Favouring the Higher Test:
Contribution to sustainability as the central criterion for reviews and decisions under the Canadian Environmental Assessment Act

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Abstract
Two recent panels providing guidelines for environmental impact statements under the Canadian Environmental Assessment Act have required the proponents involved to provide evidence that their undertakings will make a positive contribution to sustainability and respect the precautionary principle. At least on the face of things, this "positive contribution to sustainability" criterion is substantially different from the "mitigation of significant adverse environmental effects" criterion that has been the focus of most assessments under CEAA. The panels may well be justified in favouring the higher test. But the shift raises difficult questions that will need careful and early attention.

Decision criteria for reviews under the Canadian Environmental Assessment Act appear to be in the process of becoming much more ambitious (comprehensive, integrative and respectful of uncertainty). The most obvious steps have been taken by two recent panels, which have in their EIS guidelines required the proponents involved to provide evidence
that their undertakings will make a positive contribution to sustainability and respect the precautionary principle.

The reference here is to sections 3.3 and 3.4 of the "Environmental Impact Statement Guidelines for the Review of the Voisey's Bay Mine and Mill Undertaking" issued by the Voisey's Bay Mine and Mill Environmental Assessment Panel on 20 June 1997, and section 3.1 along with annex 4, section 1.0, of the "Environmental Impact Statement Guidelines for the Review of the Proposed Red Hill Creek Expressway North-South Section Project" issued by the Red Hill Creek Expressway Review Panel on 15 October 1999 (see the appendix to this paper).

The positive contribution to sustainability criterion is on the face of things substantially different from the mitigation of significant adverse environmental effects criterion that has been the focus of most assessments under CEAA. The implications may be happy ones overall, but they are worth considering with some care. Otherwise there is a danger of inconsistent application that generates inefficiencies and frustrations, and fails to achieve the potential gains.

**Background**

We have federal environmental assessment legislation in Canada today largely because the federal authorities got caught on what was meant to be a convenient ambiguity. They were under pressure to tighten up their famously ineffective policy based assessment process – EARP – but wanted to retain maximum discretion. So they created a Guidelines Order, which sounded mandatory but wasn't meant to be. Unfortunately, Stephen Hazell, then of the Canadian Wildlife Federation, won a court ruling on the ambiguity, wherein the learned judge preferred the noun to the adjective. This meant that the Order was an order and legally binding. For the federal authorities, who recognized that the Order was never intended to be taken seriously as an order, and was not designed for mandatory application, the court ruling entailed that the old process had to be replaced by a real law.

A very roughly parallel ambiguity was written into the new law. It involves the test used to determine whether a proposed undertaking is worthy of approval. Two positions are taken in the *Canadian Environmental Assessment Act* – one in the section that sets out the purposes of the legislation (section 4(b)), and another in the more specific approval requirements (especially section 37(1)(a)).

The more specific approval requirements are the most familiar. Section 37 (1)(a) reads as follows:

*Decision of responsible authority*

37. (1) Subject to subsection (1.1), the responsible authority shall take one of the following courses of action in respect of a project after taking into consideration the report submitted by a mediator or a review panel or, in the case of a project referred back to the responsible authority pursuant to paragraph 23(a), the comprehensive study report [S.C. 1994, c. 46, s. 3]:
(a) where, taking into account the implementation of any mitigation measures that the responsible authority considers appropriate,
   (i) the project is not likely to cause significant adverse environmental effects, or
   (ii) the project is likely to cause significant adverse environmental effects that can be justified in the circumstances,
the responsible authority may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part and shall ensure that those mitigation measures are implemented; or [S.C. 1993, c. 34, s. 29(1) (French)]

In effect, section 37(1)(a) focuses on avoiding or mitigating serious negative environmental effects. It appears to allow for approval of undertakings that make only minor additions to current environmental problems, and opens the door to approval of undertakings with serious adverse effects in unspecified "circumstances".

In practice, especially in screening and comprehensive studies, CEAA has generally been interpreted as requiring proponents and responsible authorities to show that proposed projects will have no significant adverse environmental effects (in accord with sections 20 and 23). In some cases, such as in the initial Cheviot Coal Mine Review Panel decision, even projects with significant adverse environmental effects have been judged acceptable when the effects were thought to be "justified in the circumstances" (section 37).

This then is the "minimal or justified damage" decision criterion in the Act.

A quite different standard seems to be implied in the purposes section of the Act. Section 4(b) reads as follows:

Purposes
4. The purposes of this Act are
   ...
   (b) to encourage responsible authorities to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy;...

What this means turns on the concept of "sustainability". The Act (section 2) does define "sustainable development" but only generally, using the standard wording from the World Commission on Environment and Development (the Brundtland Commission): "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs." Beyond this, the Act offers little direct indication of how promotion of sustainable development is to be accomplished through application of specific assessment obligations. The most direct reference to sustainability considerations is in section 16(2)(d), which requires that

   every comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of
(d) the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.

While the provision of a definition and the requirement set out in section 16(2)(d) may be taken as indications that the drafters of the Act were serious about the sustainability purpose, the Act remains less than clear about how the sustainability purpose should be reflected in assessments and decision making.

Some basic clarification, at least, is available from broader sources. There is a huge literature of debate about sustainability and no agreement on the full set of components and implications. Indeed the specifics are unavoidably dependent on local conditions and social choice. But there is general acceptance that the concept as popularized by the Brundtland Commission\(^1\), has two main elements:
- it recognizes the inseparability of biophysical and socio-economic factors, and
- it favours a positive shift from continued incremental degradation (unsustainable practices) to gradual recovery (through economic and technological efficiencies, greater equity, ecological rehabilitation, etc.).

Applied to environmental assessment, a commitment to sustainability implies requiring proponents to go beyond minimizing damage – they are to make positive contributions to improving ecological and community conditions for the long term. A sustainability objective in environmental assessment implies that undertakings should maximize durable net gains.

On the surface, there seems to be a substantial difference between the "minimal or justified damage" and "maximum durable net gains" approaches and CEAA's decision criteria appear to contradict each other.

CEAA's sustainability criterion implies that acceptability should depend on demonstrated grounds for confidence that the undertaking will make a positive overall contribution to achieving community and ecological improvement. But CEAA's focus on preventing serious negative environmental effects allows approval for undertakings that move us further away from sustainability, though usually only in small steps.

So far, the minimal or justified damage interpretation of CEAA requirements appears to have been favoured in most assessments under the federal law. But not in all of them.

Two exceptions are the Voisey's Bay and Red Hill Creek cases. In their environmental impact statement guidelines for project proponents, the Voisey's Bay Mine and Mill Environmental Assessment Panel (a joint panel) and the Red Hill Creek Expressway Review Panel (a solely CEAA panel) specified their intentions to apply the sustainability

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criterion. They used essentially identical words. The Red Hill Panel's phrasing is as follows:

3.1 Respect for the Principle of Sustainable Development
Promotion of sustainable development (development that meets the needs of the present, without compromising the ability of future generations to meet their own needs) is a fundamental purpose of environmental assessment. ...

The Panel interprets progress towards sustainable development as meeting the following goals:
1) the preservation of ecosystem integrity, including the capability of natural systems, local and regional, to maintain their structure and functions and to support biological diversity;
2) respect for the right of future generations to the sustainable use of renewable and non-renewable resources; and
3) the attainment of durable social and economic benefits.

The Panel requires the Proponent to demonstrate how the Project meets the three goals directly noted above.²

The Red Hill panel also requires application of the precautionary principle and has provided a special appendix (annex 4) with details on "ways in which the Proponent may demonstrate that the Project conforms to the precautionary principle and in turn meets the three goals of sustainable development noted above."

Annex 4 of the Red Hill Panel Guidelines reads, in part,

... the Proponent should include, at a minimum, a discussion of:
1) the extent to which the Project conforms to the precautionary principle;
2) the extent to which the Project may make a positive overall contribution towards the attainment of ecological and community sustainability, both at the local and regional levels;
3) how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and
4) the Proponent’s intended use of appropriate indicators (including, but not limited to, Sustainable Community Indicators adopted by the Proponent in 1996) to determine whether continuous progress towards sustainability is being maintained.

In effect the two panels have explicitly adopted, emphasized and specified the sustainability criterion set out in the purposes section of the Act. They have recognized the ambiguity of the law and have chosen the higher test.

It is perhaps also possible to argue that there is no fundamental ambiguity here, that the Act is internally consistent, and that the two panels have merely begun to specify the "justifiable in the circumstances" rationale for permitting any significant adverse effects. If so, their approach limits such justification to the circumstance of persuasive grounds for expecting net overall gains for sustainability. Even if this was no one's intent, it does suggest a rich area for further exploration in law, in concept and in practice.

Applied more generally, in screenings and comprehensive studies as well as in panel cases, the Voisey's and Red Hill panels' approach would gradually push all decision making under CEAA to seek positive sustainability benefits rather than accept minimal damage.

Using sustainability as a basis for environmental assessment design and practice is not a new idea and the two panels' steps in this direction are consistent with closely related initiatives of the federal government. In Canada, links between sustainability and environmental assessment were examined in detail by the Canadian Environmental Assessment Research Council in the late 1980s and early 1990s. While the federal government did not move quickly to embrace the CEARC findings, in recent years several important initiatives have begun the process of applying sustainability as a core decision making criterion. Of these, two are most significant. The first is the 1995 amendments to the Auditor General Act, which created the position of Commissioner of the Environment and Sustainable Development and required federal departments to prepare sustainable development strategies covering their activities. The second is The 1999 Cabinet Directive on the Environmental Assessment of Policy, which obliges departments to consider environmental concerns at the strategic level (in the development of policies, programmes and plans, etc.) and to link environmental assessment at this level to the implementation of their sustainable development strategies. Together these two initiatives have pushed some federal departments to develop strategic level "sustainability assessment" processes, providing more or less integrated attention to social, economic and ecological considerations.

It would seem, therefore, that general adoption of sustainability as the core decision criterion for assessments at the project level under CEAA would be consistent with federal moves towards use of the sustainability criterion at the strategic level.

Implications

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A wide range of issues and questions is raised by these developments. I will outline only a few here for illustrative purposes.

1. **Is use of the sustainability criterion under CEAA appropriate and desirable?**
   This may be a matter for debate among legal scholars. However, it would seem on the surface that choice of the higher test is reasonable in logic and that pursuit of sustainability is entirely suitable in our global circumstances.

   Even if this is quickly accepted, clarifying more precisely what application of the sustainability criterion should be expected to accomplish would be helpful, if only as a basis for building a better understanding of how to specify the relevant requirements for proponents and other assessment participants.

2. **How should the criterion be specified?**
   All decision criteria involve definitional difficulties posed by the value laden terms ("significant", "acceptable," etc.) that are unavoidable in assessment work. Adopting contribution to sustainability should not present overwhelming difficulties. The need for a working understanding of what sustainability means as an effective criterion was not among the recognized problems of the Voisey's case and, so far at least, is not among the pressing concerns of those who are unhappy about the Red Hill assessment.

   Nevertheless, there are some important areas of potential confusion to address. These include the following:

   (i) **Tradeoffs:** very generally, pursuit of sustainability entails integrated pursuit of ecological and socio-economic ends, rather than some sort of "balancing". In specific cases, however, the acceptability of tradeoffs (between short and long term gains, between ecological and socio-economic improvements, and between onsite losses and offsets elsewhere) must be considered.

   (ii) **Losses/unsustainable activities:** adoption of a sustainability criterion does not entail rejection of all undertakings that involve losses or unsustainable activities, but may limit the kinds of losses and unsustainable activities that are tolerable (e.g. mining may be acceptable where its immediate negative effects are largely corrected through remediation and its socio-economic benefits are designed to provide a bridge to a more sustainable future for the local community).

   (iii) **Gains:** because most assessment work has focused on avoidance of significant adverse effects, we will need expanded consideration of how to design for gains, and how to assess potential benefits.

   (iv) **Precaution:** the panels have properly emphasized the precautionary aspect of commitment to sustainability, and the implications of uncertainty have been receiving considerable scholarly and some practical attention in various fields, recently, but little of this has yet been interpreted for application to assessment work (e.g. in considering implications for risk avoidance versus reversibility versus replacability; or in specifying how adaptability is to be incorporated into the design of undertakings).

3. **How should broader application of the criterion to cases subject to CEAA be managed?**
It might be desirable to extend implementation of the approach gradually through CEAA decision making, beginning with the most important and promising applications. But consistency in legal interpretation of the Act's requirements would seem to demand a more comprehensive transition. Since the Voisey’s Bay panel has already applied the sustainability criterion in a completed review, there will be reasonable expectations for further and expanded use. Perhaps a case could be made for application of the sustainability criterion first to cases at the comprehensive study, mediation or panel review level. The purposes commitment to sustainability is, however, not limited to any particular set of assessed cases and would seem to be generally applicable to all work under the Act.

4. What happens to ecological concerns in a broader sustainability process?
Under CEAA, assessment and review have often remained on the periphery of decision making. They are commonly viewed as an addendum to deliberations on the central economic and political considerations. Adoption of the sustainability criterion expands the agenda of environmental assessment and necessarily pushes it closer to a position as the main governmental process for addressing broad public interest considerations in project decision making.

This seems both realistic and desirable. Already environmental assessment under CEAA is typically the only process for rigorous and open attention to public concerns about proposed undertakings. Exclusion of direct social effects and other sustainability considerations from CEAA assessment proceedings (as is suggested by the CEAA definitions of "environment" and "environmental effects") is unrealistic as well as inappropriate from a sustainability perspective. But expanding the scope can be risky.

A shift from narrow environmental assessment to broader sustainability assessment would be retrogressive if it allowed loss of the old environmental assessment focus on ecological considerations and opened the door to reassertion of the traditional emphasis on immediate economic priorities. In theory, sustainability assessment should focus on the longer term where ecological, social and economic imperatives tend to coincide. In practice, however, short term imperatives are driven by powerful economic and political interests and are difficult to resist. This suggests that transition to sustainability assessment will be helpful only if the sustainability criterion is clearly specified and imposed in ways that stress the long term and prevent ecological sacrifices for short term gain.

5. Where should sustainability-focused assessment fit in federal decision making?
If sustainability-centred assessments are be the main public vehicles for open evaluation of proposed undertakings (and their alternatives), it is not clear that the process should report to or through the Minister of the Environment. Such assessment might be more credible and powerful within government if the process reported to Cabinet or Parliament, as representatives of the broad public interest, rather than to a single minister who will be unavoidably associated with a narrower mandate. But like the more general shift away

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4 This approach is already anticipated for the proposed Yukon Development Assessment Process, which is (for territorial government decision making) to report to the territorial executive council, not to a minister.
from a narrow environmental focus, this move raises concerns about loss of attention to ecological issues.

6. How would sustainability-focused assessment at the project level fit with decision making on broader matters?

The move towards adoption of the broad sustainability criterion can be seen as part of a larger trend to expand the scope and application of environmental assessment. The trend is also evident in the gradual introduction assessment requirements at the strategic level (policies, programmes, plans, etc.) and in the growing recognition of needs for more attention to the cumulative and regional effects of multiple activities rather than just to the particular effects of individual projects.

Because many sustainability considerations are more evident at a larger scale and perhaps best addressed there, application of the sustainability criterion in assessments at the project level will need to be much better linked with assessments at the strategic assessment level. As noted above, it is convenient that The 1999 Cabinet Directive on the Environmental Assessment of Policy already includes useful steps towards a sustainability-based approach to assessment. However, it remains a non-legislated directive with weak provisions for public accountability and participation. Until strategic assessment also has a credible legislative foundation, strong integration of strategic and project level assessment will be problematic.

7. Does CEAA need amendment to facilitate application of the sustainability criterion?

The Voisey's and Red Hill cases suggest that CEAA as presently drafted can serve as a base for public sustainability assessments of significant undertakings within federal jurisdiction. But if CEAA is to serve this function effectively, several aspects of the current law would seem to need attention. For example,

(i) CEAA now applies complex and minimally workable definitions of "environment" and "environmental effects" that are open to various interpretations but seem intended to discourage consideration of direct social, economic and cultural effects. More explicitly comprehensive definitions of these two terms would seem to be appropriate for assessments focused on sustainability effects.

(ii) The current definitions of "environment" and "environmental effects" are implicitly include both positive and negative effects, as is appropriate for sustainability considerations. However, as noted above, some CEAA provisions (e.g. section 37 (1)(a)) stress attention only to "significant adverse environmental effects". As well, the current opening to accept even significant adverse effects if these are "justified in the circumstances" is not defined. In both cases, amendments would seem to be needed to clarify the implications of commitment to encouraging sustainability. This would entail mandatory attention to both positive and adverse effects and to ensuring that projects are approved only if there is good reason to expect overall positive contributions to sustainability.

(iii) As suggested above, integration of assessment at the strategic and project levels is desirable but will remain problematic so long as there is no legislative base for strategic level assessments. At minimum, it would seem reasonable to
extend *CEAA* to provide for strategic assessments that meet *CEAA* standards and that can be used as appropriate frames for relevant project assessments.\(^5\)

(iv) Probably the most difficult challenge is to specify the meaning and implications of the sustainability criterion, addressing the areas of potential confusion listed under question 2, above, and ensuring that the process is not made more vulnerable to narrow interests and short term pressures. The first step here may be to develop appropriate guidelines under section 58(1)(a).

**Looking ahead**

So far, there is little public evidence that much careful attention has been devoted to working out the practicalities of how to apply the sustainability criterion more widely in assessments under *CEAA*. Decision criteria issues were not given much attention in documents prepared by the Canadian Environmental Assessment Agency for the mandated Five-Year Review of *CEAA* undertaken this year and seems unlikely to be addressed in the conclusions from this exercise.

The steps taken by the Voisey's and Red Hill panels have, however, set the stage for higher expectations of environmental assessments under *CEAA*. And the consequent pressures are increasingly complemented by other government sustainability initiatives – especially the requirement for audited and regularly updated departmental sustainable development strategies and the related sustainability focus of the revised Cabinet directive on assessment at the strategic level. In this context, it is reasonable to anticipate at least gradual moves to define and apply the sustainability criterion consistently in assessments under *CEAA*.

Sustainability has been a widely agreeable concept in part because it has been so open to incompatible interpretations. A cynic might hold that sustainability has often been included as an objective of law and policy because it offered the appearance of responsibility without establishing any firm obligations. But the concept has basic substantive foundations involving interdependencies and concern for longer term effects. Moreover, its adoption as an objective represents recognition that what we have now – what we are doing now – is not sustainable. Commitments to sustainability therefore have consequences that must be faced.

For environmental assessments under *CEAA* the challenge is to understand the consequences of a commitment that now appears to involve actual obligations. Specifying the implications of a basic sustainability criterion for environmental assessment is unavoidably difficult and for most of the questions there can be no grounds for fully confident answers. But that seems to be the reality to be faced. The alternative is

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\(^5\) For a discussion of how strategic level assessments can be used to establish a substantive and procedural framework for the planning and review of relevant projects, see Robert B. Gibson, "Ontario's class assessments: lessons for application to policies, plans and programs," in Steven A. Kennett, ed., *Law and Process in Environmental Management* (Calgary: Canadian Institute of Resources Law, 1994), pp.84-100.
believing that we will somehow move towards a more viable future without defining or seeking relevant improvements, that all will be well if our projects avoid significant adverse environmental effects or find "circumstances" to justify them. Even highly imperfect guidance for sustainability judgments seems a better bet.
Appendix

Decision criteria set out in the Voisey's Bay and Red Hill Creek EIS Guidelines
[excerpts from the guidelines]

VOISEY'S BAY MINE AND MILL ENVIRONMENTAL ASSESSMENT PANEL

ENVIRONMENTAL IMPACT STATEMENT (EIS) GUIDELINES FOR THE REVIEW OF THE VOISEY'S BAY MINE AND MILL UNDERTAKING

JUNE 20, 1997

3.3 Sustainability Assurance

Promotion of sustainable development is a fundamental purpose of environmental impact assessment, and the MOU specifically requires the Panel to take into consideration three factors that are directly pertinent to the task of assuring sustainability (i.e. ensuring that the full costs of development are identified, mitigated, compensated or offset). These factors are:

• the extent to which biological diversity is affected by the Undertaking;

• the capacity of renewable resources that are likely to be significantly affected by the Undertaking to meet the needs of present and future generations; and,

• the extent of application of the precautionary principle to the Undertaking (see section 3.4).

It is the Panel’s interpretation that progress towards sustainable development will require the following:

• the preservation of ecosystem integrity, including the capability of natural systems to maintain their structure and functions and to support biological diversity;

• respect for the right of future generations to the sustainable use of renewable resources; and,

• the attainment of durable and equitable social and economic benefits.

Therefore, in reviewing the EIS and other submissions, the Panel will consider:
• the extent to which the Undertaking may make a positive overall contribution towards the attainment of ecological and community sustainability, both at the local and regional levels;

• how the planning and design of the Undertaking have addressed the three objectives of sustainable development stated above;

• how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and,

• appropriate indicators to determine whether this progress is being maintained.

### 3.4 Application of the Precautionary Principle

The MOU requires the Panel to consider the "extent of application of the precautionary principle to the Undertaking". The Rio Declaration of 1992, to which Canada is a signatory, states that the precautionary approach requires that: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

The Panel interprets the precautionary principle as applying, in the particular context of this Undertaking, to the following activities:

• the release of toxic or deleterious substances into the environment;

• water withdrawals and diversions;

• the use of untested technology, or of existing technology in untested situations, where reliability is uncertain; and,

• other actions likely to cause significant damage to the environment, and particularly to biological productivity and ecosystem health.

Further, the Panel understands the application of the precautionary principle to require:

• that the onus of proof shall lie with the Proponent to show that a proposed action will not lead to serious or irreversible environmental damage, especially with respect to overall environmental function and integrity, considering system tolerance and resilience;

• scientific research and high-quality information; and,

• access to information, public participation, and open and transparent decision-making.

The Proponent shall indicate how the Undertaking conforms to the precautionary principle in at least the following ways:
a) that in designing and operating the Undertaking priority has been given to strategies that avoid the creation of adverse impacts;

b) that control of deleterious outputs or other potentially damaging activity goes beyond current emission standards where warranted by the potential environmental effects;

c) that contingency plans address explicit worst-case scenarios and include risk assessments and evaluations of the degree of uncertainty;

d) that monitoring programs are designed to ensure rapid response and correction where adverse effects are detected; and,

e) that liability and insurance regimes are established that hold the Proponent and its contractors accountable for adverse effects and associated damages, and their limitation and control, throughout the life of the Undertaking, including its decommissioning and rehabilitation.

THE RED HILL CREEK EXPRESSWAY REVIEW PANEL

ENVIRONMENTAL IMPACT STATEMENT (EIS) GUIDELINES FOR THE REVIEW OF THE PROPOSED RED HILL CREEK EXPRESSWAY NORTH-SOUTH SECTION PROJECT

OCTOBER 15, 1999

3.1 Respect for the Principle of Sustainable Development

Promotion of sustainable development (development that meets the needs of the present, without compromising the ability of future generations to meet their own needs) is a fundamental purpose of environmental assessment. The Panel’s Terms of Reference outline three factors that it must consider which are directly associated with sustainable development. These factors are:

1) the extent to which biological diversity is affected by the Project;

2) the capacity of renewable and non-renewable resources that are likely to be significantly affected by the Project to meet the needs of the present and those of the future; and
3) the extent of application of the precautionary principle to the Project [The Rio Declaration of 1992, to which Canada is a signatory, states that the precautionary approach requires that: "Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation."].

The Panel interprets progress towards sustainable development as meeting the following goals:

1) the preservation of ecosystem integrity, including the capability of natural systems, local and regional, to maintain their structure and functions and to support biological diversity;

2) respect for the right of future generations to the sustainable use of renewable and non-renewable resources; and

3) the attainment of durable social and economic benefits.

The Panel requires the Proponent to demonstrate how the Project meets the three goals directly noted above. It is the Panel’s belief that the application of the precautionary principle can play an important role in meeting the goals of sustainable development. Ways in which the Proponent may demonstrate that the Project conforms to the precautionary principle and in turn meets the three goals of sustainable development noted above are included in Annex 4. In addition, the Proponent is also encouraged to reference Vision 2020 policies and plans which may be relevant to the Project.

Annex 4

Approach to the Environmental Impact Statement

The following annex provides information on the suggested approach the Proponent should use in developing the Environmental Impact Statement (EIS).

1.0 Respect for the Principle of Sustainable Development

As indicated in section 3.0 of the Main Text, promotion of sustainable development is one of the main purposes of environmental assessment. The Panel recognizes that application of the precautionary principle can play a significant role in meeting the objectives of sustainable development. The Panel understands the application of the precautionary principle to generally require:

1) that the onus of proof should lie with the Proponent to show that a proposed action will not lead to serious or irreversible environmental damage, especially with respect to overall environmental function and integrity, considering system tolerance and resilience;
2) analysis based on scientific research and high-quality information; and

3) access to information, public participation, and open and transparent decision-making.

As part of the review, the Panel will examine the extent to which the Proponent has considered sustainable development objectives in Project planning. In this regard, the Proponent should include, at a minimum, a discussion of:

1) the extent to which the Project conforms to the precautionary principle;

2) the extent to which the Project may make a positive overall contribution towards the attainment of ecological and community sustainability, both at the local and regional levels;

3) how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and

4) the Proponent’s intended use of appropriate indicators (including, but not limited to, Sustainable Community Indicators adopted by the Proponent in 1996) to determine whether continuous progress towards sustainability is being maintained.
Sustainability assessment

Sustainability assessment: basic components of a practical approach

Robert B Gibson

The last few years have brought many experiments with forms of sustainability assessment, applied at the strategic and project levels by governments, private-sector firms, civil society organizations and various combinations. The attractiveness of the work so far suggests that it is now time to prepare for comprehensive adoption and more consistent application of the requirements and processes. The key first steps in sustainability assessment regime design are addressed in this paper. They centre on the basic sustainability requirements that should inform a transition to sustainability assessment; the main implications of these requirements for sustainability assessment decision criteria and trade-off rules; how to incorporate proper attention to the specific circumstances of applications into particular cases and contexts; and, more generally, how to design practical sustainability assessment regimes.

Keywords: sustainability assessment, sustainability requirements, integration, complexity, process design, decision criteria, trade-offs

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SUSTAINABILITY ASSESSMENT initiatives in various forms and under various titles are spreading rapidly in many parts of the world. Five years ago, a capable internet search engine would identify a few dozen government, corporate, academic, civil society and personal websites presenting work labeled as sustainability assessment or one of its equivalents. Recently (June 2006) Google reported over 26 million sites mentioning the term, and hundreds, if not thousands, of distinct initiatives.

Some of the examples are Canadian, including the ground-breaking assessment of the Voisey’s Bay nickel mine and mill project on the north Labrador coast (Gibson, 2000). There are many others though. Hong Kong applies sustainability assessment in its evaluation of urban infrastructure options (HKSDU, 2002). The United Kingdom uses sustainability appraisal in regional planning (UK ODP, 2005).

Several mining operations in Namibia and South Africa have been subject to sustainability-centred planning and assessment processes (Hacking, 2005). The World Conservation Union and the Forest Stewardship Council have well established sustainability-based processes for evaluating conservation and development undertakings and for decision-making on forest product certification (Guijt et al, 2001; FSC, 2004).

Many private firms have been experimenting with forms of triple bottom-line assessment, which consider social and ecological as well as economic effects, and the North American metal-mining sector has developed a “seven questions to sustainability” methodology to guide mine planning (MMSD-NA, 2002; Hodge, 2004). Municipalities have used sustainability frameworks for site-level design of greener
neighbours (Alexander, 2001). The United Nations (UN) Development Program has fostered sustainable livelihood approaches to community-level development assistance (Singh and Wamali, 1998) and the European Community has supported sustainability-based evaluation of international trade liberalization options (Kirkpatrick and Lee, 1999).

In a recent study of approaches to sustainability assessment, Barry Dalal-Clayton and Barry Sadler (2005), expecting to find a chapter’s worth of material, uncovered sufficient for a book, and even then could only survey a selection of the many possibilities and efforts. Moreover, the many sustainability assessment efforts are accompanied by a much more extensive set of evidently serious attempts to define sustainability objectives, to identify appropriate indicators, to apply sustainability considerations in scenario building, community mapping, multi-criteria evaluations, lifecycle and flow analyses, and a host of other tools to assist decision-making in complex circumstances.

These phenomena are not entirely new. Arguably, the idea and practice of considering the interrelationships among important concerns and influences, and looking beyond immediate results to implications for future generations, stretch back to the dawn of human experience. Until the ‘invention’ of progress a few hundred years ago, most of human history was about the pursuit of sustainability (at least when it was not about the pursuit of conquest and glory).

Today, however, the pursuit of sustainability is different. In a world of rapid change, specialized expertise, narrow mandates and immediate pressures, attention to interconnections and future generations is unusual. Attention to sustainability objectives is driven not so much by a desire to preserve tested traditions as by demands for improvements — to meet the challenge of providing decent livelihoods for all without wrecking the planet.

Essentially, the present concept of sustainability is a response to evidence that current conditions and trends are not viable in the long run, and that the reasons for this are as much social and economic as they are biophysical or ecological. As a result, current sustainability efforts are not merely integrative and forward looking. They are also attempts to push us onto a different and more hopeful path and as such they are an attack on entrenched habits and structures of decision-making. This is true also of sustainability assessment initiatives, broadly speaking.

The vast diversity of sustainability assessment experiments includes a sizeable portion with tenuous claims to the category. As in the larger realm of asserted commitments to sustainable development, conceptual rigour and effective action are much less common than cheerful visions and passionate endorsement. Still there is good reason to believe that the great proliferation of sustainability assessment initiatives, including those of questionable merit, is a response to widespread and genuine pressures for more effectively comprehensive, farsighted, critical and integrated approaches to decision-making on important policies, plans, programs and projects.

We can anticipate a continuing spread of such efforts for several reasons. The costs and perils of unsustainable behavior are becoming more evident at every level; both citizens and authorities are now increasingly aware of the interconnections among economic, social and ecological considerations. Moreover, governments and private-sector organizations that have spent well over a decade making formal claims of devotion to sustainability are being pressed to act accordingly. More positively, after lengthy contests over the meaning of ‘sustainability’ and ‘sustainable development’, there is now an emerging consensus on the fundamentals of what is needed for progress in the desired direction.

This paper outlines the basics of a practical generic approach to sustainability assessment. It relies on the past two decades of deliberations and experience with sustainability assessment initiatives, as a foundation for identifying:

- the basic sustainability requirements that should inform a transition to sustainability assessment;
- the main implications of these requirements for sustainability assessment decision criteria and trade-off rules;
- how to incorporate proper attention to the specific circumstances of applications into particular cases and contexts; and, more generally,
- how to design practical sustainability assessment regimes.¹

### Sustainability concept basics

Sustainability as a recent idea arose in response to two big problems and a host of particular ones. The two big worries — the spreading gulf between rich and poor and the continued degradation of biospheric systems — are entwined in a vicious spiral that increasingly threatens the enormous achievements made in other fields. The numerous particular

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¹ The idea of sustainability arose in response to the spreading gulf between rich and poor and the continued degradation of biospheric systems; and many particular concerns about the common and sometimes catastrophic failures of decision-making efforts that failed to take key linked factors into account

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concerns have centred on the common and sometimes catastrophic failures of decision-making efforts that failed to take key linked factors into account.

Some early versions of the concept (such as the UN’s eco-development efforts in the 1970s) responded to the disappointments and tragedies of development assistance undertakings that had ignored local ecologies, cultures and capacities. Other versions (such as the 1980 World Conservation Strategy) were the fruits of gradual experiential learning that there could be no species preservation without habitat preservation and no habitat preservation without local livelihood security.

Since 1987, when the World Commission on Environment and Development issued its report, Our Common Future, the terms ‘sustainability’ and ‘sustainable development’ have been widely, if sometimes cynically, embraced by public- and private-sector bodies. There has been much debate about the meaning and implications of serious commitment to sustainability and these deliberations continue. Nevertheless, after two decades of experimentation and study, there has been evident progress towards consensus on the fundamentals, supported by complementary developments in several adjacent areas of theory and practice.

The following eight points are now safe assertions about the basic insights, at least for the purposes of sustainability assessment:

- Sustainability considerations are comprehensive, including socio-economic as well as biophysical matters, and their interrelations and interdependence over the long term as well as the short term.
- Precaution is needed because human and ecological effects must be addressed as factors in open, dynamic, multi-scalar systems, which are so complex that full description is impossible, prediction of changes uncertain, and surprise likely.
- Minimization of negative effects is not enough; assessment requirements must encourage positive steps towards greater community and ecological sustainability, towards a future that is more viable, pleasant and secure.
- Corrective actions must be woven together to serve multiple objectives and to seek positive feedback in complex systems.
- Sustainability requires recognition both of inviolable limits and of endless opportunities for creative innovation.
- Sustainability is not about balancing, which presumes a focus on compromises and trade-offs. Instead the aim is multiple reinforcing gains. Trade-offs are acceptable only as a last resort when all the other options have been found to be worse.
- The notion and pursuit of sustainability are both universal and context-dependent. While a limited set of fundamental, broadly applicable requirements for progress towards sustainability may be identified, many key considerations will be location-specific, dependent on the particulars of local ecologies, institutional capacities and public preferences.
- In the pursuit of sustainability, the means and ends are intertwined and the process is open-ended. There is no end state to be achieved.

These basic consensus points about sustainability can be translated quite directly into implications for sustainability assessment. Arguably there are four major components.

The first is that sustainability assessment processes must force decision-makers contemplating potentially significant initiatives to give serious primary attention to sustainability requirements. To do this, the processes must apply decision criteria that establish meeting the core requirements for progress to sustainability as the main test of proposed purposes, options, designs and practices. The processes must put application of these sustainability-based criteria at the centre of decision-making, not as one advisory contribution among many.

Second, sustainability assessment must take seriously the obligation to recognize interdependencies and to seek multiple reinforcing gains on all fronts. This is assisted by setting a comprehensive agenda that covers the full suite of core requirements for moving towards sustainability. Yet it is also crucial to establish firm guidance for trade-off decisions, to ensure that sacrifices are made only where there is no viable ‘less bad’ alternative.

Third, sustainability assessment processes must provide means of specifying the sustainability decision criteria and trade-off rules for specific contexts, through informed choices by the relevant parties (stakeholders).

Finally, sustainability assessment processes must apply these insights in the full set of process elements:

- identifying appropriate purposes and options for new or continuing undertakings;
- assessing purposes, options, impacts, mitigation and enhancement possibilities, and so on;
- choosing (or advising decision-makers on) what should or should not be approved and done, and under what conditions; and
- monitoring, learning from the results and making suitable adjustments through implementation to decommissioning or renewal.

**Decision criteria for sustainability**

The core requirements for progress towards sustainability can be extracted without much difficulty from the rough consensus that has emerged from the past 20 or more years of debate and experimentation.

Perhaps most obviously, sustainability is a critical concept. Attention is paid to it because the current situation and trends appear not to be viable in the
long run. Also clearly, the viability problem is as much social and economic as it is biophysical or ecological. For some years there were lively debates about whether it is best to conceive of sustainability resting on two intersecting pillars (the ecological and the human) or three (social, ecological and economic) or five (ecological, economic, political, social and cultural), or more.

However, all this was essentially about emphasis. The important point is that all are included and that human and ecological well-being are effectively interdependent. Under all the layers of artifice and ingenuity, humans are ultimately and unavoidably dependent on biospheric conditions that are friendly to human life, and we now play a huge role in manipulating those conditions. Therefore, the overall systems that must be made desirable and lasting are not just ecosystems. They are socio-ecological systems. Sustainable development must aim to foster and preserve socio-ecological systems, from the family to the global levels, that are dynamic and adaptable, satisfying, resilient, and therefore durable.

Identifying the pillars has helped to underscore the mutual importance of the several factors. Yet defining sustainability needs in the familiar but separate categories of ecology, politics, society, economics and culture perpetuates fragmentation. Most participating individuals and agencies come to the sustainability table with particular areas of expertise, mandate and interest to apply and defend. Encouraging them to think and act outside these boxes is easier when sustainability is defined in ways that stress the interconnections and go more directly to the substance of what must be considered and done.

Bottom-up sustainability assessments, driven by the expressed public concerns surrounding particular cases or initiatives, often abandon the pillar categories and focus instead on problems and aspirations that cross the social/economic/ecological boundaries. Public-issue identification and priority-setting processes typically identify secure livelihoods, safety, health, vibrant and attractive communities, new opportunities and choice, and influence in decisions as key objectives. None of these is a purely social, economic or ecological matter.

Sustainability assessment criteria that avoid the pillars, and concentrate attention on the main requirements for improvement rather than the established categories of expertise, are therefore advantageous. Many such approaches have been proposed and used. Some are not much more than eclectic lists, and some fail to include all the important needs. However, there are still many that attempt to consolidate the full range of considerations from the most advanced thinking, and their conclusions reflect broad agreement on the essentials.

Box 1 presents a set of basic sustainability requirements that should be considered the core obligations of sustainability-oriented decision-makers. Following the approach suggested above, this set of requirements is not pillar-based, though the elements draw from the usual categories. Instead, it concentrates attention on what must be achieved, and what key actions are involved, to move consistently towards greater sustainability. These requirements are framed here as criteria for sustainability assessments.

This is little more than a working list of the titles of general requirements. They are based on a careful synthesis of literature and case experience and are accompanied elsewhere by modest elaborations (Gibson et al., 2005: chapter 5). However, there is no reason to insist on this particular formulation. The items could be subdivided, reconstructed, reordered and reworded in a host of different ways. Like any such offering this one is properly subject to continued learning and adjustment.

In any event, an acceptable listing of core sustainability requirements is just a beginning. For practical applications, there are aggregation, comparison and conflict problems to be addressed. Logically, the integration requirement demands that the first six requirements be pursued in mutually compatible ways that win positive effects all round, and that precaution and adaptation be included in every case. Perhaps this agreeable result can be achieved more often than we might expect, but existing examples are rare. In practice, there will be tensions and conflicts between and among the objectives. To ensure that these are addressed carefully, in ways that do not compromise the core criteria, sustainability assessment needs trade-off rules.

Also, this listing only sets out the general requirements. As will be discussed below, the specifics of each item and the package as a whole must be defined in context, by the relevant communities of interest and concern. How this specification is done — what processes are used for the discussions and choices involved, how the means fit with the ends — is no less important than the general requirements to be respected.

**Elaborating approaches to trade-off decisions**

For sustainability, positive improvements are needed to meet all of the core requirements. Each is crucial and all are to be applied together. Significant and lasting improvements rely on linked, mutually supporting, positive steps on all fronts. There is no way around this. In practice, however, compromises and trade-offs will be unavoidable in most policy, program, plan and project decisions, if only because overall global conditions are now so very far from sustainability.

In conventional decision-making, trade-offs between narrowly biophysical or ecological considerations and competing social and economic objectives may be made outside the assessment framework. In sustainability assessment, all the policy commitments and all the development objectives are considered together and the trade-offs are addressed directly.
Box 1. Core generic criteria for sustainability assessments

**Socio-ecological system integrity**
the requirement: Build human–ecological relations to establish and maintain the long-term integrity of socio-biophysical systems and protect the irreplaceable life support functions upon which human and ecological well-being depends.
illustrative implications:
• need to understand better the complex systemic implications of our own activities;
• need to reduce indirect and overall as well as direct and specific human threats to system integrity and life support viability.

**Livelihood sufficiency and opportunity**
the requirement: Ensure that everyone and every community has enough for a decent life and that everyone has opportunities to seek improvements in ways that do not compromise future generations’ possibilities for sufficiency and opportunity.
illustrative implications:
• need to ensure provision of key prerequisites for a decent life (which, typically, are not now enjoyed by those who have little or no access to basic resources and essential services, who have few if any satisfactory employment opportunities, who are especially vulnerable to disease, or who face physical or economic insecurity);
• need to appreciate the diversity, and ensure the involvement, of those whose needs are being addressed.

**Intragenerational equity**
the requirement: Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, and so on) between the rich and the poor.
illustrative implications:
• need to build sustainable livelihoods for all, including practically available livelihood choices and the power to choose;
• need to emphasize less materially- and energy-intensive approaches to personal satisfactions among the advantaged, to permit material and energy sufficiency for all.

**Intergenerational equity**
the requirement: Favour present options and actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.
illustrative implications:
• need to return current resource exploitation and other pressures on ecological systems and their functions to levels that are safely within the perpetual capacity of those systems to provide resources and services likely to be needed by future generations;
• need to build the integrity of socio-ecological systems, maintaining the diversity, accountability, broad engagement and other qualities required for long-term adaptive adjustment.

**Resource maintenance and efficiency**
the requirement: Provide a larger base for ensuring sustainable livelihoods for all, while reducing threats to the long-term integrity of socio-ecological systems by reducing extractive damage, avoiding waste and cutting overall material and energy use per unit of benefit.
illustrative implications:
• need to do more with less (optimize production through decreasing material and energy inputs and cutting waste outputs through product and process redesign throughout product lifecycles), to permit continued economic expansion where it is needed, with associated employment and wealth generation, while reducing demands on resource stocks and pressures on ecosystems;
• need to consider purposes and end uses, recognizing that efficiency gains are of no great value if the savings go to more advantages and more consumption by the already affluent.

**Socio-ecological civility and democratic governance**
the requirement: Build the capacity, motivation and habitual inclination of individuals, communities and other collective decision-making bodies to apply sustainability requirements through more open and better informed deliberations, greater attention to fostering reciprocal awareness and collective responsibility, and more integrated use of administrative, market, customary and personal decision-making practices.
illustrative implications:
• need governance structures capable of integrated responses to complex, intertwined and dynamic conditions;
• need to mobilize more participants, mechanisms and motivations, including producers, consumers, investors, lenders, insurers, employees, auditors, reporters
• need to strengthen individual and collective understanding of ecology and community, foster customary civility and ecological responsibility, and build civil capacity for effective involvement in collective decision-making.

**Precaution and adaptation**
the requirement: Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundations for sustainability, plan to learn, design for surprise, and manage for adaptation.
illustrative implications:
• need to act on incomplete but suggestive information where social and ecological systems that are crucial for sustainability are at risk;
• need to design for surprise and adaptation, favouring diversity, flexibility and reversibility;
• need to prefer safe fail over fail-safe technologies;
• need to seek broadly comprehensible options rather than those that are dependent on specialized expertise;
• need to ensure the availability and practicality of back-up alternatives;
• need to establish mechanisms for effective monitoring and response.

**Immediate and long term integration**
the requirement: Apply all principles of sustainability at once, seeking mutually supportive benefits and multiple gains.
considerations:
• integration is not the same as balancing;
• because greater efficiency, equity, ecological integrity and civility are all necessary for sustainability, then positive gains in all areas must be achieved;
• what happens in any one area affects what happens in all of the others;
• it is reasonable to expect, but not safe to assume, that positive steps in different areas will be mutually reinforcing.
illustrative implications:
• need positive steps in all areas, at least in general and at least in the long term;
• need to resist convenient immediate compromises unless they clearly promise an eventual gain.

Source: Gibson et al (2005)
Common trade-off dilemmas include how to make net gain and loss calculations and whether to accept proposals for compensations and substitutions. For example, are the very long-term risks from initially secure deep underground disposal of toxic wastes acceptable as a trade-off for reduction of the near-term ecological damage risks from surface storage of these wastes? Are the temporary negative effects of aggregate extraction justifiable on somewhat degraded agricultural lands, if some of the profits are used eventually to rehabilitate these lands? Is a constructed wetland a satisfactory replacement for a slightly smaller natural one? Should decision-makers accept major damage to the interests of tribal people displaced by a new dam, if that dam promises more material security for larger numbers of poor farmers downstream? Can new recreational facilities compensate a First Nations community adequately for new risks to traditional hunting or fishing? Should industrial process improvements that bring efficiency gains and also job losses be considered a step towards or away from sustainability?

Even when sustainability objectives are widely understood and commonly accepted, different interests are likely to reach different conclusions about which of these compensations and net calculations may be justified. The answers often also depend on the details. Just how serious are the losses, risks and gains involved? Just how inequitable is the distribution of effects?

There are two interdependent approaches to dealing with trade-offs: rules and processes.

**Rules**: Sustainability-based environmental assessment regimes can clarify application of the sustainability requirements by setting out general rules, or at least guidelines, for decisions about what sorts of trade-off may or may not be acceptable. These can be complemented by more specific region- or sector-specific clarifications. Perhaps few set rules will be appropriate for all cases (different communities, cultures, ecosystems, stresses, aspirations, capacities, and so on) even within particular regions or sectors.

The one clearly essential general rule is that trade-off decisions must not compromise the fundamental objective of net sustainability gain. It is also generally desirable that all ‘significant’ compromises and trade-offs be clearly identified, openly discussed and explicitly justified, and that the most desirable (or least bad) option be chosen. There are also possible rules that might often be appropriate, but probably not always. In particular contexts, it might be proper to rule that:

- no ‘significant’ compromises or trade-offs will be permitted, unless approved by all relevant stakeholders; or
- only undertakings that are likely to provide neutral or positive overall effects for each core sustainability requirement can be acceptable (for instance, no net additional burdens on the poorest of the poor); or
- no significant adverse effects in any core category can be justified by compensations of other kinds, or in other places (for instance, no use of ecological rehabilitation compensations for significantly greater inequities).

On these and other such matters where the specific circumstances are crucial, the general rules will need to be complemented by case- and context-specific elaborations.

**Processes**: Some of the general and case/context-specific rules can set a more or less substantiest test (for instance, no displacement of significant negative effects to the future). However, often the key need is to ensure that the difficult choices are approached in an acceptable way. This is a job for process rules. General process rules might, for example, require that the deliberations be open to scrutiny and participation by interested parties, and that rationales be provided for proposed trade-offs.

Some process rules are broadly applicable. Others will have to be adopted as appropriate for differing circumstances. The relevant decision processes may often find it helpful to use some of the many tools (systems analysis, scenario-building, cost–benefit analysis, risk assessment, multi-stakeholder negotiation, and so on) that have been developed for formal decision-making about trade-offs. While expertise and technical tools can be beneficial, trade-off decisions are essentially and unavoidably value-laden. What and whose values are able to play a role in the design and application of tools, and in the use of deliberative processes, is therefore crucial.

Because any conceivably acceptable set of general or region/sector rules will provide limited guidance, processes for case-specific clarifications will be needed. The key considerations here are how the issues are presented, debated and resolved and by whom.

There are no easy answers to these questions. However, some central considerations seem clear enough:
While expertise and technical tools can be very helpful, these are essentially and unavoidably value-laden decisions.

Open and effective involvement of all stakeholders (those representing sustainability-relevant positions as well as those potentially affected) is necessary.

Informed clarification of rules about possibly acceptable compromises and trade-offs depends on reasonable agreement on the context-specific sustainability objectives and on reasonable awareness of the relevant conditions and influences (this favours use of scenario-building and system-depiction methods).

Because clarifications are needed to guide the planning of undertakings from the outset, anticipatory processes at the strategic level (through environmental assessment and equivalent planning and other processes) and early deliberations at the project level are desirable.

Because understandings and possibilities evolve, processes for clarifying objectives and acceptable compromises and trade-offs must be iterative, with tentative positions revisited throughout planning, decision-making and implementation.

Box 2 presents a set of generic sustainability assessment trade-off rules that are meant to be applicable in any case. Like the generic sustainability-based decision criteria, these generic trade-off rules would need to be supplemented by particular guidance adopted for, and respectful of, the particular contexts of specific cases.

**Incorporating case and context specifics**

The generic criteria and trade-off rules provide a basic framework that covers the key sustainability issues and their interconnections. Use of these should ensure that no big common issues are neglected. The next step is to add in the key considerations that are specific to the case and its particular context. Things get more difficult here.

There are two interrelated areas of practical difficulty: how to identify the case- and context-specific considerations that should be integrated with the generic requirements into the overall set of sustainability assessment criteria; and how to structure the integrated result.

The first problem is often approached, at least initially, as desk research. Sustainability assessments can draw from a variety of documentary sources to identify major case- and context-specific considerations. These include:

**Box 2. Basic sustainability assessment trade-off rules**

**Maximum net gains**

Any acceptable trade-off or set of trade-offs must deliver net progress towards meeting the requirements for sustainability; it must seek mutually reinforcing, cumulative and lasting contributions and must favour achievement of the most positive feasible overall result, while avoiding significant adverse effects.

**Burden of argument on trade-off proponent**

Trade-off compromises that involve acceptance of adverse effects in sustainability-related areas are undesirable unless proven (or reasonably established) otherwise; the burden of justification falls on the proponent of the trade-off.

**Avoidance of significant adverse effects**

No trade-off that involves a significant adverse effect on any sustainability requirement area (for example, any effect that might undermine the integrity of a viable socio-ecological system) can be justified unless the alternative is acceptance of an even more significant adverse effect.

- Generally, then, no compromise or trade-off is acceptable if it entails further decline or risk of decline in a major area of existing concern (for example, as set out in official international, national or other sustainability strategies or accords, or as identified in open public processes at the local level), or if it endangers prospects for resolving problems properly identified as global, national and/or local priorities.
- Similarly, no trade-off is acceptable if it deepens problems in any requirement area (integrity, equity, and so on) where further decline in the existing situation may imperil the long-term viability of the whole, even if compensations of other kinds, or in other places are offered (for example, if inequities are already deep, there may be no ecological rehabilitation or efficiency compensation for introduction of significantly greater inequities).

Source: Gibson et al (2005)
• existing policy and planning documents that set out key concerns and priorities at the local, regional, territorial and/or national level;
• considerations that emerged in prior assessments or similar processes dealing with the same context;
• earlier deliberations on the case, especially involving the key stakeholders; and
• other sources of local and/or larger-scale information that sheds light on how the various generic sustainability concerns are reflected in the circumstances and issues of the particular case and context.

Additional considerations can often be identified or anticipated by informed observers and specialized experts. This is rarely, if ever, sufficient, however.

What matters in any case and context inevitably depends more or less heavily on what matters to the people concerned and this means that participative engagement of these people is needed. There are several key considerations here. Perhaps the most obvious is that, on many context-specific topics, those in the context are likely to have crucial insights. Their views, hopes, fears, flexibilities and commitments are also themselves important contextual factors that will influence what changes are feasible and which ones may be judged positive.

Moreover, the context of understandings and preferences is dynamic. It will move in the course of deliberations, and it is more likely to move towards broader understandings and suitably amended preferences where there are participative deliberations about proposed undertakings and their implications, especially where these deliberations include the comparison of serious competing options, and where the broad generic suite of sustainability requirements helps to frame the discussions. Finally, the importance of issues is typically as much a matter of public preference and choice as it is a possible determination from technical analysis.

There is a wonderful array of potentially suitable methods and tools for inspiring, informing, and guiding public and multi-stakeholder discussions on case issues and priorities. They include, for example, backcasting scenario-building exercises that help reveal case/context priorities and facilitate depiction of overall objectives and implications (for instance, Ravetz, 2000; Robinson, 2003), community mapping (Lydon, 2000; Porter et al., 2002; CMN, 2005) and cumulative-effects projections (Cizek et al., 2002; Cizek and Montgomery, 2005).

Most of the leading tools can link attention to generic and specific considerations, at various scales. Beyond the elaboration of case- and context-specific decision criteria, many approaches can also go beyond the relatively easy identification of individual concerns and objectives to the much harder job of depicting systemic interrelations and overall implications. However, few, if any, are suitable for all applications and there is plenty of room here for more practical testing, and for guidance on what to use, and how, in particular circumstances.

The second problem — how to structure the resulting integrated set of generic and case/context-specific criteria into one workable package — also defies easy solution. There are three basic options:

• integration of case/context-specific considerations and concerns under the core assessment criteria categories (such as the ones set out above);
• integration of the assessment criteria under case/context issue categories; and
• hybrid models.

Each has important strengths and weaknesses. Using the generic criteria to provide the basic structure promises strong early guidance and consistency of practice, but is vulnerable to awkward fit with local concerns and poor reception as an imposed agenda. Using case/context issues as the framework offers better fit with, and acceptance in, the context, but could rarely be in place early enough to guide the crucial first steps in defining the immediate purposes and alternatives to be considered. Hybrid combinations might often work best, but they too would limit consistency, and could lead to long unwieldy lists of criteria. Here too, no single solution is likely to be satisfactory and there is still much to learn from experimentation.

Sustainability assessment process design

Designing sustainability assessment regimes, and building ad hoc sustainability assessment approaches for individual cases, is mostly a matter of integrating the insights and components above with the lessons from advanced planning and assessment initiatives and from sustainability assessment efforts so far.

Conventional assessment and planning processes today are not often well designed for addressing human and ecological effects within complex systems. Few emphasize attention to maximizing positive long-term improvements. Most fail to ensure effective integration of sustainability considerations in the key early decisions on purposes and preferred options. Too often the results are merely advisory, have little influence in final decisions, or are incorporated with compromises and trade-offs that are reached through separate, non-transparent negotiations wherein environmental matters are still treated as constraints, in conflict with priority objectives.

At the same time, the basic design features for sustainability assessment processes are not greatly different from those for best practice environmental assessment and planning regimes. They apply explicit evaluation criteria in the preparation, evaluation, approval and implementation of policies, programs and projects, are characteristically anticipatory and forward looking, and can integrate a wide variety of concerns and considerations.
Sustainability assessment is committed to positive overall contributions to a more desirable and durable future by identifying best options (not just acceptable undertakings) and multiple reinforcing gains (not mere avoidance of problems and mitigation of adverse effects)

Most are flexible enough for application to very different cases in very different circumstances, can be used to force attention to otherwise neglected considerations, are open to public involvement, and have been demonstrably adaptable in ways that suggest capacity for progressive evolution. Indeed, assessment and planning process changes over the past 30 years or so have generally moved both concept and practice in the direction of sustainability assessment (Gibson et al., 2005: chapter 2).

Sustainability assessment as the core approach to decision-making is clearly more ambitious than conventional assessment and planning efforts. It is committed to positive overall contributions to a more desirable and durable future through the identification of best options (not just acceptable undertakings), and it is designed to achieve multiple reinforcing gains (rather than mere avoidance of problems and mitigation of adverse effects).

While sustainability assessment demands more coherent and comprehensive decision-making, it must also respect context and uncertainty. Considerable flexibility for different applications is required because there are recognized obligations to understand and respect contextual differences, to work iteratively with the relevant communities, and to adapt to new understandings, different ecosystems and communities, and emerging challenges and opportunities. However, commitment to a common set of fundamental requirements, and to their integrated application, provides a strong basis for overall consistency from policy, program and plan design to post-approval project implementation monitoring.

The particular combination of flexibility and consistency permits decentralization of decision-making as well as more deliberate integration of objectives and priorities, and more consistent substance in, and processes for, overall planning and evaluation. Needs for specialists in particular areas (ecological effects, gender equity analysis, and so on) continue. Such specialists, however, need also to look beyond their particular mandate and expertise to recognize broader implications, especially where trade-offs or openings for positive reinforcements may be involved.

Even more than conventional environmental assessment, sustainability assessment is unavoidably permeated by needs for value-laden choices in the face of uncertainty; openness and effective involvement of the interested public is therefore crucial. Transparency and accountability are assisted by requirements for explicit criteria and procedures for evaluations and decisions, including those dealing with conflicts and trade-offs. However, these alone are not enough. Effective public engagement is necessary throughout the deliberations from initial consideration of purposes and options to monitoring and decommissioning or renewal.

With these considerations in mind, it is not difficult to adjust the basic characteristics of advanced assessment and planning regimes to form the essentials of generally applicable sustainability assessment process design. These are set out in Box 3.

Sustainability assessment implementation

Sustainability assessment has so far been explored mostly through particular initiatives undertaken in more or less special circumstances. Proliferation of such initiatives seems likely to continue, if only because there are so many real problems that demand attention to intertwined socio-economic/political and biophysical/ecological considerations and require a long-term perspective. Often this will involve creation of more ad hoc processes. Sometimes it will be possible to make creative use of existing legislated regimes such as in the Voisey’s Bay environmental assessment (Gibson, 2000), or to legislate new mechanisms with sustainability assessment capacities, such as the British regional planning process (UK ODPM, 2005). Nevertheless, eventually it will be necessary to establish sustainability assessment regimes that apply broadly to a wide range of undertakings.

No existing jurisdiction has yet incorporated all the Box 3 features into the design and application of a dedicated sustainability assessment regime. Probably no jurisdiction will find it easy. Sustainability is, after all, an essentially critical concept. It arose because of the evident and fundamental deficiencies of conventional decision-making and it requires significant change in how we think about our choices and how we structure our institutions as well as our processes of evaluation and decision.

Moreover, the agenda of sustainability assessment is demanding at a time when, in many jurisdictions, it will not be acceptable for sustainability assessment to add to the overall burdens of deliberation. Implementation in most places will be hampered by poor fit with the relevant authorities’ existing mandates, obligations and expectations (their established accountability and effectiveness monitoring systems, current legislated environmental assessment processes, and so on).

Sustainability assessment does offer important advantages, even from a purely administrative
Box 3. Core features of sustainability assessment regime design

- establishes assessment as an approach to decision-making (in the conceptualization, planning, design, evaluation, approval, implementation and monitoring, and eventual decommissioning of undertakings), not just a review at a particular stage or one contribution among others and establishes a ‘positive contribution to sustainability’ as the basic criterion for evaluations and decisions;
- covers all potentially significant initiatives, at the strategic as well as project level, in a way that connects work at the two levels, and focuses attention on the most significant undertakings and on openings for the greatest beneficial influence;
- ensures that proponents of undertakings and responsible authorities are aware of their assessment obligations before they begin planning, and that they have effective motivations (legal requirements or the equivalent) to meet these obligations;
- is transparent and ensures open and effective involvement of local residents, potentially affected communities and other parties with important knowledge and concerns to consider and an interest in ensuring properly rigorous assessment, and facilitates special steps to ensure representation of important interests and considerations not otherwise effectively included (such as disadvantaged populations, future generations, broader socio-ecological relations);
- adopts a scope that covers the full set of global and regional as well as local sustainability concerns, through application of generic criteria, but combines this with sensitivity to the particular context (ecological, cultural, socio-economic, and so on) through direct engagement of stakeholders in identifying key case-specific concerns and priorities to supplement, and/or elaborate, the generic criteria;
- requires integrated consideration of all factors that may affect prospects for meeting these requirements;
- focuses on achieving multiple, mutually reinforcing gains, as well as avoiding significant (especially, permanent) losses, in all the interrelated areas of sustainability concern, in addition to serving the immediate purposes of the undertaking;
- aims to identify the best option (that offers the greatest overall benefits and that avoids undesirable trade-offs) through comparative consideration of possibly reasonable alternatives (rather than merely to enhance/mitigate the effects of an already chosen option);
- is initiated at the outset of policy, plan, program and project deliberations when problems and/or opportunities are identified and selection of case-specific purposes can be informed by the ‘contribution to sustainability’ objective;
- requires critical examination of purposes and alternatives;
- addresses indirect and cumulative as well as direct and immediate effects;
- favours options incorporating adaptive design and requires preparation for adaptive implementation of approved undertakings;
- specifies and applies explicit rules and requires explicit rationales for trade-off decisions;
- includes effective means of monitoring implementation and effects, and of ensuring appropriate response to identified problems and opportunities;
- recognizes uncertainties, favours caution, designs for continuous learning and follows initial decisions for adaptive adjustment through the full lifecycle of assessed undertakings;
- contributes to sustainability through the assessment process itself as well as through the better decisions that result, in part by incorporating open participative approaches, respecting different interests, and integrating different kinds of knowledge;
- is established in law in ways that ensure openness to effective public scrutiny and participation as well as public initiation of legal action to compel compliance with assessment obligations.

One especially attractive quality is that it can offer efficiency gains by providing a means of consolidating the variety of ill-connected, overlapping and competing processes that have proliferated in most jurisdictions in recent decades. Perhaps more importantly, its consistent framework and full-cycle application can help to ensure that important lessons are learned only once the hard way and that more initiatives deliver multiple gains.

Implementation will also be facilitated by complementary progress in the broader realm of sustainability initiatives. Development of sustainability objectives and indicators, including locally and regionally specified ones, has been supported by many organizations and jurisdictions for more than a decade. Tools for integrating multiple lay stakeholders in evaluation and decision processes (through scenario-building, design charrettes, valued ecosystem component identification, site-selection criteria development, community mapping, and so on) are becoming increasingly well tested and sophisticated.

Advanced methodologies for depicting complex systems and considering future changes in them are being applied at scales from the local to the global. As the already broad range of sustainability-oriented deliberations (urban planning, collaborative resource management, corporate greening, alternative national accounts, industrial ecology, growth management, and so on) continues to expand, it is reasonable to anticipate many further contributions of insight and methodology.

In addition, sustainability assessments can act as a means of solving their own problems. Because they force more rigorous and better integrated attention to sustainability requirements as the key concern of decision-making in particular circumstances, they serve as a mechanism for clarifying general sustainability requirements, indicators and trade-off rules, and for specifying them in particular contexts, through informed choices by the relevant parties.

Nevertheless, few jurisdictions are likely to be bold enough to introduce a best practice sustainability assessment regime in a single comprehensive step. Most will rely on incremental steps, perhaps through progressive adjustment of existing planning and/or assessment processes. This can work well. However, it is not entirely risk free.

One of the great challenges of environmental assessment and planning processes has been to force attention onto factors that had been generally neglected in conventional decision-making. Effects on ecosystems and communities are now much more likely to be noted and taken seriously than they were in the years before open environmental assessment and participative planning. However, the gains so far have been limited and remain fragile in many jurisdictions.

Carefully considered steps to introduce broader sustainability assessment should root ecosystem and community considerations more deeply in the core
of deliberations and decisions. Yet badly designed incremental moves towards sustainability assessment could provide means of reasserting the old dominance of narrow economic and technical considerations, reduce direct attention to ecology and community, and erase some of the hard-won gains of the past three decades.

Three complementary solutions are available. The first is to continue efforts to clarify sustainability assessment aims and requirements. The better we understand the objective, the less likely we are to go astray in implementation efforts. The second is to accept the precautionary reliance on diversity. As noted above, experiments with sustainability assessment or its equivalent have been, and are being, undertaken not just in environmental assessment regimes but also in land-use planning, site restoration, corporate greening, community-level development assistance, trade-option evaluation and a host of other fields.

Moreover, they are using not just conventional law and policy tools but also certification schemes, corporate behavior codes, ethical investment criteria, sustainable livelihood analyses, multi-stakeholder collaborations and a long list of other mechanisms. Errors and missteps in any one of these areas will be minimally dangerous, so long as the same basic agenda is being pursued on many other fronts.

Finally, all implementation efforts, however incremental, need to be centred on establishment of the most fundamental components. These are the four identified near the beginning of this paper, plus one needed to keep the whole exercise honest.

The most crucial and first priority steps to implement sustainability assessment processes are those that:

- establish contribution to sustainability as the main test of proposed purposes, options, designs and practices, and must put application of this test at the centre of decision-making, not as one advisory contribution among many;
- adopt evaluation and decision criteria and trade-off rules that reflect the full set of core requirements for progress towards sustainability, recognize interdependencies and seek multiple reinforcing gains on all fronts;
- provide means of specifying the sustainability decision criteria and trade-off rules for specific contexts, through informed choices by the relevant parties (stakeholders);
- apply these insights in the full set of process elements, including identifying appropriate purposes and options for new or continuing undertakings; assessing purposes, options, impacts, mitigation and enhancement possibilities; choosing (or advising decision-makers on) what should or should not be approved and done, and under what conditions; and monitoring, learning from the results and making suitable adjustments through implementation to decommissioning or renewal; and
- ensure that the deliberations and decisions are sufficiently open to scrutiny and participation, and sufficiently accountable in law, that an informed public can push effectively for proper application.

The elaboration and implementation of sustainability assessment processes so far has involved a good deal of experimentation and learning-on-the-job. The resulting accumulation of insights and tested applications is now substantial, and it provides a good working foundation for the approach sketched out here. Yet we have only just begun along the path to sustainability-based decision-making. Like any other set of proposals, the decision criteria, trade-off rules, context incorporation steps and regime design features set out above are meant for critical testing and continued adjustment as we gradually develop a better understanding of desirable and durable ways of living on this planet.

Notes

1. Much of the discussion is based on, and summarizes, the much more detailed treatment in Gibson et al (2005).
2. These include, for example:
   - expanded awareness of the interconnections among social, ecological and economic factors, especially in areas of pressing public concern and controversy, such as health, security, livelihood maintenance and opportunities, and future quality of life;
   - advances in the study of ecology and resource management, but now also in other socio-political and biophysical realms, where there has been increasing attention to the realities and implications of complex systems with multiple interacting factors and dynamic self-organizing processes in multiple interacting scales, with pervasive and inevitable uncertainties (for instance, Gunderson et al, 1995; Gunderson and Holling, 2002);
   - the rise of studies and applications in the field of ‘new governance’ recognizing the limitations as well as power of market mechanisms, doubts about the potential adequacy of state interventions, acceptance of expanded ‘governance’ roles for other tools and players, awareness of context dependency, and skepticism about ‘civilizing missions’ and universal solutions (for instance, Beck, 1999; Sachs, 1999; Dryzek, 2000; Paehlke, 2003);
   - continuing economic globalization combined with concerns about its implications for distributive justice, cultural identity, and ecological stewardship;
   - pressures on public authorities and private enterprises to enhance efficiencies, including by getting multiple benefits from individual initiatives; and
   - spreading acceptance of the precautionary principle in response to deepening concerns about global-scale health and ecological risks, and declining faith in the potential adequacy of scientific knowledge and technical repair (for instance, Harreremoes et al, 2001).
3. For a discussion of the pillars approaches, see Mebratu (1998). The Canadian International Development Agency has taken a five-pillar approach, see CIDA (1997), chapter 2, “The sustainable development framework”.
4. The United Kingdom, which favours “quality of life” as an integrating title, identifies for its national sustainability strategy the following ten cross-cutting “principles” (UK, 1999):
   - putting people at the centre;
   - taking a long-term perspective;
   - taking account of costs and benefits;
   - creating an open and supportive economic system;
   - combating poverty and social exclusion;
   - the precautionary principle;
   - using scientific knowledge;
- transparency, information, participation and access to justice;
- making the polluter pay.

5. For example, the nine “Hannover principles of design for sustainability” (McDonough and Braungart, 1992) give no attention to equity considerations:
- insist on rights of humanity and nature to co-exist;
- recognize interdependence;
- respect relationships between spirit and matter.
- accept responsibility for the consequences of design decisions;
- create safe objects of long-term value.
- eliminate the concept of waste.
- rely on natural energy flows.
- understand the limitations of design.
- seek constant improvement by the sharing of knowledge.
- while suit the consolidations do not use the same categories, they reflect broad agreement on the key considerations. The sets of sustainability criteria prepared for environmental assessment applications by Clive George (1999) centre on present and future equity, combining ecological and socio-economic considerations. Keith Pezzoli, who carried out a transdisciplinary review of sustainable development literature in the mid-1990s, identified the four key challenges as holism and co-evolution, social justice and equity, empowerment and community building, and sustainable production and reproduction (Pezzoli, 1997). Neil Harrison (2000) found three key concentrations in the literature — efficiency, equity and ethics — judged each of them too limited and mechanical, and proposed to incorporate them all within an emphasis on building social capacity for flexible adaptive action. Other authors have proposed other organizational frameworks. However, the categorizations are not as important as the essential substance, and on this George, Pezzoli, Harrison and other consolidators generally agree.

7. The key design features for environmental assessment processes are well documented. See for example, Gibson (1993).

8. ‘Charette’ is the common word in North America for collaborative planning exercises using multi-stakeholder processes to design new buildings or new developments at a slightly larger scale. Our objective in the preface to this book was to enhance the process by building on the Canadian experience.

References


Robinson, J 2003. Future subjunctive: backcasting as social
Practical approach to sustainability assessment


Conceptualising Sustainability Assessment (2004)
Jenny Pope, David Annandale and Angus Morrison-Saunders

To obtain a copy of this reference please contact the Panel Secretariat at darlington.review@ceaa-acee.gc.ca
Until the Covid-19 crisis arose, the central reason for this message was to present our journey in 2019, the most difficult in the history of Vale and the community of Brumadinho, due to the rupture of Dam I at the Córrego do Feijão mine. Since the occurrence of this tragedy, we have endeavored to dedicate ourselves to rethinking not only the way we work, but also our own vision of the world and of business. Vale’s Sustainability Report 2019 summarizes the company’s actions and learning following the rupture of Dam I of the Córrego do Feijão mine, in Brumadinho (Minas Gerais State - MG), which resulted in the death of 270 people, on January 25th, 2019. AMIG’s signature for financial contributions to companies and maintenance of services totaling BRL 100 million. Apr.

Favouring the higher test: Contribution to sustainability as the central criterion for reviews and decisions under the Canadian environmental assessment act. Article. Jan 2000. 

Sustainable Development: From Concept and Theory Towards Operational Principles’. Paper presented at the Hoover Institution Conference, Population and Development Review. Jan 1989. H E Daly. Daly, H.E. (1989). 'Sustainable Development: From Concept and Theory Towards Operational Principles'. Paper presented at the Hoover Institution Conference, Population and Development Review. Also published in H. Daly (1991). Steady State Economics, 2nd edition. Sustainability in Higher Education - Free download as PDF File (.pdf), Text File (.txt) or read online for free. This is a study about sustainability in higher education, its benefits and employment potentials for sustainability graduates, as well as, contributions to sustainability through professions. The contributions to sustainability through related job positions vary from informing colleagues and co-employees on sustainability to obliging companies on adopting sustainability patterns. The selection criteria for these programs were their international status, their leadership in sustainability education and research, as well as, the entry requirements for future students and university curricula. Sustainable investing has moved to center stage in early 2020. In his latest letter to CEOs Blackrock CEO Larry Fink writes that sustainability, which involves integrating environmental and social concerns into business decisions, would be at the center of his firm’s investment approach. He also foresees an imminent and fundamental reshaping of finance that would better recognize the jeopardy to investment posed by climate risk and lead to a significant reallocation of capital. CFOs and other business leaders might see the coming changes as a threat. Blackrock, with nearly $7 trillion in as Our sustainability journey. Subsea 7 is a global leader in the delivery of offshore projects and services for the evolving energy industry, creating sustainable value by being the industry’s partner and employer of choice in delivering the efficient offshore solutions the world needs. In an ever-evolving energy industry, one of the most significant challenges we face is the increased demand society places on being able to deliver sustainable sources of energy as we transition to a lower-carbon future. Our Company is committed to meeting this challenge and to continuously improve the sustainabi...