SUSTAINABILITY AND CAPITAL INVESTMENT CASE STUDIES

A CPA Australia Global Research Perspectives Program field research study on capital investment decision-making and integrated thinking

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Contemporary Capital Investment Appraisal from a Management Accounting and Integrated Thinking Perspective: Case Study Evidence

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Foreword

At the heart of the accounting profession is information – information not merely for its own sake but as the essential ingredient of effective decision making.

Today's digital age businesses around the world and of all sizes and structures, are dealing with a revolution in information. They are coming to grips with the complex interaction of dynamic social and environmental factors, and all in real time.

It means capturing and reporting on their economic, social and environmental performance and impacts.

It also means the way we think about and understand the parameters of decision making is shifting.

The genesis of this book is an online survey of Australian companies in 2012 in collaboration with IFAC and The Prince's Accounting for Sustainability Project which looked at how sustainability issues were being incorporated into internal capital allocation.

The five case studies we detail in this book all highlight challenges to the traditional view of capital investment appraisal. Strategic commitment and duration of impact, of which sustainability has emerged as a key element, are driving significant innovation affecting our traditional views.

These dynamics are reshaping the role of professional accountants. While there is ample evidence of accounting evolving in response to organisational change, it is in some cases developed and carried out by other professions.

The challenge is clear: to ensure that accountants stay at the forefront of accounting development while deepening capacity for key roles in cross-discipline and multi-skilled decision making.

Our objective with this book, funded as part CPA Australia's annual competitive Global Research Perspectives Program, is to generate a greater depth of understanding of how sustainability is shaping management practice and decision making. My sincere thanks to the authors and case study organisations who have given so generously of their time and resources. I am confident of our shared views on the transformational power of accounting and the organisations within which they play vital roles.

Alex Malley FCPA

Chief Executive

CPA Australia

The global economy is entering a new era where many of the macro trends shaping the business world relate to sustainability. These trends include population growth, a growing middle-class consumer base, water scarcity, finite natural resource constraints, climate change and social inequality.

Companies and governments are increasingly recognising that sustainable economic performance relies on an understanding of the interdependency between financial, social and environmental factors. They are realising that sustainability trends generate and erode markets, drive costs and revenues, and create risks and opportunities, resulting in real impacts on the bottom line. As the 2014 World Economic Forum's Global Risks report highlights, six of the top ten global risks of highest concern are environmental or social in nature, making the integration of these factors into decisions imperative for businesses wishing to remain profitable and resilient.

Conventional capital expenditure appraisal techniques are often based on purely 'financial' methodologies that do not take account of sustainability considerations. This gap can have an enduring impact as today's decisions are 'locked in' for the lifetime of the asset, in many cases for decades to come. Ensuring that a broader set of impacts and risks are considered up front helps to ‘future-proof’ the investment from the changing environment and social landscape, and can deliver both improved financial returns and sustainability outcomes, as the work of The Prince's Accounting for Sustainability Project CFO Leadership Network has shown.

The case studies brought together in this paper underline this message: organisations are recognising the need to integrate a broader set of risks and impacts into capital expenditure decision making, finding practical ways to achieve this aim, and delivering improved commercial and sustainability outcomes as a result. The research provides a wealth of useful insights for organisations thinking about how to integrate sustainability effectively within capital investment decisions.

Jessica Fries

Executive Chairman

The Prince’s Accounting for Sustainability Project (A4S)

Preface/Acknowledgements

This book is the culmination of a series of research projects we had the privilege of conducting together over a period of several years. Following initial calls from The Accounting Bodies Network — a group of accounting bodies established by The Prince's Accounting for Sustainability Project (A4S) in 2008 — we commenced our research agenda, supported by CPA Australia. We began with a small study of Australia's G100 companies, enquiring about how they accounted for sustainability in their capital investment appraisal. This led to a second study, a survey of large companies to investigate the variety of appraisal methods in use. With findings that highlighted emergent integrated thinking (that is, senior management commitment to sustainability; sustainability devolved throughout the organisation; and sustainability embedded in management control systems designs), we saw the need for further in-depth case analysis to better understand the way sustainability is embedded in long-term resource commitments and decision making.

Deliberately positioned in a management accounting context we were able to investigate, not only the techniques behind contemporary capital investment appraisal, but how the particular approach taken by an organisation is situated within their specific setting. With a focus on long-term decision making we investigated how broader social and environmental impacts are imbued in organisational strategy and business model development. A management accounting focus also gave us the opportunity to investigate more broadly the causal relationships between accounting and management decisions. Thus, through in-depth case analysis we were able to better understand the processes of integrated thinking across varying organisations. We were also able to study the role of accounting in this process. Our concerns were with the potentially limited financial role of accounting in an ever expanding domain of information and data resources from which to derive decisions. We spent time evaluating the treatment of financial and non-financial information as well as investigating the ways in which this information flowed into the management accounting records. Our overall aim from this study is to not only provide a resource of contemporary practice but to empower the accountant with knowledge of the broader repertoire of tools that are being used in organisational decision making, and not necessarily by the accountants. Therefore we provide both theoretical and practical relevance to enhance the future role for accounting, particularly when it comes to long-term strategic decision making.

Obviously, a book of this kind is not possible without the cooperation and support of others. First of all, we are indebted to our case sites and all of the managers who gave so freely of their time to support the project. The diversity of organisational type is a feature of our work here. Our organisations were Water Corporation, Mondelēz International, Yancoal*,* **bankmecu** and Anglicare. We have had numerous site visits, discussions and email correspondence with a range of managers at each site and in particular have spent a significant amount of time in discussions with our direct contact within each organisation. This book would simply not have been possible without their cooperation and enthusiasm for our work. They, along with those who provided the initial introductions, have facilitated the engagement between academia and industry that has enabled the project to proceed. We have learned so much through the project and realise how fortunate we are to have spent considerable amounts of time in each organisation.

We thank CPA Australia for their funding of this project. In particular, we thank John Purcell for his cooperation and support, as well as members of the publication team who have helped finalise the production of the book. We also thank Matty Yates, Sarah Nolleth and Jessica Fries from The Prince's Accounting for Sustainability Project, as well as Stathis Gould from The International Federation of Accountants, for their constructive comments and contributions throughout this work. The assistance of Joe Ferguson is much appreciated, as is the final review work conducted by Lee Parker and Brad Potter and the constructive support of our colleagues. We have had numerous opportunities to present our research and thank the contributors at each of these presentations and accounting forums. Finally, we thank our families for their continued support.

Gillian, Albie and Judy

About the authors

Gillian Vesty is a Senior Lecturer in the School of Accounting. RMIT University. Gillian has a PhD from the University of Melbourne. She is also a member of CPA Australia. In addition to her academic role, Gillian has 20 years' experience working in the public healthcare sector. She is co-author of a management accounting textbook and teaches accounting at both undergraduate and postgraduate levels. Her research interests include management accounting for sustainability as well as accounting for public health care.

Albie Brooks is a Senior Teaching Fellow in management accounting at the University of Melbourne. He has wide-ranging teaching experiences at undergraduate and graduate levels in both domestic and international institutions. He has authored and presented materials for the profession, as well as co-authoring two university-level textbooks. Albie's research and scholarship interests include contemporary management accounting issues, the development of innovative educational materials, accounting education and corporate governance issues.

Judy Oliver is a Senior Lecturer in the Swinburne Business School at Swinburne University. After 18 years in industry she joined academia and has taught at both undergraduate and postgraduate levels both locally and internationally. She has co-authored two university-level textbooks and published research in the area of management accounting and corporate governance. Her research interest is in understanding more about how management accounting tools and practices are used within organisations.

Chapter 1: Introduction

1.0 Introduction

This research project is part of a management accounting agenda to better understand the current practices associated with capital investment appraisal. In particular, this research book has been developed to respond to the accounting community's interest in investment appraisal techniques and the link to sustainability-related impacts. The aim of this research is to highlight, through case studies, the emerging techniques and recognition of good practice in capital investment and project appraisal. This work builds on earlier survey work conducted for CPA Australia on behalf of IFAC and The Prince's Accounting for Sustainability Project (Vesty, G. (2011); Vesty, G., Oliver, J., & Brooks, A. (2013)). This background work is used in particular in the development of Chapters 1 and 2 and helps to inform the detailed case studies (Chapters 3–7). Our focus is on routine accounting practices and the recognition of sustainability-related impacts in operational, regulatory and/or strategic investment decisions.

Our case organisations — Water Corporation; Mondelēz International; Yancoal; **bankmecu** and Anglicare — were selected because of the differences in both their ownership structures and industry sector. We provide examples of the different types of investment decisions made by each of the case organisations and highlight the techniques used for these decisions. In each example provided, we demonstrate the role of accounting and how sustainability factors are incorporated in investment appraisal.

1.1 Capital investment, integrated thinking and sustainability

Capital investments are the result of the commitment of significant resources to projects that are expected to enhance the value of the organisation and/or provide shared community benefits. According to IFAC (2013), "project and investment appraisal refers to evaluations of decisions made by organisations on allocating resources to investments of a significant size. Typical capital spending and investment decisions include the following:

- Make or buy decisions and outsourcing certain organizational functions.
- Acquisition and disposal of subsidiary organisations.
- Entry into new markets.
- The purchase (or sale) of plant and equipment.
- Developing new products or services, or discontinuing them, or decisions on related research and development programs.
- The acquisition or disposal of new premises or property by purchase, lease, or rental.
- Marketing programs to enhance brand recognition and to promote products or services.
- Significant programs of staff development or training.
- Restructuring of supply chain.
- Revision of distribution networks.
- Replacing existing assets" (IFAC (2013), pp. 7–8).

Given that the management accounting literature has consistently conveyed the message that *all* relevant data must be in included in the analysis (Eldenburg, L.G., Brooks, A., Oliver, J., Vesty, G., & Wolcott, S. (2011)), the selection and use of suitable processes and techniques to make such decisions is becoming increasingly problematic for managers faced with recognising longer term strategic risks and benefits. The capital budgeting literature is abundant with studies of the techniques used in investment and resource allocation decisions (see, for example, Arnold, G.C., & Hatzopoulos, P.D. (2000); Graham, J., & Harvey, C. (2002); Ryan, P.A., & Ryan, G.P. (2002); Vesty, G., Oliver, J., & Brooks, A. (2013)). Mostly, these studies shed light on the popularity of particular techniques and consistently show the priority of corporations to use discounted cash flow techniques such as net present value (NPV) and internal rate of return (IRR). Other traditional evaluation tools such as economic value added (EVA), accounting rate of return (ARR) and pay-back-period (PBP) have not disappeared from the horizon and remain popular. Largely recognised as forms of cost-benefit analysis, these traditions continue to be largely utilised by corporations and governments. In particular, cost-benefit analysis is used by governments as an economic means to weigh societal costs against societal benefits in policy decisions that involve capital infrastructure decisions (Lohman, L. (2009)). As we have highlighted in our management accounting textbook, the data used in capital investment

appraisal should include a consideration of both quantitative and qualitative data, capturing factors such as strategy and risk (Eldenburg, L.G., Brooks, A., Oliver, J., Vesty, G., & Wolcott, S. (2011)).

Of increasing concern is the requirement to consider sustainability-related impacts (environmental, social and ethical) associated with investment (Vesty, G., Oliver, J., & Brooks, A. (2013)). This notion of responsible investment appraisal is not new and was highlighted by Middleton, K.A. (1977) many years ago:

> *". . . decision-makers in the private sector of the economy have a social responsibility; that they have an obligation to consider the social and environmental effects of investment proposals. From this standpoint, profitability is seen as an important but not over-riding factor in decision-making. It will be assumed that decision-makers wish to know the profitability of projects as a primary factor in the making of investment decisions. Given knowledge of a project's profitability, the decision-makers may then consider all other relevant factors (e.g., social, strategic, possible employee reaction, etc.) before reaching a decision." (Middleton, K.A. (1977), p. 3)*

What do we expect to account for when we consider the notion of *sustainability* in resource allocation decisions? This question is the focus of this book and helps to address concerns about externalities and the broader social consequences of corporate activity in the modelling of attributes associated with environmental, social and ethics in capital investment appraisal. To date, the accounting literature has tended to focus on sustainability-related governance in terms of disclosure-related practices (see, for example, Barth, M.E., & McNichols, M.F. (1994); Barth, M.E., McNichols, M.F., & Wilson, G.P. (1997); Bhimani, A., & Soonawalla, K. (2005); Clarkson, P.M., Li, Y., Richardson, G.D., & Vasari, F.P. (2008); Deegan, C. (2002); Islam, M.A., & Deegan, C. (2008); Gray, R., Adams, C.A., & Owen. D. (2014); Kennedy, J., Mitchell, T., & Sefcick, S.E. (1998)) rather than the processes underlying internal decision making and control. Similarly, stakeholders continue to show interest in the sustainability-related credentials of organisations but desire more detail on investment practices Vesty, G. (2011). As Epstein, M.J., & Yuthas, K. (2012), p. 27 suggest, "companies today are under constant pressure to 'go green,' and sustainability has become a critical factor in corporate competitiveness for many . . . customers, investors, employees, and other stakeholders want to know the environmental and social impacts of corporate activities". But to "go green" is about careful management of operations with a consideration of society and the environment, an ideology far removed from the deceptiveness associated with "greenwashing" on which companies are still being challenged by legislation, concerned individuals and activist groups.

When considering the extent to which companies invest directly in sustainability-related projects or indirectly through careful monitoring and attention to sustainability attributes, it is argued that corporate strategic responses to mitigate negative sustainability impacts can lead to improved future values (Austin, D., & Sauer, A. (2003); Sauer, A., & Wellington, F. (2005); Vesty, G., Oliver, J., & Brooks, A. (2013)). However, the subjectivity and uncertainty associated with measuring and identifying future material sustainability-related impacts makes investment planning and risk mitigation an extremely complex process for organisations (Gray, R., Adams, C.A., & Owen. D. (2014); Milne, M.J. (1996); Tyler, E., & Chivaka, R. (2009); Vesty, G., Oliver, J., & Brooks, A. (2013)). Our particular interest in writing this book is to contribute to addressing the gap in the literature that exists around the inclusion of sustainability-related factors in organisational resource allocation decision making with respect to capital investment decisions and techniques adopted in everyday practices.

As will be highlighted in Chapter 2: Literature and Background Review, capital appraisal techniques and models have developed over time (Haka, S.F. (2007)), in particular with respect to sustainability impacts and the belief that traditional discounted cash flow techniques are not adequately addressing the strategic uncertainty associated with climate change (Lohman, L. (2009); Tyler, E., & Chivaka, R. (2009)). For example, life-cycle analysis and associated life-cycle costing, which attempts to internalise the externalities associated with corporate products and processes, are shown to contribute to the growing body of techniques applied in capital investment decision making (Bebbington, J. (2007)). The use of real options valuation methodology arguably enhances sustainability-related decisions (Miller, K.D., & Waller, H.G. (2003); Tyler, E., & Chivaka, R. (2009)). This technique is not unlike cost-benefit analysis, where a broader set of sustainability uncertainties is quantified. Real options can also be considered in terms of the qualitative benefit they provide decision makers Graham, J., & Harvey, C. (2002). Monte Carlo simulations, decision trees and sensitivity analysis are designed to overcome issues associated with subjective judgement or reliance on "soft" methods when including all relevant data to estimate the value of capital project risk (Jackson, J. (2010); Tyler, E., & Chivaka, R. (2009); Verbeeten, F.H.M. (2006)). Notwithstanding the potential strategic benefits, problems associated with alternate approaches are: the high costs associated with data collection; practical issues associated with inconsistent and incomplete data; and potentially noisy measurement on which to base decisions (Schaltegger, S., & Burritt, R.L. (2000)). In acknowledging the uncertainty and difficulties associated with quantifying many of the stakeholder reactions, these models nevertheless attempt to broaden traditional appraisal boundaries.

Of further interest for management accounting is the more recent premise that integrated reporting (IR) can connect with integrated thinking through a central business model that considers six capitals (financial, manufactured, intellectual, human, social and relationship), as well as natural capital, as material inputs, processed in organisational activities to generate outputs and outcomes (IIRC (2013)). While <IR> acknowledges that integrated thinking is an antecedent to <IR>, they do not provide any insight as to how sustainability factors are to be embedded within the decision process, or how the reporting around the six capitals results in organisation-wide integrated thinking (Oliver, J., Vesty, G., & Brooks, A. (2014)). As a precursor to IR>, integrated thinking is argued to be at the forefront of decision making as organisations evolve their core mission and strategy to incorporate activities from a sustainability viewpoint. Similar to well-entrenched literature that details the successful implementation of new management practices (see, for example, Alcouffe, S., Berland, N., & Levant, Y. (2008); Argyris, C., & Kaplan, R.S. (1994); Baird, K.M., Harrison, G.L., & Reeve, R.C. (2004); Chenhall, R. & Langfield-Smith, K. (1998); Emsley, D. (2005); Jones, T, & Dugdale, D. (2002); Moores, K., & Chenhall, R.C. (1994); Young, M. (1997); Oliver, J., Vesty, G., & Brooks, A. (2014)) develop a series of integrated thinking themes to guide empirical data collection. In broad terms, these themes focus on whether organisations are using an integrated thinking approach within their operations and daily activities and consider the challenges and impediments that exist in achieving this objective.

In concluding this section, it is important to note that much of Brundtland's work is underpinned by his frequently cited definition of sustainable development, with its two key concepts:

> *Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:*
>
> - *the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and*
> - *the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.* (Brundtland, G.H. (1987), p. 43)

This definition provides a broad platform for accounting researchers to examine capital investment appraisal techniques in the way it reveals the challenges and limitations associated with the valuing and maintenance of finite resources over extended time frames. This highlights the importance of including sustainability impacts in capital investment appraisal so that organisational practices complement sustainable development.

1.2 Project objectives

The aim of this project is to build on earlier survey work (Vesty, G. (2011); Vesty, G., Oliver, J., & Brooks, A. (2013)) with in-depth case studies to demonstrate capital investment appraisal in practice. When sustainability is an important part of strategic decisions, our focus is on how the material, social, environmental and economic factors are included in accounting practice and processes for making capital investments. With this project, we aim to provide a reference tool for accountants in practice by providing a diverse set of insights into emerging good practice.

Our work is motivated in four key ways. First, significant research has been embarked on to explore developments in environmental management accounting[1] (Bebbington, J. (2001); Deegan, C. (2003); Bennett, M. (2009); Burritt, R.L. (2012); Schaltegger, S. (2011)). EMA techniques form part of the International Organization for Standardization (ISO) 14000 series as a means for companies to measure and manage their material cost flows.[2] Recognised as Material Flow Cost Accounting (MFCA), the monetary costs associated with waste and energy are applied to a product in two ways: as energy and materials cost (positive output) and as waste (negative output) from individual operational processes. Much of this literature focuses on detailed analysis of process inputs and outputs and ways that environmental impacts can be quantified and included in operational management accounting systems Christ, K.L., & Burritt, R.L. (2013). Our contribution to this area of the literature focuses on the organisational-level capital investment decision tools and whether they include these operational aspects of EMA in capital investment cash flows and investment decisions. That is, we focus not only on the extent to which the true costs of environmental

[1] Other terms, such as sustainability accounting, might be used to describe the practices associated with environmental management accounting (see, for example, Bennett, M., Schaltegger, S., & Zvezdov, D. (2013)).

[2] See ISO 14051:2011, Environmental management — Material flow cost accounting — General framework http://www.iso.org/iso/news.htm?refid=Ref1527.

wastes are accounted for in routine investment appraisals, but on the inclusion of other sustainability factors that might not be readily quantified.

Second, following from the first point we contribute to the capital budgeting literature in terms of how commonly accepted appraisal tools capture sustainability-related impacts. Given the uncertainty that exists around the timing, measurement and inclusion of sustainability-related impacts in cash flows, we contribute with research on the appraisal methods adopted to overcome such uncertainty in investment decisions. Moreover, we provide evidence on the extent of the use of sophisticated quantitative methods and qualitative data in shaping capital investment appraisal.

Third, the limited work that has been conducted with respect to sustainability in capital investment decisions (see, for example, Gray, R., & Bebbington, J. (2001)) tends to be predominately normative. This work has engendered debates around suitable processes of quantifying and including not only the internal environmental costs but external costs associated with corporate economic activities. Over the last decade or so comprehensive frameworks and methodologies have been developed to aid measurement of corporate sustainability Atkinson, G. (2000), but little is known about their adoption in practice. Our intention is to expand on this normative work by providing evidence of organisational decision-making processes. In doing so, we are able to extend this stream of research with insights from practice.

Fourth, at this stage guidance from the profession for industry participants is limited. Suggested tools for capital investment appraisal tend to be relatively traditional and do not include details about how sustainability impacts should be included in investment appraisals (see, for example, IFAC (2008)). While governments and regulatory authorities have provided some practice guidance for organisations, good practice guidelines from the profession remain relatively underdeveloped. To this end, our contributions have implications for practitioners by assisting with the development of good practice guidelines that meet the emerging “sustainability-related accounting” needs of professional accountants in practice.

1.3 Case study approach

As a result of earlier survey work (see Vesty, G. (2011); Vesty, G., Oliver, J., & Brooks, A. (2013)) we were provided the opportunity to conduct in-depth analysis of capital investment appraisal with carefully selected case sites.

These organisations were selected because of the nature of their operations. We wanted representation of different ownership structures. From earlier focus group meetings (Vesty, G. (2011)) we knew that financial analysts from the Water Corporation were working on detailed modelling of social and environmental factors that were to be considered in capital investment appraisal. We were offered the opportunity to spend more time with this government-owned enterprise. We also wanted to conduct research in a manufacturing company where shareholder returns were vital to the business success. We wanted to see how sustainability-related factors played out in a company where the business case approach to sustainability must prevail. Mondelēz International provided a perfect example of a global approach to recognising sustainability impacts in capital investment appraisal. Yancoal provided the opportunity to explore sustainability in a relatively highly regulated and contentious mining environment, as well as being a listed company with a major international shareholder. **bankmecu** was a suitable research site for two key reasons. First, it was part of the <IR> Pilot Programme, suggesting a sustainability focus; and, second, as a member-owned bank, it offered us a unique opportunity to explore the embedding of sustainability in organisational processes directed by member and employee philosophy and actions. The not-for-profit sector is one that has been traditionally ignored in such investigations. Anglicare provided the opportunity to help close this gap. With its social welfare agenda and practices, we were able to explore the direct links between organisational strategy and control system design.

Interviews have been held with the CFOs of each of the case organisations and others directly involved in capital investment appraisal, as well as, in two cases, board members. For example, we also spoke with engineers and sustainability managers and were able to follow up with email and telephone discussion. We were also provided with examples of capital investment proposals, internal reports and presentations, as well as other internal archival information that would assist our understanding. We also sourced publicly available data to provide a holistic overview of the case site and its operations.

Exhibit **1.01** contains a summary of our case study evidence used throughout this research book.

Exhibit 1.01: Case study evidence

Interviews	Semi-structured interviews were held with 15 different managers across our five organisations. In total, 30 interviews of 1 to 2 hours' duration were conducted. Some interviews were with an individual manager, while others were group interviews.
Email and phone	We were able to directly contact most of the managers we interviewed. Many commented on iterations of the relevant chapter relating to their organisation.
Annual reports, government reports, documents and web-pages	These documents proved very useful for providing background data and helped to link specific organisational actions and inputs (some of which were proprietary in nature) with external reports and other information requirements relating to overall investment appraisal. These included the detailed government sustainability assessment reports.
Observation	All of our interviews were conducted on-site (with multiple visits), which provided the opportunity to observe any contextual considerations.

1.4 Outline of book chapters

The different approaches to investment appraisal are the focus for this book. With a background typology of investment and project decisions in terms of regulatory, operational and strategic classifications, we reveal the different appraisal techniques applied in practice. We investigate the varying ways sustainability factors are included in investment decisions.

We commence in Chapter 2: Literature and Background Review with a detailed literature and background review that explores the prevailing literature and provides the foundation for subsequent chapters.

In the first case site, Water Corporation (Chapter 3: Water Corporation Case), natural capital (such as land, water and energy resources) and community are key factors in investment appraisal. Given water and wastewater management is an asset-intensive, energy-consuming, and ecologically and socially disruptive business, this organisation prioritises these factors in appraisal. We provide interesting insights into the efforts of a decentralised government utility to model and incorporate sustainability factors quantitatively in investment appraisal.

Our second case site, Mondelēz International (formerly known as Kraft Foods and Cadbury), is recognised globally for its history of iconic brands (Chapter 4: Mondelēz International Case). Being answerable to its shareholders, it is understandable that demonstrating financial capital growth is key to the company's success. Nevertheless, for short-, medium- and long-term value creation, sustainability factors are huge concerns for this multinational. Given a key production input is chocolate, a commodity largely grown in developing countries, the farmer, community and associated production workers are very much a focus of investment appraisal. Issues such as occupational health and safety and ways to create value by harnessing intellectual and natural capital throughout the entire supply chain are very much part of project investment decision making.

The third case, Yancoal Australia Limited (Chapter 5: Yancoal Case), is one of Australia's largest listed pure-play coal producers (if not the largest), and the ninth largest pure-play coal company globally (based on reserves). Yancoal's major shareholder is Yanzhou Coal Mining Company Limited in the People's Republic of China. Yanzhou is publicly listed on the Shanghai, Hong Kong and New York stock exchanges. As with other mining companies, sustainability is integral to Yancoal's licence to operate. Considerable attention is paid to the local environment, as well as to the social factors arising from operations. Our research highlights Yancoal's capital appraisal approach and the typical complexities found in this industry. The extensive upfront feasibility studies draw attention to risk minimisation practices and processes required to ensure a safe working environment and protection of local communities. As part of the long processes towards investment in new coal mines, capital investments are made either to maintain existing capital infrastructure or as a bridge to new investments that may take several years of appraisal development until final approval. A close relationship with government is required as mining licences are based on varying factors, including national interest, rail/port shipping infrastructure, and economic modelling of local biodiversity and community impacts.

The fourth case example, **bankmecu** (Chapter 6: bankmecu^{TM} Case), is Australia's first customer-owned bank and is a result of the joining together of a number of credit unions throughout Australia. As one of the <IR> pilot companies, **bankmecu** prides itself on its responsible approach to banking. In this case the focus

is on the internal business model, the precursor to integrated reporting, and how key aspects of integrated thinking are included in the capital appraisal process. The factors focused on include top management support, and dissemination and integration of sustainability factors in all business decisions throughout the company.

The fifth case, Anglicare (Chapter 7: Anglicare Victoria Case), is a not-for-profit organisation created by the *Anglicare Welfare Agency Act 1997*, an Act of the Victorian Parliament that amalgamated three longstanding Victorian Anglican welfare organisations. Anglicare's overall mission is to resource and empower children, young people and families to achieve their full potential by providing quality innovative services, promoting social justice and strengthening local communities. As such, they have developed key strategies for investment in significant programs to achieve their mission. This involves multimillion-dollar amalgamations with smaller regional operations to achieve economies of scale and scope. This chapter focuses largely on the social aspect of sustainability. It provides details on evaluation methodologies, the key financial and non-financial information required to monitor and reflect on investment decisions, and the achievement of strategic goals.

The book concludes with Chapter 8: Conclusion: Implications and Recommendations, which focuses on our broader-level observations and associated implications.

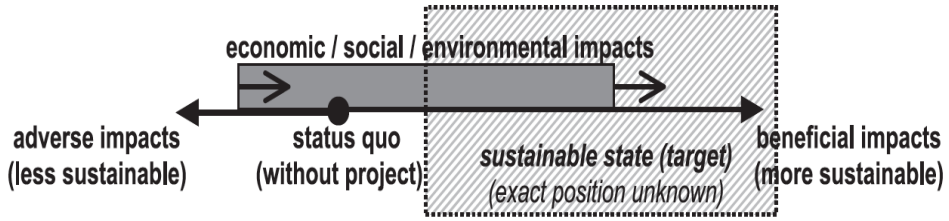
Chapter 2: Literature and Background Review

2.0 Introduction

In this chapter our focus is on the management accounting control system approach to capital investment appraisal. We pay particular attention to the processes of identifying, collecting and analysing varying types of accounting information required for the assessment of organisational efficiencies and effectiveness. We provide a brief overview of the traditional appraisal processes, including investment classification criteria and tools commonly applied in practice. We continue with discussion on the issues associated with this, including strategic and risk-related factors in investment appraisal. In particular, we focus on sustainability impacts and the debates around monetisation and the difficult-to-quantify attributes. Improving the links between internal decision-making processes and social and environmental governance have been argued along the lines of "Integrated Thinking", an approach reinforced by The Prince's Accounting for Sustainability Project (for further details refer to www.accountingforsustainability.org).

An integrated approach to the consideration of social, environmental and economic attributes helps to direct our focus and subsequent evaluation of sustainability impacts in capital investment appraisal (see Oliver, J., Vesty, G., & Brooks, A. (2014)). An integrated view is operationalised in Exhibit 2.01 below, "Integrated assessment approach to sustainability assessment", developed by Pope, J., Annandale, D., & Morrison-Saunders, A. (2004). This diagram draws attention to economic, social and environmental impacts associated with project investment and evaluation in terms of its contribution to more/less sustainable outcomes. While this diagram indicates the difficulty in recognition of the target "sustainable state", it nevertheless provides a useful background when considering the accounting approaches required to recognise a project's overall adverse or beneficial impacts to society and the environment. This reinforces the notion of integrated thinking and sustainable performance expectations of organisations, thereby drawing attention to the management accounting control tools designed to link sustainability strategies and governance with suitable appraisal tools for short- and long-term performance.

Exhibit 2.01: Integrated assessment approach to sustainability assessment



Source: Pope, J., Annandale, D., & Morrison-Saunders, A. (2004), p. 602.

As will be highlighted in this chapter, current organisational capacities to capture and value the diverse range of sustainability issues, while continuing to emerge, remain problematic for most organisations (Bebbington, J. (2007); Gasparatos, A., El-Haram, M., & Horner, M. (2009)). We now provide a brief history and overview of capital budgeting techniques and practices.

2.1 Capital investment and appraisal tools

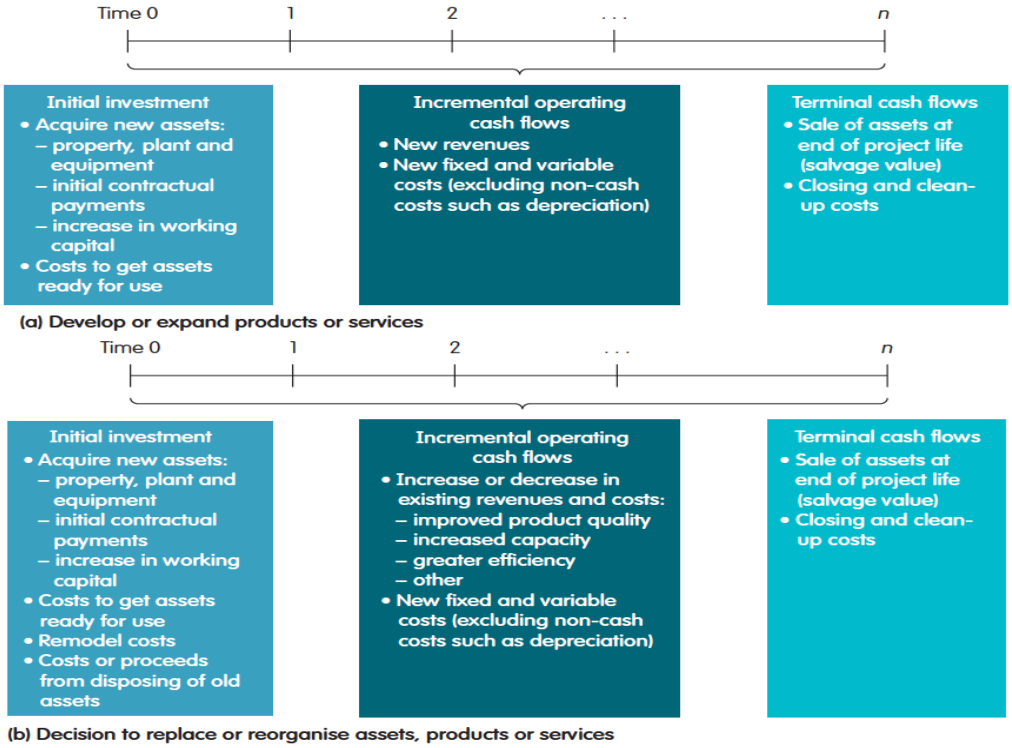
Given the risks associated with the commitment of resources to long-term projects, capital investment appraisal has broadened from decisions based on business acumen and foresight to ones based on complex methodologies and predictions of further performance. The more complex an investment, the greater the diversity of data and expertise required to determine whether or not to commit significant resources for the long-run benefit of the company (Eldenburg, L.G., Brooks, A., Oliver, J., Vesty, G., & Wolcott, S. (2011); Vesty, G. (2011)). In Chapter 1: Introduction, we provided details of what comprises project and investment appraisal. The definition of capital expenditure is broad and includes product development, acquisitions and divestitures that contribute to the long-term future of an organisation. In general, this includes major capital expenditure on operational, regulatory and strategic investments. In the case of the public sector, capital investment is recognised as large infrastructure projects that add value to national wealth, as well as providing local community benefits.

Investment appraisal generally includes calculations outlining the initial capital outlay and a broad array of expenditures from operational costs to staff training and development, research and development, marketing

and revenue enhancement activities, as well as other intangible expenditures. Understandably, systematic financial and strategic analysis is essential. Nevertheless, guidance for management accountants in practice remains challenging. While the traditional role of accounting centres on the contribution of financial data, the detail required to understand the extent and relevance of financial data in terms of corporate boundaries is becoming more complex. This is compounded by the need for expertise that is frequently not included in the acquisition of traditional accounting skills. Increasingly, data provided by other organisational experts contributes and refines the traditional management accounting appraisal.

More generally, appraisal is commonly understood as cost-benefit analysis comprising financial analysis around the investment outlay, relevant cash flows over the lifetime of the project and an understanding of the terminal cash flows at the end of the project's life. The financial decision process highlighted in Exhibit 2.02 below is commonly applied by accountants in practice.

Exhibit 2.02: Common cash flows for long-term decisions



Source: Eldenburg et al., 2011, p. 542.

Investment appraisal techniques have long been considered more broadly in terms of cost-benefit analysis; that is, financial consideration of the cash inflows and outflows associated with a project over a period of time. A more specific cost-benefit methodology, derived from a long history of valuation techniques, is particularly useful in the government infrastructure sectors (Little, I.M.D., & Mirrlees, J.A. (1974)). These models tend to be somewhat explicit to the overarching policy decision or underlying economic circumstances, but commonly involve an identification of societal costs and benefits that are broader than those necessarily captured in traditional corporate or project cost-benefit models.

2.1.1 Appraisal techniques

In general, current practice is centred around discounted cash flow (DCF) analysis with capital investment assumptions based on the risk associated with project success. Discounting future benefits relies on the notion that investors would prefer the cash now and need to be compensated for the delay in returns on their investment. Historically, investors relied on longstanding business acumen and intuition, and it is interesting to note the relatively slow diffusion of DCF into capital investment decision analysis (Haka, S.F. (2007); Parker, R.H. (1968)). Haka, S.F. (2007) literature review of capital budgeting and investment appraisal offers some insights into possible reasons for this slow diffusion of DCF. Haka, S.F. (2007) historical research highlights the previous disconnect between investment in assets and profits, suggesting that "profits were considered rewards of good entrepreneurship and were unrelated to the capital employed by the entrepreneur" (Haka, S.F. (2007), p. 698). Notwithstanding the reported use of compound interest as far

back as 1800 – 1600 BC, it was the emergence of actuarial science, engineering economy and political economy that preceded the use of DCF tools by accountants. In the United States in the late nineteenth century, Haka, S.F. (2007) suggests railroad engineer Arthur Wellington first described present value techniques for selecting profitable investments. However, it wasn't until the mid 1950s that a more dramatic move to the use of DCF techniques for capital investment appraisal began to surface. Summarily, Haka, S.F. (2007) suggests four landmark moments to help explain the emergence in the use of DCF in capital investment appraisal from the 1950s:

- The construction of the present value tables by Christenson, C. (1955).
- The publication of these tables in Anthony, R.N. (1956) text.
- The landmark case *United States v. United Shoe Machinery Corp*. (1953), which helped legitimise DCF techniques.
- The key writings of Dean, J. (1951) and Dean, J. (1954) and Anthony, R.N. (1956), which contributed not only to capital investment techniques but to management accounting in general.

As a result of these landmark moments, general practice guidance now recommends discounted cash flow (DCF) analysis using net present value (NPV) methodology (IFAC (2008), IFAC (2013)). This is largely because the appraisal process most often involves a consideration of the time value of money and capital investments are generally large outlays that are normally made for the long run. A complementary DCF technique, internal rate of return (IRR), is also popular with managers in providing an internal rate of return that can be compared with existing or required rates of return. In comparing the two techniques, the accounting profession favours NPV over IRR largely because IRR is calculated on the basis of a single discount rate applied throughout the life of the investment. IRR is calculated as a rate that makes the project break-even and is usefully applied to investments with short horizons and even cash flows, but may be problematic when used with longer-term investments, particularly when the discount rate and cash flows are fluctuating. While the use of the time value of money and a consideration of the entire life of the project in discounted cash flow analysis methods using NPV is favoured, other traditional methods, such as payback period and accounting rate of return (ARR), which do not tend to discount cash flow, provide additional and useful longstanding acceptable rule-of-thumb data (Bhimani, A., Horngren, C.T., Data, S. M., & Rajan, M. (2012); Eldenburg, L.G., Brooks, A., Oliver, J., Vesty, G., & Wolcott, S. (2011)). Competing projects can be evaluated on both NPV and time to payback with decision makers potentially selecting shorter payback to higher NPV outcomes.

Given the uncertainties around estimations of each of the key components of capital budgeting — cash flows, project life, discount rate — a range of techniques is frequently applied in practice. To make sense of and manage all relevant data, other sophisticated techniques have been added to the repertoire of tools useful for capital investment appraisal, including full cost accounting (FCA), life-cycle analysis and costing, real options, multi-criteria analysis, decision trees and Monte Carlo simulations (Baxter, T., Bebbington, J., Cutteridge, D., & Harvey, G. (2004); Bebbington, J., Gray, R., Hibbitt, C., & Kirk, E. (2001); Graham, J., & Harvey, C. (2002); Gray, R., & Bebbington, J. (2001); Herborn, P. (2005); Popovic, V.M., Vasic, B.M., Lazovic, T.M., & Grbovic, A.M. (2012); Ryan, P.A., & Ryan, G.P. (2002); Verbeeten, F.H.M. (2006)). I n addition to sensitivity analysis, these different approaches help provide a more complete picture for decision makers.

Underlying FCA is the notion of accounting for sustainability, or sustainable capital maintenance over an accounting period, requiring consideration of three capitals: man-made, renewable/substitutable and critical natural capital — in other words, irreplaceable biodiversity (Gray, R. (2010)). Modifications to FCA techniques have been made, so accounting conforms to the company's predetermined standards (see, for example, BP's "Sustainability Assessment Model" (SAM). If, however, a company were to conform to FCA and employ the true definition in practice, "the sustainable cost is the amount that the organisation would have had to spend if it had been sustainable", which is more than likely prohibitive in today's capitalist society (Gray, R., Adams, C.A., & Owen. D. (2014), p. 228). Other approaches, such as life-cycle analysis and costing, aim to identify and allocate all identifiable costs to the cost objects (products, processes, services, investments etc.), which are the ultimate cause of financial, social and environmental costs. Costs can be identified as direct, indirect, future and intangible from the adoption of sustainable business practices (Raskin, P.D, Electris, C., & Rosen, R.A. (2010)).

The use of real options valuation methodology has been proposed as a means to enhance our understanding of the impact of sustainability on organisational decision making (Miller, K.D., & Waller, H.G. (2003); Tyler, E., & Chivaka, R. (2009)). When cash flow projections or risk profiling is challenging and "potentially fraught with significant deviations consistent with the large ranges given by the latest scientific and economic reports", it is argued that real options theory offers flexibility over DCF techniques alone (Tyler

and Chivaka, 2009, p. 3). Real options extends financial models (see, for example, Black, F., & Scholes, M.S. (1973)) to options on real assets, whereby the investor or owner of the asset is provided with a right, but not the obligation, to invest (examples might include the ownership of an underlying asset such as mining rights to a piece of land or a right to develop a carbon sink). Rather than an "invest/not invest" situation presented with DCF, real options reasoning suggests delaying investment until more favourable opportunities present or when better information is made available and potentially quantifiable. Real options also gives the owner the rights to change forms, "including options to (i) expand, (ii) abandon, and (iii) switch product types or process technology . . . [and] includes compound options, where the option's value is dependent on the value of another, rather than the underlying asset" (Tyler, E., & Chivaka, R. (2009), p. 5).

Monte Carlo simulations are based on computational algorithms that arguably better predict the cost impacts of long-run investment decisions than the subjective or "soft" methods associated with management judgement (Graham, J., & Harvey, C. (2002); Ryan, P.A., & Ryan, G.P. (2002)). Likewise, decision trees are frequently associated with probability models and try to quantify the success or otherwise of the project meeting strategic goals.

Further insights gleaned from cost-benefit analysis in the public sector tend to indicate a longer-term approach and broader perspective of benefits compared with traditional DCF appraisal techniques. In practice, while much of public infrastructure development is debated from a traditional DCF perspective, the broader economic approach finds societal costs balanced against the longer-term benefits derived (see the long-term versus short-term distinction in methodologies suggested by Gerrand, P. (2013)). In another examples, Kertesz, S. (2003) demonstrated how e-Government investment, using cost-benefit, was broadened to include the impact of the investment on citizens/customers, employees and the wider community. Popovic, V.M., Vasic, B.M., Lazovic, T.M., & Grbovic, A.M. (2012) proposed a combination of techniques to evaluate public transport infrastructure investment. The repertoire of sophisticated techniques is discussed in more detail in the following subsection dedicated to sustainability.

To better understand the extent to which the different capital investment decision tools are commonly used by organisations to evaluate their resource expenditure, several surveys have been conducted over the last decade or so. Given the different lines of questioning and different techniques examined, inherently these studies, for the most part, show an increasing use and preference for DCF techniques to evaluate capital investment opportunities (Arnold, G.C., & Hatzopoulos, P.D. (2000); Graham, J., & Harvey, C. (2002); Haka, S.F. (2007); Henri, J., & Journeault, M. (2010); Pike, R. (1996); Ryan, P.A., & Ryan, G.P. (2002); Truong, G., Partington, G., & Peat, M. (2008); Vesty, G., Oliver, J., & Brooks, A. (2013)). While there is some variation in methodological choice, net present value and internal rate of return techniques generally reign supreme, as highlighted in Exhibit 2.03 below.

Exhibit 2.03: Use of capital appraisal tools

Appraisal tools	Vesty, Oliver and Brooks (2013)	Pike (1996)	Graham and Harvey (2002)	Ryan and Ryan (2002)	Hermes, Smid and Yao (2007)		Truong, Partington and Peat (2008)
					Netherlands	China	
Net present value (NPV)	76.8%	74%	75%	96%	89%	49%	94%
Internal rate of return (IRR)	55%	81%	75%	92%	74%	89%	80%
Payback period	58%	94%	57%	74%	79%	84%	91%
Accounting rate of return (ARR)	58%	50%	na	34%	2%	9%	57%
Real options	24.6%	na	25%	11%			
Monte Carlo simulation	8.6%	na	13%	37%			
Sensitivity analysis	43.4%	na	52%	85%			
Economic value added (EVA)	17.4%						
Cost-benefit analysis (CBA)	61%						
Life-cycle analysis (LCA)	29%						
Decision trees	17.4%						

Source: Vesty, G., Oliver, J., & Brooks, A. (2013), p. 16.

Emerging from these studies are a number of interesting observations that cannot be ignored when reviewing the selection of appraisal technique. These include the fact that no one technique seems to be used exclusively.

- Most organisations use a combination of techniques (see, for example, Alkaraan, F., & Northcott, D. (2006); Pike, R. (1996); Truong, G., Partington, G., & Peat, M. (2008); Vesty, G., Oliver, J., & Brooks, A. (2013)).
- Comparisons of adopted techniques are based on studies from different times and different samples, which may be problematic (Pike, R. (1996)).
- Differences in adopted techniques have been noted for organisations of different size (Pike, R. (1996)) and organisations in different countries (Hermes, N., Smid, P.P.M., & Yao, L. (2007)).
- Differences in techniques are associated with different investment or project types (Vesty, G., Oliver, J., & Brooks, A. (2013)).
- Notwithstanding the rise of DCF techniques, the payback method seems to be an enduring technique still used by a large proportion of organisations (Graham, J., & Harvey, C. (2002); Jackson, J. (2010); Vesty, G., Oliver, J., & Brooks, A. (2013)).
- More sophisticated decision tools have emerged in recent years, including Monte Carlo simulations and real options (Graham, J., & Harvey, C. (2002); Ryan, P.A., & Ryan, G.P. (2002); Truong, G., Partington, G., & Peat, M. (2008); Vesty, G., Oliver, J., & Brooks, A. (2013)).
- Complicating factors, such as the growing pressure from shareholders and other stakeholders around issues involving strategy, risk and uncertainty, have highlighted the importance that sustainability places on management control system design (Henri, J., & Journeault, M. (2010); Vesty, G., Oliver, J., & Brooks, A. (2013)).

The results evident in Exhibit 2.03 tend to reinforce the view that DCF appraisal tools such as NPV and IRR dominate within organisations. Payback period continues to be a popular tool. Graham, J., & Harvey, C. (2002) theorise that this may be due to its simplicity, its information content and the fact that payback may give a similar result to that generated from more sophisticated techniques. Truong, G., Partington, G., & Peat, M. (2008) suggest it may be more popular with smaller organisations. As its information content provides payback time, it is potentially used to compare competing assets with different NPV outcomes and may penalise projects where cash flows come later in the investment. Unfortunately, most of the studies highlighted in Exhibit 2.03 only provide evidence of use and do not show *how* these appraisal tools are used in practice. For example, payback may be a common tool for early-stage evaluation, if ultimately not a key driver of the investment decision.

Of course, the successful use of all these methods relies on the capturing of all the relevant data to ensure a fully informed decision. In considering long-term value creation, long-term Investment appraisal has both analytic and strategic components of which the practising accountant should be aware. Arnold, G.C., & Hatzopoulos, P.D. (2000) point out that organisations consider a range of other factors in their capital investment decision process. For example, they argue that *strategic fit*, *culture fit*, *availability of staff* and *technology platform building* are all important considerations in appraisal techniques (Arnold, G.C., & Hatzopoulos, P.D. (2000); Truong, G., Partington, G., & Peat, M. (2008)). Moreover, as highlighted in the earlier quote by Middleton, K.A. (1977), capital appraisal always involves a determination of the boundary in which to frame the analysis. This is a growing area of concern for the accountant, particularly around understanding the complexity of corporate boundaries and value-chain activities that directly, or indirectly, impact operations. While attention should be paid to the careful selection of the most appropriate tools, this is necessarily underpinned by a comprehensive understanding of the broader context in which the decision is situated. Investments may be made for a variety of operational, regulatory or strategic purposes, and the purposes for which the investment is made will help determine the most suitable appraisal technique.

Aside from the survey conducted by Vesty, G., Oliver, J., & Brooks, A. (2013), sustainability-related impacts have not largely been considered in recent empirical studies on capital investment appraisal. Their research highlights the use of sustainability-related tools such as life-cycle analysis. While much of the earlier background research was largely based on the adoption and use of traditional and emergent technologies, findings by Vesty, G., Oliver, J., & Brooks, A. (2013) provide useful background in which to investigate change in management accounting towards the consideration of sustainability in everyday capital investment decisions. Importantly, this research raises the notion that factors other than financial are important in the decision-making process. The type of capital investment is also implicated in the choice of appraisal tool (Vesty, G., Oliver, J., & Brooks, A. (2013)). In the sections that follow, we draw attention to the varying investment classification types and the associated treatment of information.

2.2 Investment classification

A number of studies have sought to compare and contrast the differences in treatment in capital investment analysis between different types of investments. Commonly the distinction between the types of investment relates to whether the investment is more *strategic* as opposed to more *operational* (see, for example, Alkaraan, F., & Northcott, D. (2006); Adler, R.W. (2000); Slagmulder, R. (1997); Vesty, G., Oliver, J., & Brooks, A. (2013)). Other classification models have been used, such as *mandatory or non-discretionary* and *discretionary* investments (Ross, M. (1986); Simons, R. (2000)) and *replacement* and *expansion* investments (Chen, Y. (2008)). Irrespective of the classification model used, this strand of literature is built on the assumption that the nature of the analysis will differ according to the type of investment. It has been long argued that relatively standard analysis tools, while suitable for operational-type investments, are inadequate on their own in sufficiently analysing strategic-type investments (Carr, C., & Tomkins, C. (1996); Carr, C., Kolehmainen, K., and Mitchell, F. (2010); Simons, R. (2000); Shank, J.K. (1996)).

Simons, R. (2000) typology of capital investment types is a little broader than others used, offering three components: regulatory, operational and strategic. Like others, Simons argues that the appraisal tools used should differ in their application depending on the type of investment. Moreover, he suggests that for investments such as strategic investments we should expect to see less reliance on financial tools and increasing use of non-financial information in the appraisal process. This raises some interesting issues concerning the properties of non-financial information and how it is treated and then used in decision making. Although Simons does not specifically focus on sustainability, his typology usefully contributes to the emerging sustainability-related literature addressing the challenges associated with the categorisation, and subsequent valuation, of sustainability impacts in a capital investment setting (Vesty, G., Oliver, J., & Brooks, A. (2013)).

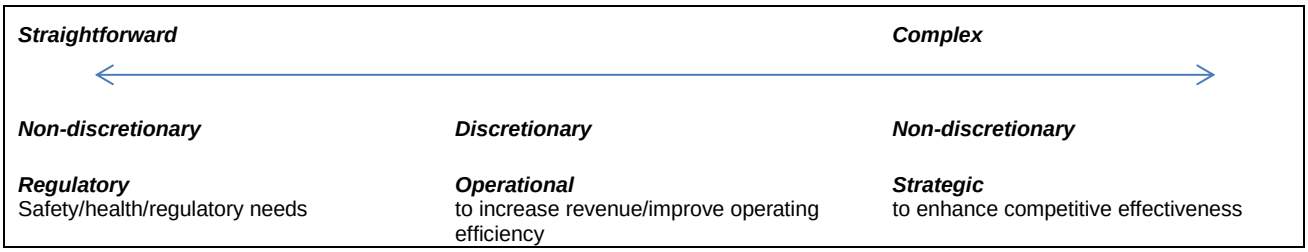
Simons, R. (2000) framework of capital investment types has three components:

1. *Safety/health/regulatory investments*. These types of investments are essentially mandatory, either to protect occupational health and safety of employees or dictated by law. As a consequence, these types of investments are commonly subjected to formal appraisals using common financial-based appraisal tools. Little choice exists about whether the project should proceed or not. Elsewhere in the literature, these types of investments have been classified as mandatory (Ross, M. (1986)). In this context, formal financial-based cost-benefit appraisal may not be relevant, so Simons, R. (2000) suggests instead that analysis should focus on the most cost-effective way to comply with regulations. To make sure the assets are appropriate and the best value relative to features and benefits, we would expect to see supplementary data in the form of engineered or human resources (HR) reports. Hence, the prevalence of non-financial based measures as part of the decision process for these types of investments.
2. *Operational investments*. These investments cover a range of possibilities, but commonly include upgrades to existing operations. While some might argue these types of investments may in fact be mandatory, Simons, R. (2000) takes the view that doing nothing is a viable option and consequently there exists an element of management discretion. He argues these operational investments need to stand on their own merits and that our standard financial-based appraisal tools are adequate for these types of investments.
3. *Strategic investments*. These investments often relate to enhancing competitive effectiveness, and as a consequence demand more varied evaluation criteria, including: financial evaluation; assessment against strategic goals; assessment of relevant internal capabilities; consideration of synergistic benefits to be generated by the investment; and the risks associated with not proceeding with the investment. The effect of this form of appraisal is that the financial evaluation often sits alongside a series of judgements about a range of non-financial factors often difficult to quantify.

Simons, R. (2000) typology furthers the consideration of differences in appraisal tools across the alternate investment types, the role of non-financial information in the appraisal process and whether this information is used quantitatively or qualitatively. How non-financial information is used in decision making and in what form (qualitative or quantitative) is a rarely explored question. Moreover, as prior literature reminds us, we do not know a lot about the nature and utilisation of qualitative information in capital investment appraisal, and further work is necessary to shed light on this aspect of capital investment decision making (Adler, R.W. (2000); Chen, Y. (2008); Klammer, T., Koch, B., & Wilner, N. (1991); Shank, J.K. (1996)). We have depicted Simons, R. (2000) typology in

Exhibit **2.04** nested within a framework of organisational decision making focused on a distinction between discretionary and non-discretionary decision making.

Exhibit 2.04: Simons' investment decision typology



Source: adapted from Simons, R. (2000).

Non-discretionary investments can be found at both ends of the continuum, however, each requiring a different approach to appraisal. At one end, there are those investments that relate to OH&S and regulatory requirements. These require a straightforward assessment due to the need only to ensure that the assets being acquired meet the task and that the business receives the best value relative to cost versus features. Engineering, personnel and other expertise relating to the regulatory and practical nature of the investment will be at the forefront of information to assess the options, rather than financial analysis. At the other end are the non-discretionary investments of a strategic nature. Simons, R. (2000) considers such investments non-discretionary, as they are required to support the business strategy and therefore must occur if the strategy is to succeed.[3] Information for such investments would incorporate not only financial but also strategic criteria and, in the end, management judgement will play a major role in the final decision. In contrast, discretionary investments must stand on their own merits and provide an economic benefit to the business. An engineering analysis alone will not be suitable for such investments; financial analysis will be an integral component.

Much of the literature in this area uses a binary classification of investment types, commonly along the lines of operational and strategic resulting in the oversight of the regulatory-type investment (see, for example, Adler, R.W. (2000); Alkaraan, F., & Northcott, D. (2006); Chen, Y. (2008)). These other works often result in the identification of the shortcomings [like Simons] of using the more traditional financial-based investment appraisal tools. For example, Adler, R.W. (2000) identifies the problems of using traditional analysis tools for strategic investment analysis as: a too narrow perspective; exclusion of non-financial benefits; over-emphasis on the short term; and faulty assumptions about the status quo. Meanwhile, Alkaraan, F., & Northcott, D. (2006) highlight the inability of traditional appraisal tools to capture the more "intangible" outcomes for strategic-type investments. As Adler, R.W. (2000) (p. 16) notes, "if the appraisal scope is not broadened for strategic investments, the effect is to view the investment through an exceedingly narrow decision-making lens".

With a focus on Simons, R. (2000) typology, Vesty, G., Oliver, J., & Brooks, A. (2013) investigated the multifaceted use of appraisal techniques. Respondents were asked to indicate the extent to which analytic tools (method) were used for the different investment types (occupational health and safety (OH&S); other regulatory; strategic; operational/replacement assets). The responses detailed in

[3] It is worth noting that the terms *discretionary* and *non-discretionary* are not necessarily applied in the same way as Simons does. For example, Ross, M. (1986) uses the term discretionary to label strategic-type investments.

Exhibit **2.05** below, highlight a number of interesting findings. As can be noted, there is evidence of reliance on DCF techniques, in particular NPV and IRR, with strategic investments. There is less reliance on these tools when it comes to regulatory-related investments. Similarly, ROI, EVA and sensitivity analysis dominate when it comes to the more complex strategic investments. Interestingly, Vesty, G., Oliver, J., & Brooks, A. (2013) found that life-cycle analysis was used more for operational or replacement investments. Nevertheless, for each of the varying investment decisions, respondents adopt a multifaceted approach. These findings are consistent with Alkaraan, F., & Northcott, D. (2006), who notes the preference for DCF techniques in relation to more complex strategic projects. For the regulatory decisions there appears to be less focus on NPV and a broader focus on the investment decision overall through the use of cost-benefit analysis.

Exhibit 2.05: The multifaceted use of appraisal techniques

Method	OH&S	Other regulatory	Strategic	Operational or replacement
NPV	24%	33%	87%	80%
Payback	30%	35%	78%	78%
IRR	23%	26%	97%	72%
ROI	22%	22%	93%	63%
EVA	31%	31%	100%	62%
Cost-benefit analysis	55%	48%	64%	86%
Life-cycle analysis	30%	40%	55%	85%
Sensitivity analysis	28%	31%	97%	76%

The multifaceted approach being taken does not necessarily indicate the use of non-financial information in the appraisal process. However, it does indicate that multiple approaches are taken across the varying investment types. The broader role of non-financial and qualitative data is discussed further in the following section.

2.3 Treatment of information

At the outset, the distinction between financial and non-financial information in capital budgeting seems rather “clear-cut”. Middleton, K.A. (1977)’s early comment, provided at the beginning of this paper, reflects the normative expectations that criteria other than purely financial are likely to (or at least should) influence capital investment decisions. Even for normative theorists, it is not always easy to designate sustainability factors as direct or indirect to the organisation, and determine whether or not they should be included, or if they are largely qualitative in nature or can be quantified in some way. Nevertheless, the issue for accountants in practice is: how should non-financial considerations be incorporated into capital investment decision models? The extent of this area of investigation is relatively limited.

On the one hand, there is a call to quantify and/or monetise as many relevant factors (such as strategic opportunities and risks) as possible so these factors are not overridden by traditional financial outcomes of investment appraisal (Baxter, T., Bebbington, J., Cutteridge, D., & Harvey, G. (2004); Simons, R. (2000)). In the management accounting literature more generally, this school of thought argues the merits of aggregating all relevant information (including the monetising of non-financial information) into a single financial result and presenting information in a common language (Bebbington, J. (2007); Hall, J.H. (2010)). This of course facilitates comparisons and ease of understanding.

On the other hand, the alternate view is that given the inherent uncertainty and ambiguity in determining longer-term cash flows, the inclusion of rough estimates will only undermine the financial analysis. Even at an operational level, Riccaboni, A., & Leon, E.L. (2009)suggest the maintenance of information in non-financial form might well be a priority, particularly as the main purpose of non-financial factors may be to make visible factors that, if monetised, might be “lost” in the singular financial result. Vaivio, J. (2004) argues that managers are potentially more likely to react strongly to non-financial measures, particularly when the measures behave as “provocative” (ac)counting techniques (such as the number of client services in the month or carbon emissions). Mostly, Vaivio, J. (2004) views non-financial information as quantified expressions of organisational activity and, if monetised, intriguing insights may be lost. More recently Bennett, M., Schaltegger, S., & Zvezdov, D. (2013) argue for the benefits of sustainability-related information in its rawest physical form and not quantified in monetary terms. Schaltegger, S., & Burritt, R.L. (2000), while highlighting the potential strategic benefit of considering sustainability-related factors, also warn of the high costs associated with data collection, practical issues associated with inconsistent and incomplete data, and the ultimate noisy measurement on which decisions are based if this data is quantified.

In practice, White, H.P., Miller, J.R., Chen, J.M., Peddle, D.R., & McDermid, G. (1995) found only 27 per cent of respondents focused their evaluation on qualitative factors when faced with full project justification. Furthermore, in this early study of US EPA companies, White, H.P., Miller, J.R., Chen, J.M., Peddle, D.R., & McDermid, G. (1995) found that the quantifiable environmental costs were more commonly tracked than those that were difficult to quantify. Similarly, environmental costs were considered more at a summary, company-wide level than as part of an individual project or investment. Seventy-one per cent of respondents

reporting environmental costs were tracked on a company-wide basis (White, H.P., Miller, J.R., Chen, J.M., Peddle, D.R., & McDermid, G. (1995)). In another study of South African organisations, Hall, J.H. (2010) found that 34 per cent of respondents indicated they would not accept an investment opportunity based on non-financial grounds. Vesty, G. (2011) reports, from a small sample investigation, that factors other than the purely financial are used by some organisations to guide their investment decisions. Larcker, D.F. (1981), in his study of the perceived importance of information characteristics for strategic capital investments, likewise found some support for the combined use of financial and non-financial information, particularly in settings where competing projects exist. In adding to the confusion about what is *qualitative*, *non-financial and quantitative*, or *financial* data, Graham, J., & Harvey, C. (2002) suggest that real options methodology is commonly used as a qualitative strategic planning tool rather than as a quantitative application. Questions can also be raised about the extent to which Monte Carlo techniques substitute management intuition in strategic capital investment decisions.

When considering financial or non-financial data in capital investment decision making, Vesty, G., Oliver, J., & Brooks, A. (2013) note that 40 per cent of their survey respondents indicated that a positive financial analysis will always outweigh qualitative analysis, while 26 per cent disagreed with this view. Interestingly, they also found that 47 per cent of respondents agreed that they consider cash flows as capturing all relevant data. The respondents to this survey suggest qualitative data is incorporated into the decision process, with the majority of respondents (98 per cent) noting that it is included in consideration of the investment but not quantified, and for some organisations it is included as a ranked item in order of importance or given a notional value. When asked to elaborate, the majority of survey respondents suggested they treated qualitative and quantitative information on an equal footing across all investment types. Vesty, G., Oliver, J., & Brooks, A. (2013) results are highlighted in Exhibit 2.06 below.

Exhibit 2.06: The use of qualitative and quantitative information across a variety of appraisal types

Quantitative: Qualitative	OH&S	Other regulatory	Strategic	Operational or replacement
100% Quantitative	0%	0%	0%	0%
10:90	3%	3%	2%	8%
20:80	6%	11%	11%	10%
30:70	6%	10%	19%	17%
40:60	2%	2%	9%	19%
50:50	23%	26%	31%	19%
60:40	6%	7%	9%	3%
70:30	18%	18%	3%	2%
80:20	20%	16%	5%	11%
90:10	8%	3%	5%	3%
100% Qualitative	8%	3%	6%	8%

While some data may be quantified and other data may remain in a qualitative format, the conflicting results above only highlight the fact that non-financial factors should not be ignored. While these results provide little scope for the stand-alone use of qualitative data, the importance of qualitative data in investment appraisal has largely been downplayed to date. Nonetheless, these findings also acknowledge the uncertainty and difficulties associated with quantifying many of the stakeholder reactions. Hence, efforts to link sustainability-related impacts in investment appraisal have tended towards promoting calculation in capital investment appraisals.

2.4 Decision-making processes

In shedding further light on the role of qualitative analysis and the use of non-financial factors in capital investment appraisal decision making, the role of this section is twofold. Firstly, the discussion concerns the type of data that provides important qualitative insights and contributes to future-focused decision making. Secondly, the discussion explores whether or not this data is quantified, or if it remains as important as qualitative factors in investment appraisal.

Qualitative factors that help direct decision making can be understood in terms of their ability to act as leading indicators of future performance (Kaplan, R.S., & Norton D.P. (1992), Kaplan, R.S., & Norton, D.P. (1996); Ittner, C.D., & Larcker, D.F. (1998)). These factors, often arising from management judgement and intuition, might also be difficult to quantify (Simons, R. (2000)). The important qualitative factors considered in capital investment decision processes have been found to include strategic fit, culture fit, availability of staff and technology platform building (Arnold, G.C., & Hatzopoulos, P.D. (2000); Truong, G., Partington, G., & Peat, M. (2008)). The safety of employees and the public are two examples of factors that influence, and potentially override, financial results in capital investment decisions (Hall, J.H. (2010); Vesty, G. (2011)). Hall, J.H. (2010) found that 2 per cent of respondents indicated that the safety of their employees or the public will influence their capital investment decisions. Vesty, G., Oliver, J., & Brooks, A. (2013) suggest the importance of OH&S and employee health and wellbeing factors relate not only to the impacts of failure on profit but also to key officer liability. Highlighted alongside other key factors in Exhibit 2.07 below, these are the items that "management policy" determines are important to include in investment appraisal.

Exhibit 2.07: Items included in capital investment appraisal due to company policy/standard procedures

MANAGEMENT POLICY DETERMINED ITEM	YES	NO	Under consideration
OH&S compliance	85%	8%	6%
Employee health and wellbeing	77%	13%	10%
Impact on brand/reputation	63%	17%	20%
Energy and water consumption	61%	31%	8%
Environmental fines, penalties, insurance	60%	27%	13%
Clean-up and remediation costs	58%	35%	7%
Supply chain impacts	55%	33%	12%
Cost of purchasing offsets	44%	44%	11%
Contingency amount to reflect uncertain sustainability impacts	43%	43%	12%
Organisational waste levels	40%	48%	12%
Environmental revenues and credits	32%	58%	11%
Sustainability-related tax payments to government	25%	63%	12%

The respondents to this survey also suggested they were concerned about linking resource allocation to brand and reputation as well as employee health and wellbeing. For employee health and wellbeing, respondents note that any potential project must at least maintain OH&S standards to ensure employee safety, with attention given to the selection of technology and consideration of whether the investment will impact on overall staff engagement, happiness and culture. Some respondents emphasised the importance of employee health and wellbeing by stating that it would be a determining factor in the investment decision even if the internal rate of return was not achieved. Respondent comments indicated that projects with lower risk options in relation to safety are always the preferred choice (Vesty, G., Oliver, J., & Brooks, A. (2013)).

In general, the factors used or recommended for consideration in capital investment decision making tended to be more qualitative in nature and connected with the provision of future-focused information. These include:

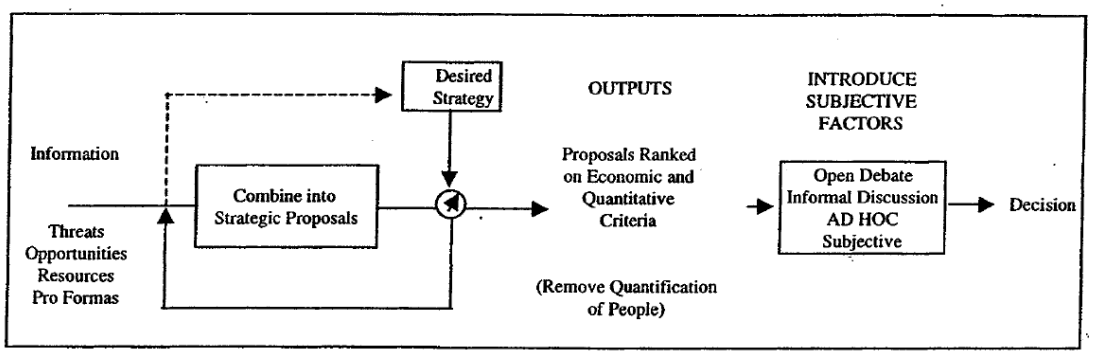
- alignment of investment proposals with strategy, risks in acquiring the asset, risks in deciding not to acquire the asset, quality of information supporting the proposal, the track record and ability of the people involved, and the feasibility and cost of reversing the decision (Simons, R. (2000))
- strategic fit, culture fit, availability of staff, technology platform building (Arnold, G.C., & Hatzopoulos, P.D. (2000))
- company strategy, growth potential and competition (Chen, Y. (2008))
- customer retention rates, employee turnover, company image, improved information and senior management leadership (Adler, R.W. (2000))

- experience with new technology, reduced lead times and inventory levels, quality and reliability of outputs, and the ability to expand in the future (Alkaraan, F., & Northcott, D. (2006))
- OH&S, employee health and wellbeing, impact on brand and reputation (Vesty, G., Oliver, J., & Brooks, A. (2013)).

A further question in relation to these more intangible items is *how* this largely qualitative or non-financial information is used. Non-financial data has long been accepted in the management accounting control environment as a means to provide forward-focused data with a predictive ability in explaining future performance (Ittner, C.D., & Larcker, D.F. (1998); Kaplan, R.S., & Norton D.P. (1992), Kaplan, R.S., & Norton, D.P. (1996)). While ultimate outcomes might be revealed with financial measures, the inputs and processes involved with capital investment appraisal can be largely non-financial in nature, and both provide valuable information for management (Henri, J., & Journeault, M. (2008)). In dynamic environments where strategic uncertainty exists, management control systems such as resource allocation tools help to ensure data is readily available (on both a routine and ad hoc basis) for evaluation of strategic and regulatory priorities (Porter, M.E. (Ed.) (1986); Simons, R. (2000)). In these environments, it is argued that accounting information systems should keep abreast of the internal and external strategic environment, providing proactive advice on how resource allocation decisions might impact desired strategy. Factors include the company's brand or reputation, existing resources, supply chain and other stakeholders such as employees, governments and communities. Such interactive control environments make sure management are aware of opportunities for competitive advantage, as well as impacts associated with changing regulatory environments (Simons, R. (2000)).

Simons, R. (2000) also considers the diagnostic role of asset acquisition systems as outlined in Exhibit 2.08. In this diagram, Simons introduces an order to the appraisal approach, indicating the times when financial and non-financial information is used in the asset acquisition decision process.

Exhibit 2.08: Diagnostic control systems model applied to asset acquisition system



Source: Simons, R. (2000), p. 174.

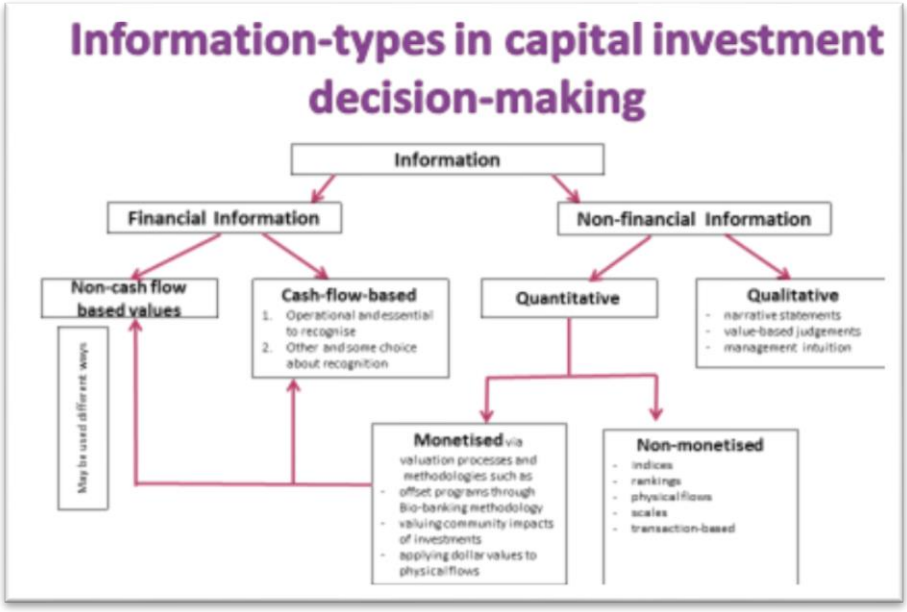
While most of the prior studies have sought to identify the non-financial considerations associated with capital investment appraisal, few have sought to explore how these non-financial factors are treated in the decision-making process. In exploring further in relation to Exhibit 2.07 above, Vesty, G., Oliver, J., & Brooks, A. (2013) found that measuring impact on brand/reputation was largely considered from a qualitative perspective. Alternatively, some respondents to their survey indicated that they ranked the data (in terms of likelihood of impact) and included this in their risk assessment, denoting qualitative measures of consequence.

When it comes to the inclusion of sustainability-related factors in capital investment appraisal, it appears that this area remains problematic for management accountants in practice. To add weight to this argument and to help explain the conflicting results found in both empirical and normative literature, Deloitte (2012) found that overall, CFOs were "disappointed in the robustness and usefulness of the sustainability data they were receiving, yet recognize the importance of this data in successfully managing business performance" (Deloitte (2012), p. 15). T hese findings likewise have implications for management accounting and associated decisions about how they might best include sustainability data in capital investment models.

Following from Vesty, G., Oliver, J., & Brooks, A. (2013) we propose a more detailed consideration of information beyond just the mere distinctions between financial and non-financial, and quantitative and qualitative. In so doing we suggest an integrated view of information that demonstrates the connections between different types of information and captures likely treatments of non-financial information (see Exhibit 2.09 below). The view of information-types illustrated in Exhibit 2.09 provides a useful resource to explore

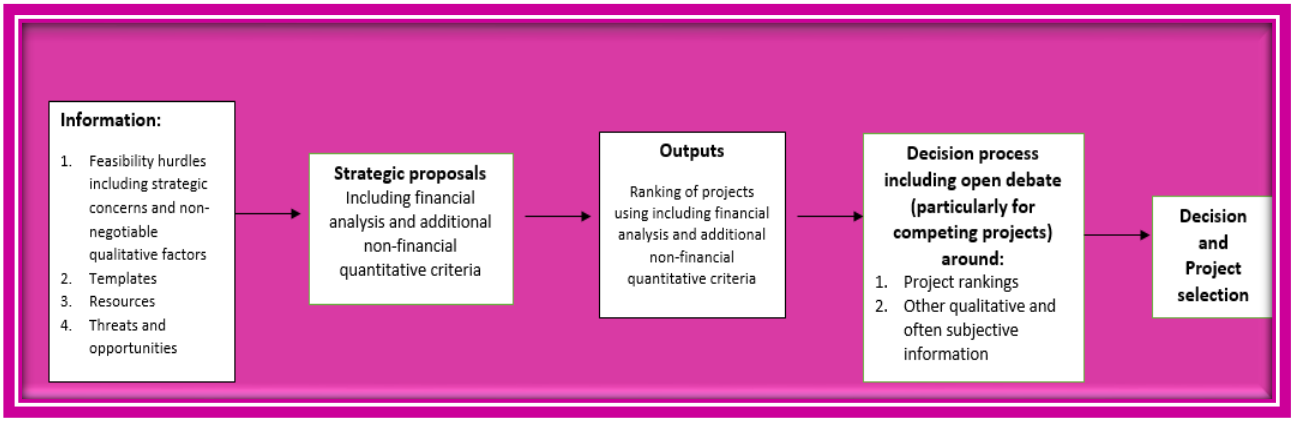
the type and use of information in a capital budgeting context. Non-financial information can be viewed as taking one of two broad forms: quantitative or qualitative. As highlighted above, qualitative information is generally more difficult to observe. Simons, R. (2000), p. 153, suggests, “managers must rely heavily on their intuition and judgement about [such things as] the ability of managers to work together, merge different cultures. . .” These issues are difficult to quantify and would generally form the basis of managerial discussion rather than appear in quantitative analysis.

Exhibit 2.09: Available treatments of non-financial information



In effect, the operationalisation of the components of the framework of information types illustrated in Exhibit 2.09 can be further viewed as a decision-making process for capital investment appraisal. Adapted from Simons, R. (2000), Exhibit 2.10 below provides a depiction of a diagnostic control system model contextualised around investment appraisal. This decision model depicts the use of financial and quantified but non-monetised information (such as rankings and indexes). It highlights the process required with overall selection of competing proposals. The decision process commences with a consideration of the broader-level qualitative factors and converts these to financial or non-financial quantitative data, enabling ranking to be undertaken. While it is possible that the key qualitative factors may have an influence over the investment in the feasibility stage, Simons, R. (2000) suggests these factors remain prevalent throughout the process and are likewise considered at the final decision stage.

Exhibit 2.10: Diagnostic management control system design for resource allocation decisions



Source: Oliver, J., Vesty, G., & Brooks, A. (2014), p. 8.

Highlighted in Exhibit 2.10 are the important qualitative factors that can also be considered in terms of the riskiness associated with the investment. At a broad level, risk can be examined in a number of ways, but

most commonly in terms of strategic, financial, operational and regulatory risks (Simons, R. (2000)). Frigo, M.L., & Anderson. R.J. (2009) break down strategic risk into more detailed risk management themes, as highlighted in Exhibit 2.11. As with the varying information types, these risks can be modelled in terms of monetary values, ranked in perceived degrees of importance, or remain as important qualitative factors and made explicit in the decision-making process. As a result of risk analysis, investment risk can be examined in multiple ways, across the varying internal and industry value chain activities. Investment risk can be viewed from an internal management perspective, as well as from the perspective of an external investor willing to take their own financial risks and invest in companies based on strategic opportunities, core corporate capabilities and sound decision making.

Exhibit 2.11: Strategic risk management

Source: Frigo, M.L., & Anderson. R.J. (2009), p. 28.

Factoring risks in decision-making processes is challenging for most organisations. Even the practice of adjusting the discount rate to accommodate perceived riskiness of the project is no longer common practice (Vesty, G., Oliver, J., & Brooks, A. (2013)). Instead, evolving risk management control practices appear to focus on the development and use of risk matrices alongside traditional discounted cash flow calculations. This was confirmed by respondents to Vesty, G., Oliver, J., & Brooks, A. (2013) survey who made the following observations in regard to the more difficult to quantify sustainability attributes:

> *It is done through qualitative risk analysis (without being quantified) and any project with high residual risk will be unlikely to get approved.*
>
> *[A] qualitative [approach] with a focus on reducing or mitigating a risk management plan.*
>
> *Impacts to employee health and wellbeing would be considered as qualitative in the capital appraisal process. The current capital appraisal process requires a 'Safety Change Assessment and Reporting Determination' to be considered for each proposal and its risk in affecting the safe operation of the railway.*
>
> *Written description of how the investment impacts employees, especially for OHS projects. The OHS aspect would detail what risks are being eliminated by completing the investment.*

As will be highlighted in the following subsections, some industries are more exposed to sustainability-related risks than others. With innovations in clean technology, changing consumer preferences and behaviour around sustainability impacts, in addition to a rapidly moving political landscape around climate change policies, strategic opportunities for some industries are evident. However, for other industries, such as coal mining, this changing landscape can put long-term assets and capabilities at risk, potentially resulting in unanticipated asset write-downs and contingent liabilities (Caldecott, B., Tilbury, J., & Ma, Y. (2013)).

2.5 Need for inclusion of sustainability

In this chapter thus far we have focused on capital investment appraisal in general. We have highlighted the commonly adopted appraisal tools, the typology of capital investments and the role, if needed, of financial and non-financial and qualitative information in decision-making processes. In this section we consider more closely the need to include sustainability-related impacts in capital investment appraisal. We highlight the

ways in which the comprehensive frameworks of monetised and physical sustainability-related accounting data over long and short time frames can offer broader insights for the management accounting practitioner (Burritt, R.L., Hahn, T., & Schaltegger, S. (2002); Burritt, R.L., & Schaltegger S. (2012); Schaltegger, S., & Csutora, M. (2012)). Not unlike the earlier discussion concerning the quantification and inclusion of relevant qualitative data in financial models, similar debates arise in the sustainability literature (Baxter, T., Bebbington, J., Cutteridge, D., & Harvey, G. (2004); Bebbington, J. (2007); Bebbington, J., Gray, R., Hibbitt, C., & Kirk, E. (2001); Burritt, R.L., Schaltegger, S., & Zvezdov, D. (2011); de Beer, P., & Friend, F. (2006); Lamberton, G. (2005); Schaltegger, S., & Csutora, M. (2012)). For example, questions over the subjectivity of values and identification and management of risk are linked with the need to better recognise and include full costs in decision-making processes (Bebbington, J. (2007); Gray, R., Adams, C.A., & Owen. D. (2014); Stern, N. (Ed.). (2007)). But when it comes to sustainability-related impacts, what are the boundaries and how are they identified and included, or not included, in management control system designs?

The notion of sustainability and associated corporate externalities is not necessarily straightforward. It is made quite clear in the literature that *sustainability* and related terms such as *sustainable development* are contested and ambiguous, commonly used by stakeholders to mean whatever the specific intent might be (Gray, R. (2010)). In fact, Gray, R. (2010) devotes much of his seminal contribution confronting and exploring the meaning of *sustainability*. Drawing on Brundtland, G.H. (1987) he makes a number of observations. First, there is no single sustainability state. Second, sustainability can be thought to exist on a number of platforms, at the planetary level and the organisational level, and it is therefore not possible to develop fully a narrative that directly speaks of sustainability at the corporate or organisational level (Gray, R. (2010), p. 56). Gray, R. (2010) offers three reasons for this. One, sustainability through its societal effects is unlikely to match organisational boundaries. Two, sustainability is not of itself a single position, but is rather a state. Three, any sustainable state achieved is likely to be the result of interactions between organisations, individuals, societies and states. While useful at what Gray, R. (2010) refers to as the planetary level, the challenge at the organisational level is how to best operationalise this view of sustainability.

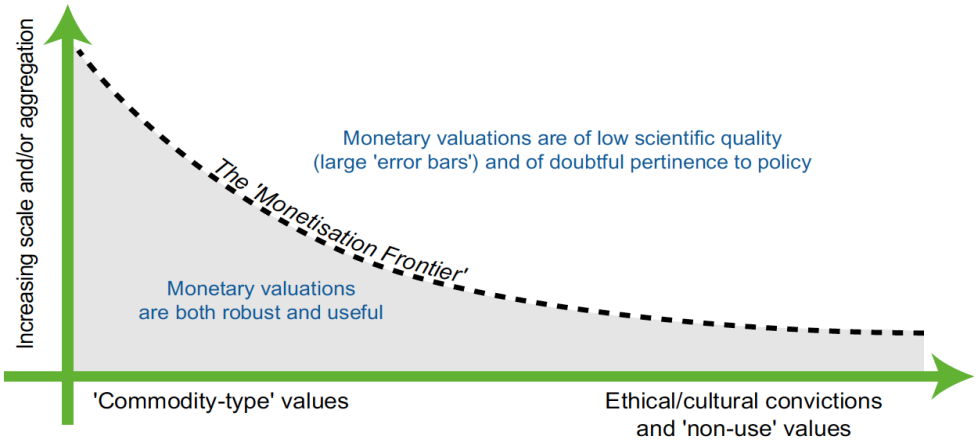
Sustainability impacts can thus present as strategic opportunities and/or risks. Managers are frequently confronted with balancing the narrow business case and company specifics with a broader suite of ramifications and decisions that are very far reaching, impacting not only the local but global economies (Frame, B., & Cavanagh, J. (2009); Henri, J., & Journeault, M. (2010); Hoffman, V.H., & Busch, T. (2008); Lash, J., & Wellington, F. (2007)). When considering the operational or business view (emerging from Elkington, J. (1997) Triple Bottom Line concept), it is argued by the profession that accountants should make their business-relevant contributions towards achieving this sustainable state (Hopwood, A., Unerman, J., & Fries, J. (2010); IFAC (2006); IFAC (2008)). The accounting profession is confounded by the need for trade-offs and finding practical ways to balance the varying philosophical stances without being captured by parties managing their own agenda. Even within an organisation, sustainability attributes can be viewed from multiple perspectives; that is, meaning different things for different people as well as eliciting different values over extended time frames (Ascui, F., & Lovell, H. (2011); Gasparatos, A., El-Haram, M., & Horner, M. (2009); Mathews, M.R. (1984)). As such, accounting for sustainability has been fraught with debates and inconsistencies from varying moral viewpoints, including: the political environment; physical measurement; the ability of market-enabling mechanisms to mitigate sustainability-related impacts; financial classification of new liabilities, assets and financial cash flows; and the broader social and environmental context (Ascui, F., & Lovell, H. (2011); Gray, R., & Milne, M. (2007); Schaltegger, S., & Csutora, M. (2012)).

Efforts to include sustainability-related impacts in quantitative investment appraisal promotes visibility and helps to internalise externalities in corporate decision making, particularly when economic rationalism dominates management decisions (Bebbington, J. (2001); Bebbington, J. (2007); Frame, B., & Cavanagh, J. (2009)). However, with the decision to include corporate externalities in financial decision models there is also the recognition that this is necessarily performed within a limited framing (Frame, B., & Cavanagh, J. (2009); Gasparatos, A., El-Haram, M., & Horner, M. (2009); Schaltegger, S., & Burritt, R.L. (2000)). Practitioners are faced with significant challenges when the potential strategic benefits of considering sustainability-related factors are less obvious. There are high costs associated with data collection as well as practical issues associated with inconsistent and incomplete data, and/or when decisions are based on the ultimate noisy quantified measurement (Schaltegger, S., & Burritt, R.L. (2000)). Quantification can thereby narrow the evaluation process. When constructing a narrative account of sustainability, the quantified data can be categorised in terms of indicators, financial quantification and non-financial quantification Gray, R. (2010). Sustainability indicators, such as those prepared by the Global Reporting Initiative (2013) (GRI), can be adapted for use as internal performance measures to help focus on specific measures and help direct performance and recognition in investment appraisal (Eldenburg, L.G., Brooks, A., Oliver, J., Vesty, G., & Wolcott, S. (2011)). Financial quantification, if prepared in accordance with capital maintenance (maintenance of man-made, renewable/substitutable and critical natural capital) would more than likely result

in incredibly large, even prohibitive, figures for most organisations (Gray, R., Adams, C.A., & Owen. D. (2014)). It also leads to practical problems for the organisation. The third category, “non-financial” quantification of sustainability attributes, focuses more on the physical inputs and outputs of sustainability assessment rather than attributing financial measurement. The gap between a sustainable and unsustainable state is used to evaluate biodiversity impacts and the ecological footprint of a company (Jones, M.J. (1996); Lamberton, G. (2000); Wackernagel, M., & Rees, W.E. (1996); Milne, M.J. & Gray, R. (2012)). This form of quantifiable data also includes the factors that are maintained in raw, physical form (such as kilowatts of electricity or carbon emissions) and is not monetised or included in financial accounting models Bennett, M., Schaltegger, S., & Zvezdov, D. (2013). Bennett, M., Schaltegger, S., & Zvezdov, D. (2013) surveyed, through interviews, eight leading companies in both the United Kingdom and Germany to explore how information flows are used and by whom, as well as how information is collected and communicated with respect to sustainability-related issues. As has been previously articulated in related work, information flows are viewed as having physical and/or monetary properties. A key finding from this study relevant here is the use by organisations of sustainability-related information used in its rawest form, and not quantified in monetary terms, as well some that is expressed in monetary terms.

To date most of the developments in sustainability accounting have focused on environmental impacts rather than on “accounting for social justice”, which is itself is fraught with complications over assumed political positions and “who has what rights and responsibilities” (Gray, R., Adams, C.A., & Owen. D. (2014), p. 231). Elsewhere in the sustainability literature, this issue of valuation is problematised. For example, O’Connor, M., & Stuerer, A. (2006) “Frontier of Monetisation” classifies data as either robust and useful (scientific) or based on ethical/cultural convictions, which should be classified as non-use because the varying valuations placed on these factors result in large measurement errors. In other words, the easier to measure “commodity-type” values provide better data for policy decisions than the harder to measure “ethical/cultural” values. This dilemma of valuation in relation to sustainability impacts is highlighted in Exhibit 2.12 below.

Exhibit 2.12: The monetisation frontier



Source: O’Connor, M., & Stuerer, A. (2006), p. 8.

To date, the sustainability measurement literature has focused on the development of a sustainability narrative for external financial reporting and accountability. Only a proportion of management accounting literature has sought to investigate any practical connections between capital investment appraisal and sustainability. Some of these opt for a normative approach, suggesting theoretical models in addressing sustainability issues in capital investment appraisal and decision making (see, for example, Epstein, M., & Roy, M.J. (1998); Epstein, M.J., & Roy, M.J. (2003); Epstein, M.J., & Yuthas, K. (2012); Mansdorf, Z. (2010); Sloan, T.W. (2011)). Sloan, T.W. (2011) theoretical model sought to incorporate environmental factors[4] in an equipment replacement decision model originally developed by Nair, S.K. (1995). Epstein, M.J., & Yuthas, K. (2012) develop a cost-benefit decision-making tool that incorporates sustainability-related factors (such as environmental, labour practices, human rights, society and product responsibility issues) that should be considered in cash flow calculations. These factors are similar to those suggested by Gray, R., &

[4] These included environmental costs and compliance mechanisms such as incentives to meet certain environmental performance.

Bebbington, J. (2001). In one practice example, these factors were considered in a sustainability-adjusted NPV/cost-benefit model developed by Atkins, M., Bell, I., & Fu, S. (2010) to use for long-term water infrastructure investments (see Chapter 3: Water Corporation Case for further details).

Technically, the processes of including the full cost of sustainability impacts in investment decisions are argued to introduce broader parameters and extend the generic NPV models (Baxter, T., Bebbington, J., Cutteridge, D., & Harvey, G. (2004); Bebbington, J. (2007); Gasparatos, A., El-Haram, M., & Horner, M. (2009)). Moves to include sustainability-related impacts (for example, carbon emissions, air quality, damage to ecosystems) into accounting designs began with full cost accounting (FCA) approaches. Full cost accounting (FCA) includes, in monetary terms, the full economic, environmental and social costs of corporate activities. A highly visible application of FCA was demonstrated by BP in their application of the Sustainability Assessment Model (SAM) which monetised a relevant range of sustainability indicators into one broad index (see, for example, Baxter, T., Bebbington, J., Cutteridge, D., & Harvey, G. (2004); de Beer, P., & Friend, F. (2006); Frame, B., & Cavanagh, J. (2009)). SAM was an attempt to manage financial quantification of sustainability within corporate boundaries, providing a signature of "positive" and "negative" performance (Bebbington, J., Unerman, J., & O'Dwyer, B. (2014)). Proponents of FCA advocate that impacts to society and the environment are largely ignored unless quantified and included in accounting models (Burritt, R.L., Schaltegger, S., & Zvezdov, D. (2011); Bebbington, J., Brown, J., & Frame, B., 2006; Cho, C.H., Michelon, G., Patten, D.M., & Roberts, R.W. (2013); Papaspyropoulos, K.G., Blioumis, V., Christodoulou, A.S., Birstas, P.K., & Skordas, K.E. (2012); Schaltegger, S., & Csutora, M. (2012)).

However, as indicated by the monetisation frontier dilemma, recognising sustainability-related impacts in financial terms has been challenging for capital investment appraisal (Freeman, M.C. & Groom, B. (2013); Jones, C.S., & Tuzel, S. (2013)). Based on natural capital valuations, Freeman, M.C. & Groom, B. (2013) draw attention to the undervaluing of projects where standard discount rates are applied. They claim that even when FCA methodology is in use, projects that are biodiversity-sensitive are still more likely to be rejected on monetary terms, even if they are for the greater societal good (also see Gray, R. (2010); Gray, R., Adams, C.A., & Owen. D. (2014)). Now with values being applied to biodiversity and offsetting available for companies that consume natural resources, Tregidga, H. (2013) questions whether "biodiversity offsetting enabled by accounting techniques is leading to greater accountability and ultimately protection of biodiversity, or whether it represents a mechanism through which particular species and habitat destruction can be justified, or at least hidden in accounting" (Tregidga, H. (2013), p. 806).

In contemplating the need for a business case approach, costing methodologies such as life-cycle costing and analysis are arguably able to provide a means to holistically calculate the sustainability-related life-cycle costs of the capital project (EPA, 1998; Reich, M.C. (2005); Soonawalla, K. (2006)). See also International Organization for Standardization (ISO 14040), which comprehensively outlines the principles and framework for life-cycle assessment; or Eco-Management and Audit System (EMAS), which provides guidance for Environmental Management System (EMS) development.[5] Reich, M.C. (2005) proposes a narrower lifecycle assessment that fits within the corporate boundary and business case model, while Soonawalla, K. (2006) claims innovative life-cycle designs can emerge as a supporting tool for subsequent strategic investment decisions. Combining activity-based costing and life-cycle costing, the USEPA (Bailie, A., Bernow, S., Cleetus, R., Dougherty, B., Heaps, C., & Runkle, B. (2002)) provides a framework of tiered costs to be collected. The tiers trend towards values that are more subjective in nature and largely associated with only the provision of environmental cost information:

- tier 0 — direct environmental costs only
- tier 1 — tier 0 data plus indirect environmental costs
- tier 2 — tier 1 data plus estimates of future liabilities
- tier 3 — tier 2 data plus intangible benefits/costs saved with responsible practices.

Depending on the extent of measurement choices and the willingness to increase sophistication of cost system designs, only certain tier-level costs might be considered in investment appraisal. That is, while a consideration of the broader stakeholder sustainability impacts when making capital investment decisions is arguably desirable (Figge, F., Hahn, T., & Schaltegger, S. (2002); Reich, M.C. (2005)), the business case approach suggests externalities and community-related social impacts be excluded from accounting's scope (Jasch, C. (2001); Schaltegger, S., & Burritt, R.L. (2000)); for more detailed discussion see Soonawalla, K.

[5] EMS can be defined as 'the organisational structure, responsibilities, practices, procedures, processes and resources, for determining and implementing environmental policy' (Netherwood, A. (1996), in Gray, R., Adams, C.A., & Owen. D. (2014), p. 170).

(2006)). In taking this business case approach to sustainability, it is proposed that managers focus only on the direct financial (or readily quantifiable) impacts of their inputs (materials and packaging, water and energy consumption) and outputs (by-products and varying forms of waste, including solid, atmospheric, water, hazardous as in ISO 14000 series standard compliance) (IFAC (2006); IOS, 2006; Schaltegger, S., & Burritt, R.L. (2000)). However, this approach might appear limiting when considering Brundtland, G.H. (1987) broad definition of sustainable development (Gray, R. (2010)).

In spite of the difficulties faced by companies, there is an underlying belief that a focus on sustainability has a positive effect on overall performance (Vesty, G., Oliver, J., & Brooks, A. (2013)). This provides an impetus for the accounting academy to continue with empirical research in this field and find manageable, practical outcomes.

2.5.1 Impact of sustainability legislation and membership guidelines

Around the world, regulators play an important role in influencing capital investment appraisals. Sustainability-related regulation is a result of individual, community and other interest/activist groups' concerns about the environmental, social and economic impacts of business activity. As such, any proposed project that has the potential to harm human health or degrade the environment (such as housing and infrastructure developments, offshore gas projects, mining projects and road construction) are increasingly being scrutinised by all stakeholders, including governments. While governments around the world might legislate for sustainability-related impacts in different ways, they tend to follow a common theme based on local needs.

At a broad level, accounting is impacted by compliance to accounting standards setting, as well as the growing movement towards integrated reporting (<IR>). In addition, compliance with sustainability-related assurance standards and guidelines provided by the Global Reporting Initiative (2013) (G4 indicators) is also important. In Australia, the legalities of sustainability-related activities, which are covered by the *Corporations Act 2001*, include: "s299(1)(f), which requires companies to include details of breaches of environmental laws and licences in their annual reports and ss1013(A), to (F) of the Corporations Act 2001, which requires providers of financial products with an investment component to disclose the extent to which labour standards or environmental, social or ethical considerations are taken into account in investment decision-making" (for further discussion, see Parliament of Australia, sustainability reporting at www.aph.gov.au).

In general, stock exchange listing rules and guidelines set minimum standards for corporate governance expectations and associated sustainability-related practices. In Australia, sustainability issues are introduced via Principle 7 of the ASX Corporate Governance Council. (2014). Principle 7 recommends companies disclose and communicate how they are managing their "material" business risks, which include risks associated with operational, environmental, sustainability, compliance, strategic, ethical, reputation or brand, technological, product or service quality, human capital, financial reporting and market-related risks. This means they must be able to assess the materiality of sustainability-related impacts on their business and manage them satisfactorily.

In recent amendments to the Australian Environment Protection and Biodiversity Conservation Act (1999), a proposed mining project, for example, with deemed "significant" residual ecological impacts, would need to factor the costs of an environmental offsets package over the life of the project. In relatively complex net present value calculations, their (mining) offsets packages must include details of activities that create, improve, protect and/or manage threatened habitats. This is calculated as follows:

> ***Impact + Offset = Improvement or maintenance of protected matter***
>
> *where,*
>
> - *total "impact" is based on ecological attribute + level of importance + extent of impact*
> - *"offset" is a tangible and measurable conservation gain (minimum 90 per cent offset, maximum 10 per cent compensation)*
> - *"Improvement/maintenance of protected matter" is based on the probability that offsets will improve habitat quality or avert loss (NPV calculations here infer the benefit today holding more value for a protected matter than the same benefit realised in the future. The discount factor adjusts the value of the protected matter according to the likelihood of extinction when the main benefit of the proposed offset becomes available).*

While all project proposals are evaluated according to their overall ecosystem damage and associated level of controllability, it is expected that approved projects will invest in offset packages that deliver early outcomes or connect with social, economic and/or environmental co-benefits. This means offsets that align

with other government strategic initiatives, such as maintaining wildlife corridors or closing the gap on Indigenous health, are viewed favourably and potentially enhance the likelihood of project acceptance by the Australian Government. Such examples include mining site restoration above and beyond requirements to increase landscape connectivity, the use of Indigenous rangers to undertake management actions, funded education programs, or payments to rural landholders to protect and manage land for conservation purposes (for discussion of further examples, refer to the government website www.environment.gov.au/epbc/publications/pubs/offsets-policy.pdf).

Polluting organisations are also faced with increasing compliance against regulations, in particular the activity associated with the legislation of greenhouse gas emissions, for *Kyoto Protocol* (1997) compliance. As part of the Australian National Greenhouse and Energy Reporting (NGER) Act 2007, polluting organisations must be seen to be mitigating their carbon emissions footprint. Organisations that emit above threshold greenhouse gas emissions (25 kilotonnes of CO_2-e (carbon equivalent emissions), energy production or energy consumption of 100 terajoules of energy) must report according to NGER measurement guidelines. Organisations must be seen to be proactive in reducing their emissions over time. As a further example, in compliance with Victorian Environment Protection Agency requirement, where projects have been identified as achieving resource efficiency and waste management goals, investment must take place. In particular, if the payback period (calculated as initial investment ÷ net annual savings) is three years or less. Annual savings include the reduced costs associated with gas, electricity and other fuel use; water consumption; and carbon credits or the cost to offset carbon emissions (see EREP Toolkit (2008), which is part of Victorian EPA legislation).

Other activities that companies might deem strategically important and a necessary part of cash flow determination, include measures associated with compliance to initiatives put in place by bodies such as the United Nations Global Compact, Carbon Footprint Accounting, International Organization for Standardization (ISO 14000 environmental management series, as mentioned above, and ISO 26000 social responsibility), the US's Dow Jones Sustainability Index (DJSI) and the UK's FTSE4Good or equivalent. Greenhouse gas protocol initiative is a further important multi-stakeholder partnership launched in 1998 to develop and provide internationally accepted greenhouse gas (GHG) accounting and reporting standards for companies. Governments, industry and NGOs use this as a standard for their carbon accounting and reporting systems. As an example, companies preparing sustainability reports using the Global Reporting Initiative guidelines are able to include information on GHG emissions in accordance with the GHG Protocol Corporate Standard (Global Reporting Initiative (2013)).

Organisations complying with the above, or associated, regulations are thereby faced with the requirement to invest if short-term gains are readily identifiable, and to provide tangible and measurable outcomes that might appear to be qualitative, uncertain and long-term in nature. Rather than the requirement for resource efficiency associated with the business case, government agencies are actively promoting comprehensive evaluations of projects that include the consideration of full costs and other non-financial outcomes, including occupational health and safety, quality, environment, society and reputation. This strengthens the case for the development of suitable management accounting tools.

In the survey conducted by Vesty, G., Oliver, J., & Brooks, A. (2013) respondents were asked to comment on their membership of the above sustainability-related reporting initiatives. The results are presented in

Exhibit **2.13**. Apart from the mandatory requirement for organisations with high greenhouse and energy emissions, compliance to other guidance or reporting initiatives is voluntary in nature. In total, nearly 70 per cent of respondent companies were required to monitor energy usage (according to their Scope 1 and Scope 2 greenhouse gas emissions) under NGERs. Nearly 44 per cent of respondents indicated their voluntary accreditation to ISO 14001 environmental management system guidelines. Just less than 12 per cent were accredited with ISO 26000, which provides guidance on social responsibility. Given that <IR> was still in its pilot stages, it is not surprising that voluntary application was low.

Exhibit 2.13: Membership of sustainability-related initiatives

Sustainability-related initiative	Yes
National Greenhouse and Energy Reporting (NGER)	69.2%
International Organization for Standardization (ISO 14001)	43.7%
Greenhouse Gas Protocols	26.0%
Global Reporting Initiative (GRI)	12.7%
International Organization for Standardization (ISO 26000)	11.6%
Integrated Reporting (<IR>)	7.3%
Dow Jones Sustainability Index (DJSI)	6.6%
Equator Principles (banking)	4.6%

In conclusion, it can be argued that, either directly or indirectly, these regulated and voluntary guidelines not only impact investment decisions, but provide guidance for activities of a sustainability-related nature. In following such sustainability philosophies, related practices are more than likely included in investment decisions and related cash flow determination, and become part of accepted routine practice (Vesty, G. (2011)).

2.5.2 Stranded assets

Following on from regulatory changes, an emerging area of concern relates to the broader technological advances and growing sustainability awareness in the community. With clean technology becoming cheaper and more assessable, political activism around polluting industries, and consumer preferences moving towards environmentally friendly and energy-efficient products, the strategic direction for businesses is also adjusting over time. As a result, some companies and entire industries face risks associated with holding "stranded assets", which are defined as follows:

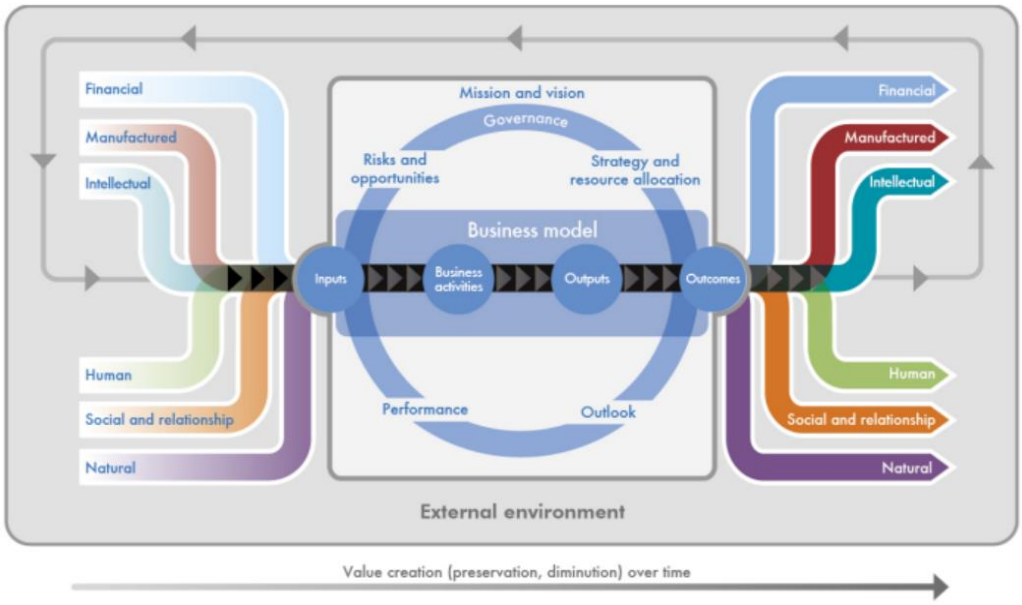
> *Stranded assets are assets that have suffered from unanticipated or premature write-downs, devaluations or conversion to liabilities. They can be caused by a range of environment-related risks and these risks are poorly understood and regularly mispriced, which has resulted in a significant over-exposure to environmentally unsustainable assets throughout our financial and economic systems. Current and emerging risks related to the environment represent a major discontinuity, able to profoundly alter asset values across a wide range of sectors. Some of these risk factors include:*
>
> - *Environmental challenges (e.g. climate change, water constraints)*
> - *Changing resource landscapes (e.g. shale gas, phosphate)*
> - *New government regulations (e.g. carbon pricing, air pollution regulation)*
> - *Falling clean technology costs (e.g. solar PV, onshore wind)*
> - *Evolving social norms (e.g. fossil fuel divestment campaign) and consumer behaviour (e.g. certification schemes)*
> - *Litigation and changing statutory interpretations (e.g. changes in the application of existing laws and legislation).* (Caldecott, B., Tilbury, J., & Ma, Y. (2013), p. 2)

This focus on environment-related risk, combined with the risk management discussion in section 2.5, raises several key areas of concern for management accounting in terms of the appraisal of environmentally related investments. Firstly, to avoid costly lock-ins there is the need to identify the associated strategic, regulatory, operational and financial risks. Secondly, a major concern for investors is in the valuation of investment risks. This is of particular concern given the recognition that such risks are regularly mispriced. Thirdly, working with a "business as usual" philosophy is no longer possible in industries potentially impacted by stranded assets. This further motivates the need for improved appraisal tools, and accounting performance measurement and control systems in general. The concept of integrated thinking around sustainability-related impacts and organisational risks is arguably aligned with calls by the accounting profession for accounting developments in this area. The concept of integrated thinking is discussed in more detail in the following section.

2.6 Integrated thinking

More recent attempts to consolidate multiple reports in a single integrated report are argued to provide greater insights into value creation within an organisation, in particular from a sustainability perspective (IIRC (2013)). For management accounting, the premise of <IR>'s central business model is with the inclusion of six capitals (financial, manufactured, intellectual, human, social and relationship), as well as natural capital, as material inputs, processed in organisational activities to generate outputs and outcomes. The business model and value creation process is depicted in Exhibit 2.14 below and is explained as: "The organization's chosen system of inputs, business activities, outputs and outcomes that aims to create value over the short, medium and long term" (IIRC (2013), p. 6).

Exhibit 2.14: The value creation process



Source: IIRC (2013), p. 8.

As highlighted in Exhibit 2.14, disclosure of the material capitals that comprise the business model is an approach largely designed to demonstrate integrated thinking and decision making (IIRC (2013); Oliver, J., Vesty, G., & Brooks, A. (2014)). The material capitals considered are: *financial capital* (the pool of funds available to an organisation); *manufactured capital* (which may be created by another organisation, such as buildings, equipment and infrastructure, and is distinct from natural physical objects); *human capital* (people's skills and competencies and motivations to innovate, and alignment with governance, risk and ethical values, such as the recognition of human rights); *intellectual capital* (intellectual property and intangibles associated with brands, patents and copyrights, as well as tacit knowledge such as systems, procedures and protocols); *natural capital* (all renewable and non-renewable environmental stocks, such as air, water, land, forests, biodiversity and ecosystems); and *social and relationship capital* (institutions and relationships establishes with communities, stakeholders and other networks). Together these capitals contribute to value-creating opportunities (see IIRC (2013) (pp. 11–12)). Underlying the business model development is the call for a broader perspective captured in both financial and non-financial information to help set sustainability-related objectives and targets for performance appraisal (Gray, R., & Bebbington, J. (2001); Milne, M.J. (1996); Schaltegger, S., & Burritt, R.L. (2000)). It is argued that <IR> will lead to behavioural change within organisations and break down silos through sustainability performance measurement and monitoring that is organisation wide rather than department specific. This concept is recognised as "integrated thinking" (Adams, S., & Simnett, R. (2011); Blacksun (2012); Krzus, M.P. (2011)).

While <IR> assumes a reporting-driven approach to change, it does not provide any insight into how sustainability factors are to be embedded within the decision process. Furthermore, there is a lack of guidance on how reporting around the six capitals results in organisation-wide integrated thinking, the proposed antecedent to integrated decision making (A4S, 2013). Originating from The Prince's Accounting for Sustainability (A4S) Project are claims that integrated reporting should encourage integrated thinking

around sustainability as central to the business model and corporate activities.[6] The 10 elements of integrated thinking proposed by A4S are detailed in Exhibit 2.15.

Exhibit 2.15: Integrated thinking: 10 elements required to successfully embed sustainability

1. Board and senior management commitment
2. Understanding and analysing the key sustainability drivers for the organisation
3. Integrating the key sustainability drivers into the organisation's strategy
4. Ensuring that sustainability is the responsibility of everyone in the organisation and not just of a specific department
5. Breaking down sustainability targets and objectives for the organisation as a whole into targets and objectives that are meaningful for individual subsidiaries, divisions and departments
6. Processes that enable sustainability issues to be taken into account clearly and consistently in day-to-day decision making
7. Extensive and effective sustainability training
8. Including sustainability targets and objectives in performance appraisal
9. Champions to promote sustainability and celebrate success
10. Monitoring and reporting sustainability performance in an integrated way

Source: A4S, 2013, www.accountingforsustainability.org/embedding-sustainability.

Viewed as a precursor to <IR>, integrated thinking is argued to be at the forefront of decision making as organisations evolve their core mission and strategy to incorporate activities from a sustainability viewpoint. The key factors underpinning innovations such as integrated thinking are not new and come from well-entrenched prior literature that details successful implementation of new management practices (see, for example, Alcouffe, S., Berland, N., & Levant, Y. (2008); Argyris, C., & Kaplan, R.S. (1994); Baird, K.M., Harrison, G.L., & Reeve, R.C. (2004); Chenhall, R. & Langfield-Smith, K. (1998); Emsley, D. (2005); Jones, T, & Dugdale, D. (2002); Moores, K., & Chenhall, R.C. (1994); Young, M. (1997); also see Martin & Austen (1998)). Integrated thinking assumes that all relevant information in relation to existing and potential future sustainability impacts forms part of the appraisal process (Oliver, J., Vesty, G., & Brooks, A. (2014)). The ability to recognise integrated thinking is "in the process of first considering and synthesising data; then by finding a creative way to resolve the tension between differing viewpoints. The outcome of integrative thinking is the generation of new ideas that contain elements of the former but is superior to both" (Oliver, J., Vesty, G., & Brooks, A. (2014), p. 2).

When combined with the implementation success factors suggested by A4S, this literature provides a background to explore how innovations such as integrated thinking might best be accomplished (or impeded) in organisational settings. Oliver, J., Vesty, G., & Brooks, A. (2014) have developed three *integrated thinking themes* to guide empirical data collection:

- senior management commitment to sustainability
- sustainability devolved throughout the organisation
- sustainability embedded in management control systems designs.

In connecting the key findings of Vesty, G., Oliver, J., & Brooks, A. (2013) with the themes above, they found the most important drivers of sustainability being embedded in control system designs were the link to strategic objectives (on a range of 1 to 5 where 5 is "strongly agree", the mean was 4.25). This was strongly linked to the requirements of the Board/CEO (mean 4.16). Reviewing their findings, it was also interesting to note that the key drivers relate more to the business objectives than to the needs or demands of external parties. Likewise, in understanding the degree to which sustainability was devolved throughout the organisation, most respondents (62 per cent) suggested their employees were empowered to take actions to enhance sustainability performance. The survey respondents were asked whether there was a designated role for sustainability, and whether this role was an individual responsibility or disseminated throughout the

[6] See The Prince's Accounting for Sustainability Project at www.accountingforsustainability.org for further discussion on the 10 factors that underlie 'integrated thinking' to ensure sustainability is embedded within organisations. For further details on integrated reporting refer to www.integratedreporting.org.

organisation. Results show that 52 per cent of organisations do not have a designated role for sustainability, with 38 per cent having a shared role throughout the organisation and 11 per cent having a dedicated sustainability manager. Given these were survey results, it is difficult to truly ascertain the extent of integrated thinking without further case research. For example, is the move to devolve the role of sustainability throughout the organisation, and away from a single manager, a result of integrated thinking? Does the lack of a designated role indicate reduced integrated thinking?

To gain a better understanding of the degree of integrated thinking, respondents were asked to comment on the impediments to collecting sustainability-related data for capital investment appraisals. Questions were asked about measurement difficulties, the cost of collecting the data and other issues around the availability of resources to help collect and analyse data. These are highlighted in Exhibit 2.16.

Exhibit 2.16: Impediments affecting collection of sustainability-related data

Impediments	Mean*	SD
Difficulty in measurement of sustainability-related impacts	3.36	0.950
Cost of external expertise	3.30	1.057
Lack of availability of data	3.30	0.922
Cost of collecting data	3.26	0.923
Regulatory uncertainty	3.25	0.799
Lack of internal expertise	3.24	0.922
Complexity of internal processes and systems	3.19	0.856
Difficulty in assigning sustainability costs to individual investment projects	3.08	0.967
Difficulty evaluating stakeholder impacts	3.00	0.752
Lack of readily acceptable accounting software/technologies	2.87	1.030
Access to external expertise	2.76	0.942

**range 1 to 5 where 5 = always*

Not dissimilar to the literature discussed above, it appears that the major hurdles to the inclusion of sustainability-related impacts in capital appraisal are the difficulty of measurement (mean 3.36) coupled with the lack of available data (mean 3.3), the cost of external expertise (mean 3.30) and the cost of data collection (mean 3.26). Some respondent comments also suggest that organisations are in the early stages of sustainability-related data collection and are currently building up the necessary resources and skills. These findings are further supported by respondent feedback on the IR Consultation Draft, which noted the difficulties associated with developing metrics for the capitals, and quantifying and attaching a monetary value to them.

In conclusion, these findings indicate that more research is still called for to better understand the concept of integrated thinking and the extent to which practices are influenced. Results also indicate that practices remain unsustainable and do not correspond with integrated thinking. In particular, Vesty, G., Oliver, J., & Brooks, A. (2013) found that only 37 per cent of their respondents would override specified financial hurdles in circumstances where sustainability impacts are identified at project level. Respondents to their survey also admitted that sustainability costs or benefits associated with capital investments were calculated, on average, for two to five years, in particular for operational investments. While this finding does not necessarily mean sustainability-related costs and benefits were not considered over the longer term, it may suggest that these items did not form part of full-cost calculative models that extend beyond specified time frames. These findings indicate a more business-centred approach to sustainability accounting with pre-defined boundaries. Perhaps this is because of the impediments to the collection and measurement of sustainability-related impacts in the longer term.

2.7 Conclusion

In this chapter we commenced discussion with the notion of taking an integrated approach to sustainability assessment when contemplating capital investment appraisal. An integrated approach considers the social and environmental impacts, along with traditional financial appraisal, and judges projects as less or more sustainable. We then moved discussion to the longstanding traditions in capital investment appraisal. The types of investments were classified, along with the emerging accounting techniques. In this literature review

we consider the important role of financial quantification for NPV and cost-benefit analysis, as well as discussing the non-quantified qualitative data required to provide a complete picture for capital investment appraisal. The decision type — *regulatory*, *operational* or *strategic* — influences the use of different appraisal tools. The differences occur in the prominence of use of appraisal tools, and whether the decision is more strategic or related to operational/replacement, OH&S or some other regulation.

The type of investment also influences the extent of the use of qualitative data, and the mix between quantitative and qualitative data. The use of data in qualitative form, rather than quantifying it (mostly in financial terms), highlights two key points: firstly, the important link between sustainability, strategy and risk with the requirement that appraisal methodology considers the impact on brand and reputation: and secondly, that the broader EMA literature and use of physical flows in decision making are a function of the regulatory environment. Empirical findings highlighted in the literature review indicate the focus on regulatory sustainability-related items such as energy consumption and carbon emissions, occupational health and safety, employee health and wellbeing effects, and clean-up and remediation costs. Together, these suggest that sustainability-related issues are broader than the project itself, with a corporate view of sustainability-related impacts directing appraisal techniques. As Vesty, G., Oliver, J., & Brooks, A. (2013) suggest, sustainability-related impacts are linked with overall corporate performance, and projects that generate returns below the financial hurdle rates are still accepted where sustainability benefits are significant.

Further research in this area will contribute to a better understanding of the role of accounting and the accountant in the decision-making process. In particular, further contributions to education and practical guidance on how to overcome issues relating to identifying, verifying, valuing and using sustainability data in capital investment appraisal is required, regardless of its quantitative or qualitative nature. Understanding this further will help determine the extent to which integrated thinking is occurring in practice.

Chapter 3: Water Corporation Case

3.0 Introduction

Water Corporation is the principal supplier of water, wastewater and drainage services to thousands of homes, businesses and farms in Western Australia, as well as providing bulk water to farms for irrigation. The central purpose of Water Corporation is its responsibility to provide safe, reliable drinking water in a sustainable way, and to dispose of it according to conditions agreed with the Department of Water, Department of Health, Department of Environment Regulation and the Environmental Protection Authority. Within the financial bounds of government and ratepayers, sustainability is a key factor driving the allocation of resources and associated appraisal methodology. The focus of this chapter is to highlight the detailed sustainability appraisal methodology that is used by this organisation as part of its planning process for infrastructure asset investment.

The chapter is structured as follows. Following a brief introduction to the organisational background and industry, attention is drawn to the organisational structure, purpose and strategy. The role of sustainability in this organisation is brought to life in this discussion. This is followed by discussion on typical capital expenditure. The body of the chapter includes details of investment classification types and methodology used for each. It concludes with a brief summary of specific areas of interest for accounting.

3.1 Organisational background[7]

Water Corporation is owned by the Western Australian Government and accountable to a sole shareholder, Minister for Water the Hon. Mia Davies MLA, for the delivery of services in a commercial manner. In 1996 it was established as a statutory corporation by an Act of Parliament, the *Water Corporation Act 1995*. It is referred to as a corporatised entity and is not part of the Public Service. As highlighted in Exhibit 3.01, Water Corporation has nearly two million customers and its services, projects and facilities span 2.6 million square kilometres, covering one of the largest administrative territories in the world (a land mass 10 times larger than the United Kingdom). The corporation has more than 3000 employees and participates in alliances to manage an asset base of over $15 billion in water supply, wastewater, drainage infrastructure and bulk water for irrigation. The price of Water Corporation's regulated services is reviewed and proposed by the Economic Regulation Authority (ERA). Government determines the prices of regulated services each year during the State Budget process. The ERA also provides and regulates Water Corporation's operating licence.

[7] Background details as provided in the 2014 annual report.

Exhibit 3.01: Water Corporation operational coverage

Source: Water Corporation Annual Report, 2014, p. 4.

3.1.1 Industry

In 2012–13, the Water Corporation delivered 357.3 billion litres of high-quality drinking water throughout Western Australia by managing the collection and abstraction from 126 dams and weirs, 96 licensed bore fields and the Perth and Southern Seawater Desalination Plants. Water Corporation's largest scheme, the Integrated Water Supply Scheme (IWSS), delivered 285 billion litres of water to more than 1.9 million customers in Perth, the Goldfields and Agricultural Region and some parts of the South West in 2012–13. In that year water supplied to the IWSS consisted of:

- 33 per cent from surface water
- 40 per cent groundwater
- 27 per cent from desalinated seawater.

Desalination plants are part of Water Corporation's long-term strategy to develop climate-independent water sources, given declining rainfall and stream flows (lower than average dam capacity).

In 2014, construction will begin on Australia's first full-scale groundwater replenishment scheme, which will have the capacity to recharge 14 billion litres of recycled water annually. The scheme will ultimately deliver around 28 billion litres per year.

In 2012–13, Water Corporation collected 156.2 billion litres of wastewater, transported it through 15,782 kilometres of sewer mains and treated it at 109 wastewater treatment plants. It recycled 13.2 per cent of that wastewater through 81 schemes across the state, and has set targets of 30 per cent by 2030 and 60 per cent by 2060.

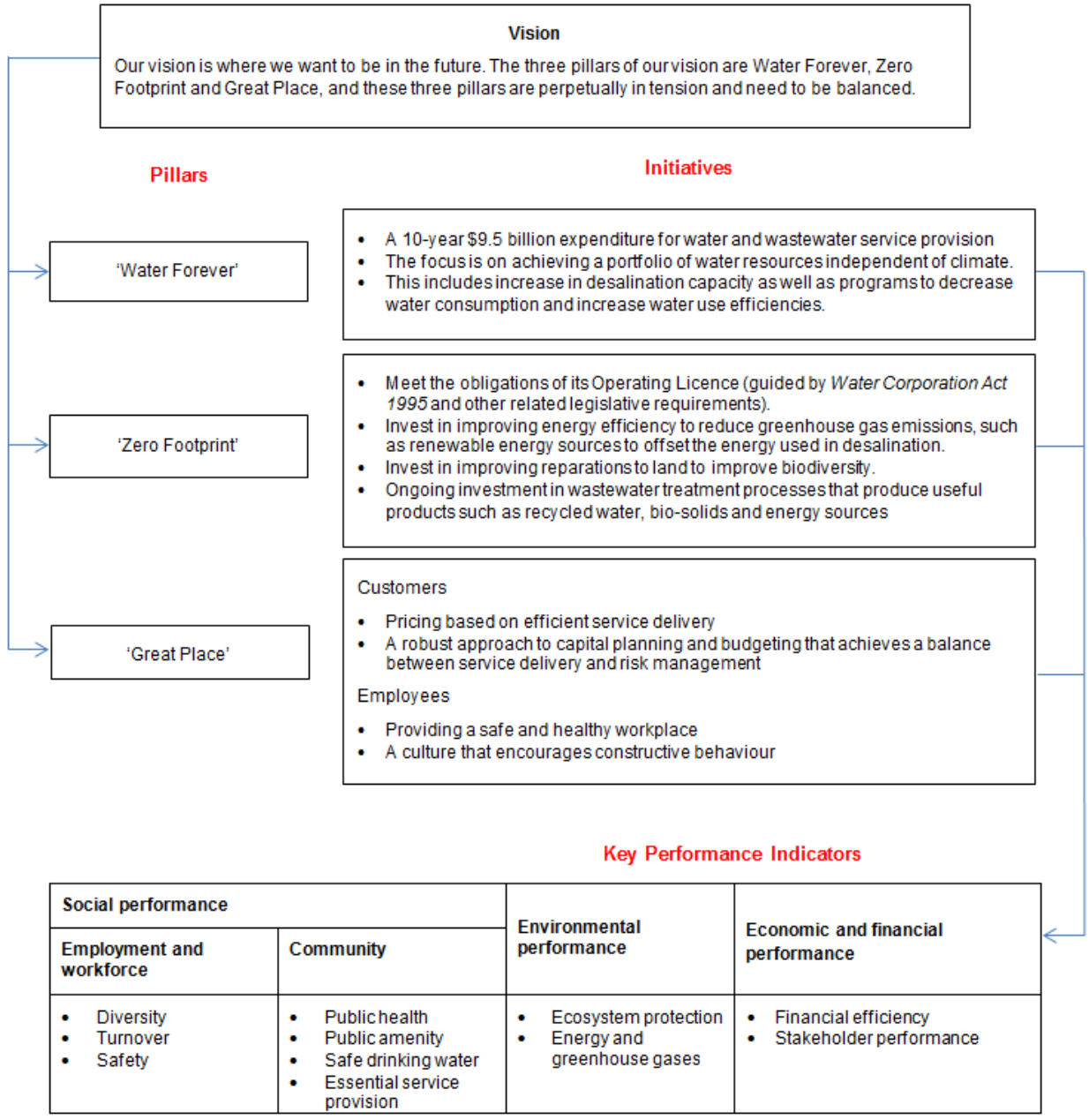
3.1.2 Organisational structure, purpose and strategy (sustainability intent)

Water Corporation's purpose is to provide sustainable management of water services to make Western Australia a great place to live and invest. It strives to consistently build a high-performing, achievement-oriented culture that is customer and safety focused. Its culture includes key values around community (excellence in customer service and community engagement), responsibility and the future (sustainability), delivering quality and supporting people. The corporation aims to maximise economic, environmental and social benefits while minimising its environmental footprint. It is committed to delivering a value-for-money service to customers to meet the needs of a growing population while continuing to face the challenge of a drying climate. It manages several key areas of risk, including:

- climate change reducing surface water and groundwater availability
- delivery of safe drinking water
- returning wastewater to the environment
- conveying drainage in accordance with its operating licence
- delivering a large Capital Investment Program
- delivering business outcomes under a constrained State Budget and debt limitations
- conducting business in a manner that does not expose its people, partners and the public to undue safety and health risks
- energy management.

Its detailed vision is highlighted in Exhibit 3.02 below. The three pillars that represent this vision are *water forever*, *zero footprint* and *great place*, and the Water Corporation has a number of strategies to achieve the goals outlined for each of them.

Exhibit 3.02: Sustainability strategic intent



Source: adapted from Water Corporation Annual Report, 2014, pp. 4, 44-45.

3.2 An overview of capital expenditure

In the year to 30 June 2013, Water Corporation spent $967 million on new and replacement infrastructure assets. Areas of investment and project management included:

- water sources — surface, ground or seawater (desalination)
- water treatment — chlorination, filtration, UV etc.
- water conveyance — water mains, pump stations, storage tanks
- efficiency programs — leakage, pressure/meter management, demand management
- wastewater conveyance — pressure mains, pump stations, emergency storage
- wastewater treatment

- wastewater disposal — waterways, ocean, evaporation/infiltration pond, reuse (municipal, industrial, agriculture), woodlots, artificial wetlands, injection to ground
- drainage conveyance — compensating basins, gravity mains, pressure mains, pump stations
- drainage disposal — ocean outlet, inland waterways.

The capital infrastructure investments range from simple to very complex projects that direct the type of appraisal processes undertaken. These are discussed in the following section.

3.3 Capital investment planning evaluation

The approach to capital investment planning is built on a consideration of not only the financial outcomes, but the impact of each project on the environment and local communities. As such, a sustainability focus is embedded in all evaluation processes. A multi-stakeholder perspective is taken to consider a project's internal impacts, in terms of costs and technical complexity, and external social and environmental impacts and sensitivities.

The planning team initially classifies the project, largely using qualitative criteria. The team is required to consider each proposed project (and its alternative options) in terms of sustainability criteria outlined in the template Exhibit 3.03(a) below. For each of the criteria, a qualitative rating of "not desirable", "negotiable", "acceptable" or "preferred" is given to determine the project classification as simple, complex or very complex. Guidelines have been prepared by varying specialist groups within Water Corporation to assist in assessing projects (see Exhibit 3.03(b)).

Exhibit 3.03(a): Sustainability assessment table

Criteria	Not desirable	Negotiable	Acceptable	Preferred	Mitigation strategy and additional comments
Environmental					
Clearing land					
Discharges to the environment					
Water abstraction					
Other environmental					
Social					
Indigenous heritage					
European heritage					
Community acceptance					
Other social					
Other					
–					
–					

When ***any*** criteria are nominated as

'not desirable'

or

'negotiable'

'Complex' project: use SET or Customised Advanced Cost Benefit Analysis Study.

When ***all*** criteria are nominated as

'acceptable'

or

'preferred'

'Low' impact:

a sustainability analysis is not required.

Exhibit 3.03(b): Sustainability Wheel guidelines on acceptability in planning examples "discharges to the environment" and "social values"

Discharges to the Environment

When discharges to the environment are proposed, a decision support table has been developed to demonstrate where impacts are acceptable and where mitigation should be provided.

Increasing Acceptability

Not Desirable	Negotiable	Acceptable	Preferred
Discharges to the environment are **not desirable** where the following characteristics exist: • National Parks; • Marine Parks; • Threatened Ecological Communities; • Declared Rare Flora; • RAMSAR wetlands; • Other environmentally sensitive areas. Appropriate mitigation and enhancement opportunities will need to be provided if impacts cannot be avoided. Management should include: • Appropriate treatment; and/or • Discharge water quantity is consistent with hydrological regime; and/ or • Discharge water quality meets agreed targets of required parameters.	Discharges to the environment are **negotiable** where the following characteristics exist: • The environment is not degraded however it is not recognised legislatively as significant; and/or • There are no significant changes to the environmental values (where determined) and /or • The project is within an approved Town Planning Scheme. Management should include: • Discharge water quantity is consistent with hydrological regime and /or; • Discharge water quality meets agreed targets of required parameters.	Discharges to the environment are **acceptable** where there are no fundamental changes to the environmental values of the area (where determined).	The preferred position is that discharges to the environment demonstrate no impacts to the environment and beneficial use of the water.

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Social Values

Social values relate to the perceived impacts of a proposal on a community. Examples of social values that may be impacted include:
- "Objective" – recreation (fishing, camping, walking, water sports) and tourism (which may also have links to economic benefit)
- "Subjective" – sense of place, lifestyle – strongly related to the environment, deriving pleasure out of something "because it is there"

In considering impacts on social values it helps to think about benefit and equity, futures foregone and procedural justice (see over for more details).

Increasing Acceptability

Not Desirable	Negotiable	Acceptable	Preferred
Impacts to social values are **not desirable** where: • Stakeholders/community perceive the project will have a significant impact; and • There is little or no opportunity to mitigate perceived impacts; and • Social values are not retained in any capacity. Mitigation actions are likely to require regulator and Government consultation/approval Mitigations: • High level of community engagement • Identify opportunities for substitution. Identify opportunities for enhancement of similar values	Impacts to social values are **negotiable** where the following characteristics exist: • Stakeholders/community perceive the project will have a significant impact; but • There is some opportunity to mitigate perceived impacts; and • Social values are retained in some (limited) capacity. Mitigations: • High level of community engagement • Identify opportunities for substitution. Identify opportunities for enhancement of similar values.	Impacts to social values are **acceptable** where the following characteristics exist: • Stakeholders/community perceive the project will have some impact; but • The impact on social values is agreed as acceptable by the stakeholders and the community.	The preferred position is that the Water Corporation, stakeholders and the community agree that social values are either enhanced or, as a minimum, not adversely impacted.

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Source: Water Corporation.

The outcome of this qualitative process is the classification of the projects as simple, complex or very complex, each with its own sustainability appraisal methodologies. The project's classification triggers the type of analysis and how items are to be included in the appraisal.

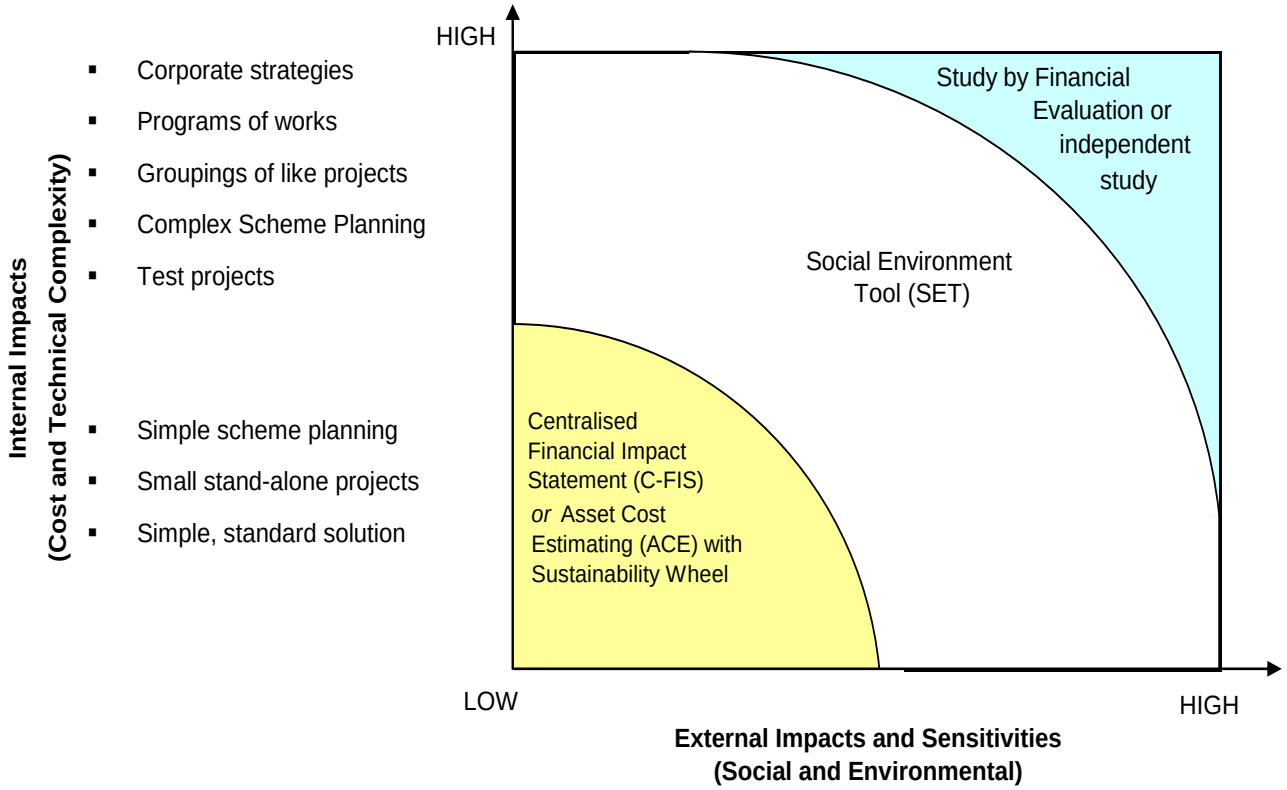
Simple investments are those low-scale projects that may involve a relatively simple solution where the environmental and social impacts are minimal. These assessments meet the acceptable and preferred criteria in qualitative assessment. Such projects would generally comprise the majority of capital investment projects. These projects may only require a financial NPV. Occasionally, they will include a sustainability assessment using the Sustainability Wheel. Further details of this classification approach are provided in subsection 3.3.1.

Complex investments are those where investment decisions are also accompanied by social and environmental complexities, some of which require negotiation or might be classified as not desirable by the broader stakeholder community. These would make up a small but material number of total capital investment projects.

Very Complex investments are those investments that might relate to a major infrastructure project and/or contain high technical complexity and/or carry high environmental or social impacts. These would generally be relatively small in number.

The classification process enables the identification of the appropriate appraisal tool. As highlighted in Exhibit 3.04 below, the appraisal methodology comprises one of three types and is matched with the type of project being undertaken. That is, simple projects may only require financial NPV analysis. A Sustainability Wheel may be used to supplement the financial analysis of the project. Complex projects require the use of the SET, and very complex projects should adopt customised sustainability assessment.

Exhibit 3.04: Advanced cost-benefit analysis decision framework



Source: Water Corporation.

The sustainability assessment used for each project type is discussed in the sections that follow.

3.3.1 Simple project assessment using the Sustainability Wheel

The Sustainability Wheel is a visual tool generated from the Sustainability Wheel Assessment Table, which converts the qualitative assessment and financial NPV to a rating against the “not desirable”, “negotiable”, “acceptable” and “preferred” positions (see Exhibit 3.05 and Exhibit 3.06). The assessment includes evaluation of three major criteria and eight sub-elements:

- *environment* — clearing native vegetation, energy consumption, discharges, water for environment
- *social* — heritage sites (Indigenous and European), social values
- *economic* — affordability and availability of capital funds, net financial impact.

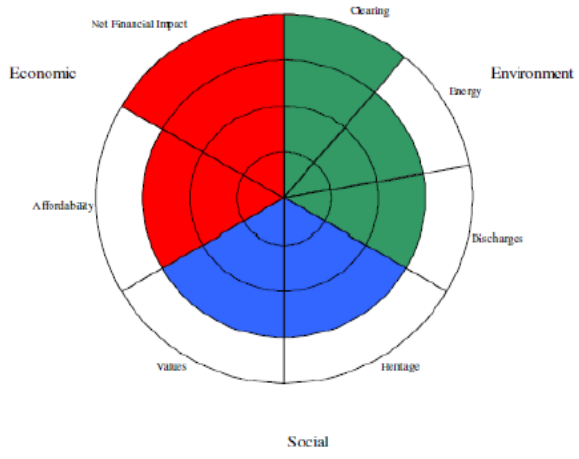
Exhibit 3.05: Sustainability Wheel Assessment Table

		Positions			
Sustainability Criteria		Not Desirable	Negotiable	Acceptable	Preferred
Environment	Clearing	☐	☐	☐	☉
	Energy	☐	☐	☉	☐
	Discharges	☐	☐	☉	☐
Social	Heritage	☐	☐	☉	☐
	Values	☐	☐	☉	☐
Economic	Affordability	☐	☐	☉	☐
	Net Financial Impact	☐	☐	☐	☉
	Totals:	0	0	5	2

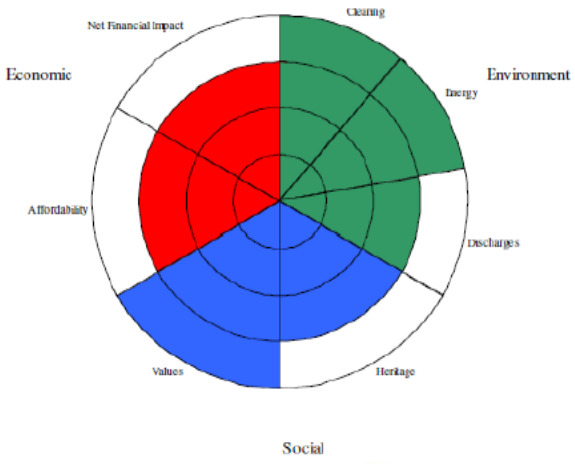
A project is evaluated using the tick box tallying of positions shown in Exhibit 3.05, which is then converted to a visual representation of the assessment as highlighted in Exhibit 3.06, Sustainability Wheel. The more segments colour shaded for each of the eight criteria, the “better” the project is against that criterion.

Exhibit 3.06: Sustainability Wheel

Option 1



Option 2



The benefit of this process is that the alternative options can be contrasted through individual visual output displays. For example, Project Option 1 appears to be more socially and environmentally favourable than Project Option 2, but comes at a greater financial cost. The trade-offs are visually implied in the decision process; that is, a less preferred financial position would be traded for higher preferred energy and social outcomes.

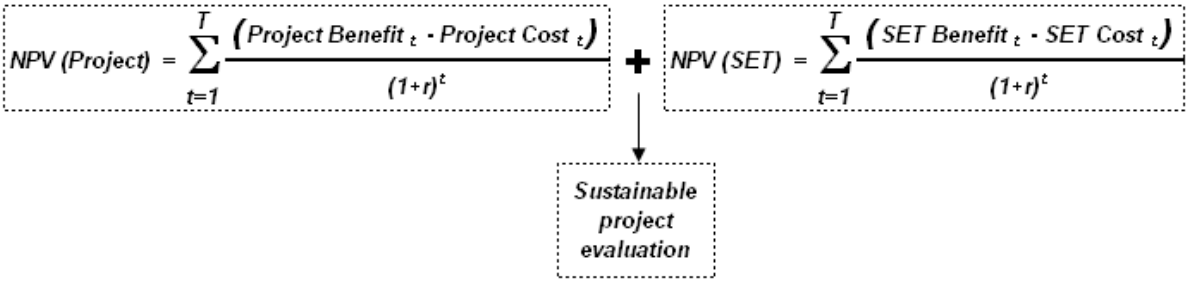
Note the economic criteria are backed up with an NPV calculation. The financial component of a project and its alternative options include sustainability-related factors when cash flows can be identified.

As highlighted earlier in Exhibit 3.03(b), to guide the selection of an appropriate position guidelines have been prepared by varying specialist groups within Water Corporation to assist in assessing projects.

3.3.2 Complex project assessment using the SET

Water Corporation has developed its own in-house investment assessment tool, referred to as the SET (Social Environment Tool), to capture the monetised values of a range of social and environmental impacts associated with complex projects. The SET tool supplements traditional financial NPV calculations for a project with the monetised NPV of the social and environmental benefits and costs, as depicted in Exhibit 3.07. The social and environmental benefits and costs are typically those that would not represent a cash flow and are not included in a traditional financial NPV calculation. The NPV Project represents the financial analysis using cash flow data, whereas the NPV SET monetises the social and environmental benefits and costs.

Exhibit 3.07: SET model present value framework



Source: Atkins et al., 2010, Water Corporation.

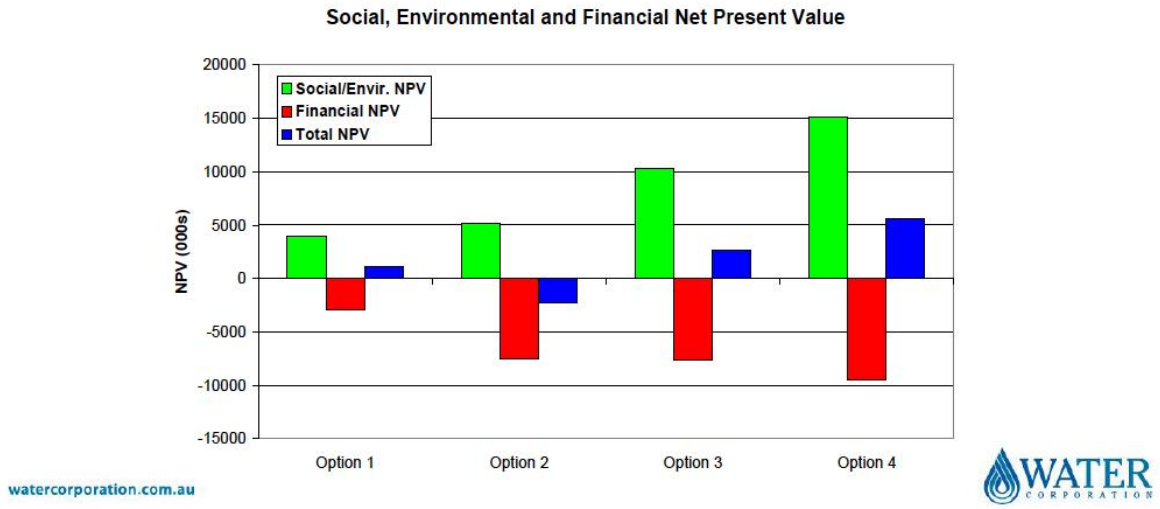
The discount rate selected for NPV (SET) is based on a social discount rate (SDR), while for NPV (Financial) it is the long-run weighted average cost of capital (WACC).

One of the key objectives of the SET appraisal tool highlighted above is to monetise as many of the relevant social and environmental impacts as possible. The social and environmental impacts (previously designated in Exhibit 3.03(a) and Exhibit 3.03(b) as “not desirable” or “negotiable”) require more extensive assessment than would occur in the Sustainability Wheel where they are not monetised. This process of monetising places dollar values on the social and environmental factors, though these do not represent cash flows (hence are not included in the financial NPV).

The SET is effectively a relational database, offering a decision tree approach to operationalise processes and produce valuations of associated social and environmental impacts. The database has been constructed with input values for a large range of social and environmental factors sourced from academic studies and from projects that have been undertaken both within and external to the Water Corporation. For example, a manager with responsibility for a wastewater project might calculate the SET NPV for each of the identified wastewater disposal options from the values populated in the SET database. The manager would include these values in the project appraisal where he or she sees them as a fair reflection of the current project at hand.

Exhibit 3.08 below demonstrates the outcome of the SET assessment for a project with four competing options. The individual component parts can be drilled down for further information on the values derived from the SET database. The value of the SET model is in the ability to compare projects (see Exhibit 3.09 below). For example, Option 4 has the highest relative social and environmental benefit, while at the same time it comes with the highest financial cost.

Exhibit 3.08: An example of the SET model net present value graph



The benefits of the SET in Water Corporation's capital planning processes include the following:

- It monetises social and environmental impacts.
- It facilitates the comparison of options or projects, not only from a financial perspective but in terms of social and environmental impacts.
- Between each of the options or projects, a breakdown of the SET impacts helps identify those that have greater impact on the environment or the community.
- It offers a vehicle for discussion among internal stakeholders.
- It allows a better awareness of the social and environmental impacts and ways to mitigate them, particularly those with the greatest impact.
- As a dynamic tool, it provides the opportunity for industry-based application.

While the SET facilitates the inclusion of monetised values across a range of social and environmental impacts, it does not claim to capture an exhaustive list of all effects. There remain a small number of key qualitative factors that could influence decision making but that are not part of the total NPV calculated by the SET. Not included, for example, are Aboriginal cultural and heritage issues, reputation issues such as community expectations, and political preferences.

If the non-monetised factors are highly sensitive, the project may be classified as "very complex", in which case customised cost-benefit methodologies and an "arm's-length" assessment by external consultants may be required. This is briefly discussed in the following section.

3.3.4 Very complex project assessment using customised methodologies

For very complex projects, a more customised analysis would be undertaken that is more bespoke and rigorous again than the SET model. Such customised analysis would likely be undertaken only for a small number of high impact/sensitive, high-cost projects. These projects, often characterised by size and risk, may utilise external consultants to undertake the social and environmental impact analysis. An example of a project of this scale would be the recently constructed desalination plant.

A discussion about such an assessment is beyond the scope of this report; however, a documented example can be found at: www.water.wa.gov.au/PublicationStore/first/73423.pdf.

3.4 An example of a complex project

A proposed development

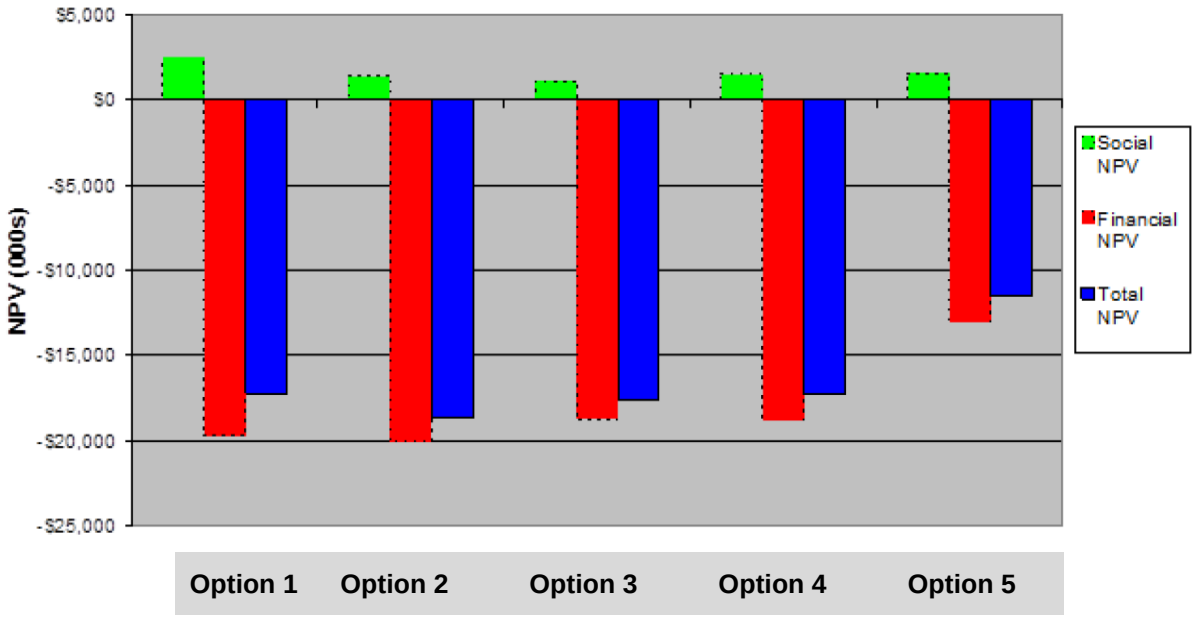
In planning for wastewater management of the proposed development, Water Corporation's Infrastructure Planning Branch reviewed the adequacy of the current infrastructure to cope with the anticipated long-term growth needs of the region. In the review process, they consulted with a wide range of stakeholders on a number of key areas such as land clearing of eco-sensitive sites and community views on alternative

preferences for the use of the wastewater (whether discharged to wetlands or the ocean or used in water recycling, such as on woodlots, pastures, golf courses or sports ovals).

Given the range and impact of qualitative issues identified, the project was designated a complex project (based on the eight criteria in the sustainability assessment process). Accordingly, the SET database was accessed so relevant values could be generated for the five options canvassed. This facilitated the calculation of the SET NPV to sit alongside the financial NPV for each option, as illustrated in Exhibit 3.09.

In this example, the differences between the options enable trade-offs to be contemplated. For example, Option 1 has a higher social benefit but a higher financial cost, compared with Option 5, which has a lower social benefit but lower financial cost. Further drilling down through the components that make up the social NPV can be conducted to highlight further differences, and potential trade-offs, between the options. From this model we can see the impact of sustainability in assessment. As it is monetised it becomes a useful decision aid in the evaluation of competing projects.

Exhibit 3.09: An example of the SET NPV and financial NPV for analysis of the five alternative options



SET NPV is a function of the monetised values derived from the SET database. These values are selected for the relevant social and environmental variables for each option. These SET values do not represent cash flows and are not part of the financial NPV. For example, each option contained a monetised value, such as community preferences measured by "willingness to pay", economic and social costs of living close to wastewater treatment plant measured by impact on house prices, and loss of species and biodiversity caused by marine discharge or clearing land.

The financial NPV represents a cash flow–based calculation. Any sustainability-related cash flows are included in the financial NPV. For example, the payment of any offsets would be included in the financial NPV.

3.5 Summary

Key issues to emerge from this case study include the following:

- A formal classification framework is used to classify different types of investments; namely, simple, complex and very complex investments.
- A formal capital investment appraisal tool exists for investments. For example, the Sustainability Wheel is used for "simple" investments, the SET for "complex" investments, and customised appraisal methodologies for "very complex" investments.

- A preference is evident to monetise sustainability impacts wherever possible. While relying on some qualitative factors throughout the investment appraisal, the SET is predicated on the notion of placing a value (including non-cash-flow-based value) on sustainability impacts wherever possible.
- Water Corporation is recognised as a leader in its field in capital investment appraisal methodologies. Its willingness to share intellectual capital with other members of the industry highlights the relevance and importance of communities-of-practice in diffusing accounting innovations.

Chapter 4: Mondelēz International Case

4.0 Introduction

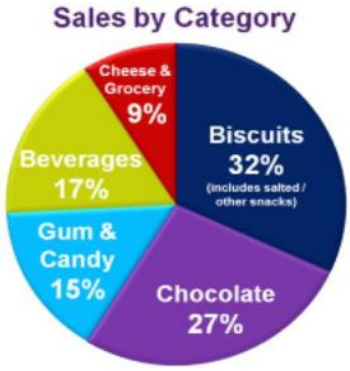
Mondelēz International was officially formed in July 2013. In a decision to separate the "Snacking" and "Grocery" operations, Kraft Foods Inc. became a separate legal identity from Mondelēz International. Mondelēz Australia Pty Ltd, the subject of this case study, has its head office in Melbourne and is a fully owned subsidiary of Mondelēz International Inc. Mondelēz Australia follows a proud heritage of food manufacturing in Australia with its Kraft Foods and Cadbury labels. The walls of Mondelēz Australia's head office are lined with posters of iconic brands, such as Vegemite, which first went on sale in 1923, and Cadbury Dairy Milk Chocolate, which has had a presence in Australia since 1881.

4.1 Organisational background[8]

Mondelēz International is organised around region and product categories, as depicted in Exhibit 4.01(a) and Exhibit 4.01(b). Mondelēz International is a $35 billion business, employing some 100,000 employees worldwide with brands sold into 165 different countries.

Exhibit 4.01(a): Sales by geography

Exhibit 4.01(b): Sales by category



Mondelēz in Australia has around 3000 employees working across a range of activities including research and development, manufacturing, marketing and a range of support services.

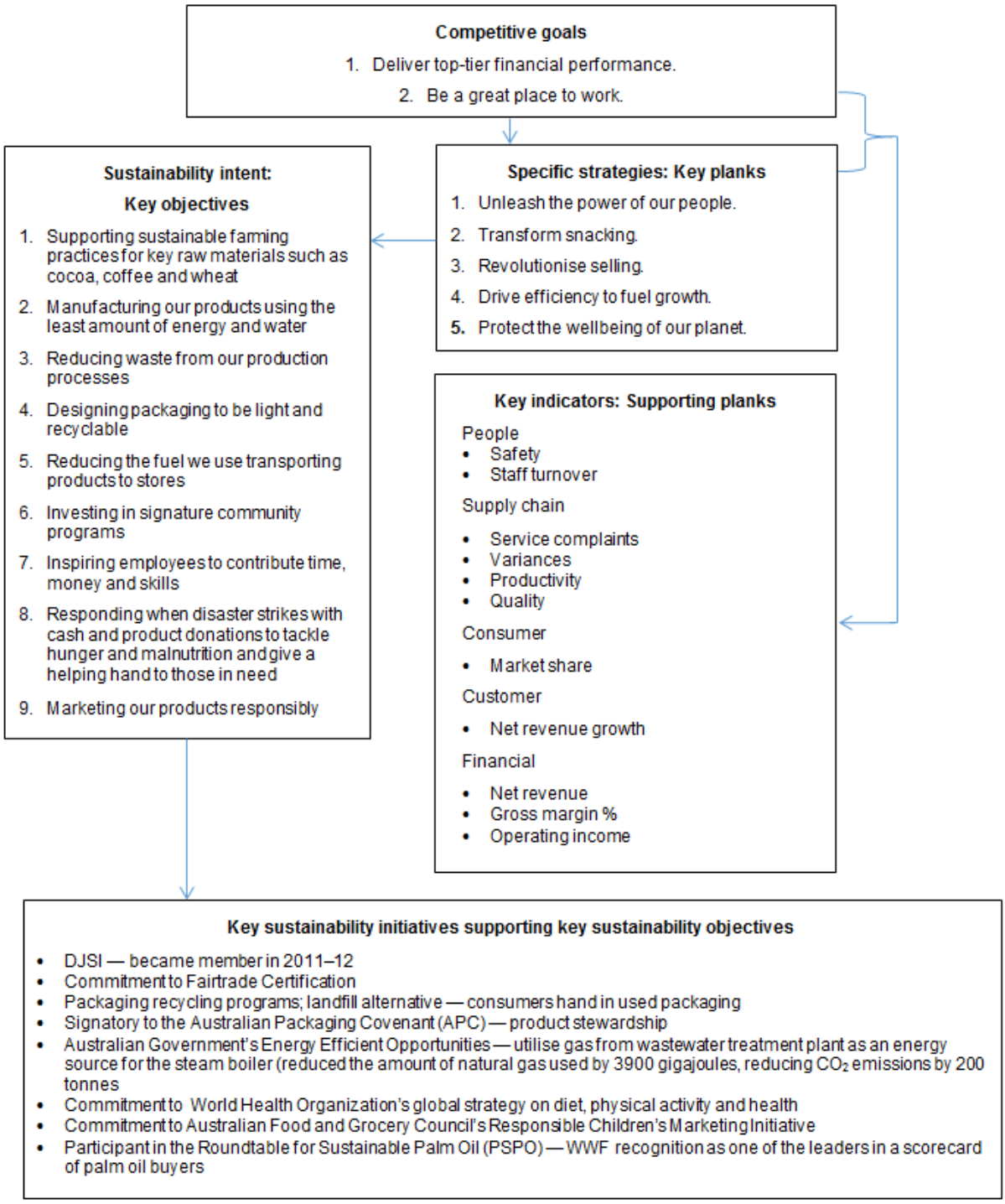
The company's strategy stresses the importance of being a global citizen, and aims to demonstrate their contribution to the wellbeing of the planet as well as the entity itself. Mondelēz reports on business activities that not only meet the needs of stakeholders today but also protect, sustain and enhance human and natural resources that will be needed in the future. The business uses corporate investments in community-related initiatives to improve the conditions of its supply chain partners as well as consumer health through healthy eating initiatives. Employee safety, food safety and environmental impacts are given key priority. Systems and processes are designed to ensure that OH&S is at the forefront of any decisions and that quality standards are not only met but exceeded. Performance measures are also used to highlight impacts on the environment through processing or transportation activities.

4.2 Organisational purpose and strategy (and sustainability intent)

Mondelēz Australia uses a balanced scorecard of measures to monitor and report performance. From its global corporate-level goals, to the development of specific strategies and objectives, it is clear that many business sustainability factors are considered and monitored. The key metrics used in Australia are categorised into five main perspectives: people, financial, supply chain, customer and consumer. The connections between strategy and sustainability performance metrics are highlighted in Exhibit 4.02 below.

[8] Much of the material provided in this section has been drawn from the websites of Mondelēz International Inc. and Mondelēz Australia (www.mondelezinternational.com).

Exhibit 4.02: The links between competitive goals and sustainability intent: Key objectives and initiatives



As highlighted in Exhibit 4.02, measures such as the safety record, the quality of products sold (as measured by customer feedback), customer service and environmental impact are all within the control of local operations. The fact that such measures are included in the scorecard reinforces the importance of these sustainability factors to the global business. This is further reinforced in the key sustainability initiatives highlighted in the final box, some of which are global and others local initiatives.

4.3 Types of investment decisions made by Mondelēz International

Mondelēz International makes various types of investment decisions to suit both corporate and local needs. Capital works range in size and expenditure and require different forms of analysis. Some investments are

made for compliance purposes and may not contribute directly to economic returns, while other investments are strategic or operational in nature and directly attributable to incremental profits. Mondelēz Australia classifies project and capital investments in the following broad categories:

- *Administrative requirement (AR).* These include regulatory and information system investments.
- *Cost reduction (CR).* These are the operational investments or replacements to enhance operating efficiency.
- *New venture (NV).* These are the new strategic projects, classified according to market impact and/or scale.
- *Other corporate-level investments:*
    - Social and community engagement Initiatives — projects that relate to supporting supply chain activities (cocoa farmers and communities)
    - Government-sponsored Initiatives.

In Mondelēz Australia the dominant capital investment expenditure category is AR, then CR followed by NV. At times one investment project will include elements of each. For example, an NV investment might comprise new operational equipment expenditure (falling into the CR category) and meet regulatory or compliance standards (an AR category). In very large projects the investment categories can be separated. In smaller projects the main reason for the investment will dominate the category designation.

The “other” categories of investment emerge from corporate strategy and leadership decisions. They are also a result of local government initiatives to stimulate the economy and support business. In addition to those mentioned in table 1 above, other examples of corporate initiatives are:

- **Global initiatives**
    - Cocoa Life: investment of $400 million in cocoa farming
    - Coffee Made Happy: investment of $200 million in coffee farming
    - Lu-Harmony: sustainable wheat program for biodiversity best practice
- **Local (Australian) initiatives**
    - Community involvement: investment in signature community programs such as “Fuel for Play”, promoting the improvement of primary school student health
    - An example of industry/government partnerships and investment through grant opportunities is the “Asia Pacific Chocolate and Confectionery Centre of Excellence” in Victoria.

The latter project is Mondelēz Australia’s largest ever investment in new technologies and innovation. In 2013 the centre of excellence was created to develop and pilot manufacture new products. As a result of Victorian Government subsidies, the centre connects expertise through partnering and business collaborations to deliver world-class innovations.

Three investment examples to operationalise the categories above are detailed below. These investments all relate to expenditure in the “chocolate” division. This division was selected as sales in this area represent approximately 25 per cent of total revenue. The revenue is matched with a representative proportion of Mondelēz International’s capital expenditure. Investments are made on chocolate production and strategic project developments. In 2013, 64 per cent of Mondelēz Australia’s total capital expenditure was dedicated to chocolate.

Three expenditure examples provided in the following subsections of this chapter are:

- $400 million corporate-wide investment in the cocoa supply chain (Cocoa Life)
- $20 million investment in Cadbury Dairy Milk Chocolate block redesign (Project Reframe)
- $120,000 investment in a new fire pump for Cadbury’s Claremont site.

4.4 Specific project and capital investment examples

Chocolate is produced from the raw material cocoa, which is a globally traded commodity product. Given Mondelēz is the world’s largest chocolate company it is understandable that their strategic intent is directed to minimising risk by protecting the quality and supply of their major raw material, cocoa. Hence the decision to invest in Cocoa Life, a $400 million project designed to improve the living conditions and livelihoods of

cocoa farming communities in six countries over the next 10 years. This key investment emerged from experiences gained from Cadbury Cocoa Partnership, which began in Ghana in 2007. This formalised relationship emerged from a long history of Cadbury's work with local cocoa farmers. Towards the goal of being recognised as a global industry leader, Mondelēz International made the decision to invest further to improve the wellbeing of six major origin sources around the world, including Ghana. The Cocoa Life investment project supports Mondelēz International's first strategy: to support sustainable cocoa farming practices. As a result, natural capital (such as cocoa plantations, water and energy sources) and social and relationship capitals (including the network of people involved in cocoa bean supply) are considered material to Mondelēz's success and will benefit by this investment.

As well as protecting commodity supply, the supply chain partnership must also be managed carefully in order for Mondelēz to maintain their reputation of being a responsible corporate leader. Given the cocoa industry has previously been tarnished with issues around exploitation of child labour and local communities, new Mondelēz strategies include direct involvement with the cocoa farmers and their communities to protect and enhance the Mondelēz brand and image and ensure long-term supply.

More specifically for internal management, this project is recognised as a stand-alone project supported by corporate-wide capital expenditure and is managed according to a range of key performance indicators tailored to the situation. The investment is designed to spread to providing support to 200,000 farmers across six countries and benefiting more than a million people. As a result, the cocoa supplied to all Mondelēz chocolate production facilities around the world will only come from certified (third-party verification) sustainable cocoa bean plantations. The cost of this investment is reflected in corporate overheads and pricing of the different cocoa products. This investment is not capitalised but considered a necessary corporate expense towards sustainability. Investment in sustainable cocoa farming will produce community benefits including increased yields and improved supply, resulting in increased profits for farmers.

The second investment, Project Reframe (renovation of the Cadbury Dairy Milk chocolate block range with major alterations to the design and shape of the traditional blocks), was to increase financial capital. Like Cocoa Life, Project Reframe was classified as a strategic investment because of its scale and market impact. It could be argued, given the project revolves around modifications to an existing product range, that the investment is more operational. The category designation for this project was also debated in the Mondelēz Australia head office. Within the company, it was confirmed as a dual-approach project categorisation with expenditure in both CR and NV categories. In addition, consumers would recognise, and were made aware of, the significant product change.

Project Reframe relates to the decision to renovate the Cadbury Dairy Milk Chocolate block range. The overall aim of the appropriation request was to seek approval for:

- a change of primary packaging from cardboard to value-added flow pack for improved freshness
- alterations to block sizes
- a reconfiguration of the production site.

Sustainability issues around inputs such as energy and water were part of the model, as was the monitoring of waste from production processes. Further emphasis on decisions around packaging contributed to providing interesting insights into operational capital investment appraisal techniques. Consumer focus groups were used to promote packaging changes and identify consumer perceptions and acceptance levels of the sustainable packaging.

In the third example, investment in a fire pump for the Claremont site, a regulatory-related capital investment was made in order to be compliant with new global fire management regulations. This case helped to highlight the use of their specific risk assessment template.

Like all the above investment decisions, options are initially tabled in management meetings to justify expenditure. Using the fire pump example, the options included the following:

1. *Do nothing*. Rejected because of the long-term business risk associated with fire.
2. *Upgrade existing fire pump*. Rejected because of new regulatory flow requirements.
3. *Acquire new equipment*. Accepted as larger capacity fire pump for the sprinkler system required to meet the flow capacity standards of risk insurance company FM Global.

In the section that follows, the accounting specifics around measurement are detailed using the cases above as examples. We follow the research framework, identified in Chapter 1: Introduction, and show how the sustainability-related impacts are included in the appraisal tool in monetary and/or non-monetary ways. We

do not impose the IR notion of capitals on this company (Mondelēz International does not explicitly report according to the IR pilot), but we use the categories as a way to display how the materiality of sustainability impacts implicitly emerges throughout their decision-making processes.

4.5 The appraisal process

At the operational level, the appraisal process generally commences with a *concept* phase. In this phase, a champion (typically from marketing or research and development) will initially present an "idea" for support. The idea will be disseminated to management and others in the organisation through informal discussions, PowerPoint presentations and meetings. If the idea gathers momentum, a project team will come together to develop the project to the *Appropriation Request* (AR) stage. Depending on the proposal, this early fact-building stage might take several months and require lead funds (which can be quite considerable, depending on the project). If the project does not get to AR stage, the lead funds become operating expenditure. If the project proceeds, some of these early lead funds might be eventually capitalised as part of the project expenditure if they meet accounting definitions (such as engineering designs). There are risks/costs associated with innovation if the proposal is not realised.

Following the concept phase is the *Appropriation Request (AR)* phase. Appraisal typically requires further analysis of the project expenditure and associated compliance and risk assessment areas. Several levels of documentation are required for each request for expenditure. These are:

- Capital Appropriation Request (AR) RACI form, which includes financial analysis
- Quality, Safety, Environment and Operational Risk Compliance form
- other detailed compliance documentation, such as Plant Change Request document, which identifies the specific alterations to the plant and highlights detailed risk assessment areas (HAZOP, HACCP HAT, MSDS, environmental issues; IR/HR issues).

The first capital AR document is a tick box summary form, shown in Exhibit 4.03 below. This document draws attention to key items such as the amount requested, category of capital, overview of cash flow forecasts and approvals required. For example, in simple projects such as the fire pump regulatory investments "Compliance with outside requirements" (Item 6) is ticked, amount is included but cash flow forecasts are not applicable and higher-level Board approvals are not required. In other projects, such as the Cadbury Reframe, several categories could be ticked. However, it is generally required that only the dominant category be ticked. In this case it was considered a joint CR/NV (items 2 and 3). Cash flow forecasts are included and all sign-offs, including Board approval, were required.

Exhibit 4.03: Capital Appropriation Request (AR) form

<table>
<tr><td colspan="4">CAPITAL APPROPRIATION REQUEST (AR)</td></tr>
<tr><td>1. COMPANY OF DIVISION</td><td>2. PLANT OR LOCATION</td><td>3. APPROP. NO.</td><td>4. SUPPL. NO.</td></tr>
<tr><td>5. PROJECT TITLE</td><td colspan="3">6. AMOUNT — REQUIRED IN LOCAL AND US$ ('000)

FIXED ASSETS
CAPITALISED INTEREST
WORKING CAPITAL
EXPENSE
TOTAL, THIS REQUEST</td></tr>
<tr><td rowspan="2">7. PROJECT DESCRIPTION</td><td colspan="3">FOREX RATE</td></tr>
<tr><td colspan="3">8. SUMMARY OF FACILITIES TO BE RETAINED (IN US$)

ORIGINAL COST
LOSS OR (GAIN) ON DISPOSITION</td></tr>
<tr><td>9. CATEGORY OF CAPITAL

1. [ ] INCREASED CAPACITY
2. [ ] COST REDUCTION
3. [ ] NEW VENTURE</td><td colspan="2">4. [ ] STRAIGHT REPLACEMENT
5. [ ] PRODUCT LEADERSHIP/COMPETITIVE PRESSURES
6. [ ] COMPLIANCE WITH OUTSIDE REQUIREMENTS</td><td>7. [ ] RESEARCH AND DEVELOPMENT
8. [ ] STRATEGIC REQUIREMENT
9. [ ] ENGINEERING DESIGN</td></tr>
<tr><td colspan="4">10. PROJECT STATUS (FIXED ASSETS ONLY) — US$
(DETAILS RELATING TO PREVIOUS AUTHORISATIONS AND INCLUSIONS IN CAPITAL EXPENDITURE FORECASTS)</td></tr>
<tr><td colspan="2">11. FORECAST OF CASH OUTLAY (FIXED ASSET ONLY)

YEAR 1 TOTAL
YEAR 2 TOTAL
YEAR 3 TOTAL</td><td colspan="2">12. INCREMENTAL PROFIT ANALYSIS

A. NOMINAL PAYBACK PERIOD
B. INTERNAL RATE OF RETURN
C. PROJECT LIFE (YEARS)</td></tr>
</table>

SUBSEQUENT TOTAL CASH OUTLAY	D. ESTIMATED COMPLETION DATE
13. REQUIRED APPROVALS RESPONSIBLE (R) — PLANT MANAGER; PLANT CONTROLLER CONSULTING (C) — HSE MANAGER; ASSET CONTROLLER; REGIONAL DIRECTOR; MANUFACTURING MANAGER; SUPPLY CHAIN FINANCE MANAGER; CAPITAL AND RELIABILITY MANAGER; NPD PROJECTS INFORMED (I) — BU GM; BU OPERATIONS LEAD; BU FINANCE LEAD	

For simple projects, the AR documentation is relatively straightforward, and the AR form becomes the coversheet with other quality, safety, environmental and operational risk compliance forms sitting underneath. However, for more complex investments several draft iterations of the proposal are required for comment and discussion. The AR form is the eventual outcome of this iterative process. A separate coversheet is provided to highlight to key personnel the stage of the iterative process, from initial draft to final documentation.

For the Cadbury Reframe project, every new version of the AR document is required to be signed and dated by the author, and detailed descriptions of changes made to the original draft included. Following reviews and discussion, amendments would be made by the project team members (marketing and others, including accounting support). With each proposal, the accounting department may be required to perform updated projected profit and loss (P&L) based on the original/early rough estimations. This reiterative process may be constructed in as many as 50 to 100 versions, including more detailed sensitivities on price and volume.

As highlighted in Exhibit 4.04 below, a history, or synopsis, of document reviews is provided in the coversheet entitled “Capital Appropriation Request”. Depending on the capital expenditure outlay being proposed, the AR coversheet is replaced with the AR form (Exhibit 4.04) for final submission to senior management, or the Board, for final approval.

Exhibit 4.04: Capital Appropriation Request (AR) coversheet

AR COVERSHEET: PROJECT REFRAME				
Version	**Description**	**Author**	**Date**	**AR spreadsheet**
Initial draft	Draft for comment	xxx	14/10/2011	
Draft 2, 3, 4 . . .	Comments and amendment process	xxx	Many iterations	AR Reframe date.xlsx
Final 1, 2, 3, 4 . . .	Minor amendments and additional data to add	xxx	Many iterations	AR Reframe date.xlsx
Final	Final agreed with . . .	xxx	08/03/12	AR Reframe final date.xlsx

A cost-benefit summary was developed with a “base case financial summary”, as highlighted below. Further sensitivity analysis was conducted based on different market conditions, as highlighted in Exhibit 4.05 below. Sensitivity analysis was evaluated with the following scenarios:

- a reduction in benefits realised by 20 per cent (#1)
- an increase in capital costs by 10 per cent
- volume at +/– 5 per cent and
- pricing at +/– 2 per cent of planned levels.

The financial results were indicated with traffic lights (red, yellow, green) to represent achievement, or otherwise, of internal financial targets.

Exhibit 4.05: Cost-benefit summary with sensitivity analysis

AUD$	Unit	Base case	Sensitivity #1	Sensitivity #2	Sensitivity #3		Sensitivity #4	
Assumption								
Capital	$'000	xxx	xxx	xxx				
Start-up	$'000	xxx	xxx	xxx				
Total cash	**$'000**	**xxx**	**xxx**	**xxx**				
IRR	%	x	x	x				
NPV @ *x*%	$'000	xxx	xxx	xxx				
Payback	Years	x	x	x				
Incremental OI (ongoing)	$'000	xxx	xxx	xxx				
Cash flow (ongoing)	$'000	xxx	xxx	xxx				

4.6 Sustainability-related appraisal

In this section, we highlight how sustainability-related impacts are considered in investment appraisal. The factors are initially considered at the concept phase and in early group discussion. They are initially dealt with through qualitative discussion and later quantified in the model, depending on the decision taken.

For example, an early iteration of Project Reframe contained the initial proposal along with a general risk assessment. The preliminary risk assessment identified the need to talk with consumers about the sustainability benefits of the new packaging. This was because the packaging had changed from foil and cardboard to resealable peel pack, which had quite a different look and required different recycling behaviour by consumers. Consumer focus groups were conducted and results reported in an early stage draft version. During the focus group consumer sessions, many aspects of the project were considered including taste and quality, as well as identifying consumer sentiment about the proposed packaging changes. Results were positive on the taste and quality perceptions. The focus groups were less enthusiastic about the new packaging, but only slightly so and not enough to change management decisions. It was explained to us that if there were a strong reaction from the focus group participants, the project would have been abandoned or modified. Following focus group participation it was decided to further pursue a recycling partner collaboration to promote package recycling by consumers.

Following this initial concept phase, a formal proposal and appropriation request was presented to management using the following headings:

- Consumer preference (packaging, shape, size, recipe, price, gross margins, global context)
- Marketing strategy (marketing program, risk mitigation)
    - Risk assessment included:
        - sustainability benefits of new pack
        - benefit of partnering with a recycling company
        - freshness of product in new pack
        - short-term stimulus (margin reinvestment requirements).
- Manufacturing strategy included:
    - plant efficiency
    - design layouts
    - equipment required (varying options formed part of the early P&Ls)
    - packaging cost-benefit

- benefits case (materials, labour, efficiency, additional benefits not quantified such as faster cycle).

- Financial analysis included calculation of net present value including sensitivity analysis, internal rate of return and payback period.
- Alternatives considered
- Risks and opportunities
- Lead times
- Government rebates (these include R&D innovation projects as part of government grants).

A cost-benefit analysis was conducted using NPV sensitivities. The benefits case was summarised as largely quantified benefits from material and packaging costs (move from foil and card to value-added flow pack (VAFP)); labour cost savings with new equipment; efficiency benefits as speed of production line has increased (contributing significantly to conversion cost reduction program at the manufacturing site). Other costs, such as inventory carrying cost reduction, have been identified but not applied to the benefits case.

The sustainability factors monetised within the process for the Reframe project included:

- packaging (links to carbon emissions)
- energy consumption and waste
- workforce planning
- occupational health and safety requirements
- machinery alternatives, based on energy consumption (carbon emissions).

The sustainability factors considered but not monetised within the process for the Reframe project included:

- reputation (evaluated through focus group comments)
- plant (line layout efficient and ergonomic ease of operation)
- machinery-related investment alternatives (selection process — issues other than cost)
  - Equipment and vendor were determined separately.
  - Final vendor selection was based on a separate "structured decision analysis tool", which included evaluating aspects of safety, cost, delivery timetable, reliability (chocolate moulding time and waste) and maintainability (cleaning).
  - One vendor was rejected because waste criteria (sanitary design guidelines) were not met.
  - Vendors were also evaluated on their safety record.
- supply source of cocoa (determined by head office).

Template extracts of the required documentation are highlighted in Exhibit 4.06:

Appraisal timelines were short for the regulatory fire pump: AR Submission (July), AR Approval (August), Project Completed (December), Project Close-out (December). The Reframe project timelines were much longer, with extensive work being conducted at the concept phase before AR documentation.

Exhibit 4.06: Quality, Safety, Environmental and Operational Risk Compliance form (QEHS Risk Assessment)

Project overview	Project overview question: • Is the purpose of this project primarily of a quality, safety and environment of operational risk nature? • Does this project address the findings of quality or safety or environmental audits? Please detail audit reference. • Does this project address the findings of items contained in the operational risk database? If yes, provide details of the item. • Does this project help deliver sustainability commitments?

Environmental and sustainability	• Water and wastewater management • Solid and hazardous waste control • Soil and groundwater pollution • Noise control • Energy conservation and air emissions • Packaging conservation
Quality and food safety	Detail: • the potential microbe biological hazards and risks associated with this project • any additional training to employees during the course of the project • any requirements for the supply of equipment from countries identified as “at risk” • training — employees • training — contractors.
Health and safety	Will this project result in new chemicals or hazardous materials being used on site? List the key health and safety aspects considered in this project. Does the equipment being installed or modified have the potential to generate aerosol?
Operational risk management **Corporate social responsibility** **Legal** **Key personnel**	

4.7 Summary

Key issues to emerge from this case study include the following:

- A key link between organisational goals, sustainability objectives and areas of performance measurement exists, as highlighted in Exhibit 4.02.
- A formal classification model of investment type is used:
  - administrative requirement
  - cost reduction
  - new venture
  - corporate-level investments.
- Of interest here is the use of the corporate-level investments category above. This is operationalised in the chapter through our discussion of the Cocoa Life project and other initiatives highlighted in Exhibit 4.02. An interesting point to note around the corporate-level projects is the connections between the project, capital investment cash flows and internal funding/regional accounting charges.
- Templates are used to guide information gathering and in the decision process for all capital investment projects. The two key templates used are the “Capital Appropriation Request” form, which also triggers the standard financial analysis, and the “Quality, Safety, Environmental and Operational Risk Compliance” form.
- Sustainability factors are included in the capital investment decision processes. Some of these are monetised (for example, energy consumption and waste, occupational health and safety requirements) and some are treated qualitatively (for example, reputation, impact on plant layout, vendor considerations).

Chapter 5: Yancoal Case

5.0 Introduction

Yancoal Australia is a significant and growing coal mining company with a diversified product mix of metallurgical and thermal coal mines in Queensland and New South Wales. Yancoal Australia also manage two mines in Queensland and Western Australia on behalf of their major shareholder, Yanzhou Coal Mining Company Limited. The focus of this chapter is on the complex, long-term nature of capital investment appraisal in the coal mining industry. Much of the complexity of coal mining is associated with maintaining a licence to operate in a difficult and somewhat contentious setting. Coal is an affordable input for a large percentage of electricity generation throughout the world and is used widely in the manufacture of steel and cement. On one hand, it is heavily linked to the sovereign wealth of nations, with significant industry contributions to exports, wages, investment and tax revenue. On the other hand, it is considered a key input into the generation of greenhouse gas emissions, with competition from alternative renewable technologies still to be realised. Australia has the fourth largest share of proven coal reserves in the world. Coal is the second biggest export after iron ore and employs more than 200,000 workers.

In this chapter we begin by providing details of the organisational background, industry, company structure and nature of operations. We follow with details of the capital investment appraisal process and provide examples of the varying types of investments undertaken and the approaches to valuation and methodologies utilised.

5.1 Organisational background[9]

5.1.1 Industry, structure and operations

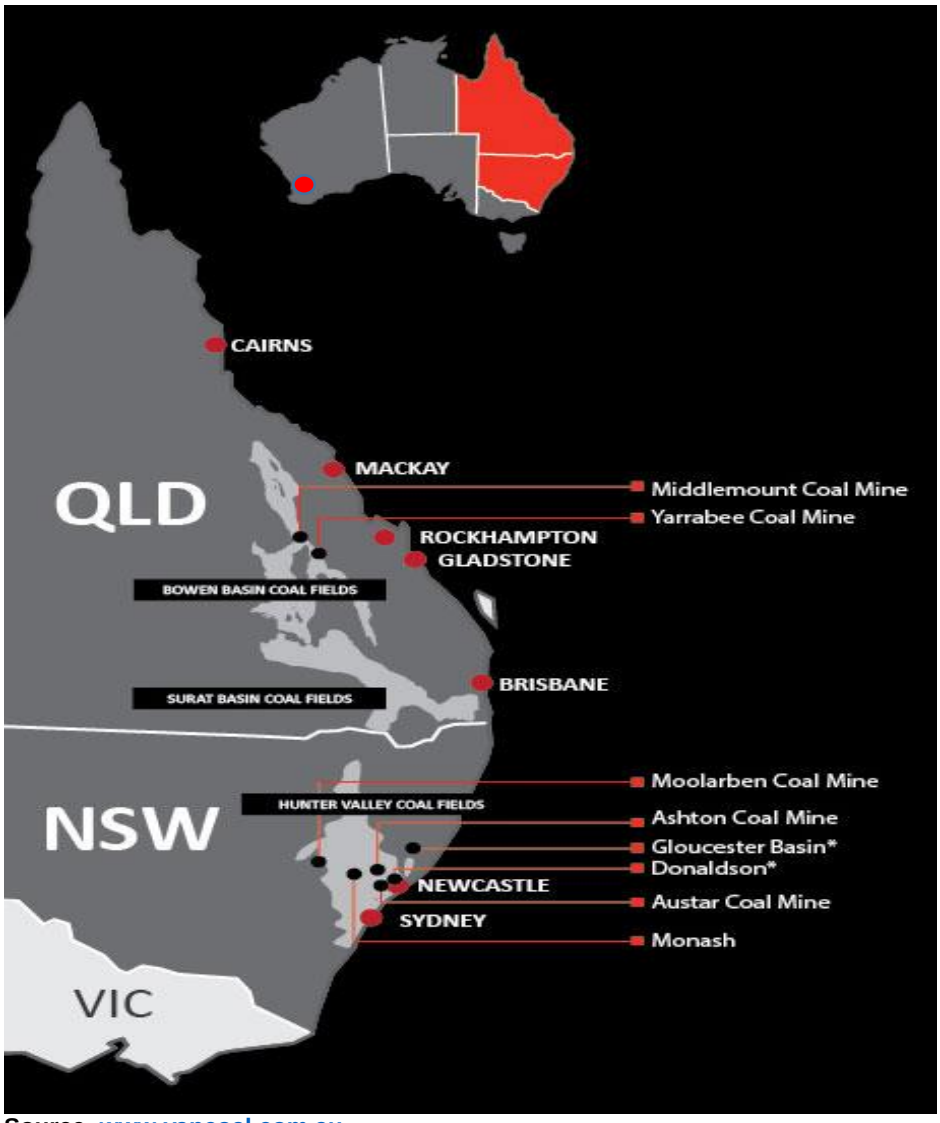
The Yancoal Group's principal activities include identifying, developing and operating coal-related projects. Following its merger with Gloucester Coal Limited and its listing on the Australian Securities Exchange on 28 June 2012, Yancoal Australia Limited is now one of Australia's largest listed "pure-play" coal producers, meaning that its business has the single focus of coal production. Yancoal is the ninth largest pure-play coal company globally (based on reserves), with 3.4 Bt of resources, 800 Mt of reserves and plans to grow saleable production to approximately 25 Mt per annum by 2017. Yancoal's joint venture entities include Ashton, Moolarben and Middlemount. The Moolarben Joint Venture (80 per cent holding) is an important part of Yancoal's growth opportunities and is discussed later in this chapter.

The current climate is not favourable for the coal industry. In general, most players are suffering from a slowing manufacturing sector and reduced global demand. Selling prices are at a current low and there is an oversupply of coal in the global market. As such, Yancoal's overall net losses are not unexpected. The key factors contributing to Yancoal's current losses include depressed pricing based on oversupply, foreign exchange losses due to the weakening of the Australian dollar against the US dollar, and impairment of mining tenements (Moolarben and Stratford & Duralie) due to the decline in forecast sale prices.

The portfolio of Yancoal mines is highlighted in Exhibit 5.01 below. In total, Yancoal has seven operating mines, six projects under feasibility study (including expansion of existing operating mines) and a suite of exploration assets and major infrastructure (port and rail) shareholdings. This includes a 27 per cent ownership of Newcastle Infrastructure Group (NCIG) Coal Terminal. While a number of Yancoal mines use the facility to load coal, the largest user of the terminal is the Moolarben Mine.

[9] Much of this background material is based on information contained on the company's website and in its annual reports.

Exhibit 5.01: Yancoal Australian operations



Source: www.yancoal.com.au.

Yancoal mine their coal using either open cut or underground methods. The underground methods comprise either “bord and pillar” operations, or more commonly the “longwall” mining method. Each method requires government approvals and associated detailed infrastructure developments. Pricing is market driven and revenue estimations are also aligned with government mining approvals. The Australian Government permits specify agreed levels of coal extraction per annum over each of the mining approval stages. As such, capacity and annual productivity of Yancoal’s mines is carefully monitored and reported to shareholders. In relation to cost management activities, Yancoal operates according to a LEAN process of continuous improvement methodology to reduce waste over the entire value chain (“from pit to port”). Profitability is also impacted by the quality of coal extracted from coal seams due to the varying levels of impurities. The raw material, referred to as Run of Mine (ROM) coal, is the total amount of raw coal taken from the mine to the production process. This coal is classified into one of two types: Washable Coal (washed to remove impurities) or Clean Coal, which together amount to the total saleable coal production. For example, in the 2013 financial year, Yancoal’s ROM coal production was 27.04 Mt with 19.70 Mt of saleable coal production.

The time taken for a mine to produce coal can be considerable (many years/decades). As a result, the mines under Yancoal’s control are at varying stages of development, ranging from pre-feasibility to feasibility to producing. As an example, Stage 1 of the Moolarben mine was approved by the Government Minister in 2007 but operations did not begin until 2010. Pre-feasibility is still in process with expansions planned to help grow the business and utilise the available infrastructure capacity. The Stage 2 project is estimated to commence in 2037. The Moolarben mining operations approvals include both open cut and underground

mines, with development of each staged over the long-term life of the mine project. Exhibit 5.02 provides a summary of Yancoal's project developments.

Exhibit 5.02: Yancoal's project developments (as at 2014)

Activity	Site
Producing	Moolarben Open Cut
	Yarrabee
	Middlemount
	Ashton Underground
	Austar
	Duralie/Stratford
	Donaldson
Feasibility	Moolarben Open Cut 4
	Ashton South East Open Cut
	Stratford Extension
Pre-feasibility	Moolarben Underground 1 & 2
	Moolarben Underground 4
	Tasman Extension
	Abel Longwall

Source: www.yancoal.com.au/page/key-assets/exploration-and-development/ (accessed 30/6/2014).

Yancoal also has access to a growing portfolio of intellectual property assets, including the proprietary Longwall Top Coal Caving (LTCC) technology, Ultra Clean Coal (UCC) patented technology and Premier Char, a patented technology that allows an innovative process for the production of coal char from low-rank coals.

5.1.2 Strategic objectives and sustainability intent

The company has a Strategy and Development Committee with a primary role to assist Yancoal's Australian Board in its oversight and review of the merged group's strategic initiatives, including a sustainability focus. As highlighted in discussions with senior management, "sustainability pervades everything we do". Sustainability for Yancoal is a broad concept involving a consideration of: land and biodiversity; communities and employees; heritage and Indigenous artefacts, which underpin their licence to operate. The Health, Safety and Environment Committee assist the Board in overseeing Yancoal Australia's health, safety and environmental responsibilities. The links between Yancoal's strategic objectives, performance measurement and sustainability intent are highlighted in Exhibit 5.03.

Exhibit 5.03: Linking strategic objectives and performance measurement with sustainability intent*

Strategic objectives

- Focus on growing production from existing assets.
- Improve efficiency of all the operations to hold and reduce costs.
- Extend the mine life.
- Actively consider all available acquisition opportunities.
- Seek opportunities to enhance the application of proprietary technologies.

Linking short-term incentives (STIs) with strategic goals, through an STI scorecard

STI scorecard category	KPIs	Weighting	Rationale
Profitability	Profit Before Tax (PBT)	40%	Key financial metric for the company
	Coal sales revenue	5%	Key profitability drivers and measures
	Total cost per tonne sold	5%	
	Product coal tonnes	5%	
	Development/overburden removal	5%	
Sustainability	Total recordable injury frequency rate (TRIFR). The target is set in the context of the state TRIFR average.	5%	Key safety measure in the mining industry. Reflects the company's commitment to care for, and protect, its people and to provide an incident-free and healthy work environment
	Environmental stewardship: • operations integrity • loss of containment • environmental awareness training sessions	5%	Reflects the company's commitment to operating sustainably and managing its environmental obligations
Growth projects	Each executive is assessed against three growth projects that are aligned to the company's strategic priorities but are within their sphere of influence. Due to commercial sensitivity, these are not disclosed.	30% (10% each)	Drives focus on the execution of the company's key strategic priorities

Short-term bonus KPIs and rationale

KPIs	Rationale
Net Operating Profit Net Operating Cash Flow Coal Sales Revenue Coal Production Total cost per tonne sold Accounts Receivable Controllable Expenses	Key financial measures/value drivers for the company
TRIFR	Key safety measures in the mining industry. Reflects the company's commitment to care for, and protect, its people and to provide an incident-free and healthy work environment
Energy Conservation	Key indicator of the company's commitment to safeguarding the environment through its mining operations
Internal Compliance	Measures the effectiveness of the company's compliance function including audit and risk management

* This exhibit has been developed using information from the company website and annual report.

The sustainability intent in Exhibit 5.03 pervades the performance measurement and incentive system through measures of health and safety, energy, waste and training sessions. More importantly, as shown later in the chapter, sustainability issues underpin the licence to operate and form a large part of the capital investment appraisal process.

In addition to strategy and risk, regulatory compliance guides some of these sustainability measures and activities. For example, Yancoal must report its annual greenhouse gas emissions and energy use against the *National Greenhouse and Energy Reporting Act 2007* (NGER). Up until 1 July 2014, under clean energy

legislation there was a price on carbon emissions. Yancoal were also required to report on action taken to meet energy-saving opportunities according to the *Energy Efficiency Opportunities Act 2006*. Given the Act has only just been repealed by the new Australian Government, Yancoal management are now investigating voluntary sustainability initiatives.

5.2 Types of capital investment decisions

Yancoal's forecast capital expenditure for 2014 is several hundred million Australian dollars. More than half of this expenditure is allocated to growth projects that are subject to regulatory approvals. At Yancoal capital investment projects are generally classified as one of four types:

1. *Sustaining investments* are maintenance-type investments often referred to internally as *bread-and-butter projects,* made to maintain the status quo.
2. *Compliance/regulatory investments* are obligatory investments that must be made according to regulations.
3. *Business-improvement investments* are investments that improve what is currently done, such as equipment upgrades and acquisition of new equipment that increases capacity. An example would be the award-winning innovation at the Moolarben mine resulting in the development of noise-reduction technologies. While this discretionary investment generated no direct incremental cash flow benefits, the investment provided social benefits.
4. *Growth investments* are investments that open up new opportunities such as expansion to an existing operation or the development of a new mine. For example, current plans to build and open a new major mine facility valued at several hundred million dollars would be classified as a growth investment. Also falling into this category are what are referred to internally as "straddle-projects". These projects are investments made to maintain existing operations in an effective "holding pattern" while preparations for an associated major new project are undertaken. Straddle projects could be seen as an illustration of options analysis.

The classification of a project according to the above model is in some cases subjective, as the nature of a project may mean it falls between two of the categories. The more strategic investments are likely to be classified as growth investments though occasionally might meet the criteria for business-improvement projects. Further, this model assists with the distinction between discretionary and non-discretionary expenditures, which may be relevant at different stages of the business cycle.

5.3 Capital investment appraisal and risk management

Appraisal is partly dependent upon the type of project undertaken. For example, for sustaining-type projects (similar to compliance/regulatory-type projects) the level of analysis reflects the need to invest where commonly there is little choice about whether to invest or not. In these circumstances the lowest-cost option within a framework of no detrimental effects on key priorities like people and environment would be undertaken. In general, a suite of financial tools are used including NPV, IRR and payback. While discounted cash flow tools are dominant, the relevance of payback is enhanced in more difficult business cycle circumstances. Time frames are inherently long term in this industry, resulting at times in a tension between NPV, payback periods and project timelines. These tensions, particularly with competing projects, will influence decision making.

Underpinning the investment appraisal process is an analysis of risk. As highlighted in discussions with management, key themes such as reputational risk, approvals risk and operational risk are considered along with probability analysis to assess the varying types of risk exposure. Those items classified with "high" probability trigger mitigation strategies to reduce or alleviate the risk. Given the nature of the business the approval process is critical. Without approval, no mining occurs. Approvals risk involves the consideration of the time it takes to a successful outcome. The analysis associated with the risk matrix also helps with capital and cash flow estimations.

At a more detailed operational or project level, risk management is complex and is bound by legislation and guiding frameworks (such as ISO 31000 Risk management standards; Coal Mining Health and Safety Act and Regulation, Explosives Act and Regulation, and state-based regulation relating to mitigating the adverse impacts of flood, bushfire and landslide). Legislation requires risk identification and assessment as well as comprehensive hazard analysis and mitigating strategies at all stages of the project. For example, early identification of hazards at the pre-feasibility stage would identify the need to construct/manage water supply infrastructure at the proposed site; as well as the impact of necessary support facilities such as haul road crossings, onsite storage areas, offices and amenities. In addition, hazards in relation to hauling of coal and overburden, use of explosives and waste rock dumping all become part of preliminary risk identification.

The range of activities becomes more formalised as the project moves through the stages to production and then to decommissioning. Risks are assessed and profiled throughout the stages according to the likelihood of occurrence and consequences using a risk assessment matrix (see Exhibit 5.04 for a generic example of a risk assessment matrix). The evaluation process considers the potential harm to people and property, including Yancoal employees and property, as well as protecting other value chain participants (suppliers, contractors), ensuring safe access. Risk management extends to the management of public health and safety, ensuring productive livelihoods are maintained in the surrounding community. As a result of this assessment and decision process around appropriate controls, values are determined (to avoid, mitigate, respond or offset) and associated cash flows included in the appraisal. The risk assessment matrix also helps prioritise risks and associated costs for management purposes. The definition of "likelihood" is attributed to a time frame — say, from once in 1000 years to a monthly occurrence. Similarly, costs can be attributed to each of the consequences, with negligible risks (less than $10,000) to disastrous consequences ($20 million or more).

Exhibit 5.04: Risk assessment matrix

Risk rating

Likelihood	**Consequences**				
	Negligible	**Minor**	**Significant**	**Serious**	**Disastrous**
Almost certain	Medium	Medium	High	High	High
Likely	Low	Medium	Medium	High	High
Possible	Low	Low	Medium	Medium	High
Unlikely	Low	Low	Low	Medium	Medium
Rare	Low	Low	Low	Low	Medium

Our discussion in the sections that follow will focus on some of the key issues associated with appraisal of the strategic investment, classified by Yancoal as their growth investments.

5.4 Growth investments — appraisal and strategic factors

The attributes of growth investments were alluded to in subsection 5.1. Of particular interest here are five key points:

1. the time frames over which the appraisal process is undertaken and, hence, the key role of the investment development and evaluation stage
2. the commonly used model of appraisal for these types of investments
3. the issue surrounding the capturing of relevant information
4. the valuation of environmental issues
5. the impact of a changing regulation environment on the appraisal process.

Each of these five key points is explored below.

5.4.1 The investment development and evaluation stage

The investment development and evaluation stage of appraisal contains a four-stage process.

- *Concept study.* Multiple options are tabled. This is the "what could it be" stage.
- *Pre-feasibility.* The options are evaluated and narrowed down to a single go-forward case. This is the "what should it be" stage.
- *Definitive feasibility.* The go-forward case is developed in detail. This is the "what will it be" stage.

- *Investment decision.* The project financial metrics and benefits are known and a decision is made on the progression of the project through to execution, delivery and handover to operations of a functioning asset.

These stages contain a number of differences. For example, the tolerance on capital and cash flow estimates tighten (from 35 per cent to 10 per cent) as each stage progresses. It is important to note the time frames over which these stages may occur. For example, the entire process may take up to three or four years. As a consequence, flexibility in the appraisal tool is vital, as strategic direction, market conditions, contemporary environmental approvals and legislation are all susceptible to change over the three- to four-year development time frame.

5.4.2 Model of appraisal for growth investments

While every project within this category demands its own specific evaluation and in some circumstances its own criteria, in broad terms, these projects are exposed to an evaluation process that includes financial analysis and consideration of strategic-related factors that might best be captured qualitatively.

The financial analysis can be summarised as including net present value, internal rate of return and payback calculations. It is important to note the strong view within the organisation that the financial analysis is most informative when used on a comparative basis. A constant, company discount rate is used and is not adjusted for risk. Instead, Yancoal management prefer to focus on the refinement of cash flows as the proposed project moves through the feasibility stages.

The strategic-related factors might include the following:

- *The role of the project.* For example, some projects might be considered for investment funds as a vehicle in the short term to facilitate a larger-scale project in the longer term. These projects may be marginal in terms of financial benefit but may be pursued to maintain community presence, retain the company's talent pool and provide the opportunity to pursue a brownfield expansion as opposed to a greenfield development. This type of project is often referred to as a "straddle-project" and was referred to briefly in subsection 5.1. Straddle projects are a good example of options analysis, which allows the company to keep their opportunities open in the future. Consequently, investments may be made specifically for the purpose of future use. This use of options analysis reinforces the qualitative role that options analysis can perform in the capital investment decision space.
- *Customer preference around the portfolio of products mined and sold.* For example, some investments may be triggered to ensure supply of a mix of coal products (in terms of quality and use) to meet customer demand. These products, in themselves, may not be profitable but may be required by customers in a specific portfolio mix.
- *The capacity of an existing or subsequent project to contribute to a coal blend or to product diversification to enhance revenue streams when prices are fluctuating*. Coal production outputs from different mines/locations might differ in coal quality and sulphur levels. Blends will ensure sales volumes and specific quality is maintained.
- *Considerations around job protection and local investment.* These are important issues for some projects, particularly when viewed in conjunction with the role of the project factor referred to above.
- *Project support around innovation in clean coal technologies.*

5.4.3 Capturing relevant information (take-or-pay example)

This aspect of the capital investment decision process is highlighted here to emphasise the interesting issues that might emerge around relevance of information at the project level. Our example relates to what is referred to as "take-or-pay". The genesis of take-or-pay was that with the significant increase in demand for coal (driven primarily by China), bottlenecks in supply arose because of port and rail infrastructure. To reduce those bottlenecks, significant investment was required by the port and rail operators/owners, but they would make that investment only if they had some certainty of payback; that generated the take-or-pay regime. Moreover, from the shipping and rail companies' perspective, they were seeking some certainty around contracts to justify their own investments and maintenance of infrastructure. The solution has seen the introduction of up to 10-year contracts between the coal mining companies and port and rail authorities.

The impact of this on Yancoal is twofold. First, the effect on existing investments is evidenced through the consideration of closing or reducing the capacity of a mine. In this case, the 10-year contracts still exist, effectively performing as an unavoidable cost. Even if there is no production at the mine, the costs associated with the contracts still exist. This may necessitate a continuing investment cycle in a mine to

maintain some production activity and contribute some cash flow to assist with meeting these unavoidable costs. The outcome of this is to generate incremental cash flows to help meet the unavoidable costs triggered by the existence of these contracts. From a capital investment appraisal perspective, the company must consider how the costs associated with the contracts are incorporated into the appraisal of current and subsequent projects. This reinforces the tension between organisational-level cash flows and project-level cash flows. Moreover, the notion of stranded assets, whereby large infrastructure investments such as take-or-pay contracts have the potential to become contingent liabilities, is not uncommon in the coal mining industry. In this case, most large coal mining companies sharing port and rail capacity and associated long-run infrastructure investment burden are similarly committed to this form of investment risk exposure.

5.4.4 Capital investment appraisal and valuation of sustainability impacts

Sustainability-related impacts commonly associated with the coal mining industry are twofold. Firstly, and indirectly for Yancoal, are the carbon emissions caused by energy consumption of their coal products. Secondly, and operationally important for Yancoal, are the direct impacts of the mining operation itself on the environment, communities and the workers, which are addressed in several ways by Yancoal. The focus for this case is on the second point around the direct impacts of the mining operation and the processes they undertake to maintain their licence to operate. The following issues are explored:

1. *Biodiversity offsets.* When evaluating environmental impacts, Yancoal's main objective is to avoid biodiversity loss. For example, they will physically fence off endangered areas. If they cannot avoid biodiversity loss they aim to mitigate the loss (through regeneration of damaged lands). Finally, if the loss cannot be mitigated, an offset arrangement is made. As indicated in Exhibit 5.05 (and detailed in section 5.4.5 that follows) a NSW Government methodology for valuing loss/gain in biodiversity, referred to as the Biobanking Scheme, outlines the circumstances in which the loss can be offset by retirement of biodiversity credits. It has been argued that while the concept is fine, the valuations underpinning biodiversity loss are not yet widely accepted, and at this stage there have been no major deals based on this methodology. Yancoal will find and buy properties with equivalent biodiversity qualities and characteristics to those in the area impacted, and secure them in perpetuity. Security can be achieved by a number of methods, including by means of a grant to the national estate (for example, for land adjacent to a state forest), the registration of a restrictive covenant on title or another such agreed methodology.
2. *Social investment strategy.* This includes contributions to local government infrastructure community engagement funds and/or specifically targeted expenditures that support local industries operating near the coal mining sites. Initiatives undertaken by Yancoal include the following:
    - A local Indigenous community had a small livelihood from the sale of marron (yabbies) caught in the waterways near the mine site. Yancoal supported an extension of this project and built several holding tanks for the commercial farming of the marron. Water from the mining operations, diverted to the tanks, provided an optimal breeding site for this crustacean. Yancoal provides further resources to maintain the profitability of this local business and employment for the local Indigenous community.
    - A discontinued mine site was flooded to create a large inland lake. The lake was developed into a thriving recreational park, used by the community to host water sporting competitions. This development has helped support the community through tourism, sport and recreation.
    - As a result of public submissions regarding the Moolarben mine, Yancoal is gaining approval to upgrade facilities and the walking track at a local feature known as "The Drip" on the Goulburn River. The Drip will not be impacted by mining operations and is on land owned by Yancoal.
    - Straightening of Bowmans Creek to align with the underground mining below the surface at Ashton will ensure that ground subsidence will not occur after mining under the creek and enable fish habitat to develop in the realigned creek course.

Note that these costs either are capitalised at the outset of the project or form part of the annual cash flows. The total community contributions are important factors in the appraisal process, as noted in Exhibit 5.05. These tables are prepared for the NSW Government Department of Planning and Infrastructure "Environmental Report" and provide detailed information in relation to the key sustainability-related government priorities.

Exhibit 5.05: Approved mining (extract from NSW Environment Report on Moolarben Coal Mine)

Aspect	Moolarben
Company	Moolarben Coal Mines Pty Ltd (MCM)
Operations	Commenced in 2010
Remaining life	16 years
Mining reserves	130 Mt
Mining areas	• 1 underground domain (UG4) • 3 open cut pits (OC1, OC2, OC3) Mining operations currently in OC1 progressing to the north
Extraction rate	Approved: 12 Mtpa ROM coal Actual in 2011: 7 Mt
Coal processing	At the mine's CHPP, which can process up to 17 Mt of ROM coal a year
Overburden	Initially used to form environmental bunds, then emplaced in pit within voids left by open cut mining
Rejects disposal	In-pit emplacements
Water balance	Water deficit (maximum of 6.8 ML/day) sourced from surface water runoff, groundwater inflows into the mining areas, groundwater extraction from the UG4 borefield and via a water sharing with Ulan
Coal transport	Approximately 4 trains per day on the Gulgong to Sandy Hollow rail line
Biodiversity offsets	1282 ha of native vegetation and 144 ha of endangered ecological communities (EEC). In addition, 153 ha of disturbed lands are to be regenerated with native vegetation and 48 ha of cleared land is to be regenerated with EEC.
Rehabilitation	Rehabilitate 370 ha of land to woodland and 580 ha of land to grassland
Employment	320

Major components of the Moolarben Stage 2 Preferred Project	
Project summary	• Extract up to 12 Mtpa of coal from one open cut pit (OC4) and up to 4 Mtpa of coal from two underground mining domains (UG1 and UG2) over a period of 24 years. • Construct a range of associated infrastructure including ROM coal factilities (rejects bin, hopper, stockpiles and a crusher), surface conveyors, support facilities and utilities. • Transfer coal from OC4 to the Stage 2 ROM coal facility and coal from UG1 and UG2 to the existing Stage 1 ROM coal facility. • Dispose of all coal rejects at the mine and rehabilitate the site.
Disturbance area	1534 ha
Mining and reserves	• Coal reserve of approximately 252 Mt • Open cut mining using trucks, excavators and blasting to remove overburden and coat • Underground mining using longwall mining methods
Coal extraction	Up to 16 Mtpa ROM coal
Project life	24 years (to December 2037), in general accordance with the following sequence: • OC4 — years 1 to 24 (operated concurrently with Stage 1 open cut mines) • UG 1 — years 5 to 14 • UG 2 — years 10 to 17

Proposed surface infrastructure	• ROM coal facility including coal stockpiles, conveyors and a crushing and sizing facility • Offices, bathhouses, workshops and fuel storages • Network of internal roads
Water demand and supply	• Water surplus in initial years (years 1–5) of 174 ML/annum are predicted under average climatic conditions. Supluses will be controlled by reducing pump from the northern borefield and by designing the master management system to contain runoff during high rainfall events. • Water deficits of 599 ML/annum in the remainder of the operating years are predicted under average climatic conditions. Deficits are to be met by accessing additional water from Ulan under a modified water sharing agreement.
Overburden emplacement	Overburden from OC4 will be emplaced in an out-of-pit emplacement area to the north of the OC4 pit.
Coarse reject, tailings management	Generation of 2 Mtpa of coarse reject and tailings, which will be transferred via conveyor to OC4 for co-disposal with overburden in the pit void
Mine access	Main site access for employees, contractors, administration personnel and CHPP workers will be via the existing sentry point on Ulan–Cassilis Road. New site access for employees to access the Stage 2 surface facilities will be via Ulan–Wollar Road.
Employment	Construction workforce of 220 employees and operational workforce of 122 employees
Hours of operation	24 hours a day, 7 days a week
Biodiversity offset	The project would result in the clearing of 1534 ha of land, of which 632 ha is grassland and 902 ha is native woodland (including 123 ha of EEC). The biodiversity offset strategy proposed to compensate for this loss includes a total of 4066 ha of land (including 1168 ha of EEC) within eight biodiversity offset areas.
Rehabilitation, final landform and end land use	The 1534 ha of land that would be cleared will be rehabilitated, including rehabilitating the 632 ha of existing degraded secondary grassland and shrubland to native open woodland and EEC communities. The rehabilitated land will be protected in perpetuity.
Community contributions	1.5 million
Capital investment value	120 million

Source: NSW Planning and Infrasture Major Project Assessment: Moolarben Coal Project Stage 2, www.moolarbencoal.com.au.

As indicated in the tables above, values are applied to the management and mitigation of sustainability-related factors throughout the majority of mining stages. These include the management of waste, water and coal transportation. Environmental factors relating to land are managed through rehabilitation, community contributions and biodiversity offsets, the details of which are highlighted in the following subsection.

5.4.5 Regulation, biodiversity offsets and the BioBanking Scheme

One of the issues to emerge that influences the appraisal process is the changing nature of regulations. This uncertainty is exacerbated by the issue raised earlier around time frames. In circumstances where the feasibility stage of appraisal may take up to three to four years, changing regulations are likely to have a significant impact on the nature of the investment as well as the cash flow estimates associated with any project. Changes to boundaries that affect the available land resources for mining activity might have a significant effect on mine operations overall. Moreover, should mining operations proceed, the cash flow estimates will require significant review. In this sense, the capital investment appraisal process at Yancoal is a dynamic process rather than a static one.

As has been noted, the mining industry is heavily regulated and controlled, and numerous authorisations are required prior to the commencement of operations.[10] Approval under the EP&A Act must be given for all new mining projects and modifications to existing projects. This includes the extensive environment reports and offsets schemes discussed earlier (see Exhibit 5.05). The environmental assessment must detail the impact

[10] For further details see www.resourcesandenergy.nsw.gov.au/landholders-and-community/minerals-and-coal/mining.

on air quality, noise, transport, flora and fauna, surface and ground water management, methods of mining, landscape management and rehabilitation. The mining companies are also required to undertake extensive public consultation.

As demonstrated in Exhibit 5.05 above, a significant weighting is placed on the management of ecosystems. Complex methodologies are being developed to address the multiple concerns relating to the achievement of a licence to operate. One such methodology is the New South Wales BioBanking Scheme methodology (details provided in Appendix 5.1), which offers an alternative assessment methodology, providing values for threatened species, populations, ecological communities and habitats. However, this system does not currently provide the same objectivity and certainty around biodiversity valuations, and Yancoal's preferred approach is to purchase equivalent direct offset properties. These emerging methodologies nevertheless highlight the extent and complexity of sustainability considerations that must be managed by coal mining companies.

5.5 Summary

Key issues to emerge from this case study include the following:

- The mining industry is a very important industry for Australia. It is heavily legislated, with government oversight achieved through comprehensive risk and environmental management strategies and frameworks, which the mining industry is obliged to follow. This regulatory environment impacts the nature of the capital investment appraisal process.
- A formal classification model of investment type recognises:
  - sustaining investments
  - compliance/regulatory investments
  - business-improvement investments
  - growth investments.
- The growth investments example highlights the issues of time frames, the impact of licence to operate and the broad range of sustainability factors considered.
- Some of the key sustainability factors included in capital investment appraisal are water, waste, biodiversity impacts, OH&S, community impacts and land rehabilitation.
- Within the capital investment appraisal process, qualitative information is critical in the early phases and is often quantified and then monetised as the appraisal process unfolds. Moreover, we note the refinement of the sensitivity analysis and expectations over time.

Appendix 5.1

The BioBanking Scheme was established as part of the *Threatened Species Conservation Act 1995* and administered by the State of New South Wales and the Office of Environment and Heritage NSW. A key aspect of this scheme is a biodiversity assessment methodology that provides values for threatened species, populations, ecological communities and their habitats. The biodiversity assessment methodology assesses the biodiversity values in terms of the loss of biodiversity or gain in biodiversity values from management actions. Actions might include retention of native vegetation, dead timber, rocks and natural water flows; replanting or supplementary planting where regeneration is insufficient; management of soil erosion; and others such as weed control and management of fire, pests and human disturbance.

In addition to valuing biodiversity losses/gains, the methodology also establishes the circumstances in which biodiversity values can be offset or not by the retirement of biodiversity credits. There are two classes of biodiversity credits calculated: ecosystem credits and species credits. The methodology includes calculations on the number and type of ecosystem credits and species credits that are created when offsetting losses by the improvement of biodiversity values at a designated biobank site.

The valuation model includes the valuation of both direct and indirect biodiversity impacts. These include the valuing of: impacts on water quality and subsequently downstream biodiversity values; increased light or noise that may affect threatened species habitat; or development that may restrict movement of threatened species or populations in surrounding areas (Office of Environment & Heritage, NSW Government (2012), p. 6). Included in the impact assessment is the demonstration of corporate measures taken to minimise these negative impacts (such as controls to prevent erosion, noise and light barriers, or structures to allow movement of threatened species or populations).

The valuation model for biodiversity credits is underpinned by a comprehensive table of varying site attribute scores. (For ecosystem credit values a vegetation database of over 1600 species is converted to attributes including: native plant species richness; extent and type of native ground cover; exotic plant cover; number of trees with hollows; total of fallen logs, and so on.) A weighting is applied for each site attribute score and included in the site value equation. The equation for ecosystem credits is presented below.

Ecosystem credits: Determining the current Site Value score for a vegetation zone at the development or biobank site

$$SV_c = \frac{\left(\sum_{v=a}^{j}(a_v w_v) + 5\left((a_a a_g) + (a_b a_i) + (a_h a_j) + (a_c a_k)\right)\right) \times 100}{c}$$

where:

SV_c is the current Site Value score of the vegetation zone

a_v is the attribute score for the *v*th *site attribute* (a-j) as defined in Table 1

a_k is equal to $(a_d + a_e + a_f)/3$, the average score for attributes d, e and f

w_v is the weighting for the *v*th *site attribute* (a-j) as defined in Table 1

c is the maximum score that can be obtained given the attributes a-j that occur in the vegetation type when in benchmark condition (the maximum score varies depending on which attributes occur in the vegetation type under assessment).

Source: Office of Environment & Heritage, NSW Government (2012), p. 6.

As demonstrated in Exhibit 5.05, a significant weighting is placed on the management of ecosystems. Complex methodologies are being developed to address the multiple concerns relating to the achievement of a licence to operate. While methodologies are still contentious they provide the starting point for conversations around sustainability risk management and the long-run mining appraisal process. They highlight the extent of sustainability issues requiring consideration by coal mining companies.

Chapter 6: bankmecu™ Case

6.0 Introduction

In this chapter we turn our attention to the financial services industry and Australia's only member of the Global Alliance for Banking on Values (GABV)[11], a customer-owned bank, **bankmecu**. This bank was selected because of its approach to sustainability and philosophy built around responsible banking. In addition to being a GABV member, **bankmecu** is part of the International Integrated Reporting Council (IIRC) Pilot Programme involved in alternative approaches to reporting. It is both taking a finance approach and considering intangibles such as intellectual and human capital (www.IIRC.org). Thus, **bankmecu**'s values-based approach to banking ensures that the knowledge that sits within its businesses is fed into the reporting process.

As a pilot member, **bankmecu** is required to consider the key interconnected concepts of Integrated Reporting, such as the use of capitals (financial, manufactured, intellectual, human, social and relationship, and natural capital) and how they are connected with strategy and resource allocation to create value over time. The various capitals are considered as inputs, which through the business activities are converted to outputs (products, services, by-products and waste), a benefit or cost that is borne by both the organisation and broader society. The use of the capitals is emphasised in **bankmecu**'s integrated report business model (see Chapter 2: Literature and Background Review, Exhibit 2.12). This case provides insights into the consideration of capitals in resource allocation decisions.

6.1 Organisational background[12]

6.1.1 Industry

bankmecu is Australia's first customer-owned bank and a product of the amalgamation of a variety of previously designated credit unions throughout Australia. With a philosophy built around responsible banking, **bankmecu** has 125,404 customers, 348 employees, 23 service centres and assets in excess of A$3.041 billion (as at 30 June 2013). Through its ownership structure as a customer-owned bank, each customer is a shareholder and, hence, owner of the bank. All customers are allocated one share and one vote in director elections.

6.1.2 Organisational structure, purpose and strategy

The bank's stated vision is highlighted in Exhibit 6.01 below. Customers are the major focus as **bankmecu**'s investments are directly connected to the use of capital resources, largely through customer-generated profits. The vision is articulated in the core business model (at the centre of Exhibit 6.01) whereby the key pillars or strategic themes evolve around the use of key capitals recognised as: customer funds; manufactured resources (financed assets, consumer goods and services); business development; employees; communities and customers; and natural resources.

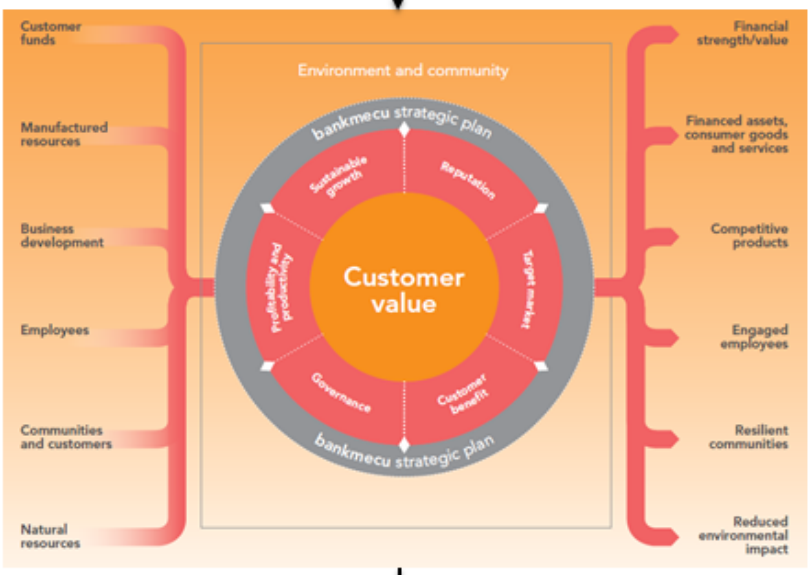
[11] GABV is an independent network of banks using finance to deliver sustainable development for unserved people, communities and the environment. GABV members have assets exceeding $60 billion and together touch the lives of more than 10 million people in 25 countries (see www.gabv.org).

[12] This material is developed from interviews as well as the website and annual reports of **bankmecu**.

Exhibit 6.01: bankmecu's vision, objectives and key priorities

Vision

"bankmecu aims to enhance the financial wellbeing of our customers in responsible ways."



Areas of strategic focus and key performance indicators

Banker for community and government	Satisfied and engaged customers	Engaged employees	Social and environmental benefits
• Investments in Community Investment Programs ($/% of profits) • Investments in carbon sequestration and biodiversity (acres held / $ invested) • Financial Inclusion Policy ($ loan support for financially disadvantaged people — via Foresters Community Finance Community Asset Building Program) • Community Housing Projects ($ loan support) • Local government infrastructure projects ($ loan support) • Standard and Poor's investment grade rating	• Customer satisfaction • Customer retention • Net Promoter Score • Customer complaints • Customer compliments • Competitive pricing (Canster Cannex financial services research group) • Loans+deposits ÷ number of account holders ($)	• Staff satisfaction • Employee organisational commitment • Employer of choice • Productivity ($ assets per FTE) • Cost-to-income ratio	• Social and environmental loans ($) • Commercial lending with a social benefit ($/% increase) • Carbon offsets to Conservation Landbank (tonnes C02-e; biodiversity offset for new home construction) • EMS measures (car travel; gas consumption; electricity; air travel; paper and waste to landfill)

Responsible banking products for competitive advantage

- New products launched
- % Account holders with three or more products
- Competitive pricing (compared with other banks)
- Products with social and environmental benefits

Financial metrics

- Cost-to-income ratio
- Productivity ($ assets to FTE)
- Asset levels
- Profit performance
- Return on average assets
- Capital adequacy ratio
- Customer-owned reserves
- Sustainable asset growth

Each of the six capitals is translated into areas of strategic focus with associated key performance indicators. These key areas, in particular measures relating to "social and environmental benefits", are discussed in more detail in the following sections.

6.2 Strategy, sustainability and integrated reporting

Sustainability is embedded into **bankmecu**'s philosophy by the belief that strong synergies exist between social and environmental responsibility and a cooperative approach to banking. The bank differentiates itself from other banks by the alignment of organisational values with stakeholder expectations of sustainable economic wellbeing. A sustainable approach is taken in everything it does, from its organisational culture, to its operations and its innovative products and services. To this extent integrated thinking is observable throughout the organisation's activities and decision-making processes. As an integrated reporting pilot organisation, its vision is linked to its business model which, in turn, highlights the key capitals utilised in organisational activities. Within the social and natural capital dimensions, the following four key performance indicators (highlighted in Exhibit 6.01) underpin the key sustainability issues of interest — that is, how they are measured and included in investment and project appraisals:

- social and environmental loans ($)
- commercial lending with a social benefit ($/% increase)
- carbon offsets to Conservation Landbank (tonnes C02-e; biodiversity offset for new home construction)
- EMS measures (car travel; gas consumption; electricity; air travel; paper and waste to landfill).

These significant integrated reporting items and associated performance measures are linked with bankmecu's commitments to sustainable development, with initiatives that include a three-year Sustainability Covenant with EPA Victoria and being a signatory to the United Nations Statement by Financial Institutions on the Environment and Sustainable Development (UNEP FI). This commitment is reflected in **bankmecu**'s Sustainability Covenant.

Resource allocation, cash flows and associated performance measurement is assumed in the business model and key performance indicators (Exhibit 6.01). The philosophy is managed within bankmecu's own operational activities as well as in aligning customer resource allocation to improve societal and environmental outcomes. In 2011 bankmecu established an environmental management system (EMS). This system ensures an organisation-wide sustainability focus on everyday activities and practices and helps to reflect the environmental policy of the bank. The main objectives associated with the EMS include to:

- use energy and water more efficiently
- reduce the amount of waste produced and increase the quantity of waste reused and recycled
- reduce the environmental impacts of travel
- consider environmental issues through procurement activities and the formation of new partnerships
- consider environmental issues associated with products and services offered to customers
- increase environmental awareness among customers and employees
- maintain carbon neutrality.

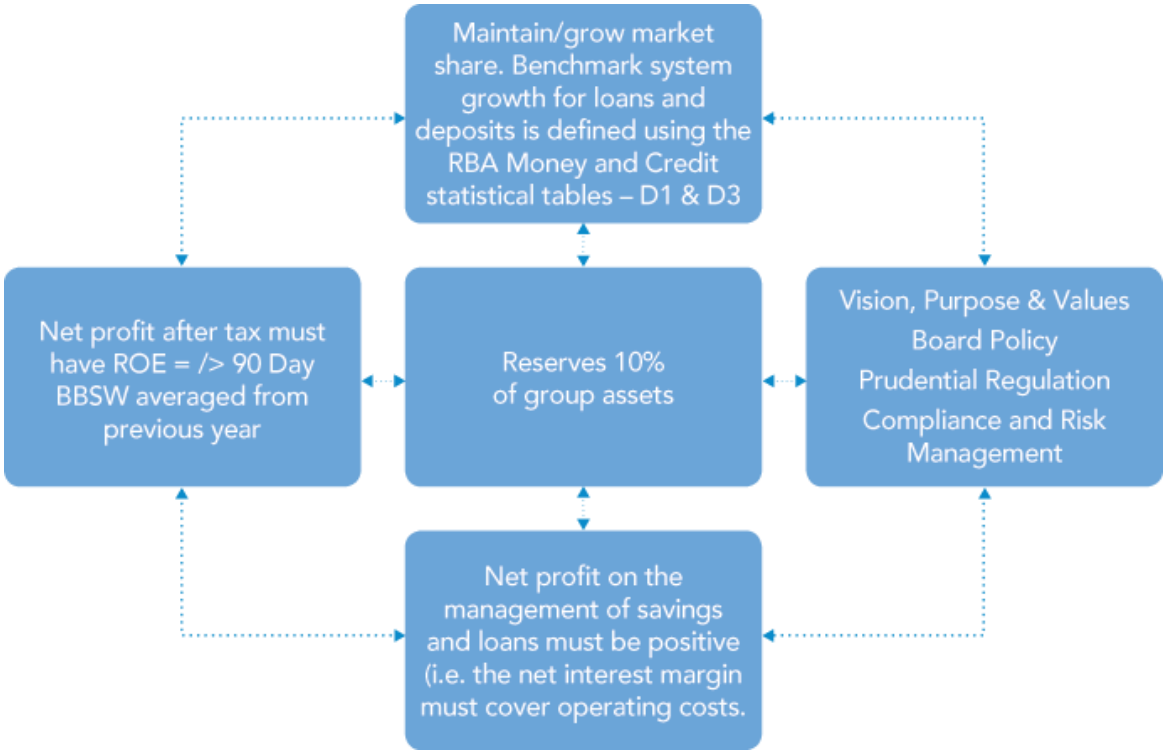
At a customer level, **bankmecu** manages biodiversity offsets through the Conservation Landbank project to offset the loss caused by the use of the bank's loans (that is, biodiversity loss through land clearance for new homes and fossil fuel emissions from motor vehicles). The offset funds are currently managed through an investment in five covenanted properties in the West Wimmera region. The bank uses two specialist external agencies (Landcare Australia and Trust for Nature) to manage the properties. These agencies oversee the quality of the conservation works and manage the covenants on the properties. Biodiversity offset arrangements are managed down to the customer interface. Evidence of this is highlighted later in Exhibit 6.03.

6.3 Capital investment appraisal and practices

Decisions, including investment decisions, are made in line with strategic goals. Given **bankmecu** is a customer-owned bank, it raises capital through its customer-generated profits. The bank is conscious of the need to achieve goals and budget targets in a financially and commercially sustainable manner. Being a financial institution, issues associated with sustainability and capital investments emerge a little differently than in other organisations. The majority of the bank's activities relate to receiving deposits and making loans. These are predominantly personal (90 per cent) rather than commercial (10 per cent). As highlighted in Exhibit 6.01, the initiatives around resource allocation are evident in the business model, the key themes and performance measures that embed their philosophy, and are designed to differentiate their product offerings from those of other banks.

Aligned with the core business model is the planning matrix (Exhibit 6.02), which outlines the minimum performance requirements, largely representative of the regulatory banking requirements in Australia. The planning matrix provides daily guidance on investment decisions through a focus on multiple performance measures. For example, a manager could not grow the loan book, and achieve growth requirements, if discounting heavily at the expense of ROE and NPAT. In other words, matrix tests are part of minimum requirements and are treated by management as *tests*, not KPIs or goals, as they are not negotiable. While managers agree they have vision, goals, corporate strategy, business strategy, budgets and associated KPIs (as highlighted in Exhibit 6.01), the overriding strategy is to ensure they meet the *planning matrix* tests through careful processes of annual business planning and budgeting. The planning matrix also acts as a risk matrix and is referred to when considering potential major investments that risk reserves or are high-cost/risk departures into other value chains or industries.

Exhibit 6.02: Planning matrix — growth/profitability/capital (minimum performance expectations)



Legend	
BBSW:	Bank bill swap rate
RBA:	Reserve Bank of Australia
D1:	Growth in selected financial aggregates (credit growth covering banks, other ADIs and non-ADIs, and including securitisation)
D3:	Monetary aggregates (ADI deposit growth, excluding currency held by the private non-bank sector and excluding certificates of deposit issued by banks)

Given the nature of the banking industry, the classic approach to capital budgeting is not necessarily appropriate for this setting.[13] Therefore understanding and managing the cost of capital is crucial in this industry. In order to achieve goals and the budget in a financially and commercially sustainable manner, the bank, unlike a listed company, raises capital through customer-generated profits. Each of **bankmecu**'s loan products offered to customers is therefore considered an individual investment in its own right, each drawing on the bank's capital in a specific way.

As part of the vision and responsible banking philosophy, **bankmecu** decisions, including investment decisions, are made in line with the planning matrix and overall business model (Exhibit 6.01). When

[13] See the earlier work of Froot and Stein in relation to 'illiquid bank investments'; that is, 'those which impose on a bank risks that, although ultimately diversifiable by shareholders, cannot be readily hedged by the bank and therefore require it to hold more equity capital' (Froot, K.A., & Stein, J.C. (1998), p. 59). In the case of **bankmecu**, the shareholders are also party to the illiquid investments (houses and cars etc.) that they purchase using one of the bank's products.

considering what **bankmecu** does differently from others, **bankmecu** managers point to the combined Responsible Investment and Lending Policy, which is driven by strategy and the planning matrix tests. The sustainability philosophy is therefore managed within the risk or planning matrix to determine resource allocation across the key operational and strategic mechanisms of, respectively:

- lending practices
- community programs
- strategic investments.

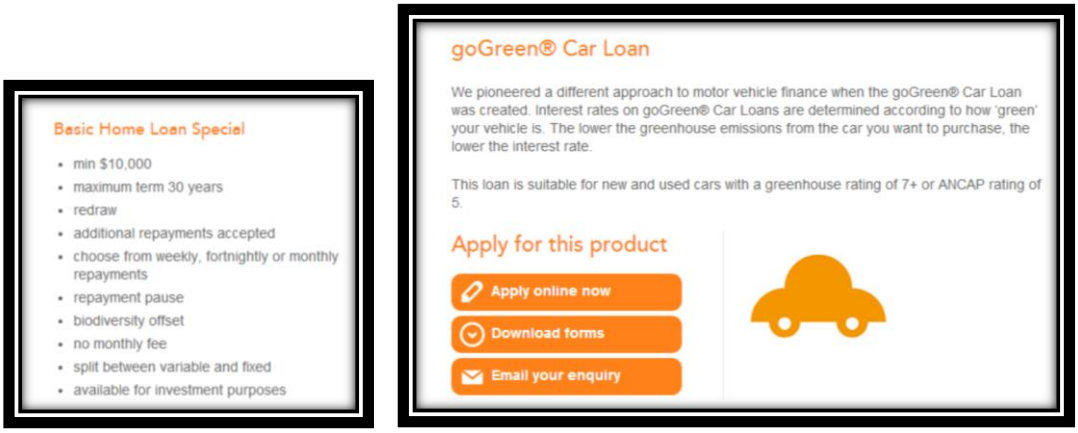
Together the embedded sustainability-related thinking and practices throughout the organisation operationalise sustainability. Each of these is explored in turn in the following subsections.

6.3.1 Operational investments and lending practices

Lending practices are key to banking operations. As indicated above, types of loans are categorised as investment classes. Classes relate to the loan structure, including interest rate and payment terms. For each investment class, the bank determines the limit of offering. Each class is subject to modelling and stress testing about the impact of loss; for example, they recently determined the limit of the bank's appetite for offering "interest only loans".

The loans are packaged to present **bankmecu**'s environmental philosophy around offering social and environmental loans. As highlighted in Exhibit 6.03 below, biodiversity offsets are included with even the Basic Home Loan. This offering is tailored further in their goGreen home loan and goGreen car loan.

Exhibit 6.03: Biodiversity offsets within the varying loan classes



bankmecu's lending practices illustrate the organisation's sustainability credentials perfectly. These practices are driven by the bank's values and mission, as well as the expressed wishes of the ownership group. As a general rule, three key considerations comprise the lending practices framework.

1. *Capacity of the loan applicant to repay.* This would commonly include the use of a standard template to assess the applicant's financial position and capacity to service the loan sought.
2. Security on offer to support the loan and protect the bank's risk position. In most case this security is in the form of property.

   While each of the above processes and practices is guided by existing legislation and regulatory requirements, deeply entwined is **bankmecu**'s sustainability philosophy around the societal and environmental themes. This is indicated in the third policy framework guideline and principles:

3. The bank overlays its own policy guidelines developed from its vision and strategy. These explicitly relate to social and environmental impacts and ethical principles. The five key principles are:

   Principle One: Strive to ensure our customers' funds are invested in loans that provide benefits to people, society or the environment.

   Principle Two: Only lend to persons or organisations if it can be determined that they have the capacity to repay the loan.

   Principle Three: Market all loan products in a responsible manner.

Principle Four: Offer support to customers facing financial hardship.

Principle Five: Assist customers to enhance their financial literacy.

As a result of these guiding principles, **bankmecu** has not:

- made any loans to the fossil fuel industry. (Given that lending for the purpose of financing homes and motor vehicles is indirectly supporting the fossil fuel industry, where energy used in these homes/cars is derived from fossil fuel sources, as part of these loans, an offset program is in place, as discussed further in the following subsection.)
- made any loans to finance coal and coal seam gas projects
- sourced funding outside Australia or through brokers or wholesale money markets to finance its loans.

The lending practices are operationalised through a combination of formal and informal procedures. For example, templates are used to ensure lending criteria (a combination of quantitative and qualitative) are adhered to by loans officers. The loan decision process is supported by a range of conversations among senior lending and management personnel, including an executive lending committee for large loans. The outcome for the bank from this process is a low level of loans in arrears and minimal bad debts.

6.3.2 Community programs and strategic investments

Retail banking makes up the majority of **bankmecu**'s investment activity. Given **bankmecu**'s history of offering loans to unserved people in the community, their current philosophy is built upon ways in which they can link operational activities with returns to the community and the environment. As such, specific social/environmental initiatives are not necessarily mutually exclusive of **bankmecu**'s operational activities. For example, environmental concerns and capital impacts are minimised by the use of offsets and managed by their Conservation Landbank. As indicated earlier, attention to the environmental capital is connected with direct banking operations (through loans and offsets directed towards the design, construction and renovation of more environmentally efficient housing), as well as through employee efficiency and performance measurement focused on reducing energy consumption and waste.

Nevertheless, there are significant areas in which **bankmecu** aim to differentiate themselves from other banks. In particular, these relate to being a banker for the community sector. The first, and one of their earlier strategies (established more than a decade ago), is in the bank's support of affordable community housing. They have long been recognised as experts in offering commercial loans for the development of a strong community housing sector and enhancing the community's access to a greater range of safe, secure and more affordable housing options. Examples include supporting third parties in commercial loans to set up women's crisis housing and maintaining a long relationship with local housing authorities offering commercial loans, from $500,000 to $55 million.

A second strategy and key desired outcome is for *Resilient Communities* (Exhibit 6.01). This investment initiative is based on the use of communities and customers' capital in their value creation activities. Investments directed to this capital represent expenditure equivalent to up to 4 per cent of after-tax profits. Specific investments focus on improving the resilience of society through education with respect to students, leaders and boards of governance. Examples of the programs include breakfast in schools or financial literacy for those in need. The programs are guided by issues of importance to customer owners and recognised as expenditure that is carefully aligned with strategies, rather than ad hoc philanthropic outlays.

In addition to community investments, a final category of investment that is differentiated from operational investments is **bankmecu**'s strategic investments. While seen as peripheral, these investments are largely undertaken to provide key value chain support to their retail banking services. Owing to the size and nature of the organisation, certain value chain functions have to be outsourced, which in turn pose major risks as the delivery of these services are key to the supply of banking services. To mitigate risk **bankmecu**'s strategic acquisitions are aligned with essential supply chain functions such as the supply of IT services. These investments not only secure supply of essential banking services that are not conducted in-house, but provide an avenue, through ownership, for enhanced collaboration around the operationalisation of their key strategies and themes. The nature of these investments means the business case is important, but so are qualitative factors associated with **bankmecu**'s reputation and brand. Thus, the decision to invest would not necessarily be driven by the size of the NPV or subsequent return on investment.

When considering Exhibit 6.01, the investment categories that are not part of operational retail activities are nevertheless scattered across all areas of strategic focus and link to the key performance indicators. As such, resource allocation through these investments is shown to be central to the business model, associated capitals and value creation activities.

6.4 Summary

Key issues to emerge from this case study include the following:

- The banking industry takes a different approach to capital budgeting than other industries, requiring them to manage their equity capital. At **bankmecu** their individual loan products are viewed as capital investments, given the long-term outlays of the largely illiquid assets. Therefore, the loan product mix must meet the risk thresholds and minimum performance expectations outlined in the planning matrix.
- Investment types are classified into: operational bank loans, community programs and strategic investments. The underlying sustainability philosophy is embedded across all classification types, in both operational and community programs, with strategic investments essential to value chain operations and aligned to support **bankmecu**'s strategy. The strategy around responsible banking is operationalised in retail banking activities.
- The operational bank loans for new homes and motor vehicles include a commitment to offset carbon emissions and work towards reducing their carbon footprint in the community.
- **bankmecu**'s strategic investments include investments in education, the environment and community resilience through:
    - supporting social housing infrastructure development
    - using up to 4 per cent of after-tax profits to invest in programs that meet strategic goals.
- Its guiding principles also ensure that any loan made is not in conflict with its strategy. For example, the bank's lending practices do not directly or indirectly support the fossil fuel industry.
- Its sustainability philosophy is embedded in day-to-day operational activities, with EMS systems that monitor energy usage and waste.

Chapter 7: Anglicare Victoria Case

7.0 Introduction

In this chapter, we consider the ways in which a welfare agency's business model and carefully managed resource allocation can cater for the most economically vulnerable people in society. To do this, we draw on the work of Anglicare Victoria, whose main goal is social in nature — that is, to help children, young people and families overcome their immediate crises through services that offer hope for a long-term solution to their problems. Anglicare Victoria's outreach work specifically focuses on supporting children suffering from abuse, homeless young people, women escaping domestic violence and impoverished families.

Anglicare Victoria's business philosophy is therefore based on attending to societal needs over the long run and depends heavily on government grants, donors and intangible assets such as passionate employees and volunteers. As a result, this organisation offers an alternative approach to understanding capital and project investment.

The chapter is structured to provide a brief background to Anglicare Victoria followed by some industry background and specifics relating to the welfare programs that Anglicare Victoria is involved in. This industry background helps to contextualise the type of capital and program budgeting undertaken by Anglicare Victoria and the issues associated with the accomplishment of long-term social goals. The focus for this chapter is the strategic investment in programs, which requires:

- a way to measure the program impact on core outcomes desired by Anglicare Victoria, government (community) and donors
- evaluation of the holistic nature of the program to ensure it achieves its vision of empowering children, young people and families to achieve their full potential
- a performance measurement system that enables third-party verification of the flow of resources to the community served by Anglicare Victoria.

Thus the capital investment is operationalised as a strategic commitment to long-term programs that depend on a continuous stream of input funds, largely from the Australian federal and state governments.

7.1 Organisational background

Anglicare Victoria was created by the *Anglicare Welfare Agency Act 1997*, an Act of the Victorian Parliament. The Act amalgamated three longstanding Victorian Anglican welfare organisations:

- Mission to the Streets and Lanes of Melbourne (established in 1886)
- Mission to St James and St John (established in 1919)
- St John's Homes for Boys and Girls (established in 1921).

Anglicare's overall mission is "to create a more just society" with a vision to resource and empower children, young people and families to achieve their full potential through:

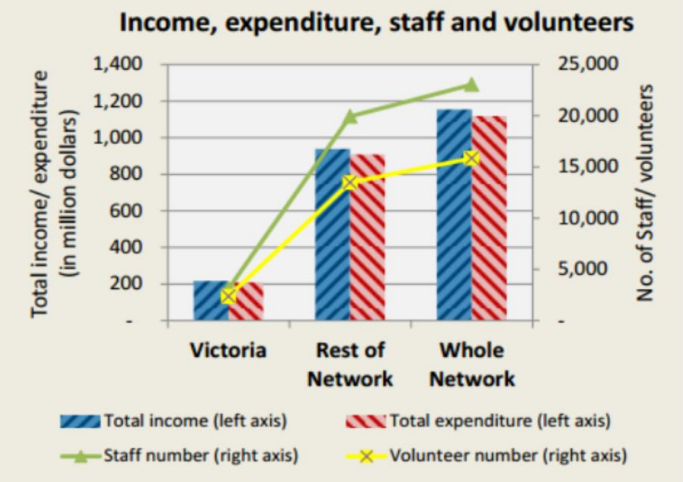
- providing quality innovative services for children and young people
- supporting vulnerable families
- promoting social justice.

The specific services provided by Anglicare Victoria include:

- placement and support
- family services
- community-based programs:
    - adoption, alcohol and drug counselling, chaplaincies, community building, counselling, disability support, emergency accommodation, emergency relief, family services, family violence support, financial counselling, foster care, homework club, juvenile justice group conferencing, out-of-home care, parent education, research and advocacy, victims assistance, youth services.

Anglicare Victoria is a member of the Anglicare Australia network, which provides services in over 50 different areas. Collectively, Anglicare Australia has a budget of over $1.15 billion per annum. 7.1 highlights the Victorian component of the overall network.

Exhibit 7.01: Anglicare Victoria Statistics 2011–12



Source: www.anglicare.asn.au/site/ad_vic.php.

Anglicare Victoria funds are largely generated through federal and state government grants and supported by donation and fundraising activities. Funds are directed towards the above range of programs, which are divided into three key areas of vulnerability, or to assist in times of crisis in people's lives. These themes also help with prioritisation of service provision and link to operational activities and the funding of research and development activities. The three key priority themes are:

- birth
- school age
- transition to adulthood.

While Anglicare Victoria's resource allocation is largely directed to the key services mentioned above, funds are also directed to staff wellbeing, research and advocacy programs as well as to activities to help build relationships with key stakeholders and develop new ways of working to meet the emerging needs of vulnerable people. The strategies of the organisation are evident when examining the key financial data. For example, the not-for-profit nature of the organisation is apparent, with all resources directed at the operating activities (described as "provision of direct services to children, young children and families, including infrastructure and support services"). The finances of the operating activities traditionally run into deficit and are supplemented by other annual fundraising and financial investment activities. Total non-current assets represent 63 per cent of annual income and largely comprise investments (59 per cent); property, plant and equipment (40 per cent), and intangible assets (less than 1 per cent). The property is largely Anglicare head office and site locations around Victoria, including residential and crisis accommodation. In classifying Anglicare Victoria's long-term investment activity, we would find the typical investments that most organisations make (financial assets; capital such as information technology and infrastructure). However, significant decisions must be made about allocation of long-term resources as well as meet compliance with not-for-profit standards set by the Australian Charities and Not-for-Profit Commission (see www.acnc.gov.au). In addition, when considering lease or buy decisions, attention is given to uncertainty of cash flows and the short-term nature of government program funding. Not-for-profits also face competition in the commercial property market, which can make outright purchases prohibitive. However, it is the social program investment that dominates strategic activity and decision making at Anglicare Victoria and is the focus of this chapter.

7.2 Industry: A broad overview

The industry in which Anglicare operates is made up of multiple organisations contributing in different ways to support the disadvantaged in our community. Each has a highly specific regional or demographic focus, with the overall industry segmented according to: people with substance abuse problems (5 per cent); people requiring palliative care (10 per cent); people needing crisis accommodation (25 per cent) and people with disabilities (physical, mental and intellectual) (60 per cent). The segments are loosely defined, and not mutually exclusive, with each associated with specific auxiliary service requirements that take a more holistic approach to an individual's needs.

Organisations operating in this industry are largely not-for-profit; charities, churches and benevolent societies, with the largest operators in this industry being The Salvation Army and St. Vincent de Paul Society Australia, with 4 per cent market share respectively. In Victoria, the largest charity is Mission Australia, which has 2 per cent market share and $324.7 million annual revenues. The Brotherhood of St Lawrence, like Anglicare Victoria, is a member of Anglicare Australia. In differentiating skills and service provision, the Brotherhood of St Lawrence focuses on the elderly and disabled support services, while Anglicare Victoria direct their attention to crisis accommodation and issues associated with children, youths or families in crisis. Anglicare Victoria is one of Victoria's largest providers of out-of-home care including foster care, residential care and youth housing.

With governments moving away from direct service provision and facility-based care to community-based accommodation and care, most of the revenue comes from government grants, client contributions and fundraising efforts. In general, it has been found that the key success factors in this industry are driven largely by:

- *ability to raise revenue from additional sources*. Industry operators need strong fundraising skills.
- *superior financial management and debt management*. It is important to keep capital and operating costs to a minimum while still providing the required level of service.
- *production of goods currently favoured by the market*. Meeting the residential care needs of disadvantaged people and minimising the level of unmet demand are important.
- *ability to allocate products and services to areas of greatest need*. Services should be provided to those people that are in most need.
- *ability to take advantage of government subsidies and other grants*. The ability to obtain all available government subsidies is important.
- *access to volunteer labour*. It is important to have access to reliable volunteer labour.[14]

These factors provide an indication of the competitive environment in which Anglicare Victoria operates, as the different charities are all tendering for government and donor funding. Profit-motivated organisations are less inclined to enter this market as margins are low and they do not receive the same tax concessions as the not-for-profit entities. Similarly, the stringent regulation, licences and accreditations required to operate in this industry make it difficult for new entrants. Government reforms in the welfare sector also contribute to an evolving landscape in which the longstanding key players either differentiate their service provision to key integrated areas of need, or merge with other groups to achieve the economies of scale needed to attract and serve a critical mass of clients.

7.2.1 Industry: Child welfare and out-of-home care

It could be argued that due to the long history of not-for-profit charities, churches and benevolent societies dominating this service delivery industry, revenue volatility is not as high as the volatility experienced by other non-essential service providers or organisations operating in the for-profit sector. The risks associated with long-term strategic decisions around capital expenditure are generally considered to be low as investments tend to be fully utilised and incrementally built upon when need arises. Nevertheless, growing competition exists among the variety of service providers for the same pool of government and donor funds. The government welfare budget is divided according to key strategic priorities, with child support a chief concern.

Given Anglicare Victoria's focus on the welfare of children, this aspect of the welfare industry can be further examined in terms of service provider expectations and associated government reforms, particularly around the provision of out-of-home foster care. This is an important segment of the welfare market, with the Australian Government budget for child protection and out-of-home welfare more than $3 billion nationally per annum.[15] Out-of-home care relates to the care of children by persons other than parents, organisations or institutions, usually under the jurisdiction of juvenile or family court. In evaluating the need for intervention in the welfare of children and young people, the government has prioritised "kinship care" as one of their key future objectives. That is, when children are unable to stay with their natural parents the best option is full-time care by relatives or adults who have a close relationship (through tribe, clan, godparent or step-parent

[14] Richardson, A. (2014), "Crisis and Care Accommodation in Australia", IBISWorld Industry Report Q8609, June 2014, p. 19.

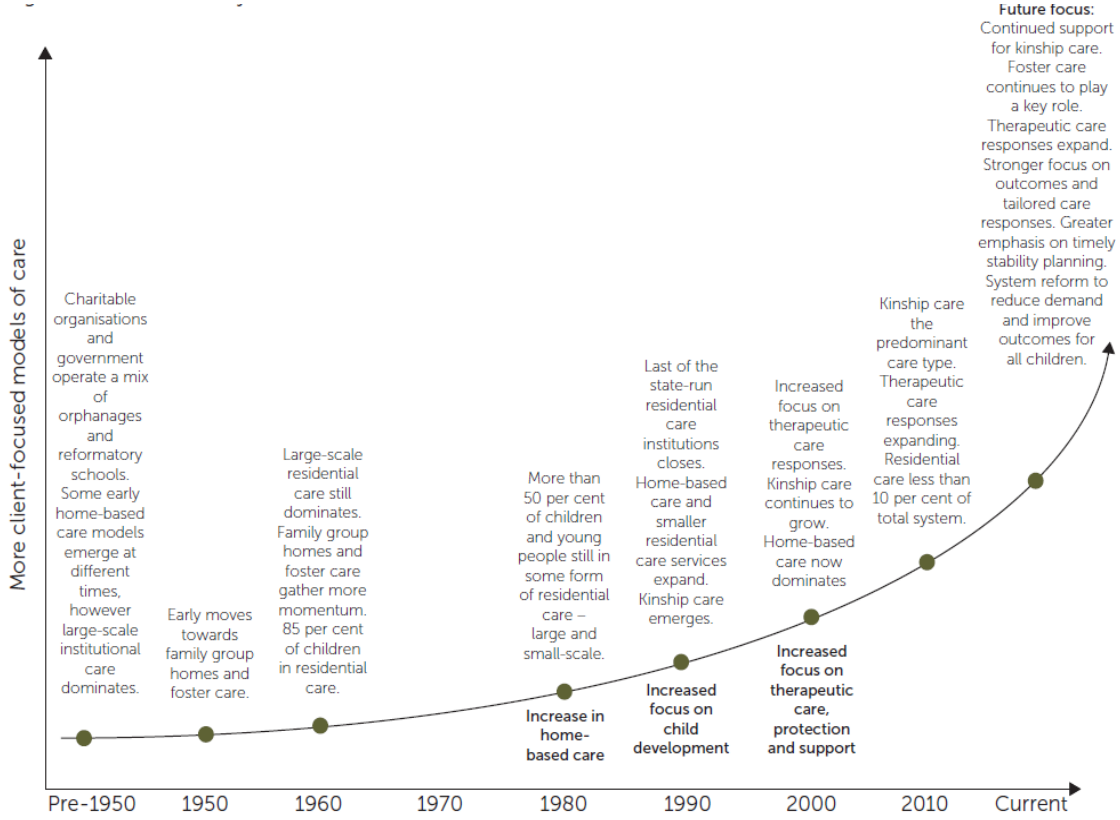
[15] Refer to www.aifs.gov.au/cfca/pubs/factsheets/a142118/.

relations). These relationships are respected on the basis of the family's cultural values and emotional ties. The institutional support provided by services such as Anglicare is necessary in order to facilitate kinship care as well as offer other services where kinship care is not possible.

A further key government priority is for service providers to demonstrate their ability to provide "therapeutic care" for young people with multiple and complex needs. Therapeutic care is defined as an approach that actively facilitates healing and recovery from the effects of abuse, neglect and separation from family (Department of Human Services (DHS), (2013)).

The changing government expectations are highlighted in Exhibit 7.02. This chart illustrates the move towards continued support for kinship care and a stronger focus on quality outcomes and tailored therapeutic care responses. As a result of this evolution of change, the need for transparency and verification of service provision is gathering increased attention. Thus service provider capabilities, not necessarily size and economics of scale, have resulted in developments in performance evaluation and greater justification of program expenditure in essential service provision.

Exhibit 7.02: Victoria's history of reform



Source: Department of Human Services, Victoria (2014), "Out-of-home care: A five year plan", accessed online, www.dhs.vic.gov.au/__data/assets/pdf_file/0010/864793/Out-of-home-care_a_five_year_plan.pdf.

In the allocation of funds to programs, the government reforms have described the way they now review service provider funding: "Organisations will need to demonstrate their capacity to achieve real-life outcomes for vulnerable children and young people in out-of-home care to qualify for government funding" (Department of Human Services (DHS) (2014), p. 5). In addition, only service providers who can demonstrate the provision of therapeutically informed care will be eligible to tender for government funds. They must demonstrate cultural sensitivity; have support services that offer more flexible and tailored approaches to care; provide "key workers"; have access to other programs and services and be able to explore all alternatives to residential care.

Thus successful service providers must be able to demonstrate the delivery of a more holistic, flexible, efficient, and therapeutic care and support service that focuses on outcomes for children and youths, as

opposed to service types, inputs or outputs (Department of Human Services (DHS), (2013)[16]). As a result of these changes, service providers are developing their own internal systems that will produce greater transparency of welfare provision through service integration and assist in discharging their activities to achieve improved outcomes. At the same time the systems must meet stringent efficiency targets and direct spending to areas of greatest need.

This strong focus on meeting desired social outcomes tends to dominate the mission, competitive activities and strategies of individual service providers. Further details relating to Anglicare Victoria's specific assessment and review tool around the educational achievement of children in out-of-home-based care are provided in the following section.

7.3 Managing program expenditure: Vulnerable children program

Most of Anglicare Victoria's goals are achieved through direct investment in community welfare, particularly focused on resourcing and empowering vulnerable children living away from parents in out-of-home care. Upfront capital expenditure is not necessarily required with this type of program investment. Generally, this industry is labour intensive rather than capital intensive, and expenditure is program-based rather than asset-based. Thus, Anglicare Victoria is more concerned with contract pricing and perpetuity of income support. To maximise the degree of support and their investment potential, Anglicare Victoria relies on government funding as its major source of revenue generation. While these funds are largely considered by governments as essential service provision for the benefit of the broader Australian society, the program funding is based on tenders and contracts awarded at a set price over a period of time. The margins are extremely tight and costs are frequently greater than the contract price paid. To meet the costs of service provision and add value to the care provided, Anglicare also relies heavily on donor support.

Anglicare Victoria provides placement and support to more than 340 children and young people every night (Wise, S. (2014)).[17] The *Transforming Educational Achievement for Children in Home-based and Residential care* (TEACHaR) is Anglicare Victoria's specialist education support program developed in response to research evidence that found that children and young people living in out-of-home-based care often experienced poorer education outcomes than those in the general student population (Wise, S., & David, L. (2013)).[18] The underlying issues that have resulted in the development of this program include:

- *personal factors* (traumatic experiences impacting cognitive language, socio-emotional and physical development)
- *home factors* (lack of parental encouragement and support; low value of formal education; lack of participation in school-based and outside school activities)
- *out-of-home-based care factors* (school changes caused by multiple placements; school absences caused by court appearances, visitation etc.; low expectations from carers and teachers; lack of participation in outside school activities; no constant education advocate).

The goals, initiatives, verification and outcomes of the specialist education support program are presented in Exhibit 7.03 and Exhibit 7.04.

Exhibit 7.03: Example of a specialist education support program — goals, measurement and verification

<table>
<tr><td colspan="8">TEACHaR Program*
Goals</td></tr>
<tr><td colspan="3">Attain literacy and numeracy skills to the same standard as other Victorian students</td><td colspan="3">Participate in compulsory schooling</td><td colspan="2">Complete Year 12 at the same rate as other Victorian students</td></tr>
<tr><td colspan="8">Holistic Approach — "Levers of Change"</td></tr>
<tr><td colspan="3">Student context</td><td colspan="3">School context</td><td colspan="2">Placement context</td></tr>
<tr><td>Engagement with school</td><td>Intensive learning</td><td>Personal support</td><td>Teaching approach</td><td>Education planning and</td><td>Intensive learning</td><td>Home-based learning</td><td>Care and case planning</td></tr>
</table>

[16] See "*Victoria's Vulnerable Children — Our Shared Responsibility Strategy 2013–2022",* accessed online.

[17] Wise, S. (2014), "Specialised educational support in an out-of-home care context: emotions, learning and lifelong health", PowerPoint presentation provided 22/5/2014.

[18] Wise, S., & David, L. (2013), "Transforming Educational Achievement for Children in Home-based and Residential care 'TEACHaR' Six Month Outcomes Report", November 2013.

and learning	*support*			*support*	*support*		
Initiatives — Intervention Approaches							
Funding of activities: *cultural interest, sporting*	*One-on-one tutoring*	*Advocating for specialist assessments* *Funding of allied health and alternate therapy*	*Teacher liaison on the impact of trauma on a child's educational ability to engage in learning*	*Heightening school's awareness of its responsibilities in accordance with the DEECD and DHS Partnering Agreement*	*One-on-one teaching and small-group focus teaching*	*Educational information and support to carers*	*Support and advocacy when transitioning clients into new educational placements*
Research in relation to alternative education placements	*Sourcing and funding of specific tutoring for clients in secondary school*	*Transport to and from educationally based appointments* *Rapport building activities*	*Support and discussion in relation to behavioural issues and appropriate management strategies*			*Development of educational plans for residential units*	*Provision of support and information to agency placement workers on educational matters* *Attendance at case plan/care team meetings*

Desired Outcomes		**Measures**
Support for children/young people in schools		Number of children with access to school-based learning mentor Number of children with individual learning plans Number of children with access to a student support group
School engagement, attendance and attitudes to learning		Average school attendance (32.5 hours represents full-time) Average number of days/weeks absent (over 4 weeks) Number of children disengaged at school now enrolled in school Number of children actively involved in learning tasks Number of children happy at school Number of children working hard or harder than other students Number of children experiencing school stability (placement changes)
Academic skills and achievement		Concentration skills at or above average Literacy skills at or above average Numeracy skills at or above average Academic performance matches ability Overall school performance at or above average
Home learning		Number of children who frequently participate in literacy activities at home (i.e. several times a week) Number of children with carers who talk to them about their school activities every day
Extracurricular activities		Number of children participating in increased number of cultural activities
Barriers to learning	**Student attitudes/behaviours**	Learning confidence; poor social/interpersonal/peer skills; willingness to learn; personal aspirations; self-confidence; school engagement/emotional connectedness
	School context	School culture; pedagogy; teacher effectiveness; teacher empathy; bullying; academic expectations
	Home context	Placement instability/breakdown and relationship breakdown

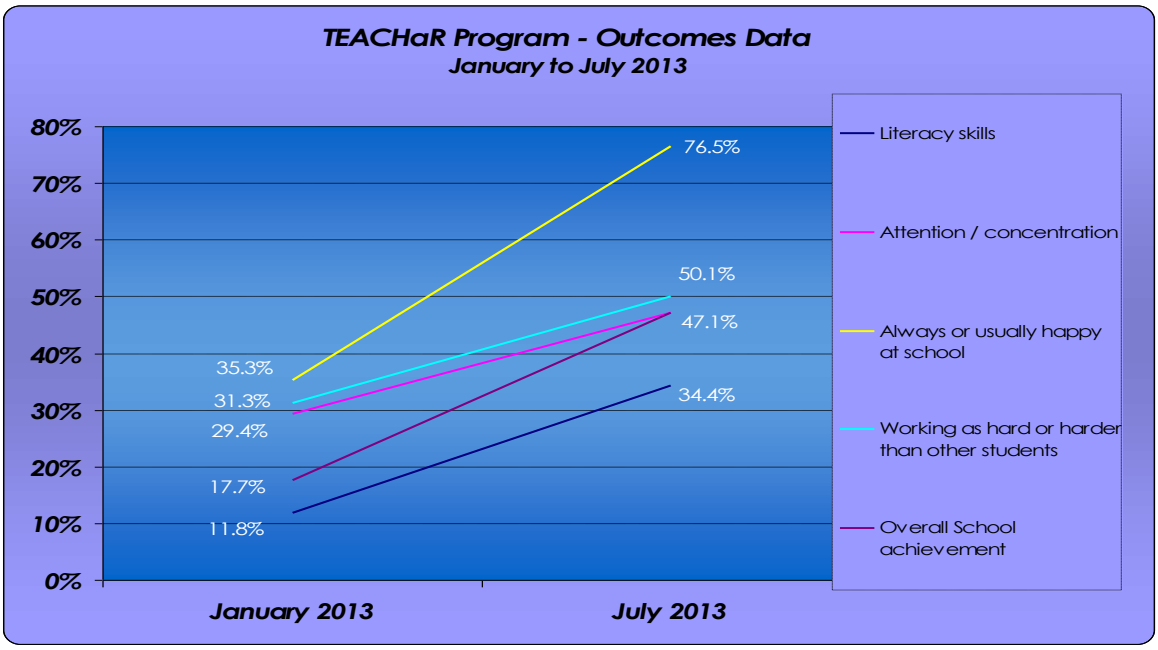
* Comparisons are made between foster care and residential care; Children and young people classification ages: 4–8; 9–12; 13+.

** The success of this program has also been monitored along a pseudo-experimental basis, using children and young people outside the program as controls.

Example of an individual intervention plan				
Intervention domain	**Summary assessment**	**Intervention goals/objectives**	**Actions work required**	**Timeline**
Personal learning *School participation and motivation/engagement*				

Academic skills *Mathematics and literacy*				
Interpersonal learning/development *Social/emotional/behavioural skills*				
Recreation and culture *Home learning environment and leisure activities*				

Exhibit 7.04: TEACHaR program outcomes data, 2013



This specialised education support program was made possible, not by government funds, but by donations from several prominent trusts and foundations. The funding has resulted in the employment of education specialists to run the program and enable a platform for ongoing research and innovation in this area. This support program also helps demonstrate the holistic, flexible and therapeutic capabilities of the service provider and strengthens their licence to operate as a welfare service provider. It also demonstrates the focus on measurement and qualitative outcomes as a result of investment in programs and draws attention to the areas to which scarce resources are directed.

7.4 Summary

Key issues to emerge from this case include the following:

- Anglicare Victoria has operated as a welfare agency since 1886, demonstrating its long-term mission to the community. Nevertheless, the ability to consider the perpetuity of commitment to long-term program investment is impacted somewhat by the short-term nature of government funding and the reliance on continued donor support.
- Investments via strategic commitments to welfare programs represent an alternative form of investment to the more traditional focus in the for-profit sector. Although Anglicare Victoria do invest in similar long-term infrastructure and associated operating assets, program investment represents their dominant long-term strategic investment activity.
- In these types of socially relevant investments, tight monitoring tools are important to manage funds and meet ever tightening government (community) and donor expectations. Meeting these tight controls is necessary to secure funds and enable continuation of the strategic commitment to such programs.

Chapter 8: Conclusion: Implications and Recommendations

8.0 Introduction

The focus of this chapter is to provide our observations and implications from our diverse set of case sites. We begin with a brief review of the cases and then provide the implications of each. We contrast the underlying nature of capital investments in each of the case organisations. These range from complex long-term infrastructure to program investments that, each in their own way, define the core essence of the organisation. Sustainability issues surface as part of strategic intent, a licence to operate, and the essence underpinning welfare calls to serve the disadvantaged in our community. We review the different capital appraisal typologies at each of the case sites and the ways in which information is used and monetised. In this chapter we also compare the role of qualitative information in the decision-making processes at each case site and include a consideration of sustainability as part of overall risk assessment. We conclude with a discussion of the role of accounting, and the accountant, and consider the ways in which integrated thinking is being recognised at each of our case sites. Our conclusion highlights key areas for further research.

8.1 Review of cases

Each of our case sites was chosen to provide a quite different setting from which to explore capital budgeting practices, the sustainability issues they confront and how sustainability is treated in the capital budgeting decision process. One of the key benefits of using diverse settings is observing differences rather than similarities. This facilitates our enhanced understanding of practices and consequently provides mechanisms to drive the education and professional development of accountants. The diverse settings and the extremely broad nature of sustainability, particularly in organisational settings, suggests one set of common practices is unlikely to emerge.

A summary of the case settings is provided in Exhibit 8.01. This highlights the diverse nature of our five case settings.

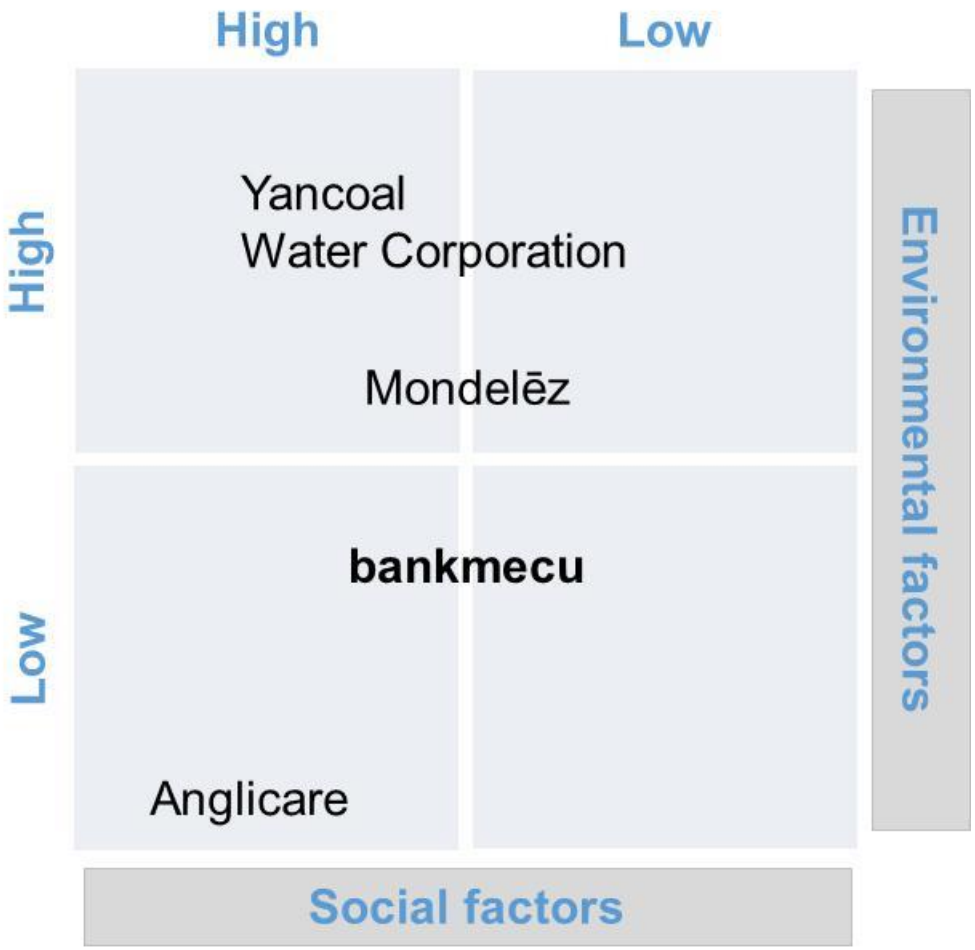
Exhibit 8.01: Case setting summary

Case site	Ownership structure	Industry
Water Corporation	Public utility	Water management and supply
Mondelēz International	Regional subsidiary	Manufacturing
Yancoal	ASX listed	Coal mining
bankmecu	Membership owned	Banking
Anglicare	Not-for-profit agency	Welfare

In terms of their exposure to sustainability issues, the impact of these on operations, and ultimately their likely influence on capital investment, varies significantly. Exhibit 8.02 provides a diagrammatic mapping of the differences between the case sites in terms of sustainability issues that are encountered.

The matrix in Exhibit 8.02 maps the case sites against the impact of environmental and social aspects of sustainability. For example, Yancoal and Water Corporation mapped in the top left-hand quadrant face significant environmental- and social-related issues. This is predominantly caused by the nature of their business (water and mining) and the consequent licence-to-operate/regulatory framework they find themselves in. Organisations in the bottom left quadrant are positioned in a more social-related setting driven by either their strategy (in the case of **bankmecu**) or the nature of their organisational activity (in the case of Anglicare). Meanwhile, Mondelēz, as a more traditional manufacturing organisation, faces moderate levels of environmental-related issues. However, given the social impact of farming and supply of their raw material, cocoa, they have higher levels of social-related issues to contend with. For example, they have implemented a third party verification process in relation to their multimillion-dollar Cocoa Life investment. These processes has been instigated to better measure and improve their impact on cocoa farmers and associated communities, as well as provide transparency of their supply chain activity (see http://ir.mondelezinternational.com/releasedetail.cfm?ReleaseID=853995).

Exhibit 8.02: Degree to which sustainability issues impact case-site context



The mapping of the case sites, in this way, provides an overview of the type and extent of sustainability-related issues that confront each of them. This also provides a window to the likely impact on the capital investment decision processes within each site. A further interesting observation regarding case-site differences is the time frame associated with investments. For example, most of the strategic investments undertaken by Yancoal and Water Corporation are extended over significant time frames. Moreover, the time assigned to the feasibility stage for these investments is often many years. It can be quite different for organisations like Anglicare, where investments rely on government funding and programs or investments are reviewed annually.

8.2 Observations and implications

In this section, we comment on our broad-level observations emanating from the five cases detailed in the previous five chapters. Our objective is to provide a set of observations and their implications that:

- informs the sustainability literature about the sustainability-related issues confronting organisations, particularly the differences across different industries, as well as how these sustainability-related issues have been captured and treated in the capital investment decision processes
- considers the degree to which integrated thinking is embedded in organisational settings within this framework of sustainability-related issues
- provides some evidence about the role of accounting and the accountant within organisations with respect to the capital investment decision processes
- contributes to the literature relating to the tensions around the monetisation (or not) of data and explores the different forms of information
- contributes to the capital budgeting literature around the decision processes.

We have organised our discussion around four subsections relating to the capital appraisal process in general: *the nature of capital investment*; *project classification models*; *information and monetisation*; and *decision-making processes*, including *risk management*. Each is discussed in turn. This is followed by a discussion of the broader role of sustainability in corporate decision making and, finally, of accounting and associated communities of practice.

8.2.1 The nature of "capital investment"

In Chapter 1: Introduction, we outlined the definition and examples of capital investments as articulated by IFAC (2008) and IFAC (2013). The focus of this and other definitions is often on the size of the investment. This makes sense, of course, as expenditure with little economic benefit beyond one year is not likely to be classified as capital expenditure. However, the diversity of our case sites triggers further curiosity around the definition of capital investments. One dimension of interest is the idea of strategic investments or strategic commitments, particularly in "outlier" organisations such as those with a social welfare orientation or with narrow ownership structures.

Anglicare, as a social welfare–based organisation, does not engage in capital investments that would fit the traditional definition. For example, the nature of its operations does not necessitate a large investment in infrastructure assets. Given the timing and uncertainty associated with its funding sources (for example, annual government contracts with no certainty of ongoing commitment and donations that rely on community and corporate support), significant loan funds may be difficult to both secure and repay. Despite this, the organisation has to commit its financial resources to programs that will meet its mission. These programs are not short term in nature, but rather determine the ongoing operations into the foreseeable future. Anglicare's programs are not profit focused, and as such, a return on investment is not considered in the traditional sense. The returns generated by the programs are measured by the benefits that accrue to both the beneficiaries and society as a whole. Social rather than financial outcomes are critical for measurement of success.

Key expenditures are targeted as strategic commitments in specifically designated welfare programs. In this sense, there is little difference between this expenditure and "marketing programs to enhance brand recognition", which is used as an example of a capital investment. Moreover, this type of investment may not necessarily have the property of a one-off, upfront capital outlay. Instead, the expenditure may be spread over the period for which the specific program is expected to run, which may be multiple years. The choice of programs (driven by strategy) determines a range of other expenditures, such as staffing and training. We tend to think this type of investment should be included as typical of a capital investment for particular organisations.

Moreover, a number of our other case sites (for example, Mondelēz and the Cocoa Life project) made community-type investments that required little in the way of significant upfront expenditure, and hence might not qualify as an asset on the balance sheet. Nonetheless, these formed important strategic commitments by the organisation, often resulting in qualitative benefits such as community and social benefits and reputation building.

One implication of this observation is a slight recalibrating of the definition and/or, at the very least, an extension of the examples used to typify capital investments. For example, *strategic commitments in specified programs with [potential] long-term community and welfare benefits* seems to qualify as an investment in the welfare sector as well as social commitments in the for-profit sector.

8.2.2 Project classification models

We have been able to observe the types of classification models for capital investment projects. We know from the literature, as discussed in Chapter 2: Literature and Background Review, that common classification models include the distinction between strategic and operational (Adler, R.W. (2000); Alkaraan, F., & Northcott, D. (2006)). Others have suggested more detailed classifications, such as including the use of regulatory investments (see, for example, Simons, R. (2000); Vesty, G., Oliver, J., & Brooks, A. (2013)). Our interest here is how, if at all, our case sites have operationalised their capital investment classifications, and whether this has any broader impact or application.

The first interesting observation is that a number of our case sites did use formal classification models for their projects, and in some instances the nature of the classification influenced the form or extent of analysis. We encountered some different classification models in use. These are summarised in Exhibit 8.03.

Exhibit 8.03: Capital investment classification models used

Case site	Investment classification model	Comment
Water Corporation	Simple	Low-scale project with relatively simple solution
	Complex	Common investment containing social and environment complexities
	Very complex	Major infrastructure or high technical complexity and/or high social and environmental impacts
Mondelēz	Administrative requirement	Regulatory and information systems investments
	Cost reduction	Operational/replacement
	New venture	Strategic
	Corporate-level investments	Corporate-level managed investments
Yancoal	Sustaining investments	Operational investments undertaken to maintain current performance
	Business improvement	Operational investment for incremental improvement
	Growth	Strategic investments such as new opportunities
	Compliance and regulatory	Required investments to meet regulations
bankmecu	Not formalised internally	Our categorisation would be: – lending practices – community programs – strategic investments.
Anglicare	Not formalised internally	Our categorisation would be: – strategic commitment to program investment – support infrastructure and operating investments.

What Exhibit 8.03 highlights is the prevalence of the use of formal classification models. Three of our five case sites use these formal classification models as part of their investment appraisal process. Moreover, we were alerted to a further classification type at one of our other case sites, **bankmecu**, which used a specific classification of *community investments*. Moreover, Anglicare was confronted with administrative (such as IT investments) and regulatory-type investments.

The implication of these observations is to suggest a broadening of the commonly used dichotomous classification models of *operational* and *strategic* to at least a four-class model:

- regulatory or compliance investments
- operational and business improvement investments
- strategic and new venture investments
- social and community investments.

8.2.3 Information and monetisation

Three key issues emerged from our case sites around the inclusion of sustainability-related factors in capital investment decisions:

- the nature of the information itself
- the form in which the information is used

- how the information is used.

As explored by Brooks, A., Vesty, G., & Oliver, J. (2014), the prevailing literature has taken a rather blunt view of information, with broad-based classifications such as financial and non-financial, or qualitative and quantitative.

Sustainability-related information is often captured, in the first instance, in a non-financial form. Examples of different types of information considered in the capital investment appraisal process at our case sites are included in Exhibit 8.04. This is not intended as any sort of exhaustive list. Moreover, all of our case sites were confronted with issues associated with OH&S and waste-level issues.

Exhibit 8.04: Examples of sustainability-related information used in capital investment appraisal

Case site	Examples of information
Water Corporation	Energy and utility use Discharges to the environment Land clearing Heritage/social/community impacts
Mondelēz	Utility use Changes to packaging impacts Supply-chain effects Noise levels Waste levels Occupational health and safety effects
Yancoal	Offset programs and expenditure (such as biodiversity offsets) Social-related items in local communities Carbon emissions Energy and utility impacts Occupational health and safety issues Land rehabilitation Reputation impacts
bankmecu	Impacts of loans on environment Biodiversity loss from loans use Energy and utility use Reputation impacts
Anglicare	Community and social welfare benefits (such as out-of-home housing for children and disadvantaged youth) Crisis housing

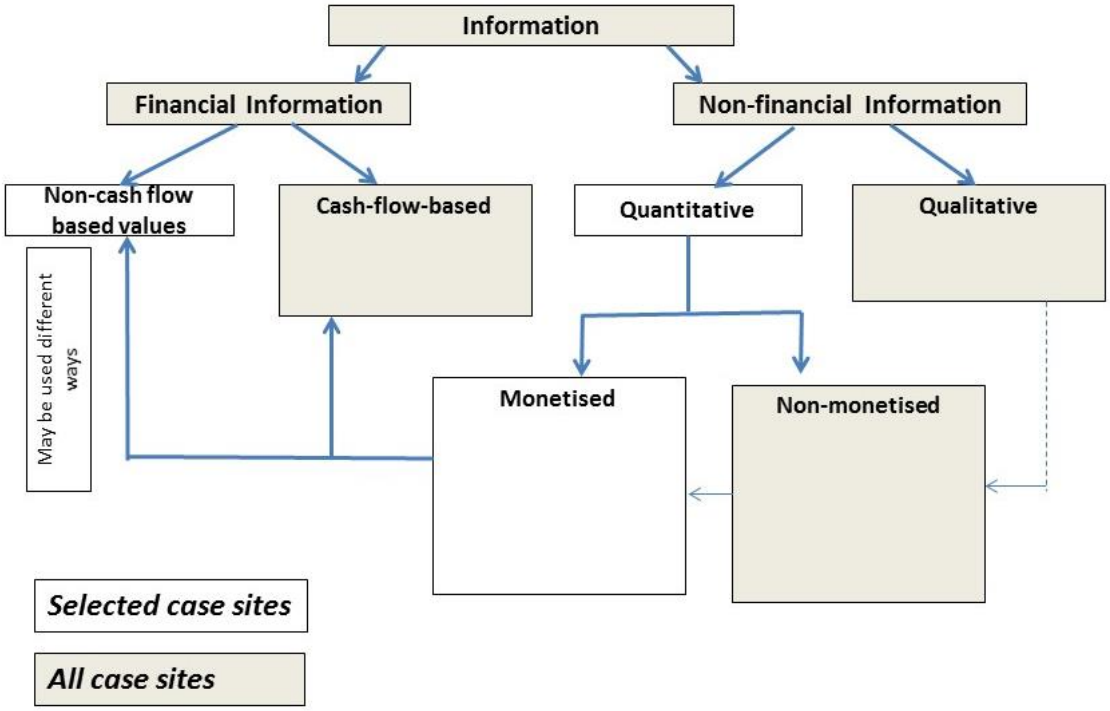
Once the information required for inclusion in the capital investment appraisal process is captured, the challenge then is what form it should take. For example, should qualitative information remain qualitative? Should it be quantified? If quantified, should it be monetised? If it is monetised, does the amount represent a real cash flow?

In Chapter 2: Literature and Background Review we introduced our broader-level view of the use of different types of information (see Exhibit 2.08) in capital investment appraisal. The trail of connections in Exhibit 2.08 illustrated the multiple forms of information and how that information may be transformed into other forms, affecting the way in which it might be used in the capital investment appraisal process. As discussed in that chapter, tension exists in the literature around the benefits and shortcomings of monetising non-financial information.

We found that our case sites use information in all forms illustrated in Exhibit 2.08. To illustrate, we have provided an amended version of this exhibit here in Exhibit 8.05. Exhibit 8.05 provides examples of the way

our case sites used these information types in their capital investment appraisal process. As illustrated, all case sites used financial, non-financial, qualitative, cash flow–based and non-monetised information at some time in the capital investment appraisal process. Meanwhile, only some of our sites monetised quantitative information and used values that were not cash flow based.

Exhibit 8.05: Information types in capital investment decision making: Use by case sites



While it can be difficult to distinguish between the form the information is in and the process of decision making, Exhibit 8.05 and Exhibit 8.06 make some attempt at doing this. One of the issues to consider further here is *how* the information is used. Our observations across the case sites in this regard include the following:

- Qualitative information is in the main used in a narrative form within the context of robust discussions. Each company is concerned about the impact of decisions on reputation, brand, employees and the community. For example, Yancoal tends to include in these discussions a consideration of the impact of a new strategic project across a range of qualitative criteria. Political considerations also play an important role in their decision making processes. Moreover, Mondelēz tends to consider qualitative information in its Quality, Safety, Environmental and Operational risk assessments. bankmecu relies on extending the bank's philosophy around sustainable banking to informed and deliberated lending decisions. Water Corporation will consider the qualitative attributes of a potential investment at the outset, describing the sustainability-related impact across a range, from *preferred* to *not desirable*. For Anglicare, the qualitative information informs the investment focus while the quantitative data is secondary but crucial in the accomplishment of desired outcomes. At Water Corporation and Yancoal sustainability considerations are included as part of the executive remuneration program.
- Non-monetised information such as physical flows and the like are also considered in this form by Mondelēz in its risk assessment process, while for Water Corporation a lot of information that starts out as non-monetised is eventually monetised through the use of valuation sources such as databases and the prevailing literature. As explored in Chapter 2: Literature and Background Review, one of the tensions around information use is the monetising issue. Nevertheless, one of the implications of the monetising of initially non-monetised information such as physical flows is the need to use relevant and up-to-date valuation sources. Going forward, this is likely to be a continuing challenge for those organisations trying to monetise as much information as possible in their decision-making models.

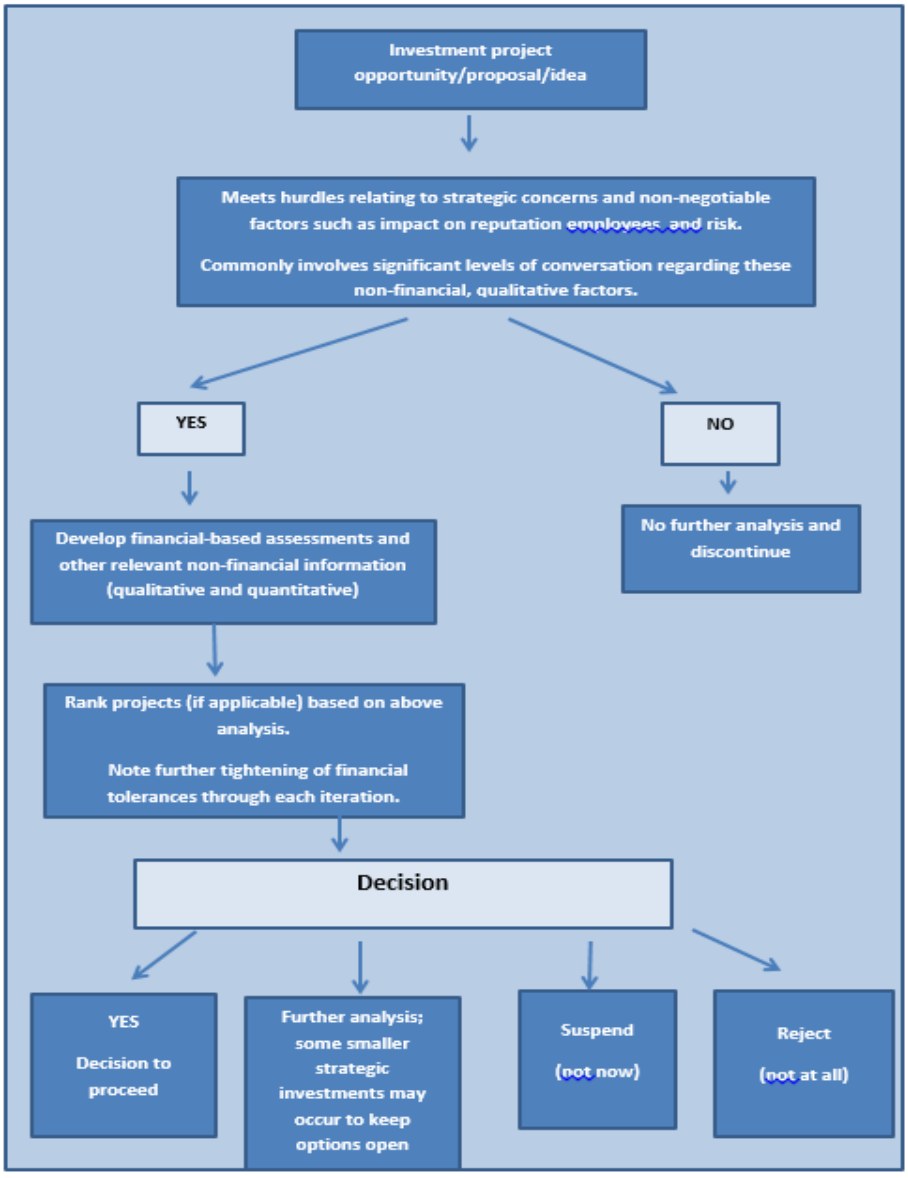
8.2.4 Decision-making processes (when the information is used)

In Chapter 2: Literature and Background Review we developed from Simons, R. (2000) earlier work some interesting insights with respect to the broader decision-making process used in capital investment decision making. We illustrated this in Exhibit 2.08 and Exhibit 2.09. From discussions and observations at our case sites, the multifaceted nature of this decision-making process was reinforced. We have reworked Simons, R. (2000) original diagnostic model of decision making (Exhibit 2.08) and our earlier adaptation (Exhibit 2.09) to illustrate the case-site examples. This is highlighted in Exhibit 8.06.

Within this multifaceted view, we particularly note:

- the different role performed by qualitative and financial information at different stages of the process
- the changing nature of the accountant's role across the different stages.

Exhibit 8.06: Capital investment decision-making process



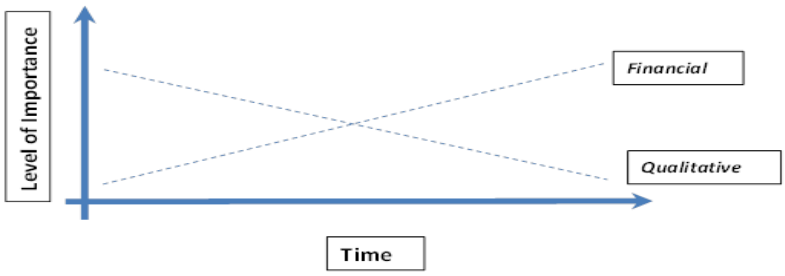
Source: adapted from Simons, R. (2000) and discussion in the literature review (see Chapter 2, p. 23).

It seemed to us that the qualitative information played a crucial role in the very early stages of the decision process. For example, threats to strategy or the non-negotiable (such as a negative impact on OH&S) would stop any further analysis and the project would be shelved. At this early stage, the extent of financial analysis might be minimal; one case site referred to this as *back of the envelope–type assessment*.

Moreover, when the project did proceed to further stages of analysis, two interesting observations became apparent:

1. While not evident in all case sites, frequently as time passed through the decision stages, the role of the qualitative and the financial information essentially reversed, much like that depicted in Exhibit 8.07.
2. As the financial analysis became more detailed, the tolerance levels on the sensitivity analysis tightened.

Exhibit 8.07: Role effects of qualitative and financial information through decision stages



As highlighted in Chapter 2: Literature and Background Review, in many ways the entire capital budgeting process is about risk management. Until relatively recently, the study of risk and risk management was more or less absent from accounting-focused curricula. We cannot underestimate the importance placed on risk management at each of our case sites. This surfaced in different ways. For example, one of our observations was the use of a risk matrix by each of the organisations to expose risk levels within the capital investment appraisal process. The relatively generic template used by Yancoal to identify risk exposures (see Exhibit 5.04) appears to be commonly used in the mining industry. Likewise, the one used by **bankmecu** would traditionally impact the banking sector. Mondelēz and Water Corporation routinely use a risk assessment matrix for all investment decisions. In particular, Water Corporation uses this model to compare the varying investment options. While not a template document, risk assessment at Anglicare is implicit in their strategic choices, monitoring processes and careful management of each of their investment programs.

Further attention to the more widespread adoption of a risk matrix within the capital investment appraisal process is suggested, particularly given the risk matrix's capacity to facilitate a more holistic view of risks. This can provide a better overall assessment and understanding of the risk exposures an organisation confronts.

8.3 Broader role of sustainability in corporate decision-making

In each of our case sites sustainability issues surfaced in different ways and consequently influenced decision making differently. As demonstrated in Exhibit 8.02 the nature of the sustainability issues was different across organisations. The main drivers of these differences seemed to be the following:

- *Strategy*. Strategy as a driver of sustainability was more evident in two of our organisations, **bankmecu** and Anglicare. **bankmecu** is an interesting case due its distinctive ownership structure. Being a member-owned bank that evolved from a number of different credit unions, the bank's strategy is driven by its members (in effect, its owners). The organisation's strategy focuses on a social consciousness that permeates the operations and decision making within the organisation. Similarly, Anglicare's strategy and key activities revolve around a social consciousness that permeates the activities and decision making of the organisation.
- *The industry and the nature or organisation's activity*. For example, Mondelēz is a relatively standard manufacturer of consumer products including chocolate and cheese. Its sustainability issues are more mainstream (water, energy, supply chain management) than other sites such as Yancoal and Water Corporation, where the core activities in themselves place sustainability issues front and centre of their decision making.
- *The regulatory environment and the extent to which the organisation is exposed to regulation*. For example, Yancoal confronts a range of sustainability (environmental and social) issues in achieving their licence to operate. In effect, many of the sustainability-related issues the organisation faces are encountered and assessed during the lengthy approvals process to which the organisation is exposed.

Combining this more highly regulated organisational environment with key activities of the industry and organisation, as described above, exposes Yancoal and Water Corporation to a significant element of environmentally-related issues. In these settings, sustainability in itself is no special case. Consequently, in these types of organisations, we need to stop looking to treat sustainability as something incremental or special.

Another interesting issue relates to the mixed messages associated with the use of the term *sustainability*. As Gray, R. (2010) has pointed out, the term itself is problematic. For example, in some organisational settings it is interpreted as meaning "financial sustainability". While clearly related to the broader meaning, when used in this context, it is possible little if any meaning is attached to environmental, social and ethical issues. Secondly, there are times when the term had virtually no meaning at all. In these settings, it wasn't that sustainability issues were not important, but that they just weren't afforded that label.

The implication of these observations is that we need to be wary about how and when we use the term *sustainability*. While the academic community might be comfortable with it and its meaning, in practice its usage is a little more problematic.

8.3.1 Integrated thinking

In drawing together the observations from the varying case sites, we can reflect on the notion of integrated thinking within the case organisations. As highlighted in Chapter 2: Literature and Background Review, an integrated thinking approach is useful to provide categories of sustainability-related factors that can be conceptualised from an internal management accounting control perspective. These include:

- senior management commitment to sustainability
- sustainability devolved throughout the organisation
- sustainability embedded in management control system designs.

In all our case sites the consideration of sustainability factors was driven by senior personnel. We noted varying ways in which sustainability was devolved throughout the organisation. For example, at **bankmecu** it was an overarching philosophy that helped guide employee actions and lending practices. Well known for their strategic intent around sustainability, the bank also attracted customers as a result. When considering the degree to which sustainability was embedded in control system designs, we found social and environmental considerations were the key inputs considered in the early stages of the decision process at most of the organisations and in some ways were the "deal breakers" as the decision process moved forward.

Integrated thinking also draws attention to the different forms of capital that can influence investment decisions and are described in integrated reporting's business model*: financial, manufactured*, *intellectual*, *human*, *social and relationship* and *natural* capital. The capitals do not necessarily need to be owned or controlled by the company but are "stores of value" providing specific inputs that will enable the company to add value to the capitals through their business cycle. Each of the capitals utilised can be increased, reduced or transformed through the investment process (IIRC (2013)). A snapshot of some of the key examples of capitals that were material to each of the case companies is highlighted in Exhibit 8.08.

Exhibit 8.08: Examples of capitals that were material to each of the case sites

Human capital and intellectual capital	All companies demonstrated some form of commitment to developing learning communities to share ideas and execute plans more efficiently and effectively, as well as ensuring a safe work environment for its people. Physical health and wellbeing dominated at Yancoal and Water Corporation, whereas for Anglicare importance was placed on the intellectual capabilities of their employees to innovate and find ways to better navigate through the welfare system to optimise client care.
Natural capital	Both Water Corporation and Yancoal faced natural capital issues on a daily basis, including finding new ways to design sustainability into their operations to minimise the toll on the planet. **bankmecu** used offset mechanisms to direct attention to the importance of natural capital.
Financial capital	While all our for-profit companies clearly focused on financial capital and returns to shareholders, Anglicare placed importance on managing the financials as efficiently as possible in order to achieve their stated welfare aims. They focused very closely on the cost per delivery and were proud to be running one of the leanest welfare agencies in terms of administrative overheads.
Manufactured capital	Yancoal was involved in the development of distribution capabilities through the port

	and rail infrastructure they heavily relied upon. Mondelēz ensured they designed their Cadbury chocolate packaging to be light and recyclable, reducing the fuel used in transportation of products. Most reported that they were working at reducing waste in the production process, reducing the amount of water and energy required in production.
Social and relationship capital	With all companies, we found support for the local communities by investing in programs and inspiring employees to invest time and skills in community initiatives. For Mondelēz, investments were directed towards empowering farming communities to manage the resources to the best of their capabilities, using third party verification to ensure they are contributing to the cocoa farming communities in Ghana and other key supply areas.

Finally, when considering integrated thinking and the bringing together of alternate and sometimes competing views, we have been able to reflect on the incorporation of natural and social capital considerations into financial decision making and strategy and the potential of coming up with new innovative approaches that capture the essence of the competing views, but are superior to both. We consider that integrated thinking is present and developing. There are many forces that have contributed to this world view, such as changing regulatory requirements and the licence to operate, the need to foster improved business reputation, or as in **bankmecu** and Anglicare's cases, the social and moral compass of the organisation. Innovation is occurring in varying ways, but largely with processes and practices that are outside the accounting system, or if included remain hidden.

8.4 The role of accounting and the accountant

While not specifically seeking to explore the role of accounting and the accountant during our investigations, the issue seemed to continually emerge for us. First of all, we should distinguish between *accounting* and *the accountant*. There is a lot of accounting being undertaken, sometimes by accountants, but sometimes by others. From our observations, these *others* might include managers in strategic-type roles; sustainability managers and those responsible for environmental-related issues; engineers; and economists. This diversity was reflected in such work as: generating cost information and cash flow data for capital investment decision making; participation in decisions about offset programs; developing the capital investment models in use; managing the capital investment models as members of relevant decision-making committees; developing qualitative information for decision making. Much of this activity is captured in the management accounting realm. The development of this management accounting knowledge and practice stems from:

- the educational environment where management accounting content is explored not just in accounting programs but in other discipline areas that explore areas of management accounting study
- within embedded organisational practices where the accounting work is spread throughout different work units.

In their paper about the role of the accountant in the sustainability era, Clarke, K., and O'Neill, S. (2005) wondered about the capacity of the profession to meet the information needs of organisations. Our observations would suggest that *accounting* is certainly central in the capital investment decision processes; while the role of *the accountant* tends to vary from the more traditional role of decision facilitating through the delivery of key cash flow analysis, a range of iterations as a support mechanism to decision makers, to the more contemporary role of decision influencing through participation in strategic decision making. A point worthy of note is that the traditional role of accounting should not be underplayed. The complexities of the environment in which contemporary organisations find themselves demands robustly generated accounting information (however defined) that can be relied upon at least within the given range of assumptions. To this end, this is a crucial role within organisations.

These roles are important ones and ultimately have an impact on the decision outcomes. However, there are many aspects of the overall decision process that accountants don't necessarily participate in. For example, we have witnessed economists driving new decision models to capture sustainability-related factors in decision-making processes; a chief operating officer developing the full net-present-value analysis of new products; sustainability-related issues identified and included in analysis by environmental managers.

The implications of these observations include:

- the continuing need for the profession to consider the distinction between the *accountant* and *accounting*, including the more specific comparison of the *management accountant* and *management accounting*

- the need for greater consideration of where in our university programs, management accounting studies are undertaken and the nature of those studies. Moreover, what view of accounting is conveyed?
- the need for a consideration of the multidisciplinary nature of a lot of our accounting work and "topics"
- professional development programs structured to capture the nuances of accounting as portrayed in the three points above
- increasing promotion of the important traditional role of accounting within organisations as a trusted and reliable source of robust analysis supporting decision-making contexts.

8.4.1 Communities-of-practice

An unexpected observation was the participation of some of our organisations in what amounts to *communities-of-practice*. The communities-of-practice literature emerged in the 1990s and has been closely linked to management learning. Huber, G.P. (1996), p. 628, describes *communities-of-practice* this way:

> *Communities-of-practice are the relationships people strike up to solve problems (though they may be influenced by formal role relationships as well). Within communities-of-practice, people share tacit knowledge and through dialogue bring this to the surface; they exchange ideas about work practice and experiment with new methods and ideas; they engage in discussions which affirm or modify theories in use; they innovate new problem-solving routines and simultaneously manage and repair the social context. In other words, they engage in experiential learning, develop and refine cognitive structures, and engage in culture formation. Through linked communities-of-practice, knowledge, rules for action, and culture are spread…*

In our context, communities of practice might stem from a number of sources such as those with memberships in specific groups or projects such as **bankmecu**'s involvement in the Integrated Reporting pilot initiative; or from participation in industry-based initiatives such as Water Corporation's lead role in modelling sustainability-related issues in capital investment appraisal.

The benefits to flow from these *communities* include the sharing of ideas and information around improved practice. We would suggest this is one of the best ways to disperse improved practices and may ultimately lead to such practices being embedded within organisations.

8.5 Concluding comments

In this book we have provided a comprehensive overview of the state of capital investment appraisal. Using five very different case organisations, we were able to consider more deeply the nature of capital investment in each and how sustainability-related issues impacted throughout their entire decision processes. As a result of this detailed study, we recommend continued research in this important, but very much under-researched, capital investment domain. In particular we suggest further research for a more detailed understanding of the values and weightings placed on the difficult-to-quantify sustainability impacts. While government agencies are developing economic models to use for cost-benefit analysis and issues relating to biodiversity impacts, there is minimal research on the connections and translations into accounting models and associated business decisions. In addition, we found evidence of the traditional role of accounting and the provision of detailed cash flow data for decisions, but increasingly this is sitting alongside non–cash flow data and values that play a very significant role in the decision-making process. If accounting innovation as a result of integrated thinking is to endure, then accountants and accounting research must continue to play an important role in this change. To achieve this, the accounting profession will need to be at the centre of future developments.

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