Conceptualising Sustainability Assessment: Three Models and a Case Study

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Abstract

Sustainability assessment is being increasingly viewed as an important tool to aid in the shift towards sustainability. It is often described as a process by which the implications of an initiative on sustainability are evaluated, where the initiative can be a proposed or existing policy, plan, programme, project, piece of legislation, or a current practice or activity. However, this generic definition covers a broad range of different processes. This paper looks beyond the generic definition to examine the fundamental question of what sustainability assessment could, and should, be.

It does this firstly by reviewing the different approaches described in the literature as being forms of sustainability assessment and evaluating them in terms of their potential contributions to sustainability. Three distinct models for sustainability assessment are identified and labelled: 'EIA-driven integrated assessment'; 'objectives-led integrated assessment' and 'assessment for sustainability'. The first two are forms of integrated assessment, derived from environmental impact assessment (EIA) and strategic environmental assessment (SEA), extended to incorporate social and economic considerations as well as environmental ones, reflecting a 'triple bottom line' (TBL) approach to sustainability. In contrast, 'assessment for sustainability' is based upon defining the concept of sustainability in terms of criteria against which a proposal is assessed to determine whether or not it is, or is not, sustainable.

To illustrate the potential application and implications of these models, the case study of the recent assessment of the Gorgon Gas Development by the Government of Western Australia is discussed. The assessment process applied was an example of 'EIA-driven integrated assessment' and some of the lessons learnt from this example are briefly outlined. The question of whether the outcomes of the assessment process would have been different had a different sustainability assessment model been applied is then considered.

1. Introduction

The pervasive growth of interest over the last 15 years in the idea of 'sustainability' or 'sustainable development'[1] has brought with it a consequent call for the development of 'sustainability assessment' procedures that would contribute to the shift towards a more sustainable society.

The concept of sustainability, or sustainable development, is clearly the basis of sustainability assessment. Since the Brundtland Commission first described sustainable development as "development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs" (WCED 1987), many alternative definitions of sustainability have been proposed. Many of these are based upon the 'three-pillar' or 'triple bottom line' (TBL) concept, which can be considered an interpretation of sustainability that places equal importance on environmental, social and economic considerations in decision-making.

The theory of sustainability assessment currently available in the literature has largely evolved from work undertaken by impact assessment practitioners challenging the way in which impact assessment has traditionally been conceived and seeking to take account of the sustainable development agenda (IAIA 2002; Sadler 1999, Partidário 2003; Gibson 2001; Verheem 2002). Therefore the approaches described in the literature as 'sustainability assessment' strongly reflect impact assessment processes, particularly project environmental impact assessment (EIA), and more recently strategic environmental assessment (SEA), which in turn has been influenced by policy analysis techniques (Sheate et al 2001; Sheate et al 2003).

This body of literature reflects a widely-held belief that environmental assessment processes such as EIA and SEA have the potential to make valuable contributions towards sustainability. Many writers suggest that this potential may best be realised by extending the scope of EIA and SEA to include social and economic considerations along with environmental ones (Devuyst 1999; Sadler 1999; Marsden and Dovers 2002) to develop a TBL integrated assessment process (Twigger-Ross 2003).

This paper builds upon, and refers extensively to, previous work by the author and colleagues (Pope et al in press 2004), in which a conceptual framework for sustainability assessment was developed. This framework consists of two generic models of TBL integrated assessment processes, as well as an alternative approach to sustainability assessment that is not necessarily based upon the TBL conceptualisation of sustainability. This conceptual framework seeks to provide a basis for meaningful discussions on the development of sustainability assessment processes around the world.

To illustrate the value of the conceptual framework for sustainability assessment and to highlight the distinctions between the three process models, the case study of the recent integrated, strategic assessment of the proposed Gorgon Gas Development in

[1] For the purposes of this article, the terms 'sustainable development' and 'sustainability' will be considered to be synonymous.

Western Australia is presented. The Gorgon assessment process is described and categorised according to the conceptual framework, and the issues which arose during the process are highlighted to illustrate the characteristics of the selected process model. The case study is then used to illustrate in broad terms how each of the two alternative process models for sustainability assessment could have been applied, and what the outcomes of the assessment process may have been in each case.

The case study also demonstrates that assessment within a sustainability framework can bring increased complexity to the relationship between an industry proponent and Government decision-makers, in comparison with more traditional forms of assessment. This has implications for both industry and government in the future development of sustainability assessment processes as a governmental decision-making tool.

The Gorgon case study is introduced in the following section.

2. Gorgon Case Study

During 2002 and 2003, the Government of Western Australia undertook an integrated, strategic level assessment of the proposed development of the Gorgon natural gas fields, located off the North West coast of Australia, by ChevronTexaco and its joint venture partners. The assessment considered environmental, social and economic issues, as well as the strategic implications of the proposal for Western Australia .

A more comprehensive overview of the Gorgon assessment process was presented by the author at the 23rd Annual Meeting of the International Association for Impact Assessment, held in Marrakech, Morocco in June 2003 (Pope 2003).

2.1 Background and context

In seeking to develop the extensive Greater Gorgon Gasfields, the Gorgon Joint Venture identified Barrow Island as the only commercially viable location for the initial stage of the development. However, although Barrow Island has supported an operating oilfield since 1967, it has been a Class A Nature Reserve since 1910 and has unique and internationally significant conservation values, including being home to a number of wildlife species that are endemic to the island, and others which are now extinct on the mainland (ChevronTexaco Australia 2003). Furthermore, the election platform of the incumbent Labor Government of Western Australia states that it will "prohibit mineral and petroleum exploration and mining in National Parks and nature reserves" (Australian Labor Party WA Branch 2001).

Unwilling in this context to invest resources to carry out the front end engineering design necessary to submit a formal proposal for EIA under the Western Australian *Environmental Protection Act* 1986, the proponent approached the Western Australian Government in 2001 seeking approval in principle for access to Barrow Island. Such approval would allow the proponent to continue its marketing efforts with more certainty and justify the commencement of front-end engineering design for the development. It was agreed that if in principle approval were granted, a more detailed project proposal would be subject to EIA at the State and Federal levels.

Cabinet responded to this request by determining that access to Barrow Island would not be rejected as a matter of policy, but that the proposed development plan would be subject to an assessment to determine:

1. Why Barrow Island? In other words, is the Government satisfied with the veracity of the proponent's analysis of alternative locations, which demonstrates that Barrow Island represents the only viable option for the initial stages of the development of the Gorgon gasfield?
2. If granting access to Barrow Island is indeed the only way that the Gorgon gasfield may be developed in the foreseeable future, the questions to be answered are:
    a) What are the potential impacts of the proposed development on the conservation values of Barrow Island, and what is the likelihood of these impacts occurring?
    b) What are the potential strategic, economic and social benefits of the proposed development to the people of Western Australia?
    c) Is the Government convinced that the environmental risks are sufficiently low, and the strategic, economic and social benefits sufficiently high, to justify allowing the proponent access to Barrow Island?
    d) Can the proponent demonstrate net conservation benefits (NCB's) associated with the development plan?

Since the proponent was not yet in a position to commit to a particular process or development plan, the assessment was conducted on an illustrative reference case for the initial development of the resource based upon a gas processing facility initially producing LNG for the international market, but with the potential to supply gas into the Western Australian domestic market, or to a gas-to-liquids (GTL) plant, in the future.

In the absence of a detailed project proposal, the process was considered to be a strategic assessment of a proposed development plan rather than a project-level impact assessment. Since the assessment process was required to consider social, environmental, economic and State strategic issues, it was put forward as a triple bottom line integrated assessment. ChevronTexaco put forward its case in a public document entitled The ESE Review…..

The Gorgon assessment was undertaken at a time when sustainability was high on the Government's agenda. The Western Australian State Sustainability Strategy was in preparation, and included commitments to introduce sustainability assessment processes (Government of Western Australia 2002 and 2003). Furthermore, a review of the project approvals processes in Western Australia had highlighted the need for an integrated assessment process for projects of State significance, which includes consideration of the sustainability issues associated with the proposal.

There is currently no established process or supporting legislative framework in Western Australia for a high-level, integrated environmental, social, economic and strategic assessment of a development plan such as that required by the WA Government in relation to the Gorgon Joint Venture. Therefore a unique process was developed for the Gorgon case (Pope 2003).

2.2 The Gorgon assessment process

The key features of the Gorgon assessment process may be summarised as follows (Pope 2003):

- The process was managed through a whole-of-government approach with a high degree of interaction between relevant agencies at both Chief Executive Officer (CEO) and officer level;
- Guidelines were prepared defining the scope of the social, economic and strategic review, although it was felt that there was sufficient experience in the environmental area to make specific guidelines unnecessary;
- The methodology mirrored that of a project EIA conducted under Part IV of the *Environmental Protection Act* 1986, in that:
    - The proponent provided the majority of the data upon which the assessment would be conducted in the form of its review document (ChevronTexaco Australia 2003), although various government agencies also sought independent expert advice on certain issues;
    - The proponent's documentation was made publicly available;
    - The proponent was required to respond to issues raised in the public submissions;
- The Environmental Protection Authority (EPA) conducted the environmental review and prepared a Bulletin for Cabinet consideration;
- Consultants to the Department of Industry and Resources (DoIR) conducted the social, economic and State strategic review and prepared a Bulletin for Cabinet consideration;
- The Conservation Commission, the vesting authority for Barrow Island, provided separate advice to Cabinet;
- An overarching summary of the two Bulletins plus the Conservation Commission's advice, with complete Bulletins and advice attached was prepared and made available for public comment;
- Based upon the overarching summary of the Bulletins and any public submissions on the summary, advice for Cabinet was prepared by the CEO's of the relevant government agencies to facilitate Cabinet's decision.

On the basis of the advice received as a result of the assessment process, Cabinet decided on 8th September 2003 to grant the Gorgon Joint Venture access to Barrow Island for the purposes of gas processing. The proponent is currently preparing its EIA documentation under Part IV of the *Environmental Protection Act* 1986.

The following sections summarise the three models for sustainability assessment that comprise the conceptual framework (Pope et al in press 2004) and discuss the Gorgon case study in the context of each one.

3. EIA-driven integrated assessment

Pope et al (in press 2004) describe how EIA-driven integrated assessment has its origins in the 30 years of international experience with traditional, project-level EIA. Like EIA, EIA-driven integrated assessment is characterised by its reactivity, since it tends to be 'applied' after a proposal has already been conceptualised. It aims to identify social and economic impacts of a proposal (in addition to traditional

environmental impacts), and to compare these impacts with baseline conditions, in order to determine whether or not the impacts are 'acceptable'. Therefore, scientific and technical data play an important role in the process.

The proposal submitted for assessment is generally the proponent's preferred option, and although some modifications may be required as a result of the assessment, the overall process can be considered 'proponent-driven'.

In terms of contribution to sustainability, EIA-driven integrated assessment reflects the 'three-pillar' or TBL model. This approach to sustainability assessment aims to ensure that impacts are not unacceptably negative overall, meaning that the guiding acceptability criterion for a proposal is that it does not lead to a less sustainable outcome. This approach can be thought of as 'direction to target', where the exact position of a sustainable state for that particular proposal is unknown (Figure 1) (Pope et al in press 2004).

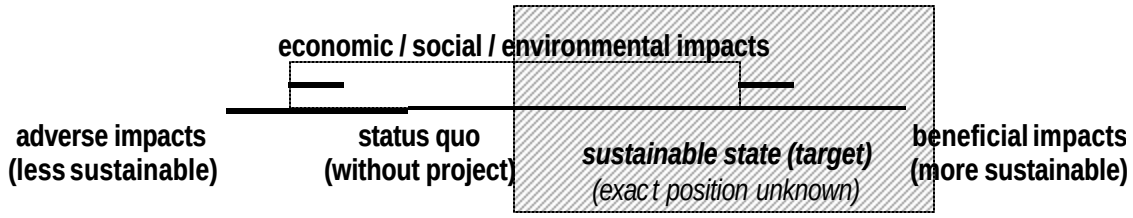

Fig. 1. EIA-driven integrated assessment approach to sustainability assessment (minimise adverse impacts). Source: Pope et al (in press 2004)

The extension of traditional EIA to an EIA-driven integrated assessment clearly allows for a more transparent examination of the social and economic implications of proposals than is the case in traditional EIA. However, this also presents significant challenges with respect to the integration of the respective TBL considerations, recognising that to be truly integrated, the interrelations between the 'three pillars' of the TBL must be considered (Gibson 2001), which is recognised as being difficult to achieve in practice (Lee 2002).

Considering the TBL categories independently from each other increases inherent risk of trade-offs being made them (Pope et al in press 2004). In fact, Gibson (2001) suggests some trade-offs may be inevitable in EIA-driven integrated assessment, and the risk of environmental standards being traded off against socio-economic factors in such a process has been discussed extensively in the literature (Sheate et al 2003; Jenkins et al 2003; Gibson 2001; Lee 2002).

Considering Gorgon as an EIA-driven integrated assessment

The Gorgon case study provides a clear example of an EIA-driven integrated assessment, because the assessment focussed on identifying and evaluating the social, economic and environmental impacts of the proposal and attempting to determine whether or not these impacts were acceptable, and it was conducted reactively, after the proponent-driven development proposal had been largely finalised.

Furthermore, the assessment methodology applied in this unique case was borrowed deliberately from the established processes for EIA of project proposals under Part IV

of the Western Australian *Environmental Protection Act* 1986, further emphasising the parallels with project EIA.

The assessment was divided into two main parts: the environmental assessment conducted by the EPA, and the strategic[2], economic and social[3] assessment conducted by consultants on behalf of the DoIR. This approach, which was at least partly a function of the institutional arrangements in Western Australia[4], highlighted some of the issues and inherent difficulties associated with this form of assessment, namely integration and trade-offs.

The two assessments essentially reflected the two distinct 'camps' which formed, both in the community and amongst the government agencies: the 'green camp' which was fundamentally opposed to an industrial development on a Class A Nature Reserve, and the 'pro-development camp' which felt that the strategic and economic benefits to Western Australia of the development outweighed the risk to the environment.

As a result of the divide between the 'green' and the 'pro-development' government agencies, it was deemed impossible to provide consensus advice to Cabinet in the final stages of the process. Neither was any attempt made to apply weightings to the critical issues in order to provide some means of integrating the competing considerations. Instead, the advice submitted presented the two opposing arguments, for and against the development, leaving it to Cabinet, as representatives of the elected Government, to make the final decision. This meant that the final weighing up of factors and the reasons behind the ultimate decision were not transparent.

At times, the process was also characterised by a high degree of conflict between the opposing camps. Since the process was being managed by DoIR, certain 'green' parties felt disenfranchised and marginalised throughout the process, and in turn were accused by some 'pro-development' parties of being emotional and irrational.

This conflict and tension arose from the fundamentally different views held by the opposing camps on issues such as development, conservation, and sustainability, and the EIA-driven integrated assessment process provided no means of reconciling these. The focus was very much on gathering scientific and other technical data upon which to base the assessments, in an attempt to make the assessment process 'rational'. However, experienced showed that no amount of data was sufficient to change the fundamental positions of the two camps, and in fact the extensive amount of data generated simply provided further ammunition in the conflicts. It was suggested by some participants in a post-process review that this focus on the quality and quantity

[2] In this case, the term 'strategic' was used to mean strategic to the future of Western Australia and the 'strategic assessment' was therefore a component of the economic assessment.

[3] In reality, the social issues associated with the development were peripheral to the assessment. This was due partly to the location of the development on an uninhabited island with no local community, and also to the lack of experience in social impact assessment within Western Australia's government agencies.

[4] Under the *Environmental Protection Act* 1986, and as a result of a Supreme Court challenge, the EPA is restricted to providing advice only on environmental matters, and is not permitted to consider social or economic issues. Therefore, final decision-making taking all factors into consideration is the role of the elected Government in Western Australia.

of technical data was a result of the process's origins in EIA methodology, and was inappropriate for a strategic level assessment.

This situation highlighted the practical difficulties of integrating environmental considerations with socio-economic ones. It was subsequently suggested by some participants in the process and other stakeholders that some of the conflict and the integration issues could perhaps have been overcome by incorporating a multi-criteria analysis into the assessment process with appropriate weightings applied to the critical issues. Others suggested that a fundamentally different institutional structure was required, specifically a multi-disciplinary agency or body with overall responsibility for sustainability.

The issue of trade-offs was also paramount. While some felt that one of the significant benefits of the process over traditional EIA was the transparency of the social and economic data, others felt that this very transparency encouraged the decision makers to compromise the environment for economic gain. It was perceived that the so-called integrated assessment acknowledged an inverse relationship between the level of environmental risk considered acceptable and the level of socio-economic benefits that the project could potentially provide for Western Australia, implying that the environment could and would be traded off if the project and its economic benefits were sufficiently large. Many in the community feel that Cabinet's eventual 'yes' decision, and its determination that the environmental risks were considered manageable, reflected exactly this trade-off.

4. Objectives-led integrated assessment

Pope et al (in press 2004) describe objectives-led integrated assessment as being based upon objectives-led SEA extended to include the three pillars of the triple-bottom-line. Therefore it reflects a desire to achieve a particular vision or outcome defined by integrated environmental, social and economic objectives by assessing the extent to which the implementation of a proposal contributes to this vision, in contrast with EIA-driven integrated assessment, which aims to ensure that TBL impacts of a proposal are acceptable compared with baseline conditions. Although derived from objectives-led SEA normally applied to PPP's, an objectives-led integrated assessment approach could equally be applied to project-level proposals.

Like objectives-led SEA, objectives-led integrated assessment aims to be a proactive, ex-ante process. As such, the assessment should be an integral part of the process of developing a PPP that best meets the desired objectives, rather than a process for evaluating the preferred option after the fact. This requires agreement on a broad set of TBL objectives at the prior to the development of the proposal, which for an assessment conducted by Government decision-makers, means defining Government objectives relevant to the proposal up front. This effectively provides boundaries within which the proposal is to be developed, making the overall process essentially Government-, rather than proponent-, driven.

Similarly to EIA driven integrated assessment, objectives-led integrated assessment has a 'direction to target' characteristic with the exact position of the sustainable state unknown (Figure 2).

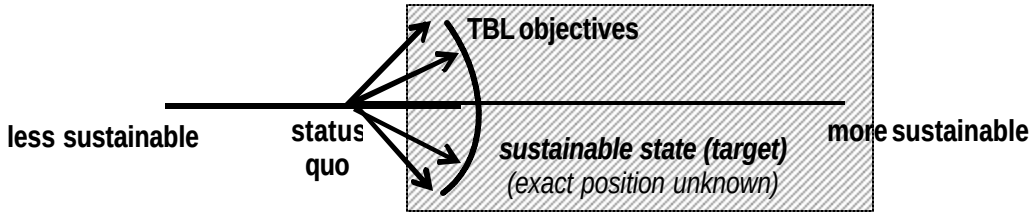

Fig. 2. Objectives-led integrated assessment approach to sustainability assessment (maximise objectives). Source: Pope et al (in press 2004)

Given the prevalent view that sustainability is about positive change rather than simply minimising the negative, objectives-led integrated assessment clearly has more potential to contribute to sustainability than EIA-driven integrated assessment (Gibson 2001), and therefore is a more appropriate model for sustainability assessment.

However, the fundamental question with respect to objectives-led integrated assessment as a form of sustainability assessment is whether the chosen triple-bottom-line objectives really reflect 'sustainability'. This issue is highlighted and discussed by George (2001) in his analysis of the UK Department of Environment, Transport and the Regions (DETR) process, which is an example of an objectives-led integrated assessment process.

Considering Gorgon as an objectives-led integrated assessment

The objectives-led integrated assessment approach interprets sustainability as a series of triple bottom line goals or objectives to be achieved. At the time of the Gorgon assessment, this was consistent with the Western Australian Government's definition of sustainability as "meeting the needs of current and future generations through simultaneous environmental, social and economic improvement" (Government of Western Australia 2002)[5], or in other words achieving a 'win-win-win' outcome.

In the early days of the Gorgon assessment, it was argued by some that the process was indeed intended to ensure a 'win-win-win' outcome with respect to the triple bottom line, by virtue of the inclusion of the requirement for 'net conservation benefits' (NCB's). The implication was that the environmental risks associated with the development proposal could be outweighed by a sufficiently large environmental offset to be provided by the proponent, perhaps in the form of funding for the restoration of a degraded ecosystem, and that therefore the development would deliver environmental improvements as well as social and economic gains. However, NCB's became a highly contested issue throughout the assessment process, with the EPA finally concluding that no net conservation benefit could be achieved in the event of any loss of conservation values on Barrow Island. NCB's came to be viewed by most as a compensation package, rather than any attempt to achieve environmental improvements.

[5] The final version of the Western Australian State Sustainability Strategy has a slightly modified definition: "Sustainability is meeting the needs of current and future generations through an integration of environmental protection, social advancement and economic prosperity" (Government of Western Australia 2003).

Furthermore, while many State policy issues and objectives, including the requirement for NCB's, were understood by the proponent and given some consideration in the assessment process, the primary aim of the Gorgon assessment was not to evaluate the proposal in terms of how well it met the State's TBL objectives, but to determine whether or not the identified TBL impacts were acceptable to the State. Furthermore, it was a reactive process conducted after the development proposal had largely been finalised by the proponent. Therefore, it clearly could not be considered an example of objectives-led integrated assessment and, as already discussed, reflects an EIA-driven approach.

The Gorgon experience can be considered a missed opportunity for Western Australia to maximise benefits to the State from the development with respect to policy objectives. Instead, the proposal was developed to meet the proponent's own strategic objectives, and not Western Australia's, leaving the Government on to conduct the assessment 'on the back foot'.

Had a proactive, objectives-led integrated assessment methodology been applied, the State's objectives with respect to the Gorgon development would have been developed up front. These would have included both broad strategic objectives and TBL objectives[6]. The proponent would have been required to develop its proposal to meet both the State's objectives and its own strategic and commercial objectives and Government would then have assessed the final proposal against its own objectives.

The distinction between the EIA-drive and objectives-led approaches is perhaps best illustrated by the alternative sites debate. While the proponent was required to prove its assertion that Barrow Island was the only commercially viable location for the development, the process focussed on a justification of an established position. A proactive, objectives-led process would have instead considered which of the alternative locations could best meet defined objectives. Although the proponent may have still chosen to take the "Barrow or nothing" line, it is likely that this would have more explicitly shown the proposal to be contrary to several State objectives.

While an objectives-led integrated assessment approach represents a radical departure from traditional impact assessment processes as conducted in Western Australia, it is consistent with best practice objectives-led SEA processes and also with repeated calls from local industry for clearly defined 'goalposts' as the basis for assessments[7].

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[6] It is likely that these objectives would have reflected Government's goals for:

- Development of a new industrial estate on the mainland;
- Gas to shore within a defined time frame or a time frame determined by the State's needs;
- Transition to natural gas as a cleaner fuel;
- Development of natural gas resources;
- Protection of the conservation estate;
- Innovative greenhouse gas management strategies;
- Local workforce (as opposed to fly-in, fly-out)

As it was, some of these objectives were reactively applied by incorporation into the enabling legislation: the *Barrow Island Act* 2003 and the associated *Gorgon Gas Processing and Infrastructure Project Agreement*.

[7] Interestingly, some industry bodies involved in a post-assessment review pointed out that the assessment had been conducted in somewhat of a 'policy vacuum' and highlighted the lack of State policies for greenhouse gas emissions, geosequestration and triple bottom line methodologies. Others highlighted the lack of government policy with respect to NCB's. The implication was that without

The issue of agreed up-front objectives for assessments is currently under consideration by the relevant government agencies with respect to both the development of sustainability assessment processes and the implementation of the recommendations of the recent review of project approvals.

What the outcome of this hypothetical process would have been depends upon how the State's objectives were defined and whether the proponent was able to develop a commercially viable proposal within the boundary formed by these objectives. However, the fact that the objectives-led approach is proactive and integral to the process of developing the proposal means that options are left open longer and the focus is on finding the best option rather than defending the proponent preferred option. This in turn suggests it may have been possible to reach different and more widely acceptable outcome through an objectives-led process, particularly in relation to the location of the Gorgon development.

5. 'Assessment for sustainability'

The discussion so far has pointed to the possible benefits, and the main limitations of the current approaches to sustainability assessment. EIA-driven integrated assessment approaches allow decision-makers to ask: Are the triple-bottom-line impacts acceptable? The focus in these approaches is on minimising negative triple bottom line impacts. Alternatively, objectives-led integrated assessment goes further to ask the question: Does this proposal make a positive contribution to triple bottom line goals?

Both of these conceptions of sustainability assessment can be described as 'direction-to-target' approaches, and both avoid attempting to define a condition of sustainability and that a proposal should be required to meet. George (1999 and 2001); Sadler (1999) and Gibson (2001) suggest that there is room for a new conception, where sustainability assessment can be defined as a process to determine whether or not a particular proposal, initiative or activity is, or is not, sustainable, and therefore effectively becomes a yes/no question. Instead of asking: Are we heading in the right direction?, the alternative process allows us to ask: Are we there?

To avoid confusion between terms, the term 'assessment for sustainability' has been coined to distinguish it from other related forms of assessment that do not share this specific aim (Pope et al in press 2004). Assessment for sustainability represents an entirely different approach to impact assessment, and does not reflect existing processes such as EIA and SEA.

One of the main implications for this conception of sustainability assessment is that it necessarily requires a clear vision of what sustainability means. Further, this vision needs to be translated into context-specific sustainability criteria. Sustainability criteria should effectively separate sustainable outcomes from unsustainable ones for the purposes of the assessment process, which would then ask whether or not these criteria have been met.

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these policies and clear associated objectives, it was difficult to assess whether the development proposal was a good thing for Western Australia.

While defining sustainability in terms of criteria is a challenging proposition, the explicit embodiment of the notion of sustainability as a societal state to which we should aspire makes 'assessment for sustainability' the most promising of the three models presented in this paper in terms of making a significant contribution to sustainability (Pope et al in press 2004).

Pope et al (in press 2004) discuss two alternative approaches to defining sustainability criteria: one based upon the triple bottom line and the other based upon sustainability principles. The latter is the preferred approach of several writers (George 2001; Sadler 1999; Gibson 2001), since it avoids many of the challenges of integration and tendencies towards reductionism associated with the TBL conceptualisation of sustainability. The use of sustainability principles as defined in the Rio Declaration has been advocated by some (George 2001; The Natural Step 2001; Sadler 1999; IAIA 2002), while others suggest other suites of sustainability principles as an appropriate basis for developing sustainability criteria (Gibson 2001).

However the principles and criteria are ultimately defined, assessment for sustainability can be considered a society-driven process since the basis for the assessment is a societal vision for sustainability, as opposed to the proponent-driven and Government-driven processes already discussed.

Table 1 compares the three conceptual models for sustainability assessment discussed in this paper.

Table 1: Comparison of three conceptualisations of sustainability assessment. Derived from Pope et al (in press 2004)

	EIA-Driven Integrated Assessment	Objectives-Led Integrated Assessment	Assessment For Sustainability
Origins	Ex-post, project-based EIA	Ex-ante, objectives-led strategic environmental assessment	Recently defined in theory, but not yet evident in practice
Aims	To identify the environment, social and economic impacts of a proposal and compare these impacts with baseline conditions to determine whether or not they are acceptable	To determine the extend to which a proposal contributes to defined environmental, social, and economic goals, and to determine the 'best' available option in terms of meeting these goals	To determine whether or not an initiative is actually sustainable
Contribution to sustainability	Reflects a 'three-pillar' or 'triple-bottom-line' approach. Aims to ensure that impacts are not unacceptably negative in any of the three pillar-categories.	Reflects vision of sustainability as a series of societal goals and measures contribution to goals. Asks whether things can get better, rather than just whether they can be prevented from getting worse	Allows society to define what is meant by 'sustainability', and then to compare initiatives against this definition.
Treatment of impacts	Minimise negative triple-bottom-line outcomes	Maximise positive triple-bottom-line outcomes	Starts not from a 'trade-off' perspective between impacts, but from the idea that 'sustainability' may be more than the some of parts
Relation to 'target'	Direction to target	Direction to target	Distance from target
Limitations	Most likely to result in 'weak sustainability' and trade-offs between categories	Do triple-bottom-line objectives really reflect sustainability?	Deciding upon a clear concept of what is meant by 'sustainability', and defining criteria
Drivers	Proponent	Government (in case of external assessment)	Society

Considering Gorgon as an 'assessment for sustainability'

The point was made in Section 4 that while the Western Australian Government did not explicitly state its objectives prior to the Gorgon assessment, some objectives

were understood throughout the process and even became explicit through the drafting of the enabling legislation. Many of these objectives were related to the triple bottom line: for example there were environmental objectives associated with protecting conservation values and managing greenhouse gas emissions; there were economic objectives associated with industrial development, such as the eventual delivery of Gorgon gas into the domestic gas market; and there were social objectives related to education and training, and the health and safety of the workforce.

While this is not a complete version of Government's 'wish-list' with respect to Gorgon by any means, it does suggest that these types of objectives are unlikely to adequately define a societal condition of sustainability. For one thing, they are largely specific to the development, and for another they clearly do not adequately cover the holistic concept of sustainability.

The recommended approach to an 'assessment for sustainability' would have required criteria based upon sustainability principles. The development proposal would then have been assessed against whether or not it meets those criteria. It is recognised that the development may also be required to meet strategic objectives and criteria not related to sustainability, but that 'assessment for sustainability' is the process of assessing against the sustainability criteria.

In Western Australia, this means that the proponent would have been required to demonstrate how its proposal achieves the Western Australian sustainability criteria. Table 2 presents the sustainability principles that have been developed for Western Australia and the criteria for sustainability assessment that have been derived from the principles (Government of Western Australia 2003). Clearly the criteria are somewhat generic and insufficiently defined to form the basis of an 'assessment for sustainability' process. The next stage in the process of defining criteria for the purposes of assessment would be to operationalise the criteria in Table 2 specifically for the assessment at hand.

Had such an approach been adopted, the purpose of the Gorgon assessment process would have been to determine whether or not the development proposal was consistent with the vision of a sustainable Western Australia as defined by the State's sustainability principles and criteria, as opposed to assessing whether or not certain TBL policy objectives were met (objectives-led integrated assessment) or whether the potential TBL impacts were acceptable (EIA-driven integrated assessment). It is likely that the proposal would have failed to meet some of the sustainability criteria, particularly those relating to biodiversity and ecological integrity. While this assessment outcome would not have precluded Cabinet from deciding in favour of the proponent, the proposal would have been clearly and publicly demonstrated to be unsustainable.

Interestingly, the proponent in this case did attempt its own version of an assessment for sustainability process by establishing sustainability principles and associated criteria for the Gorgon development and demonstrating how these criteria could be achieved (ChevronTexaco Australia 2003). However, a number of the public submissions received pointed out that the proponent's sustainability principles and criteria were markedly different from the State's. Particularly contentious was the proponent's principle of "economic benefit delivery" which included the criteria of

corporate “profitability” in contrast to the State’s principle of “long term economic health” of all people.

This clearly demonstrates how interpretations of sustainability can vary significantly, and how sustainability principles and criteria developed by an organisation for the purposes of an internal assessment may be vastly different from those developed as a tool for governmental decision-making.

Table 2: Western Australian sustainability principles and criteria . Source: Government of Western Australia (2003) p40.

Principles	Criteria
Long-term economic health. Sustainability recognises the needs of current and future generations for long-term economic health, innovation, diversity and productivity of the earth.	Provides both short and long-term economic gain.
Equity and human rights. Sustainability recognises that an environment needs to be created where all people can express their full potential and lead productive lives and that significant gaps in sufficiency, safety and opportunity endanger the earth.	Increases access, equity and human rights in the provision of material security and effective choices.
Biodiversity and ecological integrity. Sustainability recognises that all life has intrinsic value and is interconnected and that biodiversity and ecological integrity are part of the irreplaceable life support systems upon which the earth depends.	Improves biodiversity and ecological integrity and builds life support systems
Settlement efficiency and quality of life. Sustainability recognises that settlements need to reduce their ecological footprint (i.e. less material and energy demands and reduction in waste) while they simultaneously improve their quality of life (health, housing, employment, community…)	Reduces ecological footprint while improving quality of life
Community, regions, 'sense of place' and heritage. Sustainability recognises the significance and diversity of community and regions for the management of the earth, and the critical importance of 'sense of place' and heritage (buildings, townscapes, landscapes and culture) in any plans for the future.	Builds up community and regions, 'sense of place' and heritage protection
Net benefit from development. Sustainability means that all development, and particularly development involving extraction of non-renewable resources, should strive to provide net environmental, social and economic benefit for future generations.	Provides conservation benefits and net social-economic benefit
Common good from planning. Sustainability recognises that planning for the common good requires equitable distribution of public resources (like air, water and open space) so that ecosystem functions are maintained and a shared resource is available to all.	Increases 'common good' resources
Precaution. Sustainability requires caution, avoiding poorly understood risks of serious or irreversible damage to environmental, economic or social capital, designing for surprise and managing for adaptation.	Ensures there are acceptable levels of risk with adaptation processes for the worst case scenarios
Hope, vision, symbolic and iterative change. Sustainability recognises that applying these principles as part of a broad strategic vision for the earth can generate hope in the future, and thus it will involve symbolic change that is part of many successive steps over generations.	Brings change and a sense of hope for the future as it is linked to a broader strategic vision

6. Conclusion

This paper has reviewed the evolving concept of sustainability assessment by discussing a conceptual framework consisting of three broad process models, labelled 'EIA-driven integrated assessment'; 'objectives-led integrated assessment' and 'assessment for sustainability'. The potential of each of these processes to contribute to a shift towards a more sustainable society was discussed. The case study of the recent strategic, integrated assessment of the proposed Gorgon Gas Development in Western Australia was used to illustrate the distinguishing features of each process model.

It was argued that EIA-driven integrated assessment, derived from project level EIA, is proponent-driven and tends to focus on minimising the potential negative impacts of the proponent's preferred option, but fails to address the concept of sustainability as a positive societal goal. The Gorgon assessment process as it was conducted is an example of EIA-driven integrated assessment, and it clearly demonstrated two of the significant issues associated with this process model: integration and trade-offs.

Objectives-led integrated assessment, derived from certain forms of SEA, was found to be far more compatible with the concept of sustainability, since it assesses the contribution of a proposal to aspirational objectives, rather than against baseline conditions. However, the question was raised as to whether TBL objectives can adequately define sustainability. It was then illustrated how the Gorgon assessment could have been conducted as an objective-led process had the Government of Western Australia clearly stated its objectives 'up front' and required the proponent to develop a proposal that best met these State objectives as well as their own strategic corporate objectives. It was suggested that this Government-driven approach may have resulted in a better outcome in terms of the State's policy objectives.

However, it was pointed out that both forms of integrated assessment processes in practice tend to limit themselves to measuring whether or not a proposal represents a positive or negative contribution to sustainability. In other words, they consider 'direction to target', where the target is a sustainable society. It has been pointed out that while this may be useful, it may not be sufficient to drive the kind of change required in the pursuit of this goal and that processes are needed that actually assess whether an initiative is, or is not, sustainable. For the purposes of this paper, such processes have been termed 'assessment for sustainability' approaches.

'Assessment for sustainability' requires a clear definition of sustainability and corresponding criteria against which the assessment can be conducted, a definition that reflects societal views. Several writers have recommended principles-based criteria for sustainability that avoid some of the inherent problems of the alternative TBL approach. The Western Australian sustainability principles and criteria were presented as a possible basis for this form of assessment. It was suggested that an assessment for sustainability of the Gorgon proposal using these criteria may have demonstrated that the proposal was fundamentally unsustainable.

Broad conclusions can therefore be drawn relating to the potential contribution of existing impact assessment processes in providing a basis for sustainability assessment. The analysis presented in this paper suggests that traditional EIA (even

extended to EIA-driven integrated assessment) is of limited value by virtue of its reactive nature and focus on minimising negative impacts; some forms of SEA (extended to objectives-led integrated assessment) are more appropriate since they aim to ensure that certain aspirational goals are achieved; but that 'assessment for sustainability', which represents a fundamentally new way of thinking about impact assessment, has the most potential to make significant shifts towards sustainability.

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