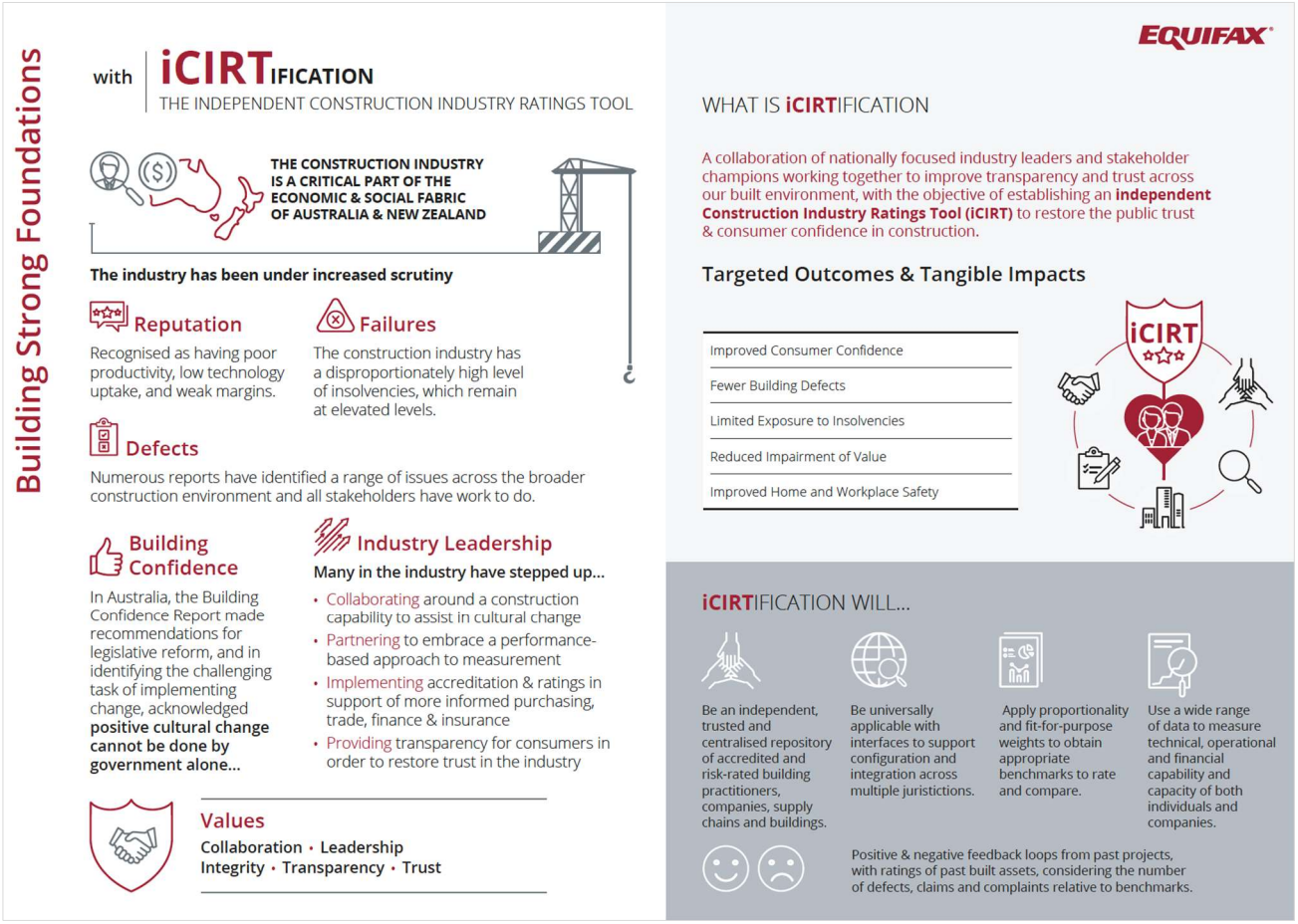
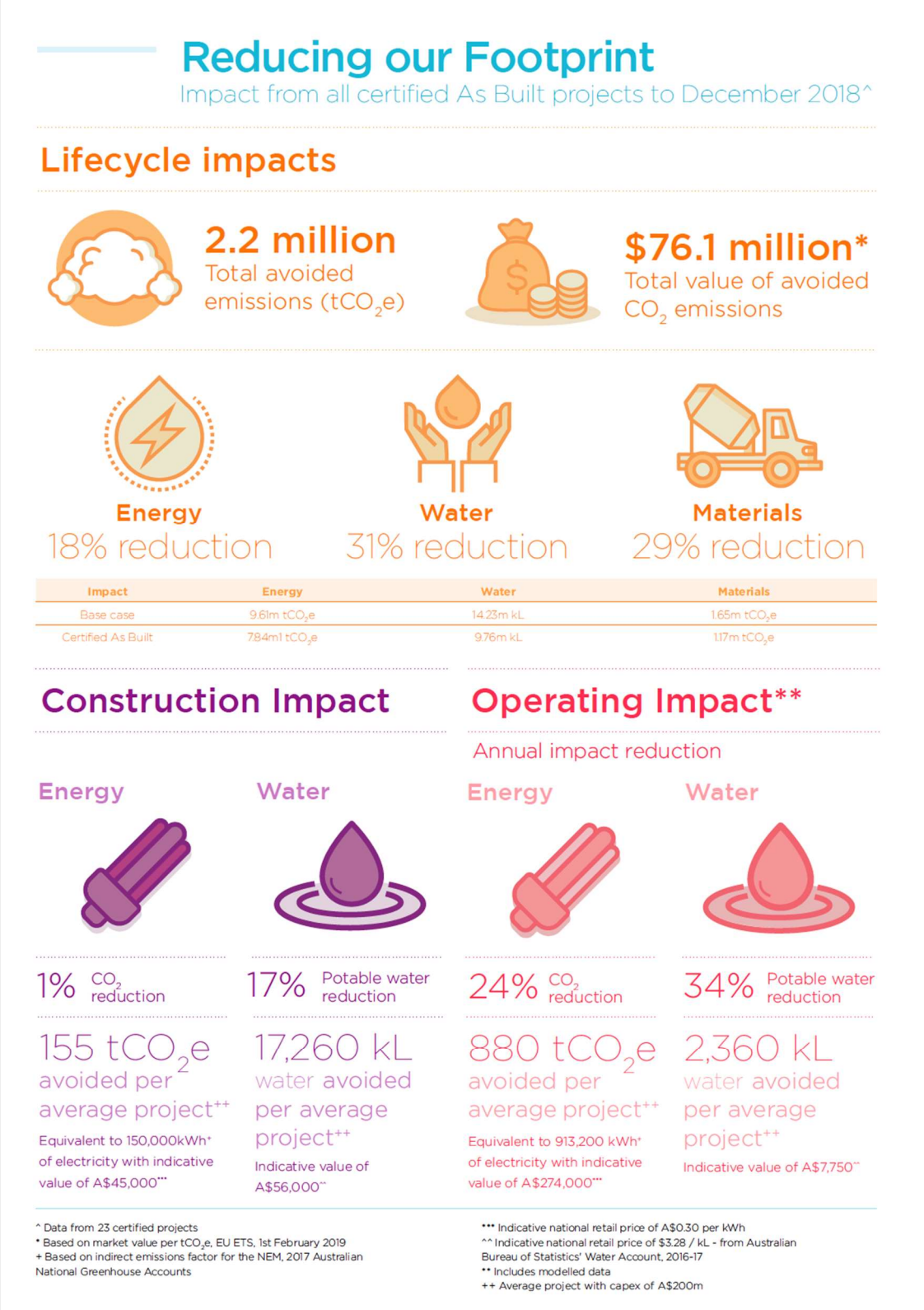
Appendix 1: iCIRT infographic

The following infographic has been provide by Equifax about iCIRT (Equifax, 2020).



Appendix 2: ISCA's aggregated impacts

ISCA aggregates some data on positive impacts in their ISCA Impacts Report (*ISCA*, 2019, pp. 4, 5).



ISCA aggregates some data on positive impacts in their ISCA Impacts Report (*ISCA*, 2019, pp. 4, 5). (cont.)