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ENVIRONMENTAL AND SOCIAL MANAGEMENT ACCOUNTING: ITS CONTRIBUTION TO BUSINESS SUSTAINABILITY

DISCUSSION QUESTIONS

1. Sustainability has different meanings to different people. There are over 300 definitions for the term 'sustainability'. The best-known definition of sustainability that 'sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs' has been issued by the Brundtland Commission of the United Nations on March 20, 1987. This definition has been supplemented in more recent times to provide a more inclusive meaning that 'sustainability is improving the quality of human life while living within the carrying capacity of supporting eco-systems' [IUCN/UNEP/WWF, 1991, *Caring for the Earth: A Strategy for Sustainable Living*, Gland, Switzerland]. Another definition added by The Earth Charter Initiative (see <http://earthcharter.org/>) is 'a sustainable global social justice society founded on respect for nature, universal human rights, economic justice, and a culture of peace'. From this range of definitions it can be seen that the nature of sustainability is multifaceted because it includes social (employees and the community), environmental and financial perspectives.

2. The five major frameworks in accounting literature that formed the basis of the concept of sustainability are:
 1. The agency framework that requires shareholders' funds to be used exclusively for maximising the value of the organisation.

 2. Corporate social performance (CSP) framework that argues the pursuit of corporate social responsibility (CSR) goals should be associated with improved financial performance.

 3. The resource-based view (RBV) framework that argues financial performance is improved and a competitive advantage is experienced by the organisation.

 4. The supply and demand framework places a primary focus for the level of CSR investment on satisfying stakeholders' demands for CSR.

 5. The stakeholder theory framework recognises that organisations need to understand (a) how their actions are affected by relationships with many internal and external (stakeholder) groups, as well as (b) how many of these stakeholder groups are influenced by organisations' actions.

3. The first bottom line of sustainability is social responsibility (people), the second bottom line is the environment (planet), and the third bottom line is economic (profit). Triple bottom line accounting is of interest to 'for-profit' and 'not-for-profit' organisations, as well as government sectors: federal, state and local.

4. The theoretical underpinning of business and corporate sustainability is linked to four conceptual pillars: (1) The sustainable development concept has been described as development necessary to meet the needs of the present and future generations; (2) The stakeholder concepts are (a) the recognition that the global impact of businesses on climate and cultural changes is of concern to all stakeholders, and (b) the acceptance by businesses that each stakeholder group has different goals, priorities and demands; (3) The corporate social responsibility concept is based on the ethical responsibility argument that businesses should consider the needs of all stakeholders, not just shareholders or business owners; (4) The concept of business accountability relates to a legal and ethical responsibility by business to all stakeholders and this concept demands transparency of information that communicates, explains, justifies and reports business activities and outcomes of these activities to all stakeholders.

5. It is imperative for businesses to adopt sustainable systems and processes; irrespective of the size of the business because a large organisation will have an extensive value chain while a small-to-medium enterprise (SME) business probably will be part of a larger organisation's value chain. The adoption of sustainable systems and processes has become a prerequisite for the selection of suppliers by business and government sectors as well as by customers.

6. According to the Chartered Institute of Accountants and KPMG, there are many issues that underpin the building and implementation of a sustainability strategy while embedding sustainability as a core value within business processes and creating value within the business through measuring, monitoring and reporting performance. Some key considerations about systems and processes needed as part of an organisation's attempts to be a sustainable business are: (1) The source of raw materials because organisations need to know the sustainability of the supply of raw materials through an audit about the adequacy of suppliers' processes and the impact of transactions with such suppliers on the business' sustainability; (2) The production process because it offers the greatest gains in sustainability through savings in energy and reducing waste by using efficient plant and equipment; (3) The use of recycled packaging and 'greener vehicles' for product distribution; (4) The employee acceptance and commitment to sustainability initiatives of the organisation.

7. The six phases of organisational sustainability represent different reactions by organisations to the acceptance of organisational sustainability. These six phases represent stages at which an organisation is placed with regard to the acceptance of the need for organisational sustainability. Effectively, Phase 1 represents one end of a continuum and phase 6 the other. Organisations that may be categorised as positioned in phase 1 actively reject the need for sustainability and concentrate on a profit maximisation primary focus, which reflects an exploitation approach to society, employees and the environment. Organisations positioned in phase 2 have not yet responded or progressed towards sustainability mainly because management view sustainability as an unnecessary cost and ignore their stakeholders' concerns. The third phase has two levels. The first level of this third phase is known as an introverted strategy and exhibits the organisation's decision to manage and reduce risk by focusing on sustainability issues that represent the highest litigation risk. The second level of phase 3 is known as an extroverted strategy where self-regulation is the preferred action as a strategy to oppose regulatory imposition. The fourth phase represents organisations that display an increased appreciation of sustainability issues. In this phase 4 involves transitioning into a sustainable management system where there is an emphasis on energy (and other non-renewable resource) cost savings through an efficiency (productivity) strategy. The fifth phase signifies the point at which sustainability becomes of organisation's mission and core strategy and these organisations focus on a long-term growth strategy using the sustainability initiatives as an innovation differentiation strategy. This innovation strategy may range from innovative processes to minimise carbon emissions, innovative products that may be used in a cradle to grave life-cycle and minimising the impact on their disposal after their life usefulness, or use of innovative production equipment and processes to minimise poor quality products or services. The sixth phase is the other end of the continuum and involves completely embracing the sustainability ideology. Management for organisations within the fourth to sixth phases should employ the four strategic management processes developed by Kaplan and Norton (1996, 2007).

8. Businesses, irrespective of their size, need to consider adopting sustainable systems and processes. The two reasons why organisational sustainability is becoming more important are, firstly, the importance relates not only to help reduce the impact of climate change and conserve limited natural resources, but also to enhance the competitiveness and reputation of the business. Furthermore, many organisations are not vertically integrated from the raw material through to the retail outlets and therefore the organisation needs to recognise that it is important to have a sustainable value chain first before business sustainability can be achieved. That is, it is imperative for businesses to adopt sustainable systems and processes, whether the business is a large organisation with an extensive value chain or one of the small-to-medium enterprise (SME) businesses within an organisation's value chain.

The adoption of sustainable systems and processes has become a prerequisite for the selection of suppliers by business and government sectors as well as by customers and the community. Many organisations operating in Australia (such as Visy, Unilever Australia, and Dark Horse Print & Design) have embraced organisational sustainability. Also, CPA Australia as well as KPMG have identified that businesses that embrace sustainability are seeing benefits from their efforts, specifically the implementation of a sustainability strategy while embedding sustainability as a core long-term value within business processes and creating value within the business through measuring, monitoring and reporting performance. The benefits are received through the effects of a productivity strategy that focuses on minimising the cost of energy and other non-renewable resources (phase 4 organisational sustainability) and through innovative growth strategies that reflect the long-term values of the organisation that has embraced sustainable business (phase 5 organisational sustainability).

- 9.** While the manufacturing and mining industries have a strong visual impact on the environment, the impact of businesses in other industries also has an effect on the environment. Further, the broader definition of sustainability includes social and financial outcomes, which affects businesses from all industries as well as for-profit and not-for-profit perspectives. Therefore, businesses in service and retail industries should consider building stronger relationships with the local community and provide training and development programs for employees with the focus on management systems and procedures. This focus is intended to gain employees' commitment to sustainability by embedding sustainability culture into the organisation's ethos. The broader community and customers place an emphasis on a growing number of tourism operators and providers that are working towards reducing emissions and the impact of climate change through their operations. Examples of sustainability in the tourism industry are provided in the textbook. Banks, as an example of a service industry, now provide customers with the option of either viewing information on the ATM screen or printing the information in an effort to save paper and ink, which set an example for other organisations in that sector. An example in the retail sector are supermarkets that encourage customers to purchase carry bags.
- 10.** The answer should be one of agreement and the argument and examples should provide separate reasons for the external and internal reporting. First, organisations need to provide external transparent reporting about the triple bottom line of activities and of the level of success for each line of activity. Therefore, management will need to use measures of achievement that are relevant external communication to all stakeholders. Second, all organisation should try to identify the needs of stakeholders through investigating, researching and evaluating whether these needs are being met by the market. Management can determine whether the business should undertake and can achieve its sustainable business strategies, objectives and goals through cost-benefit analyses. Therefore, management need to use non-financial or physical measures of activities and achievement that are relevant for internal communication that are appropriate for different levels of the organisation and community (that is, the measures must be understandable by both accountants and non-accountants).

11. The answer should support the statement as a valid statement for the following reasons. First, activities such as resource consumption (e.g. kilowatts or litres) are physical measures that do not provide any financial information themselves (therefore they are non-financial measures). Exhibits and Staircase examples in the text illustrate what activities may be undertaken and how savings in water usage, energy consumption and solid and liquid waste are measured. The examples show that once the physical measures of savings are identified then the financial cost savings can be calculated. An electricity bill or water rates bill are examples. Without the physical measure the costs cannot be calculated by these utilities. Similarly, cost savings through the implementation of sustainable strategies cannot be estimated without first identifying the amount of physical unit of resource or energy that will be saved.
12. Activity-based working (ABW) represents the reorganisation of the workplace to enable staff to be more productive and collaborate using shared workspaces in the office and external locations such as home offices. However, ABW involves more than a simple reorganisation of the workplace (or office). In addition to hot desks, client meeting rooms, and shared workspaces (which are the essential components of ABW), advanced technology components and supporting devices as well as application access and strategies are needed to be implemented by workstations adopting the ABW to encourage employees to work more productively.
13. The first of the six considerations before ABW should be adopted is identifying whether an organisation has the need or capabilities for ABW. Also, the second consideration an organisation needs to recognise is that there is no single ABW model to suit all organisations or even between offices within the same organisation. For example, Microsoft Australia reports that it needed custom-made for its workplaces in Sydney and Brisbane offices. A brand new environment was developed for Brisbane while in Sydney the existing premises were refurbished. These two fundamentally different responses occurred after consultants obtained a detailed 'get to know you phase' with the local Microsoft businesses, provided information for an informed design process and was a critical path for Microsoft's changes in ways of working never previously encountered by the organisation or its employees. Individuals are different where and when they produce their best results. Also, the use of computers for a wide range of routine tasks, which makes more time available for problem solving and innovation generation activities.

People are the most critical component when transitioning to ABW and is the third consideration. Sitting at a single desk in a designated room may not be the expectation of the workforce. The success of the ABW adoption is unlikely without acceptance of proposed working space changes and without the employees seeing the benefits. Herzberg's hygiene factor provides the setting for encouraging employee motivation, but does not in itself motivate employees. Their knowledge and understanding needs to match their activities to identified critical success factor activities in the Business Planning Process needed to achieve the organisation's goals, which provides employee motivation that Herzberg called the satisfier factors. Furthermore Vroom's expectancy theory includes the 'what's in it for me' valence component of motivation (see Chapter 16 for details of both motivational theories).

The fourth consideration needs to focus equally on whether the organisation has the capacity and the needed mobility enabling technology as well as the support for and backing of senior executives for this change in working patterns, which requires a different leadership and control style. The culture must be built on trust and delivery of outcomes (results control). Identifying the appropriate and most effective way to communicate the intended changes, identifying the opportunities for individuals, and explaining how it will feel to work in the new workplace is the fifth consideration. The final consideration is pilot testing ABW at one location and including representatives from other locations within the organisation as changed champions. This is essential due to the need to communicate effectively and adapt the ABW rollout into offices other than the test location. For example, KPMG used its Sydney office before rolling ABW out across its organisation in Australia. The overriding consideration for executives and employees is to realise that benefits derived from ABW require a long-term view.

14. There are a number of issues that need to be assessed for each company considering the adoption of ABW. The first issue is to identify what capacity of mobility enabling technology is needed for the ABW adoption to be successful and whether the organisation possesses the capacity or has the resources to acquire the technology needed. It is essential that senior executives adopt the appropriate communication mechanisms to illustrate their support for and backing of this change in working patterns. The use of strategic management processes such as the one suggested by Kaplan and Norton (1996, 2007), where the first process (translate the vision) and the second process (communicate and educate) are used enables executives and employees to identify the benefits to them individually and collectively.

Following on two strategic management processes, the business plan and feedback processes should provide employees with information about the control mechanism and performance evaluation system that should be implemented to reinforce the benefits derived from ABW and that this reward requires a long-term view by both the executives and the employees. Process running concurrent to this dissemination formation is the identification of costs and benefits related to the redesign premises, probably including a more open plan office design. Using these cash inflow and cash outflow figures enables the calculation and complete analysis of the capital investment decision. An organisation may use a payback period and an NPV analysis to provide the time period needed to pay back the investment as well as provide an overall potential cost saving benefit for the long-term.

15. The reasons why organisations adopt ABW may be seen in the benefits experienced by organisations after implementation. An example of the benefits experienced by Goldman Australia are listed below:
- Increased staff collaboration, productivity and efficiency
 - Flexibility in where and how an employee chooses to work
 - Reduction in power, paper usage, real estate costs
 - Improved work environment and job satisfaction
 - Freedom and choice for staff
 - Breaking down silos focus and developing team focus
 - Modern work environment and practices
 - Employer of choice that attracts top quality potential employees.
- (Source: Activity Based Working – Space to Work, <https://au.goodman.com/about-us/activity-based-working>)

More details of such benefits, cited by ABW Australia, are provided in the textbook.

(Source: ABW Australia, Activity Based Working (ABW), <http://www.abwaustralia.com.au/consultancy-services/activity-based-working/>)

16. The energy efficiency pyramid illustrates not only the actions required to develop an ecoefficient set of processes but also the appropriate order in which these ecoefficient set of processes need to be undertaken.
17. Other energy efficient considerations that result in energy savings include not only the insulation of air conditioning and setting the air cooling to around 24 degrees Celsius, but also the enclosure of areas to prevent or minimise the escape of cool or hot air, and therefore less energy is consumed. Also, the use of electricity for heating water to different levels will vary significantly and the electricity usage will increase disproportionately and exponentially as the heat of the water increases. Identifying and setting water heaters to an appropriate and lower level of heating will save energy consumption.

18. **There are two purposes for environmental cost reports. The first purpose is to achieve the robust quality model's desired environmental cost curve (the same shape as the desired curve illustrated in Exhibit 14.5). Achieving the robust quality water follows the four-step approach mentioned under the Quality Cost Management and Reporting section (see Chapter 14, Staircase 14.5. Many of the prevention and appraisal activities used in the quality cost management and reporting section of Chapter 14 are similar control activity costs for an environmental cost except the activities relate to environmental issues, for example, protection control activities, such as recycling and reuse activities (including containers), are the focus of the environmental cost reports. The second purpose involves performing a cost-benefit analysis summary to establish whether the environmental costs strategy has a worthwhile net benefit to the organisation. A successfully implemented environmental cost saving plan should result in increased benefits over time.**

19. **The environment financial report usually appears when organisations focus on adopting sustainability as a core value (productivity strategy) to reduce quality control and failure activity costs (situated in Phase 4 of organisation sustainability adoption) and is produced by organisations that are transitioning or have completed the integration of sustainability into the their mission and core objectives (situated in Phase 5 of organisation sustainability adoption). This would further advance these companies' competitive advantage through an innovation product design that is environmentally friendly, innovation in product production process, or innovation in use of non-renewable resources that would be the basis of a growth sustainability business strategy. The purpose for this financial report would be to provide senior management with an infrequent report identifying where the organisation is improving in its environmental performance and in controlling its environmental costs. Preparing this report not only provides executives with the relative amounts spent in each of the four categories to minimise environmental costs but also the impact of environmental costs on an organisation's sustainable profitability.**

20. **Environmental and social management accounting (EMA) comprises two forms of reporting that each play a key role in providing information for business sustainability; internal reporting and product or services costing as well as sustainability external reports about performance. EMA integrates a number of accounting tools and techniques in the internal reporting and costing function so that managers can recognise and manage the impact of their businesses' operations on the environment and the community. Therefore, the purpose of EMA is to provide managers with information about sustainability (environmental, social and financial) issues that commonly are hidden in overhead accounts of traditional management accounting. An additional role played by EMA is to identify the hidden vital information that is frequently unidentified and causes managers to miss opportunities to improve economic, social and environmental (sustainability) performance.**

- 21.** Students should use the EMA measures shown in Exhibit 17.10 to identify how the measures collect information that is useful for the completion of the sustainability report that follows the GRI guidelines. The type of information gathered as shown in the columns related to the four perspectives (financial, environment, employee and community) in the EMA measures may be matched to GRI indicators as shown in Exhibit 17.14. Such matching of measures provides some illustration of how the data gathered under an EMA system may be used for integrated reporting.
- 22.** Physical measures are measures that record the quantity of either an activity undertaken or a resource used. One example of a non-financial measure is the number of litres [usually measured in megalitres (ML)] used, which may be calculated by inspecting the water meter or reading the water bill. Another example is the kilowatt hours of energy (kWh) (electricity) used. A third example is a measure to record the savings from recycling waste, such as savings from the decreased need for the hire and collection costs of commercial waste bins.
- 23.** GRI is the Global Reporting Initiative established initially in the Netherlands for the purpose of setting general sustainability reporting guidelines, a set of sector specific protocols guidelines, and a set of performance indicator protocols and protocols as a framework for report boundaries. The components of GRI are indicators that fall into the three categories. Each category has its own subcategories as well as aspects of focus within each subcategory. The triple bottom line (TBL) also has three components but these are more general concepts of sustainability. That is, while the TBL relates to the same general issues as GRI, the GRI guidelines are more specific in their reporting process and content through the provision of the categories and subcategories mentioned.
- 24.** Businesses are expanding their integrated reporting to include governance performance because they realise the markets need to analyse not only financial information but also environmental, social and governance (ESG) performance as indicators of an organisation's health and future prospects.
- 25.** A 'market pull' relates to investment decisions where the markets need to analyse more than financial and CSR information. This demand for more information and the company's desire to attract investors influences the extent and type of publicly available information provided by a company to investors once it has recognised these information needs. An 'organisational push' refers to the influence that customers and other key stakeholders place on a company to report their sustainability credentials. Both are influences that promote integrated reporting.

26. The Sustainability Balanced Scorecard (SBSC) differs from the Balanced Scorecard (BSC) through the inclusion of business sustainability within a BSC framework. SBSC, therefore, differs in two ways. The first way is through the inclusion of one perspective or two additional perspectives to the original four BSC perspectives. The additional perspective or two perspectives are incorporated to reflect social and environmental activities and outcomes. The second way is to expand the scope of the original four BSC perspectives to include social and environmental activities as well as outcomes into each perspective. Both of these ways (or schools of thought) expand the scope to CSR matters for BSC to create the difference between the SBSC and the BSC frameworks.
27. This question has been included in the textbook to allow the adopting academic to have students undertake some information literacy activities in relation to this topic. There are two schools of thought, which are still actively promoted in the literature, expanding the framework for this school of thought, and providing evidence to support their point of view. The following is intended as a form of scaffolding for students and the adopting academic to start the discussion.

The discussion about business sustainability within a BSC framework has developed following two schools of thought. The first school of thought argued that social and environmental activities and outcomes are represented in one or two additional perspectives to the original four BSC perspectives. The second school of thought holds that social and environmental outcomes occur as a result of an organisation adopting sustainable strategies, objectives, and measures. One of the bases to include social and environmental outcomes in the existing perspectives is that particular activities (especially in the learning and growth and the internal process perspective) generate the social and environmental outcomes and unless the activities are measured within these processes, then they do not form part of employees' activities within these perspectives. There is an old adage 'if it doesn't get measured, it doesn't get done'. Therefore, the second school of thought follows the original four BSC perspectives and extends the scope within some of the BSC perspectives to develop the Sustainability Balanced Scorecard (SBSC). It is argued that including social and environmental activities within the four teaching management processes developed by Kaplan and Norton (1996, 2007) enables the associated outcomes to be established, which helps identify critical success factors (CSF) through the 'cascading down' process and critical success indicators (CSI) following the 'bubbling up' process for each perspective, to reflect the sustainable strategies and objectives.

More recently, Kaplan and Norton (2001, 2004) introduced corporate responsibility factors (social and environmental) within the regulatory and social value creating process in their strategy maps. Exhibit 16.4 illustrates this inclusion of environment, health and safety, employment and the community as components of the regulatory- and social-value-creating internal process. The inclusion of social environmental activities within the internal process perspective implies the integration of sustainability issues within this perspective of the BSC framework, which is consistent with the arguments put forward by the second school of thought.

Therefore, discussions about the development of an SBSC should occur during (1) the initiation of four strategic management processes and (2) the creation of the strategy map. The sustainable organisation phase positioning of the organisation along the chosen path to organisational sustainability should not impact upon the discussion that would occur. For example, the discussion and design should involve the contribution of the learning and growth perspective and the internal process perspective's value creating social and environmental process if the organisation has adopted sustainability phase 4 (Productivity strategy) or phase 5 integrated sustainability focused (differentiated innovative growth strategy) (See the 'Six phases of sustainability' section of this chapter).

It therefore seems the authors of the BSC are recognising that organisations need to integrate sustainability within the four original perspectives with CSF and CSI for social and environmental matters included in performance measures, which is consistent with the second school of thought.

The designers of the BSC (Kaplan and Norton) and subsequent empirical evidence discussed in this section support acceptance of integrating the sustainability processes and systems into the original BSC framework. However, there may be an argument based on a contingency theory that supports the first school of thought of having a separate environmental perspective (e.g., Hansen & Schaltegger, 2016). There may be circumstances surrounding the organisation or the industry in which it operates may require either a four-perspective-based framework or a five-perspective-based framework. This difference and the number of perspectives may be contingent upon the needs for the information by the particular organisation due to its operations (e.g., mining or manufacture) or industry sector (e.g., healthcare services) with specific information that must be reported and therefore needs to be separated into an additional perspective within the SBSC. Another example of the contingency framework argument is related to a disaster plan needed by the organisation so that it can continue to provide essential services to the community.

In conclusion, a number of studies have been conducted to examine how the environmental dimension may be incorporated into the SBSC (e.g., Lämsiluoto & Järvenpää, 2008, 2010; Van der Woerd & van Den Brink, 2004; Dias_Sardinha & Reijnders, 2005; Dias_Sardinha et al., 2002). Equally, other studies have examined the fifth perspective for a SBSC across a number of countries (e.g., Van der Woerd and van Den Brink, 2004; Dias_Sardinha et al., 2002; Dias_Sardinha & Reijnders, 2005, 2007; Journeault, 2016). Therefore, there are strong arguments for and against integrating social and environmental dimensions within the existing four perspectives or creating a fifth perspective. The body of knowledge may be resolved with the understanding that the relevance of these two frameworks may be contingent upon the circumstances within the organisation and the industry sector in which it operates.

Reference List

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28. This question has been included in the textbook to allow the adopting academic to have students undertake some information literacy activities in relation to this topic from an Australian perspective. Literature is still being published that represents both schools of thought, which are still actively promoting or developing further the framework for this school of thought. The purpose is for students to search for recent literature and the following discussion provides one finding for each of the two schools of thought, which may be used by students and the adopting academic as a start point for students' search for articles representing one of the two schools of thought.

Literature provides support for both schools of thought. A study by Jassem, Azmi and Zakaria (2018) examined the two types of Sustainability Balanced Scorecard architecture (1) environmental data embedded within the traditional Balanced Scorecard perspectives; and (2) stand-alone environmental data as an additional fifth perspective along with the traditional Balanced Scorecard. In this study, they compared the different presentations of environmental data but only from an overall perspective. That is, they compared it with the information within the four perspectives or across five perspectives but did not look at the relationship between each of the perspectives and their impact on environmental investment decisions. The findings highlighted the need for informed environmental knowledge, which would be gained from knowledgeable participants being included in the decision process. Finally, their tests show that there is no effect on the relationship between the SBSC type (four-perspective vs. five-perspective) and investment decision-making. The conclusion that can be drawn from these findings is that the existence of environmental data to managers is of benefit irrespective of whether it is embedded in the traditional four perspectives or there is a standalone fifth perspective called environmental.

Another Australian-based study (Sands, Rae and Gadenne, 2016) used the responses of 300 senior and middle managers to examine the relationship between the components within the four traditional perspectives of the Balanced Scorecard with the environmental information embedded into these four perspectives. Their findings examined the relationship between the human capital component of Learning and Growth perspectives and the value-creating processes as well as among the value-creating processes. The results provided evidence about the direct association of human capital (learning and growth perspective) with value-creating processes (internal processes perspective). Also, direct associations are found between value-creating processes within the internal process perspective. In particular, several human capital components of Learning and Growth (autonomy, effective goal commitment, training) to Safety and health performance and Employment practices (within the Regulatory and Social Processes) (students may wish to include the four strategic management processes and the benefits of using psychological empowerment, organisational goal commitment, and motivational theory). Further, the employee performance review process within the Learning and Growth perspective was directly associated with both the Community investment and the Environmental practice (within the Regulatory and Social Processes). All four practices within the Regulatory and Social Processes were directly associated with the collective practices within the Innovation Processes.

Sands et al (2016) then analysed the findings not only between the value creating internal processes and the customer perspective but also value creating internal processes and financial perspective. These results identified a direct association of value-creating (internal processes perspective) with customer value (customer perspective); and direct as well as indirect associations of value-creating (internal processes perspective) with financial performance (financial perspective). The results of the direct association study between the internal process perspective value creating processes and the financial perspective support the conclusion that some activities in the internal process should lead to financial savings in the financial bottom line perspective, which should be achieved through a productivity strategy being implemented. The indirect associations of value-creating (internal processes perspective) with financial performance (financial perspective) that is mediated by customer value (customer perspective), is consistent with improved customer satisfaction leading to a growth in sales, which should be attributed to a sustainable growth strategy. The results, therefore, support the feasibility of integrating environmental, social and innovation-orientated value-creating processes into the internal process of the four-perspective SBSC model. (The findings of this study provided in Exhibit 17.17 illustrate this integration of the social and environmental component into a value-creating internal process within the strategy map as proposed by Kaplan and Norton (2001, 2004)).

These two studies provide a common finding that the recognition and use of environmental information improves both performance and decision-making. Further Australian studies that have been found by students will probably find a similar result to these two studies. In effect, the performance driver is the recognition, inclusion, and use of social and environmental data within the organisation's performance measurement system. However, there are published arguments (Hansen, & Schaltegger, 2016; Hahn & Figge, 2018) that support the first school of thought of having a separate environmental perspective based on a contingency theory where the circumstances surrounding the organisation or the industry in which it operates may require the SBSC to be either a four-perspective-based framework or a five-perspective-based framework and this difference is contingent upon the needs for the information by the particular organisation industry sector. Research that has put forward this contingency theory framework proposition started in Europe and when the search by students is conducted there may well be similar arguments put forward in Australian studies that are published at that time.

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29. SBSC as a management process includes the original BSC processes but expands the scope of the framework to include CSR matter. This expanded scope enables management to translate the vision, mission and strategies about how to achieve sustainability into an operational level, which can be communicated to all levels and sections of the value chain of the organisation.
30. SBSC as a management process also enables management to identify critical success factors (CSF) and these CSF may be linked to critical success indicators (CSI). These indicators then form the basis for the strategic performance measurement system. While this is similar to the original BSC, the SBSC may include the corporate index of sustainability performance (CISP) in addition to CSIs sustainability performance as the basis for the strategic performance measurement system of the organisation. This index is achieved by combining different sustainability tools, such as sustainability reporting guidelines of GRI and BSC, and is considered a comprehensive evaluation process of corporate sustainability performance.

MULTIPLE-CHOICE QUESTIONS

17-1.	b	17-11.	d
17-2.	e	17-12.	c
17-3.	d	17-13.	a
17-4.	b	17-14.	d
17-5.	d	17-15.	c
17-6.	d	17-16.	d

STAIRCASE EXERCISES

SE 17-20

1. The four steps are:

- 1 Turn your tap on to an average rate of water flow
- 2 Place the container under the tap until it fills, measuring the time that it takes to fill
- 3 Calculate the flow rate. For example, if it takes 20 seconds to fill a 4-litre container, then your tap's flow rate would be 12 litres/minute.
- 4 Repeat steps 1–3 for both hot and cold water across your business.

2.

197.1 calculations of kilolitres used without a flow restrictor

98.55 calculations of kilolitres used with a flow restrictor

a flow restrictor will save 98.6 kilolitres per year
\$113.33 dollar saving if a flow restrictor is installed

3.

- Step 1 Find out what temperature you are heating water to (in this case, 70°C)
- Step 2 Look at the table on page 887 and see how many kWh this requires.
- Step 3 Multiply this figure by your electricity cost to get the cost to heat 1 kl

4. Cost of purchasing, heating to 70°C and disposing of water per kilolitres of water
- \$1.15 purchasing per k/litre
- \$10.53 heating to 70°C per k/litre
- \$0.95 disposing of water per k/litre
- \$12.63

SE 17-21

1. $\underline{\hspace{1cm}}$ lights \times $\underline{\hspace{1cm}}$ kW \times \$ $\underline{\hspace{1cm}}$ /kWh \times $\underline{\hspace{1cm}}$ hrs \times $\underline{\hspace{1cm}}$ days = \$
\$931.30 current annual lighting cost for the business with 70

2. $\underline{\hspace{1cm}}$ lights \times $\underline{\hspace{1cm}}$ kW \times \$ $\underline{\hspace{1cm}}$ /kWh \times $\underline{\hspace{1cm}}$ hrs \times $\underline{\hspace{1cm}}$ days = \$
\$266.09 annual lighting cost for the business with 20-watt LE
\$665.21 business save in electricity costs by using energy-ef

SE 17-22

1. $\underline{\hspace{1cm}}$ **3** wheelie bins per week

2. **\$450.00** annual cost for sending solid waste to land fil

SE 17-23

Data input and calculation section between cells K42 to Y76

Students' answers to this question will vary. However, any answer should demonstrate an understanding of the principles that are involved in developing an activity-based working environment.

To: The Chief Executive Officer (CEO)

From: The Organisational Management Accountant (OMA)

Re: Possible Adoption of Activity-based Working (ABW)

I provide the following issues that should be considered first to evaluate the adoption of ABW. These considerations form the first section of this internal report. Subsequent sections will provide an analysis of the ABW options as well as an analysis of costs using a payback period and an NPV analysis for these ABW options.

Capacity and actions needed to be consider to evaluate before ABW adoption

1. TinCannery Ltd will need to provide employees with a new laptop and internet equipment access capabilities as well as provide an internet virtual private network (VPN) with a secure mobile connection capacity to enable them to successfully work at their own home premises while protecting the integrity of TinCannery's information. Applications and software to enable scanning or saving of documents storage by using the cloud or other online share site facilities. TinCannery Ltd should bear the cost of these capabilities.
2. Senior management needs to involve an employee representative group in the initial discussion process. They may use the four strategic management processes and adapt the content of the processes to suit the specific ABW adoption strategy. The selected employee representative group members will provide excellent and relevant feedback to the ABW proposal. As change champions, the group members will report back to other employees in their work function the benefits of ABW to them. Newsletters from management and informal progress report meetings organised by senior management that provides feedback to employees; a form of intrinsic reward (students should refer to the section in Chapter 7 'Monetary and non-monetary incentives').
3. After combining the information of general benefits, individually they will identify their personal benefits, such as time saved travelling, the savings for the cost of transportation (fares or petrol), parking costs, wear and tear on their own vehicle, and having their own vehicle under cover. Clothing cost savings may be significant to some either through less frequent purchases or range of clothing options needed for only one or two days a week in the office. The change to work collaboratively on tasks allows quicker responses to clients and minimises the impact of absence through illness. From management's perspective, the costs savings may be tangible savings (lower rental costs or subletting of property owned by the organisation, lower energy, water, and paper usage costs, improved productivity or lower absenteeism). However, there are intangible benefits such as employee satisfaction that leads to retention of experienced staff or attraction of prospective experienced staff as a recruitment time-saving exercise. Also, customers' perceived goodwill and the reputation of TinCannery through quick response and solutions through the collaborative team-based servicing of clients is not visible but may be captured in lead indicators such as repeat sales or recommendations to friends. These non-financial measures are discussed and illustrated throughout Chapter 16 but specifically in Staircase 16.4 and Exhibit 16.12 under the customer perspective of a Balanced Scorecard discussion.

4. The focus must be moved from a task control system to an outcomes (results) control system (students should refer to Staircase 16.3 for a discussion on task versus results control systems). The use of a strategy map and the design of a strategic performance measurement system (SPMS) to provide management and employees with links between the strategy objectives and the critical success factors (CSFs) should communicate and reinforce the desired results and benefits to employees and the organisation. (Students should refer to Staircase 16.3 for a discussion on the four strategic management processes).

In the next section of this internal report, the basis for the discussion will relate to issues that TinCannery Ltd will need to consider when identifying the required redesign. These issues will relate to lighting levels per square metre required by workplace health and safety legislation or by-laws, the aesthetics of the office design and functionality.

Data input and calculation section between cells K42 to Y76

This data is used in the previous answer and the next answer, which is part of the informal report

SE 17-24

Consideration of quantitative and qualitative factors in its assessment of a project's viability

Quantitative and qualitative factors to be considered when identifying the required redesign include issues related to lighting levels per square metre required by workplace health and safety legislation or by-laws, the aesthetics of the office design and functionality. For example, the process is not a simple one of changing the light bulbs for lower energy use emission but you need to know the required lux level per square metre because each type of lighting has different lux per square metre (students should refer to Exhibit 17.6). Therefore, TinCannery Ltd should use both quantitative factors for the current location to assess the viability of the ABW project as well as qualitative factors related to aesthetics of the office design and functionality of the current location in its assessment of the benefits of the projects.

The calculations needed to consider and analyse the ABW proposal involve five steps. This section of the informal report will specify the information needed for the quantitative analysis through steps 1 to 4 and the information needed in step 5 will be contained in the next section, Long-term viability of ABW project – a Payback period and Net Present Value (NPV) analysis.

(Students should refer to this staircase exercise 17–24 and staircase exercise 17–25 to recognise the 5 step 5 STAIRCASE 17.4)

Step 1: Calculating yearly lighting hours and ABW project period lighting hours

Calculations for the hours of lighting for the period using hours provided in my brief (Students should refer to Table 1). The expected yearly lighting hours and the lighting hours forecast across 10 years are shown in the table below.

Sub-section Table for Step 1

Lighting Times	Daily Hours of lighting	Weekly Total
7am-5pm (5 days)	10 hours per day	50 hours
Total weekly hours of lighting:		50 hours
Yearly hours of lighting: (50 x 52 weeks)		2 600 hours
Hours of lighting for 10 years: (2 600 x 10 years)		26 000 hours

Step 2: Estimated lighting lumens required

This step involves using the information given in my brief (students should refer to Table 1) about the area of the office times the recommended lux needed to achieve the needed minimum average of 320 lux. The higher lux from each light is needed because the level of lux reduces the further any point within the room is away from the light fitting. Lux is therefore calculated by multiplying the room size by estimated lighting lumens required at the light to achieve 320 lux on average at any point within the room.

Sub-section Table for Step 2

Room in m2	30
recommended lighting (lumens/m2) = amount given in Lux*	320
estimated lighting Lumens Required = recommended lighting of 640 lumens/m2 (to achieve an average Lux Level 320 Lux) x in Room 30 m2	9,600

* While the level of (lumens/m2) is 320 lumens/m2, the output of lumens weakens towards the outer limits of the light, therefore a higher output of lumens/m2 is needed so minimum average lux of 320 lux is the level across the entire light arc.

Step 3: Initial and ABW project's lifetime number of bulbs, lamps, or panels calculations

The first phase of this step is to calculate the number of light bulbs/lamps/panels required initially to provide the required lux and then the cost of the bulbs/lamps/panels replacement scheduling for 10 years. Calculations use figures not only provided in my brief (students should refer to Table 1, Table 2 in the question) but also the table provided in sub-sections Step 1: Calculating yearly lighting hours and ABW project period lighting hours and the table provided in Step 2: Estimated lighting lumens required.

While the yearly frequency of replacement is provided the replacement frequency is a more accurate figure because some bulbs still have half of a year life expectancy at the end of a year but over the 10 years the remaining life expectancy is included. For example, replacement in fluoro across 10 years x 10 replacement lamps and 2 panels times twice and LED do not need to be replaced across 10 years x 10 lamps and 2 panels because the operations would only use half of the useful life of the LED bulbs across 10 years.

<i>Sub-section Table for Step 3</i>	Fluro	LED
Lumens per bulb (efficacy [watts] provided in my brief (see Table 2 of Staircase exercise 17-24)) x Watts used (Staircase exercise Table 1) = 50 x 40 x 2 tubes per fitting ; 200 x 32 x 2 tubes per fitting	4 000	6 400
Annual energy consumption kilowatts per hour (kWh) = efficacy [watts] Table 2 of Staircase exercise 17-24) x standard bulb or panel wattage (see question's Table 2) ÷ 1000 kWh	208	83.2
Number of light bulbs needed per fitting in office to provide lumens = estimated lighting Lumens Required (from table in step 2 subsection) ÷ Lumens per bulb in each fitting (see question's Table 1) = 19 200 ÷ 2 000; 19 200 ÷ 3	10	6
Number of Light bulbs Required to be replaced in 1 year annual hours of lighting hours (from step 1 table) ÷ Life expectancy of bulb (in hours) (see question's Table 2) = 2 600 ÷ 20 000 ; 2 600 ÷ 50 000	0	0

Number of lightbulbs required over 10 years = 10 years of lighting hours (from sub-section step 1 table) ÷ Life expectancy of bulb (in hours) (see question's Table 2) $26\,000 \div 20\,000$; $26\,000 \div 50\,000$	2	0
Replacement light bulbs/tubes in 10 years = 2 replacements of times fluoro tubes x 10 fluoro (2 X 10) (sub-section step 3 table); and 0 replacements of 6 LED panels (sub-section step 3)	20	0
Costs 10 years	Fluro	LED
Cost of refurbishment of fittings per panel/tube (including the purchase of the initial lights) = Number of light bulbs needed per fitting in office to provide lumens = estimated lighting Lumens Required (from table in step 2 subsection) ÷ Lumens per bulb in each fitting (see question's Table 1) = $19\,2000 \div 2\,000 = 10 \times \$68.50 = \$685$ (see question's Table 2); $19\,200 \div 3\,200 = 6 \times \$105 = \$630$ (see question's Table 2)	\$685.00	\$630.00
Replacement cost (replacements in 10 years x cost per bulb) = 20 fluoro tubes (sub-section step 3) x \$68.50 (see question's Table 2); Zero LED panels (sub-section step 3) x \$105 (see question's Table 2)	\$1,370	\$0.00
Energy Consumption = Annual energy consumption KW (hours of lighting from step 1) x KW Energy Consumption for one light (from step 3) x cost per kWh (see question's Table 1) = $208\text{ KW} \times \$0.16 \times 10\text{ years} \times 10\text{ light fluoro tubes} = \$332.80 \times 10\text{ light fluoro tubes}$; $83.2\text{ KW} \times \$0.16 \times 10\text{ years} \times 6\text{ LED light bulbs} = \$133.12 \times 6\text{ LED light bulbs}$	\$3,328.00	\$798.72
Total Costs of lights and electricity over 10 years	\$5,383.00	\$1,428.72

The resulting figures from this sub-section (step 3), may then be used as the basis for the calculations and discussions in sub-sections for Step 4: Savings by adopting ABW as well as Long-term viability of ABW project – a Payback period and Net Present Value (NPV) analysis, Step 5: (payback and NVP Analysis).

SE 17-25 Data input and calculation section between cells K42 to Y76 of worksheet 17-8SE
as well as Cash Flow analysis, payback period, and NPV analyses calculation in cells K24 to X67

- Step 4: Savings by adopting ABW
In addition to the costs calculated in step 3, other costs and benefits provided in my brief (see Table for Staircase Exercise 17.25) will need to be included in the step 4 calculations.

<i>Sub-section Table for Step 4</i>			
		Fluro	LED
Lighting Cost Comparison (from Step 3)		\$5,383.00	\$1,428.72
Add Additional ABW costs (from Table this Staircase exercise)			
Office redesign (beams to replace load bearing walls and build meeting room and purchase smaller air conditional unit)		75,000	75,000
Furnishings		13,000	13,000
Enabling technology Equipment to permit ABW		15,000	15,000
Total costs		\$108,383.00	\$104,428.72
Other savings through adopting ABW (from Table for this Staircase exercise)			
Additional energy savings (energy not used for office equipment and lower costs for smaller air conditioning unit)		\$25,000	\$25,000
Rental Income from Sub-lease 30 square metres of the office		\$210,000	\$210,000
Savings (benefits) by adopting ABW		\$126,617.00	\$130,571.28

Sub-section Table for Step 4 provides a summary of the costs needed to be invested to implement ABW as well as the savings that are derived from its implementation. The benefits from implementing ABW are expected to have a significant positive reduction in overall costs irrespective of the option selected. While there is a \$3954.28 savings by installing LED lighting compared to fluro lighting, TinCannery Ltd will have a significant cost savings by adopting ABW. The savings comparison is identified by subtracting the net costs of the two ABW options (i.e., ABW costing comparison after additional cost and benefits) from the cost savings form not using the existing lighting (benefits), the savings over 10 years from ABW option 1 is \$126,617 and \$130,571.28 from ABW option 2. The results, based on the quantitative information calculated in steps 1 to 4, suggest the ABW should be adopted.

Long-term viability of ABW project – a Payback period and Net Present Value (NPV) analysis

Based on the calculations provided in step four within the answer for Staircase Exercise 17.24 that provide the savings over 10 years from ABW, the results suggest, based on the quantitative information calculated in steps 1 to 4, that the ABW should be adopted. However, benefits derived from ABW require a long-term view. Therefore, the next section (step 5) is necessary to identify the payback period and the Net Present Value (NPV) to reinforce the long-term view needed for ABW.

2 Step 5: Long-term view analysis (payback and NPV Analysis)

The payback period calculation identifies the period of time it would take to repay (payback) the initial investment outlay. The calculations for the period are provided in two tables. These tables represent two ABW options related to the type of lighting (Table - Option 1 Fluoro 2 x 40w Tubes and Table - option 2 LED panels). These two tables each provide three sets of information. The first set of information in each table provides the Annual Net Cash flow. The figures used in each table were calculated and presented in various tables in earlier sections (steps) of this informal report. Using the annual net cash flow figures in these tables, the payback period can be calculated. The net cash flow for the first year is deducted from the initial investment amount (option 1 \$105,408, option 2, \$103,630), and each subsequent year the cash flow is deducted from the balance of the initial investment. The payback period for option one is four years and five months while the payback period for option two is four years and four months. Based on the calculations of quantitative factors, option 2 would appear to be the preferred option should TinCannery Ltd decide to implement the ABW project. It also may be noted that the annual return on investment (ROI) for option 1 is 22.37% while the ROI option 2 is 22.92%, which are both good returns on the initial investment.

2 continued However, TinCannery Ltd should consider the overall benefits from adopting the ABW project as well as the overall return after taking into consideration the changing value of money (purchasing power of money), which requires the net present value (NPV) analysis conducted across both lighting options. There are two methods to calculate NPV analysis. The first method uses the annual net cash flow and then applies that year's discount factor, which can be used where the annual net cash flow differs from year to year or where the same net cash flow figure is expected to occur each year. The second method can only be used where the same net cash flow figure is expected to occur each year. For both methods, the same NPV result calculated for option 1 is \$67,914 while option 2 is \$71,201. Based on these quantitated analyses, lighting option two within an implemented ABW project should be selected provided there are no qualitative issues that may present an alternative lighting option selection.

Table - Option 1 Fluoro 2 x 40w Tubes and Table - option 2 LED panels providing Cash Flow analysis, payback period, and NPV analyses calculation in cells K24to X67

(Students should be aware of the payback period method's limitations; see the explanation in Chapter 12 under the section entitled USING THE PAYBACK PERIOD TO CHOOSE AMONG ALTERNATIVES). First, the calculations finish as soon as the years have been identified that are needed for the initial investment in the project has been paid back. Second, the cost of capital and the diminishing purchasing power of the dollar over the years of the project are not considered under this method. Also, the NPV analysis provides a longer term view than the payback period due to limitations of the payback period. For the NVP analysis, it has been assumed that the costs and savings, other than the initial costs in year 0, are spread equally across the 10 years the following NVP analysis is prepared. If savings differ across the 10 years then the longer version of this analysis will be necessary. Both versions of the NPV analysis calculations are provided in the solution should the adopting academic wish to make the question or subsequent assessment items more comprehensive with varying net cash flow across the project's life)

3. ***Darwin and Auckland offices approach to the proposed adoption of ABW***

After considering the information provided earlier sections and subsections of this informal report and implementing the ABW project in Brisbane, TinCannery Ltd must consider other factors. It must realise that there is no single ABW model to suit all organisations or between offices within the same organisation. A brand new environment needs to be developed for Darwin and Auckland while Brisbane is being redesigned and refurbished. Fundamentally different responses to the question of implementing ABW may occur therefore TinCannery Ltd should engage consultants (or select employees from Brisbane that were used as change champions to disseminate the information prior to implementing ABW in Brisbane) to obtain a detailed 'get to know you phase' with the local TinCannery Ltd businesses and the employees. This detailed local knowledge information provides a platform for an informed design process and is a critical path for TinCannery Ltd to change the ways of working never previously encountered by the organisation or its employees. Individuals are different where and when they produce their best results. Therefore, people are the most critical component when transitioning to ABW as a further consideration. The success of the ABW adoption is unlikely without acceptance of proposed working space changes and without the employees seeing the benefits (students should review the discussion about 'what's in it for me', the valence component of Vroom's expectancy theory; see Chapter 16).

The company has an opportunity to assess the success of the ABW operations in Brisbane after the ABW's first 12 months because it leases its premises in Darwin and Auckland and these leases have 1 to 2 years remaining. During the second 12 months, TinCannery Ltd can consider these two additional considerations and design an appropriate ABW for these two other locations.

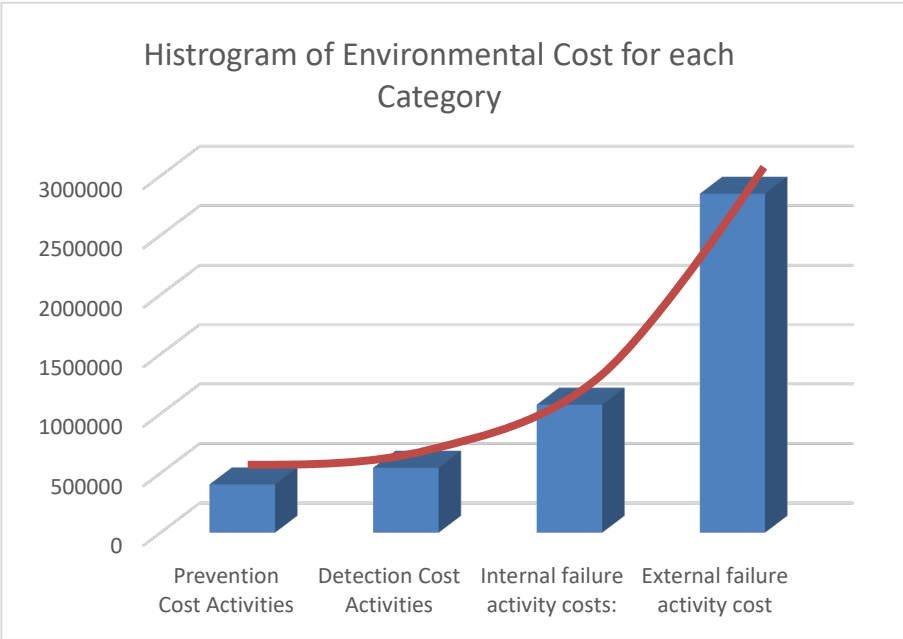
Req 1 and 2:

The prepared environmental cost report below is represented by the first three columns of the table. The third column of the report shows that a total of \$4,875,000 has been incurred by the company on environmental costs while the fourth column expresses these costs as a percentage of operating costs.

Activities	Environmental Costs	Category Totals	Percentage of Operating Costs	Control and Failure Activity Category Costs	Percentage of Total Environmental Costs
<i>Prevention Cost Activities</i>					
Training employees	\$95,000				
Designing products	\$250,000				
Selecting equipment	\$60,000				
		\$405,000	8.31%		
<i>Detection Cost Activities</i>					
Inspecting processes	\$420,000				
Developing measures	\$125,000				
Total Control Costs		\$545,000	11.18%	\$950,000	24.2%
<i>Internal failure activity costs:</i>					
Operating pollution equipment	\$650,000				
Maintaining pollution equipment	\$425,000				
Total Internal failure activity costs		\$1,075,000	22.05%		
<i>External failure activity cost</i>					
Cleaning up lake	\$1,450,000				
Restoring land	\$750,000				
Incurring property damage claim	\$650,000				
Total External failure activity costs		\$2,850,000	58.46%		
Total Failure Costs				\$3,925,000	100.0%
Total Environmental Costs	\$4,875,000	\$4,875,000	100.00%	\$4,875,000	
operating expenses	80,000,000				

Req 3: When analysing the information in the fourth column using the zero defect quality model, the shape of the curve is inverse to the desired curve's shape. The design shape would have more costs in the prevention activity category and the detection activity category and a decreasing shape reflecting a very low internal failure activity category with even lower (almost zero) external failure activity category costs. When these activity costs are classified under control activities and failure activity costs (information provided in columns five and six of the solution), only 19.5% of these costs are spent on the control activities with the aim of minimising or preventing these environmental costs, while 80.5% is actually incurred either internally to correct or minimise environmental costs or is actually incurred due to the impact of these activities on environment and society. Although the total environmental costs represent 6% of operating costs (the total column three), the majority of these costs (almost 5%) is incurred in environmental failure costs, which will have an unobservable external failure costs to its reputation and potential future sales growth. Therefore the environmental management system practice is non-congruent with either a productivity strategy or a sustainable growth strategy and would not be a suitable

Prevention Cost Activities	\$405,000
Detection Cost Activities	\$545,000
Internal failure activity costs:	\$1,075,000
External failure activity cost	\$2,850,000



SE 17-27

Req 1: The environmental financial report is provided in the table below. The income sources, current savings, and cost avoidance (ongoing savings) shows a total of \$1,590,000 has been achieved by your organisation in the current year. In the fourth column of this table, the percentage that each of the sources has contributed to this amount shows the majority (56%) has been contributed by current savings. Ongoing savings contribute the second largest savings and represent almost 24% of these total savings. Although income sources only contribute 20% to the savings, as the organisation continues to improve its operations there is a possibility that further income may be achieved from the sale of its re-cycling process to other organisations.

Environmental Benefits	Benefit Amount	Category Total	Percentage
<i>Income Source</i>			
Recycling income	\$320,000		
Rental income from ABW adoption	\$5,000	325,000	20.4%
<i>Current savings</i>			
Cost reductions, contaminants	\$350,000		
Cost reductions, hazardous waste disposal	\$540,000	890,000	56.0%
<i>Cost Avoidance Source</i>			
Ongoing energy conservation cost savings	\$150,000		
Ongoing packaging cost reductions	\$225,000	375,000	23.6%
<i>Total Savings</i>	\$1,590,000	1,590,000	100.0%
<i>Environmental Activity Categories</i>			
Prevention Cost Activities	\$405,000		
Detection Cost Activities	\$545,000	\$950,000	19.5%
Internal failure activity costs:	\$1,075,000		
External failure activity cost	\$2,850,000	\$3,925,000	80.5%
<i>Total Environmental Costs</i>	\$4,875,000	\$4,875,000	100.0%

Savings as a percentage of Environmental costs 32.6%

Req 2:

While the benefits reported in the environmental financial report reveal good progress, the environmental costs presented in this report show the current cost recoupment benefits are only 32.6% of the total environmental costs. This low percentage indicates that more improvements are clearly needed in the environmental costs savings strategy. When this information is combined with the evidence and histogram provided in the solution for requirement 3 for Staircase Exercise 17.26, EZY Pharmaceuticals should invest heavily in the prevention activities as well as the detection activities. Following the zero defect quality model, these control activity categories must be maintained at a much higher level until there is significant reduction in both the internal and external environmental failure cost categories. That is, until the desired negative sloping curve is achieved (the inverse to the curve in the histogram for Staircase Exercise 17.26), the cost activity category investment must continue and the detection activity cost category investment can then be relaxed but monitored over time.

The overall conclusion is that EZY Pharmaceuticals should adopt the alternative 'doing it right the first time' approach, where product quality is achieved by prevention (control activity costs), to improve environmental performance. This approach will assist EZY Pharmaceuticals in its successful transition into phase 4 of a sustainable organisational set of values and will continue to advance the company into phase 5 of the set of values.

EXERCISES

E 17-28

This decision is similar to the decision faced by the board of James Hardie case in 1966.

For parallels to this set of circumstances the instructor may wish to refer students to that case.

- 1. The decision is consistent with the agency framework where the board and executives are required to consider shareholders' funds primarily and that these funds should be used exclusively for maximising the value of the organisation.**
- 2. The four conceptual pillars underpinning business and corporate sustainability are:**

(1) The sustainable development concept has been described as development necessary to meet the needs of the present and future generations; (2) The stakeholder concept is (a) the recognition that the global impact of businesses on climate and cultural changes is of concern to all stakeholders, and (b) the acceptance by businesses that each stakeholder group has different goals, priorities and demands; (3) The corporate social responsibility concept is based on the ethical responsibility argument that businesses should consider the needs of all stakeholders, not just shareholders or business owners; (4) The concept of business accountability relates to a legal and ethical responsibility by business to all stakeholders and this concept demands transparency of information that communicates, explains, justifies and reports business activities and outcomes of these activities to all stakeholders.

The third conceptual pillar (the corporate social responsibility concept) is based on the ethical responsibility argument which is drawn from four theories:

- 1 social contract theory (the contract extends beyond the physical parties to the contract to other members of society for their approval)**
- 2 social justice theory (the needs of all members of society should be considered and goods or services distributed fairly in society)**
- 3 rights theory (businesses need to comply with basic human rights of stakeholders in their operations)**
- 4 deontological theory (a moral duty to treat others with respect).**

The argument may be that all four pillars have been ignored. Pillar 1 has been

ignored because the board and executives have not considered their social contract to society and have put profit first. The reported potential health problems shows they have ignored how some sectors of society (pillar 2) may be more adversely affected by the continued use of the materials. Not knowingly exposing any member of society to risk (pillar 3) has not been a key consideration of the board or executive either. Finally, the decision reflects more the teleological Utilitarianism approach of 'cost/benefit' at best or the egoist stance and not their duty to society (pillar 4) as outlined in the other 3 pillars.

3.

The interests of all stakeholders identified as being part of the potential health problem groups (employees, installers, customers and school children) should have been considered as paramount in the final decision. Also, future investors who may have future dividends diverted into a health fund for the people affected by the board's and executive's decision. And lastly, the government health system which provides health benefits, which is taxpayer funded. Consequently, society as a whole has not been considered by the board and executives in their decision.

4.

The concept of sustainability has developed in accounting literature around five major frameworks. This answer extends students' answers for Requirement 2. The corporate social performance (CSP) framework, the supply and demand framework places a primary focus for the level of CSR investment on satisfying stakeholders' demands for CSR, and finally, a wider view for examining business sustainability through the stakeholder theory framework. All three frameworks have not been considered and agency framework has been given the sole consideration by the board and executives of Asbos Linings Ltd.

E 17-29

1

(1) The source of the raw materials because they need to know the sustainability of the supply of raw materials through an audit about the adequacy of suppliers' processes and the impact of transactions with such suppliers on the business' sustainability, and (2) The employee acceptance and commitment to sustainability initiatives of the organisation.

2

The company should consider building stronger relationships with the local community and provide training and development programs for employees with the focus on management systems and procedures. This focus is intended to gain employees' commitment to sustainability by embedding sustainability culture into the organisation's ethos.

E 17-30**1**

The costs should not be limited to the internal costs of the organisation. Costs related to other members of Asbos' value chain need to be included into the costs. These costs include the suppliers' and customers' costs. Such costs may not be clearly identifiable if Asbos uses a traditional approach to product costs; i.e. only allocating manufacturing indirect costs to the overhead costs and ignoring the cost of dealing with the suppliers and customers. Some of these costs are observable and others unobservable, such as the hidden costs of poor quality or a bad quality provider reputation, which will cause lost current and future sales. Finally, the board and executives need to investigate, research and evaluate whether the needs of stakeholders that will be affected by the use of the current materials will be met by continuing with the new product.

2

Beyond the cost-benefit analyses results, the board and executives should, initially, consider the broader view of sustainability beyond the agency framework. The use of internal information should not be limited to the estimated costs in master budgets (see Chapter 7), but should include the comparing of operating cost efficiency between capital investment options (see Chapter 13) and environmental cost management reports. In addition to the stakeholders' reaction to a poor decision, the resource-based view (RBV) is financial performance improved and a competitive advantage experienced by Asbos and the association under the RBV and the supply and demand framework places a primary focus for the level of CSR investment on satisfying stakeholders' demands for CSR. Therefore, both quantitative and qualitative analyses are needed for an informed and appropriate long-term decision.

E 17-31**1**

The board and executives should be using environmental and social management accounting to gather information before making their decision. That is, the provision of information within the business to manage environmental, social and financial performance is known as environmental management accounting (EMA). Some of the benefits of EMA include the following:

- 1 identifying opportunities for cost savings**
- 2 improving product mix and pricing decisions**
- 3 avoiding future costs associated with long-term investment decisions**
- 4 improving environmental and social responsibility performance.**

- 2 External stakeholders (shareholders, governments, the community, employees, creditors and suppliers) will receive information by reading publicly available sustainability external reports (ER) prepared by the company. If EMA is used then there should be an improvement in the accuracy and the transparency of the information reported. The internal information is gathered using physical (non-financial) measures that are converted into monetary measures for decision making for employee managers and external reporting for all other stakeholders.**

- 3 Some of the benefits of EMA for internal decision making and external reporting include the following:**
 - 1 identifying opportunities for cost savings**
 - 2 improving product mix and pricing decisions**
 - 3 avoiding future costs associated with long-term investment decisions**
 - 4 improving environmental and social responsibility performance**
 - 5 the provision of information in sustainability external reports. People, the planet and profit are the three pillars of sustainability, and the Global Reporting Initiative (GRI) that establishes general sustainability reporting guidelines, provides sector-specific protocols and guidelines as well as performance indicator protocols and protocols for setting the report boundary.**

E 17-31 (continued)

- 4 The three factors that should influence Asbos' adoption of GRI integrated reporting are:**
- 1 The Global Financial Crisis.** This event demonstrated to investors that if their analysis is focused solely on financial data they cannot develop an adequate understanding about the health and future prospects of businesses.
 - 2 'Market pull'** where markets need to analyse not only financial information but also environmental, social and governance (ESG) performance as indicators of an organisation's health and future prospects.
 - 3 The 'organisational push'** given to Asbos by customers and other key stakeholders so that it aligns its sustainability focus with its customers' needs to build customer loyalty and to deliver community and financial benefits to stakeholders.
- 5 The SBSC has two purposes; first as a sustainable management system, and second, as a strategic performance measurement system.**

The sustainable management system will include the social and environmental activities as well as outcomes identifying critical success factors (CSF) and critical success indicators (CSI) that reflect the sustainable strategies and objectives within the four original BSC perspectives; Learning and Growth, Internal Process, Customer and Financial. This expanded scope enables management to translate the vision, mission and strategies about how to achieve sustainability into an operational level, which can be communicated to all levels and sections of the value chain of the organisation.

SBSC as a management process also enables management to identify critical success factors (CSF) and these CSF may be linked to critical success indicators (CSI). These indicators then form the basis for the strategic performance measurement system. In particular, the internal process will include CSF and CSI that include both social and environmental activities within that perspective.

According to Kaplan and Norton (2004), their strategy could help organisations develop a visual framework of the cause-and-effect relationships among the specific components of an organisation's strategy, which can be used to integrate the BSC's four perspectives during the conceptual and planning stages. Included in the value creating process within the BSC internal process of an organisation there are the Regulatory and Social Processes, which include Environment, Employment, Safety and Health, and Community considerations that lead to other customer-valued attributes, such as Product/Service Attributes, Relationships and Image.

This information is captured for use by managers at different levels of the organisation. The multidimensional natures of both non-financial and financial SCIs are available in different formats, measures and frequencies. Lower levels of management would require either non-financial or financial or both depending upon whom they are intending to provide the information to for decision-making purposes (e.g. shop floor workers would require more daily trend graphs).

Reference

EXERCISE 17-32

- | | | | |
|----|-----------------------------|----|-----------------------------|
| a. | Prevention (SD) | i. | Detection (SD) |
| b. | Prevention (SD) | j. | External failure (societal) |
| c. | Internal failure (SD) | k. | Prevention (SD) |
| d. | External failure (societal) | l. | External failure (realised) |
| e. | Detection (SD) | m. | Internal failure (SD) |
| f. | Prevention (SD) | n. | Detection (SD) |
| g. | Internal failure | o. | Internal failure |
| h. | External failure (societal) | p. | Detection (SD) |

PROBLEMS

P 17-33

1. NPV for Option 1 = \$117,167 using 10% cost of capital (required rate of return)

	Net cash flow	Discount rate	Net discounted cash flow
	(\$80,000)	1.0000	(\$80,000)
April 2016 – March 2017	\$ 71,514	0.9091	\$65,013
April 2017 – March 2018	\$ 78,165	0.8264	\$64,599
April 2018 – March 2019	\$ 79,917	0.7513	\$60,043
Disposal benefits* (costs)	\$ 10,000	0.7513	\$7,513
NPV =			<u><u>\$117,167</u></u>

- NPV for Option 2 = \$116,499 using 10% cost of capital (required rate of return)

	Net cash flow	Discount rate	Net discounted cash flow
	(\$68,000)	1.0000	(\$68,000)
April 2016 – March 2017	\$70,045	0.9091	\$63,677
April 2017 – March 2018	\$76,696	0.8264	\$63,385
April 2018 – March 2019	\$78,448	0.7513	\$58,939
Disposal benefits* (costs)	(\$2,000)	0.7513	(\$1,503)
			<u><u>\$116,499</u></u>

2. ____ machines × ____ kW × \$ ____ /kWh × ____ hrs × ____ days = \$ ____ /yr

Energy (electricity) costs without modification to machine Option 1

1 machine × 3250 kW × \$0.235 kWh × 10 hrs × 250 days

\$1,909.38

Energy (electricity) costs with modification to machine Option 1

1 machine × 1250 kW × \$0.235 kWh × 10 hrs × 250 days

\$734.38

Annual cash outflow savings from modification to machine Option 1 =
\$1,175.00

3. Recalculation of NPV for Option 1 with reduced annual cash outflows

NPV for Option 1 = \$120,089 using 10% cost of capital (required rate of return)

	0	Net cash flow	Discount rate	Net discounted cash flow
	0	(\$80,000)	1	(\$80,000)
April 2016 – March 2017		\$72,689	0.909090909	\$66,081
April 2017 – March 2018		\$79,340	0.826446281	\$65,570
April 2018 – March 2019		\$81,092	0.751314801	\$60,925
Disposal benefits* (costs)		\$10,000	0.751314801	\$7,513
NPV =				<u>\$120,089</u>

The new calculated NPV for Option 1 is \$120,089 when allowing for the savings from modification to machine Option 1, which is higher than the NPV for Option 2, which is \$116,499

- 4 A decision based on the comparison in Requirement 3 is that Option 1 has the higher NPV. In addition to this quantitative analysis evidence that Option 1 is the better option, there are other sustainability matters to consider, which would form part of the qualitative analysis. The reduced use of resources to produce the same output of quilts would save not only energy consumption (through a greener product process that may be used as an example to motivate employees to be committed to the organisation's sustainability eco-efficiency strategies) but would also provide a cost saving platform for future energy savings as the electricity costs increase by 2019. Consequently, the NPV calculated for Option 1 may increase further when the electricity costs increase.

The calculations in Requirement 3 are not usually considered when the traditional NPV analysis is calculated. This problem provides an insight into the types of modifications to the traditional NPV that should be considered when the business is adopting a sustainability and ecoefficient set of strategies. On reflection, although in this example the modification did not increase the purchasing price, the saving was identified (as in the answer for Requirement 3) so then there is an additional amount that the purchaser should be willing to pay to improve the use of energy efficiency and save funds. That is, if the modification cost were up to \$3,000 then Quilts Galore Pty Ltd should be willing to pay this cost.

P 17-34

1. The first task is to calculate the actual kWh expected to be used with the two new machines.

This will involve the use of the formula $P(\text{kW}) = E(\text{kWh})/t(\text{hr}) = 160 \text{ kilowatts-hours}/24 \text{ hours} = X \text{ kilowatts (kW)}$

$P = \text{expected usage of electricity} = 160 \text{ kilowatts-hours}/24 \text{ hours} = 8.89 \text{ kilowatts (kW) (per day)}$

The second task is to research the output for 20 solar panels.

Have the students complete a Google search. The EuroSolar website (<http://www.eurosolar.com.au>) provided the following information*:

System capacity : 5 kW solar system

No. of panels: 20 × 250 W solar panels

Inverter capacity : 5.0 kW

Approximate output range: 6,387 to 9,125 kWh/year*

Roof area required: 36.0 m²

*All calculations are estimates based on publicly available data provided by the Clean Energy Council. The level of savings a customer will make depends on their location and their individual circumstances. These calculations also assume that 50% of the electricity produced by the customer will be used for their daily household needs, with the remaining power fed back into the grid through their electricity retailer.

To calculate the daily kW, divide the approximate output by 365 days.

Minimum electricity generated by 5 kW inverter with 20 solar panels = 17.50 kilowatts (kW) (per day)

Maximum electricity generated by 5 kW inverter with 20 solar panels = 25 kilowatts (kW) (per day)

The tariff for the utility buying back the surplus electricity has decreased significantly around Australia and is different in each state/territory.

Although the calculation of the rebate may be needed for some situations, it isn't relevant to the answer for this requirement.

The answer, therefore, assumes the buy back rebate is zero.

Therefore, the answer is yes, the 20 Mono Crystalline solar panels with 5 kW will cover expected electricity usage.

2. Calculating the IRR requires this formula:

$$I = \sum [CF_t / (1 + i)^t]$$

where CF = future cash flow

I = Investment

t = time period

i = interest rate

To calculate the future cash flow of the electricity costs savings the following is needed (based on the two assumptions in the Requirement).

Expected electricity usage = 8.89 kilowatts (kW) (per day) and because the minimum electricity generated

by a 5 kW inverter with 20 solar panels = 17.50

then the annual electricity savings will be the usage not used × 350 days (the small amount for the other 15 days is insignificant).

160 Watts-hour (8.80 kWh) × \$0.235 per kW × days			<u>\$7,560.00</u>		
	Year 0	Year 1	Year 2	Year 3	Using Tables in Chapter 13 required rate of return 10 % for 3 years 2.48685
Cash outlay	(\$6,000)				
Cash outflow savings		\$7,560	\$7,560	\$7,560	
Discounted Cash outflow savings				\$18,801	
NPV	(\$6,000)			\$18,801	= \$12,801
IRR using Table in Chapter 13	3.133				
IRR using the formula					
$I = \sum [CF_t / (1 + i)^t]$					
through substitution using 18%		\$11,443			
through substitution using 19%		\$11,157			
through substitution using 20%		\$10,880			
through substitution using 25%		\$9,626			
through substitution using 30%		\$8,557			
through substitution using 40%		\$6,852			
through substitution using 46.336%		\$6,000			

Therefore the IRR of 46.34% is greater than the 10% required rate of return so the installation should proceed.

Note, the NPV was also calculated (although not a requirement of the question) to show a strong positive NPV as a check for the IRR.

3.

Electricity costs comparison between fluorescent lighting and LED lighting after allowing for conversion costs:

Fluorescent lighting calculations ___ lights × ___ kW × \$ ___/kWh × ___ hrs × ___ days = \$ ___/yr

Lighting costs during daytime

20 lights × 0.015 kW × \$0.135 cost per kWh × 10 hours × 350 days = cost per year using
\$141.75

6 lights × 0.015 kW × \$0.135 cost per kWh × 10 hours × 365 days = cost per year using
\$44.35

Total cost of lighting with fluorescent = \$186.10

LED lighting calculations ___ lights × ___ kW × \$ ___/kWh × ___ hrs × ___ days = \$ ___/yr

20 lights × 0.015 kW × \$0.008 cost per kWh × 10 hours × 350 days = cost per year using
\$78.84

6 lights × 0.015 kW × \$0.008 cost per kWh × 10 hours × 365 days = cost per year using
\$23.65

Total cost of lighting with LED = \$102.49

Annual savings from using LED \$83.61

4.

- a The cost of installing the 20 Mono Crystalline solar panels compared to the benefits of their installation shows the single cost of installation \$6,000 results in a \$7,560 reduction of costs, annually. Therefore the benefits exceed the cost in the year of installation.
- b The annual saving from using LEDs is \$83.61 and the costs would be $\$80 \times 20$ light fittings. Therefore \$83.61 is compared to \$1,600. Cost benefit analysis shows that a payback period of 20 years is required to break-even. However, if the LED lighting could be installed in the existing light fittings, then the annual saving would be the benefit of \$83.61 less the cost of the replacement globes. However, if LED lights were progressively installed as the fluorescent light bulbs needed replacement then the cost of the replacement LED globes would be the difference between the price of the fluorescents and LED bulbs. Therefore, if there were no conversion costs the recommendation would be to progressively replace the fluorescents and LED bulbs, mainly due to the slight potential cost saving through the longer life of the LED bulbs.

P 17-35

Data input and calculation section between cells K42 to Y76

Students' answers to this question will vary. However, any answer should demonstrate an understanding of the principles that are involved in developing a activity-based working environment.

1. The replacement of individual offices for each manager with a hot desk area will mean information will need to be electronically stored and a small locked cabinet may be provided each manager for their current files. The production and floor managers as well as floor supervisors would seem to be the main personnel that would deal with suppliers and commercial intermediate customers, which could be scheduled either from their home or during the day at work as suitable for suppliers and commercial customers. Also, where it is more suitable to contact suppliers or commercial customs during times when they are in the office, each manager could make their telephone contacts using a mobile phone that would enable them to use the new smaller area effectively for such contacts as well as morning tea, lunch, and afternoon tea breaks. Therefore, AllFruitCo will need to provide employees with a new laptop, mobile phone, and internet equipment access capabilities as well as provide an internet virtual private network (VPN) and secure mobile connection capacity to have them successfully work at their own home premises while protecting the integrity of AllFruitCo's information. Applications and software is needed to enable scanning or saving of document storage by using the cloud or other online share site facilities as well as the use of a USB stick store information about the current orders for the coming weeks. AllFruitCo should bear the cost of these capabilities.

2. Senior management needs to involve an employee representative group in the initial discussion process. As the organisation is heavily invested in modern technology, this has reduced the workforce needed within the premises and senior management may need initially to only involve production and floor managers as well as floor supervisors. Irrespective of the employees that will be included in the initial discussions, senior management can use the four strategic management processes (students should be referred to the illustration in Staircase 16.3) and adapt the content of the processes to suit the specific ABW adoption strategy. The managers may wish to select key employees to represent members of the various process teams to be included in the four strategic management processes, which will provide excellent and relevant feedback to the ABW proposal. These team members will act as change champions for their team members to whom they will report back about the benefits of ABW to them. Newsletters from management and informal progress report meetings organised by senior management provides feedback to employees, a form of intrinsic reward (to expand their answer students could refer to the section in Chapter 7 'Monetary and non-monetary incentives').

3. After combining the information of general benefits identified in the four strategic management processes, managers and employees can recognise, individually, how they will personally benefit from the implementation of an ABW structure. These benefits will include time saved travelling to the second premises where products are stored to check the quantity and quality of the product received, which will increase their efficiency from the one location, the savings for the cost of transportation (fares or petrol), parking costs, wear and tear on their own vehicle, and having their own vehicle under cover. Clothing cost savings may be significant to some either through less frequent purchases or range of clothing options needed for only one or two days a week in the office. The change to work collaboratively on tasks with suppliers and commercial customers allows quicker responses to both value chain members. This collaboration among members of the production team will allow more than one person to be known to the suppliers and customers thus minimising the impact of absence of one person through illness or annual leave. From management's perspective, the costs savings may be tangible savings (savings from a cancel lease of property owned by another organisation, lower energy and water usage costs available with the purchase of new equipment and machinery, improved productivity or lower absenteeism). However, there are intangible benefits such as employee satisfaction that leads to retention of experienced staff or can be used as an attraction for prospective staff and could be a recruitment time-saving exercise. Also, suppliers and commercial customers perceived goodwill and reputation of AllFruitCo through quick response and solutions through the collaborative team-based servicing of suppliers and commercial customs. While these intangible benefits may initially not visible, non-financial performance measures may be captured as lead indicators, such as repeat sales or recommendations to friends. (Students should refer to chapter 16 because these non-financial measures are discussed and illustrated throughout Chapter 16 as well as discussed specifically in Staircase 16.4 and Exhibit 16.12 under the customer perspective of a Balanced Scorecard discussion.

4. While there are routine activities that occur through the high level of mechanisation of the process still require task control systems, there are some new activities, which require the focus of the control mechanisms to move from a task control system to an outcomes (results) control system (students should refer to Staircase 16.3 for a discussion on a results control system). Also, from the long-term perspective the use of a strategy map and the design of a strategic performance measurement system (SPMS) will provide management and employees with links between the strategy objectives and the critical success factors (CSFs). These links should be used to communicate and reinforce the desired results and benefits to employees and the organisation.

Data input and calculation section between cells K42 to Y76

This data is used in the previous answer and the next answer, which is part of the informal report

5. There are issues to be considered when identifying the required office and building redesign and their relationship to lighting levels per square metre required by workplace health and safety legislation or by-laws, the aesthetics of the office design and functionality. For example, the process is not as simple as changing the light bulbs for lower energy use emission but there is a needed lux level per square metre because each type of lighting has a different lux per square metre (students should refer to Exhibit 17.6). Therefore, an organisation should use both quantitative and qualitative factors in its assessment of a project's viability. The calculations below form part of the five steps required to analyse the ABW proposal based on quantitative factors.

Step 1: Calculate the hours of lighting for the period using hours provided in Table 1 in Problem 17-35.

<i>Hours of lighting required for the period calculation box</i>		
Lighting Times	Daily Hours of lighting	Weekly Total
7am-5pm (5 days)	12 hours per day	60 hours
Total weekly hours of lighting:		60 hours
Yearly hours of lighting: (60 x 52 weeks)		3 120 hours
Hours of lighting for 9 years: (3 120 x 9 years)		28 080 hours

Step 2: Estimated lighting Lumens Required

This step involves using the information given in Table 1 in Problem 17.35 about the area of the office times the recommended lux needed to achieve the needed minimum average lux of 320 lux. The higher lux from each light is needed because the level of lux reduces the further any point within the room is away from the light fitting. Lux is therefore calculated by multiplying the room size by estimated lighting lumens required at the light to achieve 320 lux on average at any point within the room. Please note that this example of step 2 is part of the ABW calculation process for identifying the correct number of fittings and needed light wattage. As this is a technical calculation and will vary depending upon the room characteristics (e.g., natural lighting) step 2 has been retained for completeness of the steps in this example. The number of fittings and needed light wattage has been given in Table 1 to simplify this illustration.

Estimated lighting Lumens required for the period calculation box

Room in m2	800
------------	-----

recommended lighting (lumens/m2) = amount given in Lux*	525
estimated lighting Lumens Required = recommended lighting to achieve the Average lumens/m2 x Room in m2 = 525 x 800 = 420 000	420,000

* While the level of (lumens/m2) is 320 lumens/m2, the output of lumens weakens towards the outer limits of the light, therefore a higher output of lumens/m2 is needed so minimum average lux of 320 lux is the level across the entire light arc.

Step 3: Initial and ABW project's lifetime number of bulbs, lamps, or panels calculations

Figures from Table 1 and Table 2 in Problem 17-35, as well as the Hours of lighting required for the period calculation box provided in Step 1 and the Estimated lighting Lumens required for the period calculation box provided in Step 2 (as identified for each item below in step 3 calculation box) are used in the calculations for this step. First, the annual energy consumption kilowatt hours (kWh) for one fitting is calculated by multiplying the lumens per bulb. Second, the number of lightbulbs required (needing to be replaced) over 8 years is calculated per lightbulb. The 9-year calculation is a more accurate figure because some bulbs still have half a year life expectancy at the end of a year but over the 9 years the remaining life expectancy is included. For example, 15 existing Metal Halide HighBay lamps no replacements in a year but over 9 years only two sets of complete lamps (i.e., 30 lamps replacements) are necessary.

	Metal Halide HighBay Fitting (existing)	LED HighBay Panels (ABW Option)
<u>Initial and ABW project's lifetime number of bulbs, lamps, or panels calculations box</u>		
Lumens per bulb (efficacy [watts] provided in my brief (see Table 2 of Staircase exercise 17-24)) x Watts used (Staircase exercise Table 1) = 50 x 40 x 2 tubes per fitting ; 200 x 32 x 2 tubes per fitting	36000	28000
Annual energy consumption kilowatt hour (kWh) for one fitting = efficacy [watts] Table 2) x standard bulb or panel wattage Table 1) ÷ 1000 kWh	1248	624
Number of lightbulbs required over 9 Years = 9 years of lighting hours (from step 1 table) ÷ Life expectancy of bulb (in hours) (Table 2) = 28 080 ÷ 15 000; 28 080 ÷ 50 000	2	0
Replacement panels in 9 years = 2 replacements (step 3) x 15 panel (Table 1) (2 X 15 = 30; 0 replacements (step 3) x 15LED panels (Table 1) = 0	30	0
Costs 10 years	Metal Halide HighBay Fitting (existing)	LED HighBay Panels (ABW Option)
Cost of refurbishment of fittings per panel 0; \$200 per panel x 15 panels	\$0.00	\$3,000.00

Replacement cost (replacements in 9 years x cost per panel) = 2 replacement of 15 panels (step 3) x \$490 (Table 2); 0 replacement of LED panel (step 3) x \$320 (Table 2)	\$2,700	\$0.00
Energy Consumption = Annual energy consumption KW (hours of lighting from step 1) x KW Energy Consumption for one light (from step 3) x cost per kWh (see question's Table 1) = 208 KW x \$0.16 x 10 years x 10 light fluro tubes = \$332.80 x 10 light fluro tubes; 83.2 KW x \$0.16 x 10 years x 6 LED light bulbs = \$133.12	\$26,956.80	\$13,478.40
Total Costs of lights and electricity over 10 years	\$29,656.80	\$16,478.40

The resulting figures from step 3 may then be used as the basis for step 4 and step 5.

**Data input and calculation section between cells K42 to Y76 of worksheet 17-8SE
as well as Cash Flow analysis, payback period, and NPV analyses calculation in cells K24 to X67**

4.

Step 4: Net Benefits/Savings by adopting ABW

In addition to the costs calculated in step 3, other costs and benefits provided in Table 2 will need to be included in the step 4 calculations. The total costs over 9 years for all lights calculated in step 3 include the costs of refurbishment of fittings, replacement cost of the light panels, and the energy consumption costs over the 9 years. The comparison between the existing lighting system and the replacement lighting system is \$13,178.40 (costs over 10 years for the existing lighting system = \$29,656.80 minus costs over 10 years for alternative LED lighting system \$16,478.40). However, the capital investment required to implement the ABW project and the net savings (benefits) that the company will derive from implementing the ABW project need to be considered and this will occur in step 4.

The Net Benefits/Savings by adopting ABW calculation box provides an estimated net benefit of implementing the ABW project of \$177,000 without replacing the current lighting system and a further net benefit of \$16,178.40 from choosing the LED alternative lighting system. Therefore, the adoption of ABW and the implementation of a change of lighting system will have a net benefit for AllFruitCo of \$193,178.40.

However, these calculations do not take into consideration the fall in the purchasing power of the Australian dollar over the 9-year period and does not identify the payback period for this project. These calculations are undertaken in step 5 of this ABW assessment process.

Net Benefits/Savings by adopting ABW calculation box

	Existing Metal Halide HighBay Fitting	LED HighBay Panels
Total Lighting benefits Comparison (from Step 3) existing lighting system = \$29,656.80 minus - LED lighting system \$13,478.40 = \$16,178.40		\$16,178.40
Other savings through adopting ABW (from Table for this Staircase exercise)		
Additional (benefits) energy savings (energy not used for office equipment and lower costs for smaller air conditioning unit) across 9 years (from Table 2)	24,000	24,000
Reduced transportation of materials between premises	108,000	108,000
Rental Income (benefits) from Sub-lease 12 square metres of the office across 9 years (from Table	180,000	180,000
Total benefits over 9 years from ABW	\$312,000.00	\$328,178.40
Add Additional ABW costs (from Table this Staircase exercise)		
Office redesign (beams to replace load bearing walls and build meeting room and purchase smaller air conditional unit)	-95,000	-\$95,000
Furnishings	-25,000	-\$25,000

Enabling technology Equipment to permit ABW	-15,000	-\$15,000
Total capital investment	-\$135,000.00	-\$135,000.00
Net benefits (Cost) from adoption ABW	\$177,000.00	\$193,178.40

In summary, the results suggest that the ABW should be adopted based on the quantitative information calculated in steps 1 to 4. However, benefits derived from ABW require a long-term view. Therefore, step 5 is necessary to identify the payback period and the Net Present Value (NPV) to reinforce the long-term view needed for ABW.

5. Step 5: Long-term view analysis (payback and NVP Analysis)

Payback period and NVP calculations has assumed the benefits will be received from a decreased purchasing power from the net cash flows (paying less). For this assessment step 5, the discount value of the net cash flow may be calculated by either discounting the net cash flow on an annual basis by using the alternative method of using the accumulated discount factor because the project is expected to receive the net benefits equally across the 9 years. Therefore, benefits are spread equally across the 9 years. This assumption enables the NVP to use the cumulative discount factor and calculation box illustrated across a shorter period than the 9 years. However, if the dollar cash flow savings differed each year across the 9 years then the longer version of this analysis and the individual time period discount factor will be necessary.

The NPV analysis provides a longer term view than the payback period due to limitations of the payback period (students should refer to the explanation provided in Chapter 12 under the section entitled USING THE PAYBACK PERIOD TO CHOOSE AMONG ALTERNATIVES). A payback period and NPV analysis will be conducted for the implementation of ABW using the new LED lighting system because step four shows a considerable saving by installing this lighting system compared to the existing lighting, which would make the payback period and NPV for the existing redundant.

The ABW option with the installation LED panel system has a payback period of 3 years and nine months with a positive NVP of \$129,241. The positive ROI of 25.7% is consistent with Telsyte's findings (students should refer to Chapter 17 for details) that 41% of ABW adopters receive an increase to their return on investment (ROI) within 1 to 2 years. AllFruitCo is estimated to make significant ROI in the first year.

In addition to these quantitative factors, there are qualitative factors that may lead to further cost savings (i.e., further quantitative factors considerations). These qualitative factors should be considered when assessing whether to adopt ABW. In many buildings, when Metal Halide HighBay Fitting lighting is installed it is highly likely a higher level of heat is generated from the light fittings to achieve the required lux to meet the minimum legislative requirement. These higher levels of heat from this lighting may lead to discomfort among employees and management as well as requiring later energy consumption from the use of air-conditioning units for a greater length of time and at a lower temperature. This higher temperature in the building can lead to either a lower work output, dissatisfied employees, or much higher electricity costs or staff turnover. In conclusion, based on the quantitative and qualitative factors discussed, the adoption of ABW should be recommended.

P 17-36

Req 1 and 2: The prepared environmental cost report below is represented by the first three columns of the table. The third column of the report shows that a total of \$5,250,150 has been incurred by the company on environmental costs while fourth column expresses these costs as a percentage of operating costs.

Activities	Environmental Costs	Category Totals	Percentage of Operating Costs	Control and Failure Activity Category Costs	Percentage of Total Environmental Costs
<i>Prevention Cost Activities</i>					
Performing environmental studies	\$75,000				
Advanced technological equipment to prevent environmental damage	\$965,000				
Training (environmentally related)	\$95,000				
Total Prevention Costs	\$1,135,000	\$1,135,000	1.42%		
<i>Detection Cost Activities</i>					
Verifying supplier environmental performance	\$58,890				
Testing for contamination	\$283,140				
Total Detection Cost	\$342,030	\$342,030	0.43%		
Total Control Costs		\$1,477,030	1.85%	\$1,477,030	35.9%
<i>Internal failure activity costs:</i>					
Operating pollution equipment	\$482,520				
Maintaining pollution equipment	\$248,100				
Treating and disposing of toxic waste	\$850,000				
Total Internal failure activity costs		\$1,580,620	1.98%		
<i>External failure activity cost</i>					
Inefficient materials usage	\$382,500				
Clean-up of chemically contaminated soil	\$675,000				
Total External failure activity costs		\$1,057,500	1.32%		
Total Failure Costs		\$2,638,120	3.30%	\$2,638,120	64.1%
Total Environmental Costs	\$5,592,180	\$5,250,150	5.14%	\$4,115,150	100.0%
operating expenses	80,000,000				

The initial action needed in this first step is to group environmental costs into one of the four categories. Each category must be totalled and its percentage of operating cost calculated.

When these environmental costs categories are reduced into the control category (Prevention and Detection) and failure category (Internal and External Failure), the following relationship is noted in Histogram 1: Control and Failure Cost Categories. There are about 36% of environmental costs incurred in the control category (Prevention and Detection) while failure category (Internal and External Failure) represents 64% of environmental costs. AllFruitCo, while in the efficiency (productivity) strategy phase stage (sustainability adoption phase 4), seems to have adopted the first approach to prevent the release of residues once the product is produced through the use of technology and methods [students should look at the discussion of the first approach in the paragraph immediately following Exhibit 17.9].

Req 3:

This approach achieved product quality by verifying supplier environmental performance as well as testing for contamination (detection costs) and operating and maintaining pollution equipment control investment in technology as well as treating and disposing of toxic waste to mitigate the escape of residues (internal failure costs). These are all non-value-adding activities from the customers' perspective and the approach will only minimise the environmental damage through higher environment costs as supported by the answer for step 1. Poor environmental quality performance is the conclusion drawn from the analysis.

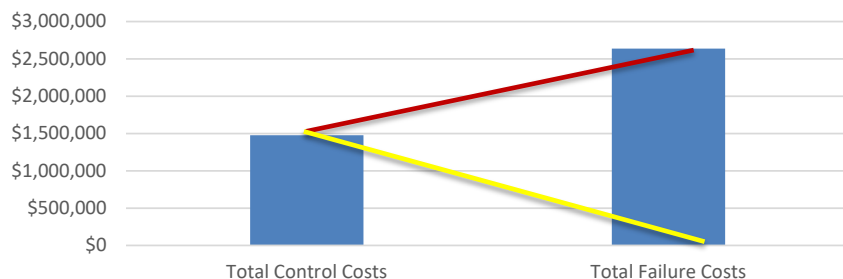
The alternative 'doing it right the first time' approach is by investing in the prevention activities of training, investing in advanced technological equipment to prevent environmental damage, and conducting studies into environmental damage prevention. While where is evidence of product quality achieved by prevention and detection activities (control activity costs), more needs to be committed to these activities to improve environmental performance. Histogram 2: Environmental Cost for each Category illustrates the current and desired curves for each of these four costs categories.

Perhaps as AllFruitCo transitions to phase 5 of sustainability and devotes more resources to reflect its sustainability values more will be spent on prevention and detection activities so the costs are more consistent with the desired curve in Histogram 2.

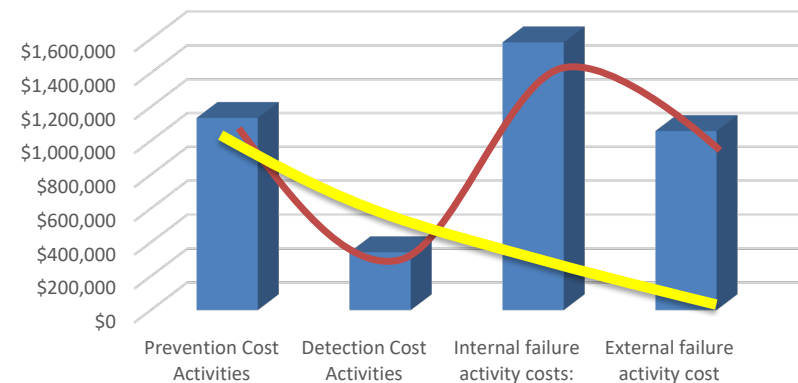
Prevention Cost Activities	\$1,135,000
Detection Cost Activities	\$342,030
Internal failure activity costs:	\$1,580,620
External failure activity cost	\$1,057,500

Total Control Costs	\$1,477,030
Total Failure Costs	\$2,638,120

Histogram 1: Control and Failure Cost Categories



Histogram 2: Environmental Cost for each Category



Red Curve = actual curve
Yellow Curve = desired curve

Req 4:

In addition to the four categories environmental costs produced in the Environmental Cost Report, Environmental Financial Report provides information about the benefits of adopting sustainability values by the company.

Step 2 Environmental Financial Report

After grouping the various benefits into one of the two categories of benefits relevant for this company's strategy, these benefits are totalling. The summary of the four categories of environmental costs is included into the environmental financial report.

Environmental Benefits	Benefit Amount	Category Total	Percentage
<i>Income Source</i>			
	\$0		
	\$0	0	0.0%
<i>Current savings</i>			
Cost reductions, contaminants clean up	2,642,860		
Cost reductions, Treating and disposing of toxic waste	190,000	2,832,860	78.5%
<i>Cost Avoidance Source</i>			
Ongoing energy conservation cost savings	354,000		
Ongoing packaging cost reductions	423,000	777,000	21.5%
<i>Total Savings</i>	<u>\$3,609,860</u>	3,609,860	100.0%
<i>Environmental Activity Categories</i>			
Prevention Cost Activities	\$1,135,000		
Detection Cost Activities	\$342,030	\$1,477,030	35.9%
Internal failure activity costs:	\$1,580,620		
External failure activity cost	\$1,057,500	\$2,638,120	64.1%
<i>Total Environmental Costs</i>	<u>\$4,115,150</u>	\$4,115,150	100.0%

Savings as a percentage of Environmental costs

87.7%

Req 5:

The benefits reported in the environmental financial report, particularly, reveals 78.5% from current cost savings and 21.5% from cost avoidance activities. Benefits from these two categories are consistent with the company being positioned in Phase 4 where there is an emphasis on energy (and other non-renewable resource) cost savings through an efficiency (productivity) strategy. However, the benefits from the current savings and cost avoidance represent 87.7% of environmental costs. Consequently, although an efficiency (productivity) strategy, the result indicates that more improvements are clearly needed in the environmental costs savings strategy and the transition of the company into phase 5 where sustainability values are the focus of the company may result in benefits from income sources, which are not currently being achieved.

Req 6:

The overall conclusion is that AllFruitCo should adopt the alternative 'doing it right the first time' approach, where product quality is achieved by prevention (control activity costs) and incorporate sustainability into its mission and core strategy (the fifth phase of sustainability) is in place and the focus is on a long-term growth strategy using the sustainability initiatives as an innovation differentiation strategy to improve environmental performance.

P 17-37

1. and 2. The answer for this requirement will depend upon the year the question is answered and the contents of the report for the relevant three years. Use the question to provide a framework about the company's performance. Access the most recent sustainability reports for Westpac Corporation. Under the section called 'sustainability performance metrics', compare Westpac's performance and trend across five years for the following sections. First, the environment section containing performance details about GHG Emissions, Paper Consumption, Water, Business Travel. Second, the supplier performance section includes Indigenous Australian suppliers. Third, the Social and economic performance impact, including Economic impact, Community investment, Foundations, Social impact, Reconciliation Action Plan progress, Financial Inclusion Action Plan progress. Also, there are metrics for 'The issues that matter...' where the scatter plot on two axis 'Important to Stakeholders' and 'Important to Westpac' uses the labels 'highly material', 'material', and 'important' for the stakeholders (Y axis) and Westpac (X axis). The 'emerging issues that matter' are grouped into themes and colour coding provides information about their reported themes: Service leadership, Conduct and trust, Digital innovation, Workforce of the future, Positive societal impact, and Value chain risk. Conduct and trust may raise some interesting questions and discussions following the Royal Commission into the banking industry and the subsequent civil and criminal legal action mentioned by the Royal Commission. The discussion should focus on the environmental, social, and governance (ESG) performance of Westpac (and other banks if the adopting academic wishes to expand the discussion).

3. Aspects identified by GRI in G4 are divided into three categories; economic, environmental, and social. The social category is subdivided into four sub-categories. These sub-categories and aspects are illustrated in Table 1 below.

The aspects listed relate to activities then are not financial (monetary) in nature and therefore it is essential that physical (non-financial) metrics are used in environmental management accounting (EMA) so that the activities can be measured so a financial value may be attributed to the aspect and Westpac can then report these aspects as physical measures or percentages and a financial measures.

The recently released GRI standard (effective for 1 July 2018) had 36 GRI specific standards (GRI 101 to 103; GRI 201 to 206 economically focused; GRI 301 to 308 environmental focused; and GRI 401 to 419 socially focused across the four sub-categories). These new standards reinforce the detailed nature of the GRI sustainability reporting and the need for EMA to expand into the future.

4. The answer to this question will vary from year depending upon the results of Westpac in their environment and sustainability performance. The use of Kaplan and Norton for identified groups of four processes should be the basis for an answer, which will vary in how the discussion develops depending upon the performance of Westpac in the specific year.

1., 2., 3. The first of these value creating processes is the operations management processes, where activities with the suppliers and distributors within the company's value chain are considered along with the production processes and risk management of the activities undertaken. All of these activities are reflected in the scatter plot diagram, associated themes, and activities within these themes. For example, value chain sustainability risk and the direct environmental footprint activity both form part of the value chain risk theme and would cover activities related to the supplier, the distribution of services, the production of the services (which may contribute to the sustainability footprint) and the sustainability risk assessment of its operations. Customer management processes represent the second value creating processes where the selection retention or acquisition of customers may be based on a customer profitability analysis (students should refer to Chapter 10) and the growth in customers may be achieved through a business growth strategy, which may involve experience, support, and access. Innovation processes are often linked to a business growth strategy and from a sustainability perspective will require the identification of opportunities, the R & D coupled with the design and development of sustainable products as well as the launch of these products. For Westpac, the digital product and service transformation, information security and data privacy issues would form part of these activities within the third processes. Finally, the regulatory and social processes would relate to activities that would be reported within the issues: changing regulatory landscape, covenants risk and remuneration, climate change transition and opportunities, conduct and culture, inclusion and diversity, workforce wellbeing, as well as societal diversity and prosperity.



P 17-38 The following discussion and illustration of a Sustainability Balanced Scorecard (SBSC) followed the school of thought where the sustainability perspective of a business operation that adopts an integrated approach of sustainability measurement and evaluation within the four perspectives of the traditional Balanced Scorecard philosophy. This perspective follows the 2001 and subsequent articles by Kaplan and Norton. This four-perspective framework is discussed in Problem 17.37 requirement 4. It is acknowledged that the literature also supports a five-perspective SBSC and recent literature has incorporated contingency theory into the design companies may select, which may vary between a four-perspective and a five-perspective strategic performance measurement system for their operations. Consequently, the suggested solution provided is not a model answer but merely an example involving the use of the four-perspective framework provided by Kaplan & Norton to help students develop an overview to the process involved according to the Balanced Scorecard philosophy. Students need to develop an understanding of the application not rote learn the following because the developers of the Balanced Scorecard (Kaplan & Norton) have acknowledged the application of the Balanced Scorecard philosophy will vary from circumstance to circumstance and from organisation to organisation.

For a more advanced course in management accounting, the adopting academic may wish to refer to the following literature as examples of the five-perspective SBSC as well as discussions about the contingency approach to the design of a SBSC.

Stefan Schaltegger, Igor Álvarez Etxeberria and Eduardo Ortas, 2017. Innovating corporate accounting and reporting for sustainability – attributes and challenges, *Sustainable Development*, 25, 113–22.

Tobias Hahn and Frank Figge, 2018, Why architecture does not matter: On the fallacy of Sustainability Balanced Scorecards, *Journal of Business Ethics*, vol. 150(4), 919–35.

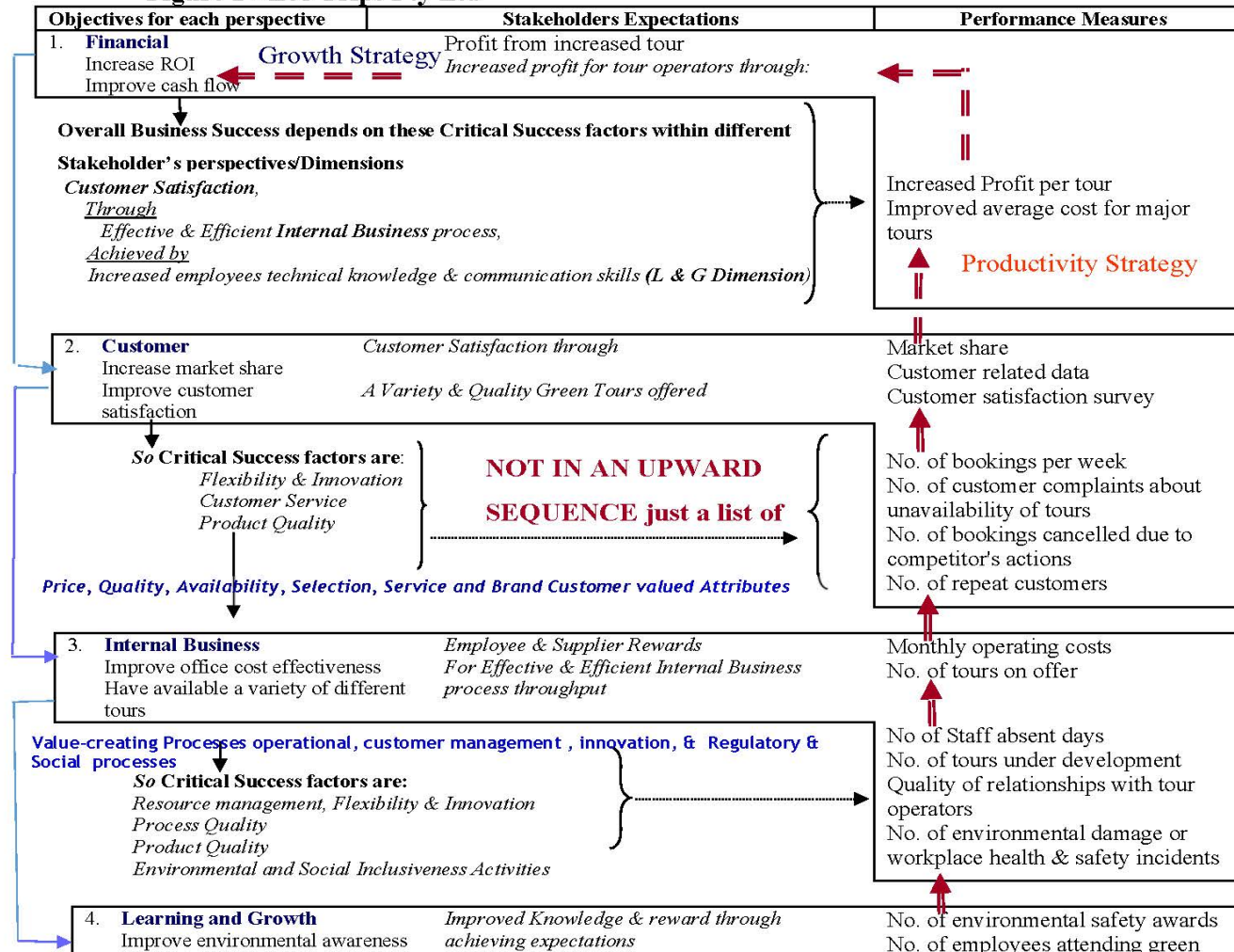
Erik G. Hansen and Stefan Schaltegger, 2016, The Sustainability Balanced Scorecard: A systematic review of architectures, *Journal of Business Ethics*, vol. 133(2), 193–221.

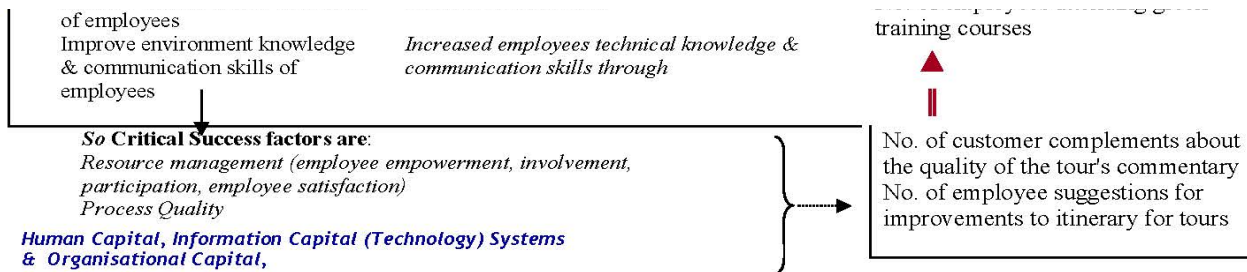
Erik G. Hansen and Stefan Schaltegger, 2018, Sustainability Balanced Scorecards and their architectures: Irrelevant or misunderstood, *Journal of Business Ethics*, vol. 150 (4), 937–52.

Journeault, M. 2016. The integrated scorecard in support of corporate sustainability strategies, *Journal of Environmental Management*, 182, 214–29.

For this problem, all requirements are contained in the illustration provided below which is a demonstration of the 'cascading down' effect (blue arrows), including the identification of each perspective's link to the relevant critical success factors (CSFs) (vertical solid black arrow), which is requirement 1. The 'building up' effect (Maroon double line arrow) flows from the linking of CSFs for each perspective (horizontal black dotted arrows) to provide the answers to requirement 2. Requirement 3 is interwoven with requirement 2 because the identified performance measures for the CSFs illustrate the measures related specifically to each perspective and its CSFs, which are under the control of Eco Trips. All three requirements have been answered within Figure 1 - Eco Trips Pty Ltd below.

Figure 1 - Eco Trips Pty Ltd



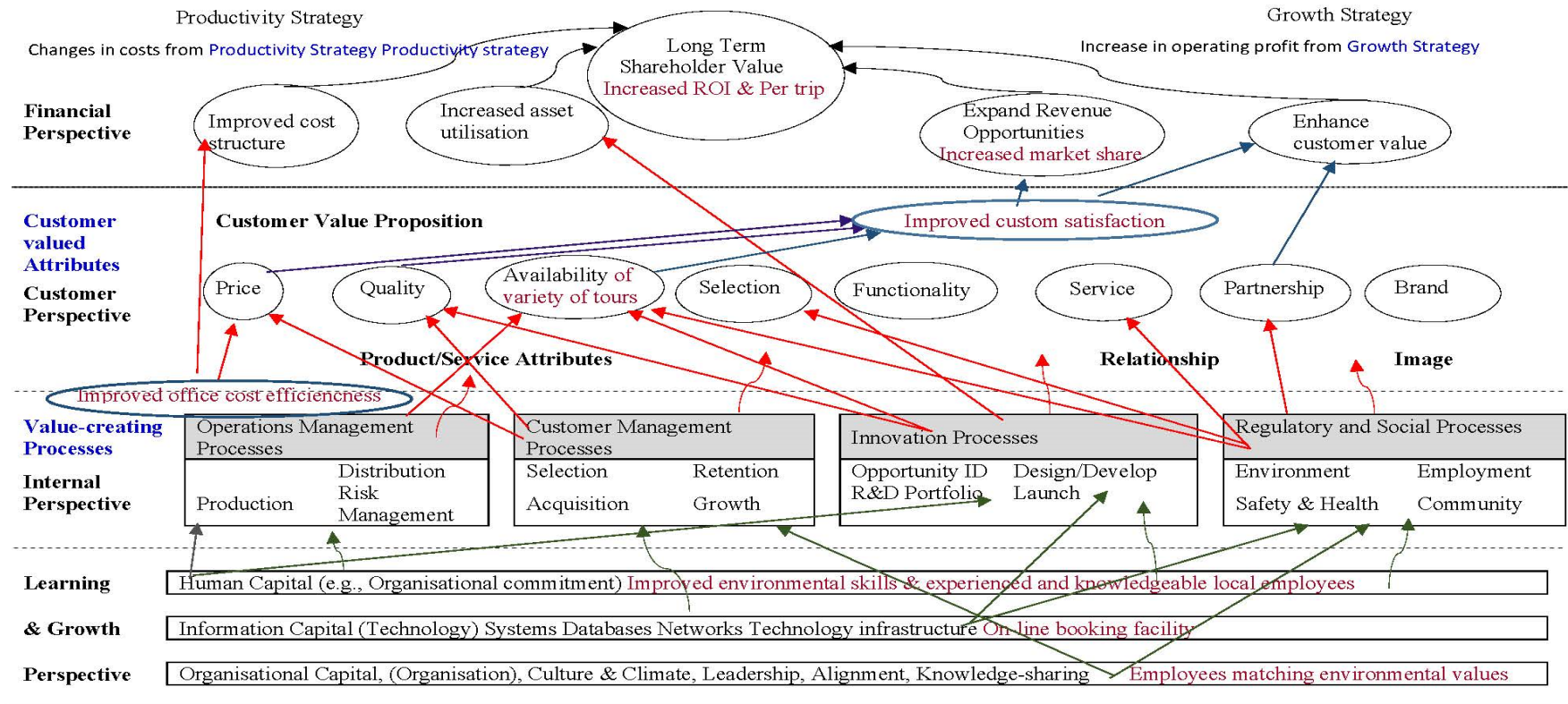


4. A summary can be provided for each of the four perspectives in a tabular format, which provides the objectives of eco-tours, the identified CSF outcomes and the relevant measures four drivers that would support the achievement of the objectives. Your measures must be linked specifically to CSF and be controllable by Eco Trips. There are two columns in the table below. Included in these two columns are performance measures for both outcome measures (lag indicators) and measures for success into the future (i.e., lead indicators). In Table 1, there are examples of both the lead and lag indicators for the three perspectives, financial, customer, and learning and growth. In the internal process perspective, more indicators are provided as this is the focus of the question of providing specific measures for the 'regulatory and social value-creating processes'.

Perspectives, Objectives and CSFs	Performance Measures	
	Outcome Measures	Measures for drivers of success
1. Financial Increase ROI Improve cash flow	Profit per tour ROI Average cost for major tours	Average value of each booking Number of tours cancelled Quality of tour operators
2. Customer Increase market share Improve customer satisfaction	Market share Customer satisfaction survey	No. of bookings per week No. of customer complaints No. of bookings cancelled No. of repeat customers
3. Internal Process Improve office cost effectiveness Have available a variety of different tours Environment protection and regulatory compliance Employment of experienced who fit the environmental values of the company Safety & Health of the employees, clients and the community Community Inclusiveness in the development of tours in sensitive areas cultural communities	Monthly operating costs No. of tours on offer No. of environmental incident involving fines for breaches of regulatory non-compliance No. of accident free days for 'Workcover' (or workers' protection) insurance No. of public liability claims MOA (memorandum of agreement) with local cultural communities	Staff absenteeism and the cause of the absenteeism No. of tours under development Quality of relationships with tour operators No. of training session for environmental and social issues Frequency of training session for environmental and social issues No. of community meetings prior to designing, formulating and implementing new eco-tours Frequency of community meetings after implementing new eco-tours to allow for emerging strategies

4. Learning and Growth Improve environmental skills of employees Availability of On-line booking facilities	No. of employees attending green training courses No. of experienced and knowledgeable local employees No. of On-line bookings	No. of customer complaints No. of employee suggestions for tours No. of employees recruited from the local cultural communities
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PROBLEM 17-38 Requirement 5 - visited Elizabeth could give Strategy Map development from Requirements 1 to 4



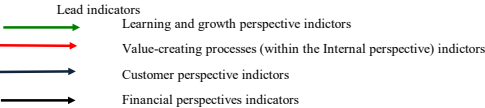
Source: Adapted from Kaplan and Norton. (2004a, Strategy Map, p 2, Strategy Maps – The Complete Summary

Lead indicators

- Learning and growth perspective indicators
- Value-creating processes (within the Internal perspective) indicators
- Customer perspective indicators
- Financial perspectives indicators

Indicators in Brown font in each perspective

5. The fifth requirement for this Problem 17.38 involves the designing of a strategy map and for students to include the CSF links linkages among the CSFs among the 'regulatory and social' value creating processes.
- For completeness, links between each of the four perspectives are shown and associated performance measures are provided in a brown form to print specific measures for the 'regulatory and social value-creating processes'. The different lead indicators for each perspective are illustrated using a different coloured arrow for each perspective, which is provided below. Adopting academics of this textbook may wish to extend the discussion beyond the wording of the question to a more complete illustration of the direct linkages not only between subsequent perspectives but also between perspectives which do not follow a sequential pattern (i.e., the direct association between some value creating processes within the internal perspective and the financial perspective).
- Due to the limited space within the strategy map, not all measures provided in Figure 1 or Table 1 have been included however the information provided will allow an adopting academic to expand on the discussion as part of the academic freedom for that person.
- Finally, in the financial perspective, there are outcomes which have been grouped near either growth strategy or productivity strategy, which provides the adopting academic with an opportunity to link this strategy map to the topics covered in Chapter 16.



The strategy map below provides these illustrations of how the measures under requirements 1 and 2 are linked to the CSFs identified in these earlier requirements (particularly Figure 1 and Table 1).

The attributes identified under the customer perspective have been listed under the critical success factors section to provide the link between these CSFs and the lead indicator performance measures. Similarly, in the internal perspective, the four value creating processes have been identified next to the three major CSFs for Eco-trips. There is an extensive set of measures under this perspective for the 'regulatory and social' value creating processes.

The requirements under the learning and growth perspective include training of staff, purchasing of equipment that will not damage the environment, and the establishment and maintenance of a culture that has interests in the environment and this is reflected in employees' presentations to the clients travelling on the eco-tours. Managing of these resources is captured under the three capitals: human, information, organisational, which are the three capitals mentioned under the learning and growth section for this illustration.

Although requirement 5 requests that the links be provided for only one of the four value creating processes within the internal process (i.e., the 'regulatory and social' value creating processes), linkage has been illustrated for each perspective in a strategy map, which uses different coloured arrows for each perspective in the strategy map for Eco Trips Pty Ltd.

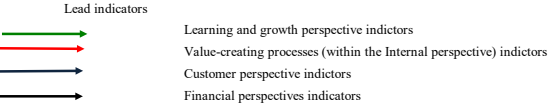
Also, the complete illustration of indicator links between the four perspectives provides some example of how Eco Trips Pty Ltd may be successful with its sales growth strategy and its productivity strategy. The following colour coding of the arrows shows that indicators may not only lead to outcomes in subsequent perspective but also between perspectives that are not sequentially situated in the SBSC framework. This provides some revision for students for the topics and concepts presented in Chapter 16.

The fifth requirement for Problem 17.38 involves the designing of a strategy map and for students to include the CSF links linkages among the CSFs among the 'regulatory and social' value creating processes.

For completeness, links between each of the four perspectives are shown and associated performance measures are provided in a brown form to print specific measures for the 'regulatory and social value-creating processes'. The different lead indicators for each perspective are illustrated using a different coloured arrow for each perspective, which is provided below. Adopting academics of this textbook may wish to extend the discussion beyond the wording of the question for a more complete illustration of the direct linkages not only between subsequent perspectives but also between perspectives which do not follow a sequential pattern (i.e., the direct association between some value creating processes within the internal perspective and the financial perspective).

Due to the limited space within a strategy map, not all measures provided in Figure 1 or Table 1 have been included, however the information provided will allow an adopting academic to expand on the discussion as part of the academic freedom for that person.

Finally, in the financial perspective, there are outcomes which have been grouped near either growth strategy or productivity strategy, which provides the adopting academic with an opportunity to link this strategy map to the topics covered in Chapter 16.



5. In particular, the green arrows between the three learning and growth components and 'regulatory and social' value creating processes are represented by CSFs Improved environmental skills & experienced and knowledgeable local employees, (Human component), On-line booking facilities (information capital), and Employees matching environmental values (organisational capital). Furthermore, there are a number of measures within the learning growth perspective that were identified and linked to the provision of the innovative product through training or recruitment of staff with the appropriate qualifications, which are linked using green arrows to the internal value creating processes.

The red arrows represent the measurements and outcomes provided under the value creating processes within the internal process perspective. In particular, 'regulatory and social' value creating processes provides links to the following customer valued attributes of the customer perspective: quality, availability, selection, service, and partnership. Also, the red arrows provide an illustration of the link between the customer perspective discussion about the measures and its outcomes that lead from the internal perspective value creating, processes operational management processes and the innovative processes. The availability and selection has contributed to the sales growth strategy while the efficiency in the financial perspective related to the productivity strategy. The black arrows in the financial perspective represent lead indicators for the two lag indicators (increased ROI & profit per trip) under this perspective.

CASES

Case 17-39

1.

If following Kaplan and Norton's (1996, 2007) description of the management process, then this process within the SBSC would be located after 'Translating the vision process', where managers translate the vision from a broad statement into terms that have specific meaning to the people who would realise the vision. To achieve this, senior executives need to reach a consensus about the words used in the vision and strategy statements so that sustainability objectives can be integrated with other business strategy objectives and operational measures. The internal value chain stakeholders, such as suppliers, managers at different levels of the organisation and other employees, need to be communicated to via the 'Communicating and linking process', which forms part of the answer for Requirement 2.

2.

The suggested method to explain the strategy, vision and journey to employees flows from the 'Translating the vision process'. These measures clarify to all people within the firm the meaning of these statements in specific terms; for example, which specific products and services need to be delivered to customers in targeted segments. Furthermore, this clarification will highlight gaps between the required and available capabilities of employees' skills and information system (executional cost drivers) so that the strategy can be implemented successfully.

The next process is 'Communicating and linking', where the strategy and critical objectives are communicated to all staff involved in achieving those objectives. This signals to everybody what the firm is trying to achieve for its stakeholders. To implement successfully, a firm must educate those who have to execute a strategy/objective, often by linking performance measures to the rewards. These measures are linked to actions/activities/processes that drive success by identifying critical success factors (CSFs) and a set of critical success indicators (CSIs) for each CSF through communication among internal stakeholders in the 'Business planning process'.

Finally, the SBSC measures are used periodically to provide feedback on progress towards objectives — revising/adjusting strategy and measures are essential for the learning and growth process and to keep the firm 'on-track'.

3

The centralised approach follows the traditional functional responsibility accounting reporting systems where departments and head office operate in silos. Students could connect their answers here with the concepts included in Chapter 10 for resource management. In Chapter 10, the activity-based management focus on process for responsibility accounting reporting systems is introduced and in Chapters 14 and 15 the strategic responsibility accounting reporting system is explained. The embedding of the sustainable practices and associated responsibility into roles of all senior management enables the management team to have an holistic view of the strategies and objectives so synergies may result and redundant activities be avoided.

4

The five major frameworks in accounting literature that form the basis of the concept of sustainability, as well as the underpinning of business and corporate sustainability, are linked to four conceptual pillars. The third conceptual pillar (the corporate social responsibility concept) is based on an ethical responsibility argument that is drawn from four theories:

- 1 social contract theory (the contract extends beyond the physical parties to the contract to other members of society for their approval)
- 2 social justice theory (the needs of all members of society should be considered and goods or services distributed fairly in society)
- 3 rights theory (businesses need to comply with basic human rights of stakeholders in their operations)
- 4 deontological theory (a moral duty to treat others with respect).

The benefits that flow from compliance and achievement of these frameworks and pillars are evident through research findings mentioned earlier in the Solutions Manual, particularly in Chapter 12's Discussion questions. Also the use of EMA to link the external reporting to the GRI reporting framework to an integrated reporting approach enables AWL to include governance performance. This is because AWL realises the markets need to analyse not only financial information but also environmental, social and governance (ESG) performance as indicators of an organisation's health and future prospects. The development of these policies will help identify and disclose financial and CSR information that will aid investment decisions where the markets need to analyse more than just financial information (the 'market pull' influence). Also, such policies will enable AWL to be transparent in its sustainability credentials towards the needs of customers and other key stakeholders (an 'organisational push' influence). These policies will help promote integrated reporting and the benefits from incorporating the needs of investors, customers and the general community into company policies and objectives.

Note, profits may increase through increased sales revenue or by decreased expenses. Kaplan and Norton (2001, research (e.g. Sands, Rae and Gadenne, 2016) provide findings that support direct links between the internal processes and financial perspectives via the customer perspective.

References

Kaplan, R. S. and D. P. Norton, 1996, 'Using the Balanced Scorecard as a Strategic Management System', *Harvard Business Review*, Managing

Case 17-40

The answer for this case study should provide some discussion on the following issues after students visit the Vision Australia website.

1.

The question aims to bring to the students' awareness that there is a need for the third sector (not-for-profit) organisation to be committed to environmental performance. While not-for-profit (NFP) organisations do not have a profit motive they should still have a focus on efficient use of resources. Kaplan and Norton (2001, p. 100, Figure 4) provide a BSC model for NFP organisations. The move away from the shareholder as the key focus towards the community, government agencies or philanthropic donors still involves the accountability responsibilities for efficiencies within the organisations. A common term used in business is 'more bang for your buck'.

2. One way Vision Australia can achieve efficient operations is through the reduced use of water and energy, as well as improvements in waste management. Its website lists the following six sustainability goals.

- 1 Comply with requirements of government legislation and regulations as applies to environmental sustainability.
- 2 Reduce consumption of energy, water and consumables across all sites.
- 3 Reduce waste to landfill and improve our recycling system.
- 4 Record energy usage and provide an annual estimate of carbon emissions.
- 5 Incorporate sustainability measures into relevant business decision.
- 6 Promote Vision Australia's environmental sustainability goals to staff, customers, clients and key stakeholders.

The list of achievements on Vision Australia's website demonstrates success with sustainability strategy implementation. Students should discuss how Vision Australia implemented its sustainability strategies, how it selected measures to monitor cost savings, as well as the type of measures (physical and/or monetary) and when physical would be used and when monetary would be reported.

3. Although the focus of Vision Australia is not-for-profit, the organisation receives funding from governments and donations from the general community including philanthropists. Therefore the responsibility reporting will need to reflect the same information as a 'for profit'. Governments require NFP organisations to report their corporate governance policies and structure in an application for funding grant and their final report about how the funds were used in the community. Therefore, the use of EMA physical and monetary measures could be matched with the GRI reporting measures and guidelines and should include the ERG to report their corporate and social responsibility performance to government and private donors. The use of EMA with GRI facilitates the use of ERG benchmarking mechanisms so that members of the value chain and government and private donors are able see transparent reporting in order to identify eco-efficient and process efficient operations.

4.

Students should look at the management process and strategic performance measurement system used on Vision Australia to identify whether the organisation has adopted a form of BSC or SBSC or another multidimensional framework. Students should also try to establish why this management process and strategic performance measurement system were selected, especially given the NFP focus away from shareholders. Vision Australia should use the same or similar management process and strategic performance measurement system as 'for profit' organisations, especially with the 'Translating the vision', 'Communicating and linking', 'Business planning' and the 'Learning and growth' processes to keep themselves 'on-track'. The Vision Australia website provides a detailed list of achievements and other information useful to developing an answer for this essay.

5. The answer will integrate the measures identified in a SBSC with the measures provided in the GRI measurement guidelines in Exhibit 17.14 and the discussion under the Sustainability Balanced Scorecard (SBSC) section of the textbook and the reference provided in that section (Medel-González, et al., 2013; Jasiulewicz-Kaczmarek and Drożyner, 2013).

References

M. Jasiulewicz-Kaczmarek and P. Drożyner, 2013, 'The Role of Maintenance in Reducing the Negative Impact of a Business on the Environment', in *Mathematical Techniques for Environmental Performance Evaluation*, M. G. Erechchoukova et al. (eds.), Springer-Verlag Berlin Heidelberg