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Abstract

The precautionary principle has been adopted in such a widespread fashion that it is now difficult to find in either the international environmental arena or countries with advanced environmental protection frameworks an environmental policy document, a new environmental law, or even a political statement about environmental management that does not include a reference to the principle or reflect some of the core ideas of the precautionary concept. References to the principle can be found in documents produced by organizations such as the European Environment Agency, the World Trade Organization, and of course the United Nations; in numerous environmental treaties ranging from the management of straddling fish stocks to the prevention of pollution in the North Sea; in domestic and provincial environmental legislation; as well as in a plethora of domestic environmental policies and strategies. That the precautionary principle/approach is commonplace internationally (and, in fact, is considered by many to have crystallized into a norm of customary international law) and in domestic jurisdictions, is a testament to the soundness of the concept and the usefulness of considering precaution when devising environmental management and protection strategies.

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The Precautionary Principle in Australia: Policy, Law & Potential Precautionary EIAs*

Warwick Gullett**

Introduction

The precautionary principle has been adopted in such a widespread fashion that it is now difficult to find in either the international environmental arena or countries with advanced environmental protection frameworks an environmental policy document, a new environmental law, or even a political statement about environmental management that does not include a reference to the principle or reflect some of the core ideas of the precautionary concept. References to the principle can be found in documents produced by organizations such as the European Environment Agency,¹ the World Trade Organization,² and of course the United Nations;³ in numerous environmental treaties ranging from the management of straddling fish stocks⁴ to the prevention of pollution in the North Sea;⁵ in

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¹ See EEA Scientific Committee meeting and report, *Practical Applications of the Precautionary Principle*, Copenhagen, May 20, 1999.

² See Agreement on the Application of Sanitary and Phytosanitary Measures (1998), Article 5(7).

³ See Rio Declaration on Environment and Development (1992), Principle 15.

⁴ See, e.g., the 1995 Agreement for the Implementation of the Provisions of the United States Convention on the Law of the Sea of December 10, 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. The precautionary aspects of the Agreement are discussed in detail in David Freestone & Zen Makuch, *The New International Environmental Law of Fisheries: The 1995 United Nations Straddling Stocks Agreement*, 7 Y.B. of Int'l Envtl. L. 3 (1996).

⁵ See London Declaration of the Second International Conference on the Protection of the North Sea (1987). For discussion of the inclusion of the precautionary concept in environmental treaties, see Jay E. Hickey, Jr. & Vern R.

domestic and provincial environmental legislation,⁶ as well as in a plethora of domestic environmental policies and strategies.⁷ That the precautionary principle/approach is commonplace internationally (and, in fact, is considered by many to have crystallized into a norm of customary international law) and in domestic jurisdictions, is a testament to the soundness of the concept and the usefulness of considering precaution when devising environmental management and protection strategies.

At its broadest level, the precautionary principle can be understood as a crystallization of numerous concerns about the nature of modern development, ranging from concern about the cumulative, long-term and distant effects of activities to the lowly status often accorded to environmental and health issues in public administration. Critics of the principle have expressed the view that the reason it is popular is because it has “rhetorical appeal.”⁸ Some advocates also see the concept as being politically attractive, so long as it continues to be “tantalisingly ill-defined and imperfectly translatable into codes of conduct, whilst capturing the emotions of misgiving and guilt.”⁹ While there is no

Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 V. Envtl. L. J. 423 (1995) and Warwick Gullett, *Environmental Protection and the ‘Precautionary Principle’: A Response to Scientific Uncertainty in Environmental Management*, 14 Envtl. & Planning L. J. 52 (1997).

⁶ In Canada, see e.g., *Environment Act*, R.S.N.S., § 2(a)(ii) (1994-95) (Nova Scotia), *Sustainable Development and Consequential Amendments Act*, R.S.M., § 3(1), Sched. A4 (1998) (Manitoba), and the proposed amended preamble to the *Canadian Environmental Protection Act* of 1997 that is, at the time of writing, before the House of Commons (2nd Session, 35th Parliament, 45 Elizabeth II, 1996-97, Bill C-74). The most recent innovative inclusion of the principle in a Bill before parliament is contained in the *Massachusetts Precautionary Principle Bill* which aims to establish the principle of precautionary action as ‘the guideline for developing environmental policy and quality standards’. The innovative aspect of the Bill is that it uses mandatory language in relation to the application of the principle by employing the auxiliary ‘shall’. (The long title of the Bill is “An Act to Establish the Principle of Precautionary Action as the Guideline for Developing Environmental Policy and Quality Standards for the Commonwealth,” House No. 1998 (Mass. 1999)).

⁷ See *infra* for discussion of Australian environmental policy documents containing the principle. The principle is also entrenched in environmental policies of many other countries. Just one example is the Danish Government’s 1995 Nature and Environment Policy Report.

⁸ See, e.g., Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 Washington & Lee L.R. 851, 859 (1996).

⁹ Andrew Jordan & Timothy O’Riordan, *The Precautionary Principle in Contemporary Environmental Policy and Politics*, in *Protecting Public Health and the Environment: Implementing the Precautionary Principle* 5 (C. Raffensperger & J.

doubt that some encapsulations of the principle are attractive populist statements (who can deny the statement “It’s better to err on the side of caution”), overuse of such statements contribute to the perception that the principle is simply a pleasant-sounding but vacuous concept. The debate tends to overlook the growing recognition that the principle has far more substance to it than is indicated, for example, in the oft-quoted misstatement that it simply prohibits development projects wherever there is uncertainty. The principle does not equate a “no risk” policy but rather requires greater weight to be given to environmental and public health protection in the all too common situation where there is insufficient scientific information available upon which to base decisions. Its most specific instruction is for us to be responsive to problems created by scientific uncertainty. The two central elements of the principle are that we should be confident about predictions of future environmental effects of activities before allowing them and that we should not wait for conclusive proof of environmental harm before adopting appropriate remedial measures.

Yet, the principle still faces considerable hurdles. Implementation remains problematic due to imprecise expressions of it in policy and law, the fundamental challenge it presents for environmental management, and the difficulty of making decisions in the face of scientific uncertainty. Also, as the need for precaution arises in circumstances where not all the facts are available, the principle’s application will always take place to some degree in a political context. Fortunately, attention is being devoted to developing the necessary conceptual frameworks for advancing the concept as well as identifying the practical steps that can be taken to implement precaution. More theses, reports and articles are appearing that identify how precaution could be implemented and decision-points for doing so.¹⁰

Tickner eds., 1999).

¹⁰ See, e.g., Joanna Catherine Spencer Brown, *Interpreting and Implementing the Precautionary Principle: The Management of Sulphide Bearing Materials in Nova Scotia* (1997) (unpublished Master of Environmental Studies thesis, Dalhousie University (Halifax, Nova Scotia)); see also Adrian Deville & Ronnie Harding, *Applying the Precautionary Principle* (1998); *Protecting Public Health and the Environment: Implementing the Precautionary Principle* (Carolyn Raffensperger & Joel Tickner eds., 1999); see also *Perspectives on the Precautionary Principle* (Ronnie Harding & Elizabeth Fisher eds., 1999).

This article contributes to this process of facilitating the inclusion of the principle in decision-making with respect to the approvals process for large developments. It is submitted that environmental impact assessment (EIA) is a logical vehicle by which to give effect to the principle because it is a long-standing practice common in many jurisdictions and the context in which it is used is appropriate for considering precaution; namely, whether to proceed with development proposals in situations where uncertainty exists about future environmental effects. First, adaptive management is briefly discussed as a suitable heuristic framework for achieving sustainability objectives. The precautionary EIA process proposed here should be seen as part of this approach to effect adaptive responses to environmental exigencies. A review is then presented of Australia's experience with the principle in policy, legislation and case law to place this reform proposal in context of the principle's institutional setting. The common adoption of the principle in the environmental field is observed together with the need for more guidance for decision-makers to enable them to implement precaution. In response to this need for more formal instructions on how to implement precaution in decision-making processes, a three-step method is then suggested by which the principle could be integrated systematically in EIA.¹¹

Adaptive Institutions: A Note on Uncertainty, Risk and Precaution

In recognition of irreducible uncertainty and complexity in ecosystems, ecologists have proposed that management interventions be framed as testable hypotheses with feedback mechanisms established so that management experience could inform system understanding and, thus, improvements in management. This notion of adaptive management envisages situations of multiple uses and stakeholders that incorporate learning dimensions whereby policy processes and institutions could adapt in a persistent yet flexible and informed manner.¹² Many challenges to existing decision-making frameworks

¹¹ Some of the material contained here is drawn from Gullett, *supra* note 5, and Warwick Gullett, *Environmental Impact Assessment and the Precautionary Principle: Legislating Caution in Environmental Protection*, 5 Australian J. of Env'tl. Management 146 (1998).

¹² See Stephen Dovers & Catherine Mobbs, *An Alluring Prospect? Ecology, and the Requirements of Adaptive Management*, in *Frontiers in Ecology* 39 (N. Klomp &

are presented by this concept, for example, in determining how to enable responsive approaches to the problems created by scientific uncertainty. EIA is a useful analytical tool to utilize because of the opportunity it provides for public participation as an integral part of an informed decision-making process which is ongoing and responsive.

This paper focuses on reforming an established, discrete decision-making structure to embody the precautionary principle, yet application of the principle is set to take place within the context of broader policy and institutional settings. Approaches to uncertainty developed as part of such institutional evolution will need to have regard to adaptive processes, thus providing new settings for the application and interpretation of the precautionary principle.¹³ One area of relevance here is risk management and the established process of risk assessment. Management decisions based on risk assessment can be considered to be preventative insofar as issues and projects are examined prior to their implementation. However, it is important to recognize that uncertainty analysis — which the precautionary principle requires — goes beyond risk assessment which focuses on identifiable hazards and, for many problems, is quite reductionist. An unavoidable but sometimes overlooked shortcoming of risk assessment is that rarely, if ever, is full scientific certainty achieved in relation to predictions of environmental outcomes. This is due to the combination of the difficulties associated with analyzing complex natural systems and the nature of scientific inquiry itself. Ambiguity, subjectivity and assumptions are inherent in scientific methods and interpretations. Uncertainty is not defined simply by the absence of “objective” scientific knowledge. It is partly a social construct insofar as it involves approaches to information affected by, among other things, taboo, distortion, irrelevance and confusion.¹⁴ Uncertainty is more

I. Lunt eds., 1997).

¹³ See Elizabeth Fisher & Ronnie Harding, *The Precautionary Principle: Towards a Deliberative, Transdisciplinary Problem-Solving Process*, in *Perspectives on the Precautionary Principle* 290 (R. Harding & E. Fisher eds., 1999).

¹⁴ See Michael Smithson, *Ignorance and Uncertainty: Emerging Paradigms* (1989); Brian Wynne, *Uncertainty and Environmental Learning: Reconceiving Science in the Preventative Paradigm*, 2 *Global Envtl. Change* 111 (1992); Stephen Dovers & John Handmer, *Ignorance, the Precautionary Principle, and Sustainability*, 24 *Ambio* 92 (1995); and Stephen Dovers & Warwick Gullett, *Policy Choice for Sustainability: Marketization, Law and Institutions*, in *Environmental Justice and*

commonly encountered than risk, but often the situation is better described as one of ignorance, even where there is some uncertainty about the direction of change (for example, regional impacts of climate change).¹⁵ In sum, uncertainty can exist where the likely direction of change is known, but probability distributions cannot be assigned to outcomes, as can be done with risk.

Certainly risk assessment is necessary for the precautionary principle due to the need to identify and analyze the risks, costs and benefits associated with issues and projects. Yet a broader approach is necessary, one that would, for example, take into account cumulative effects and strategic planning. Specifically, a more explicit attempt to include uncertainty analysis is needed to make the existing, rather narrow-focused risk assessment process truly precautionary. The need to consider uncertainty is not satisfied by the current practice of building pessimistic assumptions into risk assessments because the focus remains on *risks*, which are, by definition, outcomes that are identifiable and quantifiable, rather than largely unknown. Risk assessments are preventative, and the distinction between “prevention” and “precaution” is important. Prevention deals with avoiding an identifiable threat, whereas precaution is aimed at avoiding uncertain outcomes which may, or may not, be harmful (although there must be some reason to believe that harm may occur). The precautionary principle is innovative because it encompasses the preventative aspects of traditional regulatory approaches, but also justifies acting in advance of knowledge where outcomes are uncertain; that is, before a perceived threat becomes a known risk.

Another limitation of risk assessments as currently practiced is that they tend to simplify available information due to the constraints of decision-making, thus obscuring the limitations of the available information. A message that needs to be underscored is that the numerical estimates provided in risk assessments of probability and severity of harm can create “a false security that the numbers derived are legitimate and correct”¹⁶ when, in fact, there are significant parts

Market Mechanisms: Key Challenges for Environmental Law and Policy 110 (K. Bosselmann & B.J. Richardson eds., 1999).

¹⁵ See Smithson, *id.*

¹⁶ Allison R. Denning, Formulating a Publicly Acceptable Risk-Based Management

of the process which are non-scientific and subjective. The precautionary principle is relevant here because it encourages more critical examination of scientific information by reminding us of the subjective and imprecise nature of many scientific endeavors.

Recognition of the broader nature of uncertainty presents the challenge of devising methods to deal with its wide-ranging ramifications. What is dealt with here is a proposal to give effect to the principle by reforming an existing environmental management tool: EIA. The institutional setting of the precautionary principle in Australia is used to frame this approach. Although the measures suggested here do not purport to solve the complex problems created by uncertainty and meeting the challenges presented by adaptive management, it is submitted that they are a necessary practical step towards more precautionary and adaptive environmental decision-making.

Adoption of the Precautionary Principle in Australia

There has been considerable interest in Australia's experience with the precautionary principle due to the early and systematic inclusion of it in environmental policy documents and legislation and the status accorded to it by the courts. This section reviews this experience and shows that the adoption of the principle in Australia is better characterized as widespread, rather than innovative.

Inclusion in Policy Documents

The precautionary principle was firmly established in Australia with the signing, in May 1992, of the Intergovernmental Agreement on the Environment (IGAE)¹⁷ by the Commonwealth, States and Territories and the Australian Local Government Association.¹⁸ Although as a

Approach to Decision-Making for the Nova Scotia Department of the Environment 26 (unpublished Master of Environmental Studies thesis, Dalhousie University (Halifax, Nova Scotia)).

¹⁷ The IGAE set up a framework for improved environmental management throughout Australia. It aims to provide a mechanism to facilitate a co-operative national approach to the environment, better definition of the roles of the respective governments, greater certainty in decision-making and better environmental protection.

¹⁸ Australia has a federal system of government which consists of the Federal (or Commonwealth) government and the governments of the six states and two territories. There also exists another level of government: local government. Many environmental responsibilities which had been the purview of state governments in the period following federation now rest with local government. In effect, there are three

political accord the IGAE is not legally binding on the parties, it is influential because it is the highest level of environmental policy commitment that exists between all three spheres of government (federal, state and local). The precautionary principle is listed as one of four principles intended to inform environmental policy and programs within the purview of each of the parties, thus covering all Australian public environmental policy and management decisions. Under clause 3.5.1, the parties agreed that, “Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.” This is the traditional formulation of the principle — closely resembling that contained in the 1992 Rio Declaration — which embodies the notion that cautious actions should be taken whenever uncertain environmental risks are encountered. However, the IGAE expands upon this core requirement. “In the application of the precautionary principle, public and private decisions should be guided by:¹⁹

- (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and
- (ii) an assessment of the risk-weighted consequences of various options.”

Schedules to the Agreement identify specific areas of policy and management where the principle “should” be applied. These are:

- data collection and handling;
- resource assessment, land use and approval processes;
- environmental impact assessment;
- national environment protection measures;
- climate change;
- biological diversity;
- national estate;
- World Heritage; and
- nature conservation.

levels of government with environmental responsibilities. *See* Timothy Doyle & Aynsley Kellow, *Environmental Politics and Policy Making in Australia* 145 (1995).

¹⁹ Commonwealth of Australia, *Intergovernmental Agreement on the Environment* (May 1992).

Part (ii) above is an important expansion to the Rio Declaration formulation because it gives more substance to the principle by indicating that precaution requires careful assessment of various management options and that they be balanced in any final decision. However, it does not greatly assist implementation of the principle or remove confusion about its content because further necessary detail is lacking about exactly how, for example, decision-makers should assess “risk-weighted consequences.” Another concern with this formulation of the principle is that it is phrased in preventive rather than precautionary language. It does this by focusing on risk (including “serious” and “irreversible” damage) rather than uncertainty, which, as explained above, is the essence of the principle.

Another important document which includes the principle is the National Strategy for Ecologically Sustainable Development,²⁰ also released in 1992, which outlines essential approaches for achieving ecologically sustainable development (ESD) (Australia’s version of “sustainable development”). Some of these approaches are consistent with precaution, such as considering national implications of local activities and taking long-term rather than short-term views in environmental decision-making. The Strategy, although not employing the term “precautionary principle,” does adopt the principle by mirroring the first part of the IGAE definition.

The recognition of pervasive and irreducible risk and uncertainty associated with sustainability issues is leading to a crucial rethinking of approaches to environmental management. At a practical level, the Australian Standard/New Zealand Standard 4360 Risk Management has been developed for generic use in risk assessment and management. Given the IGAE definition of the precautionary principle to include “risk-weighted assessments,” the Risk Management Standard may well become a major mechanism for interpreting whether the principle has been adequately applied in decision processes, as it is the only formalized framework available. Proposals to insert widely applicable “duty of care” provisions in resource and environmental laws in Australia state that principles of risk identification, prediction and management would be central to such legal reform.²¹ The principle’s

²⁰ Commonwealth of Australia, National Strategy for Ecologically Sustainable Development (1992).

prevalence in Australia is evidenced by its inclusion in numerous specific Commonwealth and State environmental policy documents,²² as well as overarching policy documents such as the IGAE and the National Strategy for Ecologically Sustainable Development (NSESD). It is now rare for an environmental policy document not to mention the principle or to adopt it implicitly by referring to ESD.

Inclusion in Legislation

In the later part of the 1990s, the precautionary principle appeared in Australian statutes with increasing frequency. Due to its now entrenched status in Australian environmental policy, it is normally mentioned in some form in new statutes dealing with environmental protection. Further, a number of provisions in environmental legislation enacted prior to the principle's widespread adoption in policy instruments in the early 1990s have been updated to include the principle. For example, an important reference to it in Commonwealth legislation is contained in the Environment, Sports and Territories Legislation Amendment Act, 1995, § 31 (Cth), which amended the Great Barrier Reef Marine Park Act, 1975, § 39z (Cth) to require the Great Barrier Reef Marine Park Authority to be informed by the principle in preparing management plans and protecting World Heritage values. The Act adopts the IGAE definition of the principle. In addition, the Fisheries Legislation Amendment Act, 1997, Sched. 2 (Cth) amended the Fisheries Management Act, 1991, § 3(1)(b) (Cth) to provide that the Minister, in the administration of the Act (and the Australian Fisheries Management Authority in the performance of its functions), "must" pursue the objective of:²³

ensuring that the exploitation of fisheries resources and the
carrying on of any related activities are conducted in a

²¹ See Industry Commission, *A Full Repairing Lease: Inquiry into Sustainable Land Management*, Report no. 60 (1998). (I thank Stephen Dovers for suggesting this to me.)

²² These include the Guiding Principles for the Sustainable Management of Coastal Resources, the National Strategy for Rangeland Management, the National Strategy for the Conservation of Australia's Biological Diversity, the National Waste Minimisation and Recycling Strategy, the National Greenhouse Response Strategy, and the Tasmanian State Policy on Water Policy Management.

²³ The principle is also contained in the *Ozone Protection Act*, 1989 (Cth) by way of the inclusion in Schedule 3 of the Montreal Protocol on Substances that Deplete the Ozone Layer.

manner consistent with the principles of ecologically sustainable development and the exercise of the precautionary principle, in particular the need to have regard to the impact of fishing activities on non-target species and the long term sustainability of the marine environment.

The most recent Commonwealth inclusion of the principle is contained in the Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act). Section 391 is the most progressive legislative inclusion of the principle in Australia. The section provides that the Minister “must take account of the precautionary principle” in making any of the 16 specific decisions listed in Section 391(3).²⁴ These decisions include whether to approve projects or developments and decisions relating to conservation and management plans. The innovative nature of the provision is that it requires consideration of the principle in situations deemed appropriate. Therefore, the principle is now a matter that must be taken into account for these decisions, rather than a matter that may be taken into account. The provision will do much to entrench precautionary thinking at the highest level of environmental decision-making and will provide a firmer basis for litigants to argue that application of precaution is necessary in certain cases. The formulation of the principle adopted is a reworded, but substantively identical, version of that contained in the IGAE. Regrettably, the opportunity was not taken to provide a stronger and more precise definition of the principle. This is unfortunate, considering that the Act is the main product of a large-scale review of Commonwealth environmental law and will be the pivotal piece of Commonwealth environmental legislation. Among other things, it provides the new legislative basis for federal EIA. Section 391(2) which states, “The *precautionary principle* is that lack of full scientific certainty should not be used as a reason for postponing a measure to

²⁴ A curious proviso is contained in § 391(1): the Minister need only consider the principle “to the extent he or she can do so consistently with the other provisions of this Act.” It is difficult to imagine a situation in which the mere “consideration” of the principle could be inconsistent with other provisions in the Bill. Perhaps this proviso indicates legislative contemplation that the principle would largely be applied to some degree. Consider also that Part 16, in which the section is located, is titled “Application of precautionary principle in decision-making.”

prevent degradation of the environment where there are threats of serious or irreversible environmental damage.”

Although the principle is espoused in a handful of Commonwealth Acts, there has been greater explicit endorsement of precaution in State legislation. This is because authority to legislate on environmental matters is traditionally the preserve of the State parliaments because they have authority to legislate on matters not specifically reserved to the Commonwealth parliament by the Australian Constitution. The conventional view is that the Commonwealth has no environmental power (or at least no exclusive environmental jurisdiction) due to the absence of a head of power specifically dealing with environmental matters in §§51 or 52 of the Constitution.²⁵ The first legislative inclusion of the principle in Australia is found in the New South Wales (NSW) Protection of the Environment Administration Act, 1991. Section 6(2) outlines the principles of ESD and specifies that it can be achieved, in part, by implementing “the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.” This section is referred to in many subsequent NSW statutes where the Parliament considered that principles of ESD should be complied with in other fields.²⁶ An early inclusion of the principle is found in the Environment Protection Act, 1993 (SA). The objectives of the Act include ensuring that “all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment having

²⁵ In the period 1976 to 1989, a number of legal challenges regarding the constitutional validity of Commonwealth environmental legislation were prosecuted. The High Court of Australia delivered four pivotal decisions incorporating expansive interpretations of a number of relevant heads of Commonwealth power and upheld the validity of each enactment challenged (*see e.g.*, *Murphyores Inc. Pty. Ltd. v. Commonwealth* (1976) 136 C.L.R. 1). It confirmed that the main source of Commonwealth environmental power relates to the implementation of obligations in treaties, or (in the absence of a treaty) in the more problematic concept of legitimate “international concern” (*see Koowarta v. Bjelke-Petersen* (1982) 153 C.L.R. 168, 220).

²⁶ *See, e.g.*, *Coastal Protection Act*, 1979, § 54A; *Environmental Planning and Assessment Act*, 1979, § 112D(g); *Energy Services Corporations Act*, 1995, §§ 5(1)(b), 8(1)(b); *Fire Brigades Act*, 1989, § 10A; *Gas Supply Act*, 1996, § 3(1)(a); *National Parks and Wildlife Act*, 1974, § 91CC(2)(a); *Threatened Species Conservation Act*, 1995, § 4(1)(b); and *Waste Minimisation and Management Act*, 1995, § 3(2)(h).

regard to the principles of ESD” and “to apply a precautionary approach to the assessment of risk of environmental harm.”²⁷

Despite the appearance of the principle in Australian legislation with environmental matters, specific references to the principle, separate from its inclusion as a major component of ESD, are rare. The principle is contained in statutes as a specifically mentioned component of ESD or by way of inclusion of the IGAE in schedule sections of legislation. Australian examples include:

- Environment Protection Act, 1997, § 3(2)(a) (ACT);
- Gungahlin Development Authority Act, 1996, §7(3)(a) (ACT);
- National Environment Protection Council Act, 1994, Sched. 1 (Cth);
- Contaminated Land Management Act, 1997, §10(2)(a) (NSW);
- Local Government Amendment (Ecologically Sustainable Development) Act, 1997, Sched. 1 (NSW);
- Native Vegetation Conservation Act, 1997, §4(2)(a) (NSW).

Some Acts do not specifically refer to the principle but enable consideration to be given the essence of the principle by, e.g., prohibiting the postponement of measures to prevent environmental degradation simply due to an absence of scientific certainty with respect to threats of causing serious or irreversible damage.²⁸ There is a compelling argument that legislative intent requires decision-makers to consider the principle, even where it is not specifically referred to in legislation. As precaution is accepted as a guiding principle of ESD, it must be recognized as implicit in any statement of ESD.²⁹ References to ESD in legislation would entail a consideration of the principle.³⁰

²⁷ Section 10(1)(b)(iv).

²⁸ See, e.g., *Natural Heritage Trust of Australia Act*, 1997, § 21(3)(b)(ii) (Cth). The existence of the principle in Australian legislation is extensive when one considers the 75 Commonwealth, state and territory statutes that include the ecologically sustainable development (ESD) concept (which includes the principle) and the 30 proceedings in courts and tribunals that have dealt with these principles. See Greg Rose, *Implementation of the Rio Principles in Australia*, Papers from the Workshop on National Implementation of the Principles Contained in The Rio Declaration on Environment and Development, U.N. Dept. of Economic and Social Affairs, Jan. 12-14, 1999.

²⁹ See Ronnie Harding & Liz Fisher, *The Precautionary Principle in Australia*, in *Interpreting the Precautionary Principle* 252, 257 (T. O’Riordan & J. Cameron eds., 1994).

³⁰ Acts which fall into this category include the *Endangered Species Protection*

A recent inclusion of a version of the principle is contained in the NSW State Environmental Planning Policy No. 58 — Protecting Sydney's Water Supply issued under the Environmental Planning and Assessment Act, 1979 (NSW).³¹ The Policy, which commenced effect on February 1, 1999, provides that for any development that has significant potential to impact on drinking water quality in Sydney's catchment, the developer will need to provide evidence that the development will have either a neutral or beneficial impact on water quality and that the methods of containing and treating any pollutants generated are sustainable in the long term. Neither the precautionary principle nor scientific uncertainty are mentioned in the Policy. However, the Policy embodies a strong version of precaution in the sense that it places an obligation on the developer to establish that the proposed development will not adversely impact on water quality.³² Approval can be refused on the grounds that a developer has not furnished the consent authority with an assessment of these matters.

Although the inclusion of the precautionary principle in Australian legislation is widespread (particularly in relation to other developed countries), the formulations of it in statutes are not strong. The new EPBC Act, 1999, is a notable exception insofar as it provides for mandatory consideration of the principle, although it provides a relatively weak version of precaution. Most existing acts adopt the IGAE definition, which is itself only a slightly expanded form of the rather weak Rio Declaration version. As such, current legislative incorporations of the principle in Australia are worded generally and reflect an intent to advance precautionary decision-making but not to mandate particular environmental outcomes based on precautionary criteria. Legislators have not turned their attention to clearly expressing the principle so that it will be implemented in discrete cases.

Act, 1992, §§ 32(3)(c), 34(3)(c), 60, 70, 81 (Cth); Natural Resources Management (Financial Assistance) Act, 1992, § 3(2)(b) (Cth); and the Agricultural and Veterinary Chemicals (Northern Territory) Act, 1995, preamble (NT).

³¹ New South Wales Government Gazette no. 178 at 10163 (December 24, 1998). See also Minister for Urban Affairs and Planning, Minister for Housing (NSW), *Tough New Policy to Safeguard Sydney's Drinking Water*, News Release, Dec. 24, 1998.

³² Also, Clause 12 of the Policy contains a notification requirement where a proposed development has less than a "significant" potential to impact on water quality.

To date, in Australia, the principle's most important test — implementation — has been bedevilled by problems. This is due, in large part, to concerns by industry groups that there should be certainty concerning the principle's implementation. Governments, being concerned about reducing investment opportunities, have been cautious about adopting strict versions of precaution and, thus, we see the prevalence of “let-out” phrases in virtually all legislative examples of the principle (including the words “wherever practicable” in the IGAE formulation *supra*). The principle typically is either contained in non-operative provisions of legislation or it is relaxed and expressed in permissive terms. As such, existing Australian legislative and policy enunciations of the principle are of limited practical use due to their ambiguity; decision-makers are not bound to apply the principle, and are in doubt as to how to do so. Although the federal government has embraced the principle internationally and domestically, the current practice of repeatedly espousing the principle as a guide to environmental decision-making is not sufficient to discharge the Commonwealth's obligation to ensure that the precautionary approach is “widely applied.”³³

Judicial Application

The true test of effectiveness of the principle is not simply the inclusion of it in legislation, but rather the willingness of the courts to uphold its application as expressed in statutes.³⁴ However, due to the weak incorporation of it in Australian legislation, there is little Australian jurisprudence on the principle. It has been judicially considered in a handful of cases, most notably in a series of decisions of the NSW Land and Environment Court, and more recently, by the Federal Court of Australia in the Friends of Hinchinbrook case.³⁵

The first and most significant judicial consideration of the principle was in 1993 by Judge Stein in the NSW Land and Environment Court in Leatch v. National Parks and Wildlife Service.³⁶ His Honour

³³ See Rio Declaration on Environment and Development, *supra* note 3.

³⁴ See Harding & Fisher, *supra* note 29, at 255.

³⁵ Friends of Hinchinbrook Society Inc. v. Minister for Environment (1997) 69 F.C.R. 28. See Rosemary Lyster, *The Relevance of the Precautionary Principle: Friends of Hinchinbrook Society Inc. v. Minister for Environment*, 14 *Envtl. & Planning L. J.* 390 (1997) and Gullett, *supra* note 11, at 155.

³⁶ 81 L.G.E.R.A. 270 (1993). The decision in *Leatch* has been referred to in most

noted the inclusion of the principle in government strategies and legislation, and while stating that there was no express legislative provision requiring the consideration of the principle in the matter before him, refused a license for a road through an area of endangered species habitat because of uncertainty as to impacts on the species and lack of consideration of alternatives. He stated that “the precautionary principle is a statement of commonsense . . . where uncertainty or ignorance exists . . . decision makers should be cautious.”³⁷ This is an example of how the principle can operate as a determining factor in environmental decisions.

However, optimism that the NSW Land and Environment Court was going to establish a firm basis for the application of the principle was shaken by obiter dicta in a decision less than one year later. In *Nicholls v. Director General of National Parks and Wildlife Service*,³⁸ a case concerning the same legislative provision that was considered in *Leatch*,³⁹ a sharply contrasting judgment was delivered. At issue was the applicant’s contention that the precautionary principle should be invoked to refuse the granting of a license for forestry operations to “take or kill” endangered fauna because there were shortcomings in the fauna impact statement (required to accompany any application for such a license) which prevented the determination of appropriate ameliorative measures as required by the Act. Judge Talbot stated that the applicant’s contention went beyond that argued and endorsed in *Leatch* and upheld the issuance of the license. He continued:⁴⁰

[T]he statement of the precautionary principle, while it may
be framed appropriately for the purpose of a political

subsequent Australian judicial decisions which discuss the principle. It was considered by the High Court in *R. v. Secretary of State for Trade and Industry ex parte Duddridge* (decision delivered 4 October 1994), although held to be of no relevance to English law. See David Hughes, *The Status of the ‘Precautionary Principle’ in Law: R. v. Secretary of State for Trade and Industry ex parte Duddridge*, 7 J. of Env’tl. Law 224 (1995).

³⁷ *Id.* at 282-84. See also Gullett, *supra* note 5, at 62-64.

³⁸ 84 L.G.E.R.A. 397 (1994).

³⁹ The definition of “take or kill” in *National Parks and Wildlife Act*, 1974, § 5 (NSW) (since repealed).

⁴⁰ *Nicholls*, 84 L.G.E.R.A. at 419.

aspiration, its implication as a legal standard could have the potential to create interminable forensic argument. Taken literally in practice it might prove to be unworkable. Even the applicant concedes that scientific certainty is essentially impossible. It is only 500 years ago that most scientists were convinced the world was flat.

Such differing interpretations are perhaps predictable in these early days of the principle's incorporation in domestic law, but they reinforce the inoperational nature of the principle as currently expressed in legislation and policy documents.

Despite the absence of legislative expression of an enforceable standard of precaution, since 1997, the principle has been argued in court cases more frequently, mostly by applicants or respondents seeking to have planning decisions influenced by precaution. For example, in *Grishin v. Conservator of Flora and Fauna*,⁴¹ the applicant sought a review of the decision not to allow her to ride a horse in a designated nature reserve. The respondent, in seeking to have the decision upheld, argued that the precautionary principle should apply to the decision. The Australian Capital Territory (ACT) Administrative Appeals Tribunal stated:⁴²

We... believe that the adoption of a cautious approach to the protection of the environment is consistent with the object and purpose of the Nature Conservation Act [ACT 1980] and the management objectives applying to Aranda Bushland. However it is a matter of judgement as to whether the granting of permission to take horses into Aranda Bushland at the present time would be incautious.

The tribunal considered evidence given by an expert witness that baseline data should be obtained so that there could be scientific measurement and evaluation of any future environmental impact by horses on the land. In summarizing the evidence, the tribunal stated that it appeared that "well-controlled and cared for horses pose only a small risk."⁴³

⁴¹ [1998] A.C.T.A.A.T. 250 (23 April 1998).

⁴² *Id.* para 15.

⁴³ *Id.* para 21.

The tribunal stated further that it was not persuaded:⁴⁴

that horses admitted under the controls envisaged... would contribute significantly to soil erosion. However the possibility that they may carry weed seeds into the Aranda Bushland and that the seed growth may be promoted by horse manure cannot be ruled out, particularly if horses step off the formed gravel tracks.

In deciding to uphold the decision, the tribunal regarded the “desirability” of first obtaining baseline scientific data so that there could be assessment of any future impact of horses on the Aranda Bushland. Quite remarkably, the tribunal based its decision, in part, on precaution. It did so even though it was not certain that the activity in question would cause significant harm. It was sufficient to base the decision on the mere possibility of harm being caused, given that this approach was consistent with the intent expressed in the relevant statute under which the decision was based.⁴⁵ This recent administrative appeals case demonstrates that tribunals conducting merits review (but not necessarily courts conducting judicial review) of environmental decisions are prepared to consider arguments based on the precautionary principle.⁴⁶

Yet, even when courts find that the principle is a relevant (or rather, not an irrelevant) consideration, they seem not to be rigorous when considering whether decision-makers have acted with requisite caution in the absence of clear instructions to do so in legislation.⁴⁷ This

⁴⁴ *Id.*

⁴⁵ What is also of note is that the *Nature Conservation Act*, 1980 (ACT) does not mention the precautionary principle or even ESD.

⁴⁶ See *R. v. Resource Planning and Development Commission; ex parte Aquatas Pty. Ltd.* (1998) T.A.S.S.C. 82 where, in reviewing a decision made by the Resource Planning and Development Commission, Cox, Chief Justice of the Supreme Court of Tasmania stated that the Tasmanian State Coastal Policy, which includes the IGAE formulation of the principle, requires that, “[i]n the application of the principle, decisions must be guided by a proper process of evaluation to avoid damage and of assessment of the consequences of possible choices.” However, on the facts his Honour held that the Commission’s decision in the case did not conflict with the principle. Thus, the opportunity to quash the decision on precautionary grounds did not present itself. See also the decision of Judge Wright of the same court in *R. v. Land Use Planning Review Panel; ex parte M. F. Cas. Pty. Ltd.* (1998) T.A.S.S.C. 131.

⁴⁷ See, e.g., the decision of Judge Gallen in *Greenpeace New Zealand Inc. v. Minister of Fisheries*, Unreported, High Court of New Zealand, CP 492/93, Nov. 27,

indicates a still pressing need for clearer expressions of the principle and more debate by practitioners and theorists about what the principle should require in specific circumstances. Nonetheless, in Australia the principle has been afforded a degree of legal recognition by the courts and the legislature, as well as being endorsed routinely by all spheres of government in environmental policy commitments and by the majority of the professional literature. The increasingly high profile of the principle in these fora indicate that the necessary ingredients exist for it to evolve into a common law doctrine.⁴⁸ It is now unlikely that, in the environmental arena, it could be held to be an irrelevant consideration. Indeed, Leatch established that the principle may need to be considered even if it is not included in the specific legislation upon which a matter is being litigated.⁴⁹ Reinforcing this view are the statements of the High Court of Australia that there is a “legitimate expectation” that Commonwealth discretion will be exercised in conformity with the terms of international conventions to which Australia is a party,⁵⁰ and there are numerous such conventions which embody the principle. Yet, more guidance is needed as to the circumstances in which the principle is, or should be, a consideration.⁵¹ Given the vague language used in legislation enshrining the principle, the courts have been given an insubstantial mandate to enforce it. The formulation of the principle in the pieces of legislation which adopt it indicate that it is most likely to be applied as a general principle of statutory interpretation and not as a legally enforceable rule.⁵² Thus, the need for more specific operating instructions for applying precaution in environmental decision-making is clear.

1995. The case is discussed in Sharon Mascher, *Taking a 'Precautionary Approach': Fisheries Management in New Zealand*, 14 *Envtl. & Planning L. J.* 70 (1997) and Gullett, *supra* note 5, at 63.

⁴⁸ See also Charmain Barton, *The Status of the Precautionary Principle in Australia: Its Emergence in Legislation and as a Common Law Doctrine*, 22 *Harvard Env'tl. L. R.* 509, 535 (1998).

⁴⁹ See Stephen R. Dovers, Tony W. Norton, and John W. Handmer, *Uncertainty, Ecology, Sustainability and Policy*, 5 *Biodiversity & Conservation* 1143, 1149 (1996).

⁵⁰ *Minister for Immigration and Ethnic Affairs v. Teoh* (1995) 183 C.L.R. 273 at 287-88 per Chief Justice Mason and Judge Deane; at 298-303 per Toohey, J.; at 303-305 per Judge Gaudron.

⁵¹ The inclusion of the principle in the *EPBC Act*, 1999, is welcome in this regard.

⁵² See Gerry Bates, *Editorial*, 11 *Envtl. & Planning L. J.* 251, 253 (1994).

Other Examples of Precaution in Australia

The Australian experience with the precautionary principle has been characterized by considerable conflict, particularly concerning environmental lobbyists and industries associated with resource extraction. This is because Australia has a resource-based economy, and application of the principle is seen by many to be a threat to resource security.⁵³ Industry groups continue to pressure governments to consider economic implications of environmental objectives.⁵⁴ Concerns expressed by these industries tend to mirror concerns expressed in other countries — that the principle requires the prohibition of activities where there is uncertainty. Thus, if precaution were to be adopted as a governing principle, development would be characterised by a “do nothing” approach.⁵⁵

However, this view is inconsistent with all formulations of the principle. The principle requires some indication that harm may result before the burden shifts to the proponent of an activity to negate the possibility of unacceptable harm.⁵⁶ There is, or should be, a quasi-scientific threshold (differing according to the level of anticipated harm) which must be met in order for it to be necessary to consider the principle. However, even where there are grounds to implement precautionary measures, these still should be weighed against expected benefits, including economic, which may be foregone if a proposed activity is prohibited. Importantly, some benefits of implementing precaution are non-quantifiable (e.g., improvement in air quality), and

⁵³ See Harding & Fisher, *supra* note 29, at 253. Consider also the federal government’s successful bid to have less onerous conditions placed on it at the greenhouse reduction meeting in Kyoto. See Clive Hamilton, *Australia’s Climate Change ‘Victory’: A Poisoned Chalice*, 3 *Ecological Econ. Bull.* 10 (1998).

⁵⁴ See Gordon Drake, *Precautionary Principle: A Mining Perspective*. Paper presented at the Precautionary Principle Conference, Institute of Environmental Studies, University of New South Wales, Sydney, Sept. 20-21, 1993. For example, Drake notes that the Australian Mining Industry Council’s position is that risk-taking should not be eliminated. It has argued that this is essential in human progress.

⁵⁵ See Ronald Brunton, *We Must Adopt a Risk-Averse Approach and Always Err on the Side of Caution When Dealing with Environmental Issues*, in Tall Green Tales 29 (J. Bennett ed., 1995); Hickey & Walker, *supra* note 5, at 425; and Ian Wills, *The Environment, Information and the Precautionary Principle*, 4 *Agenda* 51 (1997).

⁵⁶ This is particularly the case in weak formulations of the principle, such as in the Rio Declaration, where the threshold for application is threats of “serious or irreversible damage.”

likewise it can be difficult to measure economic benefits of developments. Even though complete information is unobtainable, what information there is can be weighed in order to achieve a well-considered decision appropriate for the context. Where the magnitude of uncertainty is large, more reliance on precaution is warranted. The fundamental misunderstanding about the principle – that it simply, and irrationally, stops development – and the rhetoric associated with it, indicates the need for more discussion and education about what the principle does, and does not, entail.⁵⁷

Application of the principle has been advocated in areas other than the environmental field (including health concerns such as the uncertainty associated with cellular telephone towers). Arguably, the most important non-judicial decision made on precautionary grounds in Australia is that concerning the NSW government's rejection in 1996 of a proposal to construct an open-cut gold mine in the Lake Cowal area in the central west region of the state. The area is a listed wetland under the National Estate⁵⁸ and is considered by Commonwealth and state government agencies to meet criteria for listing under the Ramsar Convention⁵⁹ and there is much uncertainty about the effects a mine would have on the environment. Notwithstanding this, a Commission of Inquiry found that likely environmental impacts were consistent with

⁵⁷ For further explanation of the principle, see Gullett, *supra* note 5. Events such as the Precautionary Principle conference held at the Institute of Environmental Studies at the University of New South Wales in 1993 and the Wingspread conference, Strategies for Implementing the Precautionary Principle, held in Racine, Wisconsin in 1998 are important in this regard because they bring together a range of people from many disciplines, all of which are touched by the principle. See also arguments about the dangers of risk-tradeoffs and false positives ("Type I" error) which have done much to undermine the precautionary principle by incorrectly asserting that the principle does not enable consideration of negative consequences of precaution. On this point, see Cross, *supra* note 8, and Jonathan Baert Wiener, *Protecting the Global Environment*, in *Risk versus Risk: Tradeoffs in Protecting Health and the Environment* 193 (J.D. Graham & J. B. Weiner eds., 1995). Type I and Type II errors are discussed in R. Michael M'Gonigle et al., *Taking Uncertainty Seriously: From Permissive Regulation to Preventative Design in Environmental Decision Making*, 32 *Osgoode Hall L. J.* 99 (1994).

⁵⁸ National Estate areas are protected by the Australian Heritage Commission under the *Australian Heritage Commission Act*, 1975 (Cth). Section 4 specifies that for a place to be listed on the National Estate, it must be part of Australia's natural or cultural environment and have aesthetic, historic, scientific or social significance or other special value for future generations as well as existing generations.

⁵⁹ Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (1972).

planning and environmental guidelines,⁶⁰ thus presenting the government with no legal hurdles with respect to the issuance of a development consent order. The decision of the government to act as it did in the face of pressure from the proponent, North Limited, as well as the Australian Workers' Union, is remarkable given that the proposal had met all necessary requirements and had satisfied a Commission of Inquiry. The government based its decision, in large part, on the grounds that only by refusing the proposal could unknown risks to a significant environment be avoided.⁶¹ Undoubtedly, other political factors influenced the decision to some degree, thus calling into question the strength of commitment to the principle espoused by the government. Notwithstanding this, the government's use of the precautionary language, in a context where the level of uncertainty made consideration of precaution appropriate, provides evidence that precautionary thinking has achieved legitimacy as a reasonable basis for public decision-making.

More indirect versions of precaution are evident in other areas. For example, there has been considerable development in cleaner production and environmental management systems in the 1990s. Many corporations are seeking accreditation for the ISO 14000 series of standards which cover issues, such as life-cycle assessment and environmental auditing.⁶² Also, the inclusion of the principle in most state and federal environmental policy documents not only has influenced decisions by governments and ministerial authorities, but it also has influenced the recognition of it by professional organisations and corporations which, although not necessarily committing themselves to the application of the principle, do adopt environmental policies which include ESD.⁶³ However, more work needs to be done on determining other ways to implement precaution, such as subsidies or research grants for clean technology, waste minimization plans, safe minimum standards, prohibition or limited sale of certain products, injunctive remedies and adaptive management.⁶⁴ The task is to

⁶⁰ See Deville & Harding, *supra* note 10 at 11.

⁶¹ At the time of writing (mid 1999), a new development application for the mine is being considered. However, a number of aspects of the original proposal have been modified significantly.

⁶² See Deville & Harding, *supra* note 10, at 21.

⁶³ *Id.* at 15-16.

recognise when and how to use different techniques appropriately to support decision-making in the face of scientific uncertainty. Decision-makers need clear guidance as to the circumstances in which they need to adopt precautionary responses and they also need to know which methods to use. In this respect, after a development approval decision has been made, there is a need for courts to be empowered to ascertain what precautionary methods were used, and the reason for selecting them, as part of the process of assessing whether the principle was taken into account appropriately.⁶⁵

On the whole, Australian environmental strategies tend to be cautiously preventative, rather than anticipatory and precautionary. The National Pollutant Inventory (NPI), established in 1996, is an example. The Commonwealth established the inventory — mainly a reporting and public disclosure exercise — of substances which are “known to, or reasonably expected to, cause serious health problems or severe damage to the environment,” that is, only substances with a clearly identified hazard potential.⁶⁶ A truly precautionary approach would apply regulatory standards to substances about which there may still be uncertainty, a process known as “reverse listing.”⁶⁷ The focus should be to establish the principle as a mandatory consideration in environmental matters. This has, in late 1999, been achieved for certain decisions made under the EPBC Act, however, in many other contexts decision-makers can ignore the principle in circumstances in which its consideration or application is appropriate. A compounding factor is that existing law in property and torts in this regard is far from precautionary because it is heavily influenced by the assimilative capacity approach which holds that the environment can tolerate certain

⁶⁴ For more detail on the techniques available to support decision-making in the face of scientific uncertainty, including the 1995 Risk Management Standard (AS/NZS 4360), see Dovers et al., *supra* note 49.

⁶⁵ For a discussion of how courts should substantively review expert decisions made under scientific uncertainty, see Elizabeth Fisher, *Risk, Expertise and Judicial Review: Scope of Review and Decision Making Under Scientific Uncertainty* (1998) (unpublished D.Phil. in Law thesis, St. John's College, Oxford University).

⁶⁶ Commonwealth Environmental Protection Agency, *National Pollutant Inventory: What it Means to You* (1996).

⁶⁷ See, e.g., the Canadian Pest Control Products Act, 1985; and Article 4 of the 1996 revisions to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter.

activities and levels of pollutants without detrimental change to overall quality. For example, for a concerned resident to succeed in prohibiting a development application where planning guidelines have been met, he or she typically is required to adduce evidence to show that the activity would result in impermissible environmental harm, rather than the developer being required to establish that the activity is unlikely to result in such harm. The principle is, at least in its strictest forms, quite a radical departure from traditional concepts of property law which have developed out of a perception that the environment is a resource to exploit rather than to conserve; and as a result, it requires innovative methods to be implemented.⁶⁸ The principle is a stated aim of virtually all environmental policy documents and its expression in environmental legislation is commonplace, yet attention now needs to shift to the task of assisting decision-makers to implement precaution.

A Precautionary Option: Environmental Impact Assessment

The need to integrate the precautionary principle systematically in decision-making requires us to examine the potential to include it in existing environmental protection measures. EIA is the most sophisticated environmental protection framework that exists in many jurisdictions, and therefore, it is arguably the most obvious vehicle for giving effect to the principle and the logical starting point for reform options. In 1974, Australia became the second country, after the U. S., to introduce legislative EIA measures. EIA has become an established component in the planning process for most major developments in Australia, and it is the only federal legislative process which provides expressly for environmental considerations to be taken into account in developmental decision-making. The purpose of EIA is that matters affecting the environment are fully examined and taken into account so that activities avoid or minimize anticipated adverse environmental effects. The hallmark of the process is its institutionalisation of foresight. It introduces consideration of environmental factors as a condition precedent to planning decisions.⁶⁹ Not only are the precautionary principle and EIA complementary in so far as they are

⁶⁸ See Barton, *supra* note 48, at 542.

⁶⁹ For more detail on Australian EIA, see Nick Harvey, *Environmental Impact Assessment: Procedures, Practice, and Prospects in Australia* (1998).

both means of informing decision-making, but EIA itself is also precautionary in a minimal sense because it is predicated on addressing uncertainty about future environmental effects,⁷⁰ although one concern often expressed is that in practice EIAs tend to be poor in identifying knowledge gaps and uncertainties.⁷¹ Feedback mechanisms of post-decision monitoring in good EIA processes fulfill the learning goal of adaptive management. Further, subsequent EIAs of similar proposals enable the transfer of experience across departments, developers and practitioners.

Connections between EIA and sustainable development have been made for more than a decade, including by the World Commission on Environment and Development in the 1987 Brundtland Report.⁷² There is consensus among environmental planners and resource managers that EIA must reflect sustainable development principles more closely. However, little has been done in a formal capacity to effect this goal. The question is: "How can these practical steps be taken?"

A three-step method is presented for integrating the precautionary principle, a key component of sustainable development, into legislative EIA processes.⁷³ In sum, effective integration of the principle in current project-specific EIA requires three modifications to existing processes.⁷⁴ They would need to ensure that:

⁷⁰ See James Cameron, *The Precautionary Principle: Core Meaning, Constitutional Framework and Procedures for Implementation*. Paper presented at the Precautionary Principle Conference, Institute of Environmental Studies, The University of New South Wales, Sydney, September 20-21, 1993.

⁷¹ See, e.g., David P. Lawrence, *Quality and Effectiveness of Environmental Impact Assessments: Lessons and Insights from Ten Assessments in Canada*, 12 *Project Appraisal* 219 (1997).

⁷² World Commission on Environment & Development, *Our Common Future* 222 (1987). See also Australian & New Zealand Conservation Council, *A National Approach to Environmental Impact Assessment in Australia* (1991); Commonwealth of Australia, *supra* note 19; Owen McIntyre & Thomas Mosedale, *The Precautionary Principle as a Norm of Customary International Law*, 9 *J. of Env'tl. L.* 221, 238 (1997); and Brown, *supra* note 10, at 31.

⁷³ For more detail on this argument see Gullett, *supra* note 5.

⁷⁴ The basic steps in the EIA process of project screening, scoping of impacts, description of proposal and environment affected, assessment of predicted impacts, community consultation, and post decision monitoring and auditing are, in general terms, more or less consistent in all EIA jurisdictions, although the detail within each step can vary considerably.

1. EIAs are conducted where there is uncertainty regarding environmental impacts;
2. there is adequate assessment of environmental uncertainties; and
3. environmental uncertainties are given appropriate weight in final decisions.

Step 1: Threshold for Operation of EIA

The first step to integrate the principle in EIA would be to amend the project screening criteria or threshold for operation of EIA to ensure that EIAs are not limited to activities which *will* affect the environment “to a significant extent” as is the common practice.⁷⁵ The EIA process must also be triggered where there is uncertainty regarding the possibility of serious environmental impact. Although the parameters of environmental uncertainty are elusive, particularly at the larger scale, guidelines could be prepared to render this threshold operable. This is where more work on risk assessment and uncertainty analysis needs to be undertaken. A lower evidentiary standard requiring EIAs where there is insufficient information available to predict whether non-negligible environmental harm may occur would reflect the principle in so far as it would shift attention from the acceptability of the “significance” of the environmental impacts of a proposal to the acceptability of the scientific uncertainty which attaches to the predictions of the impacts.

Step 2: Content of EIA

For the principle to be taken into account, the uncertainty associated with a proposal (concerning both what is known and not known) must explicitly be examined and evaluated in EIA. Yet, an essential prior ingredient for achieving precautionary EIAs is to ensure that feasible alternatives to the proposed activity are assessed and considered. It is necessary from a precautionary standpoint to consider alternatives, including the “no proposal” alternative, as a way to *reduce* environmental impacts by logical choice of best design options, rather than merely to *assess* actual predicted impacts of the sole option being considered. Most jurisdictions require or allow consideration of alternatives as part of their EIA process.⁷⁶ However, in practice,

⁷⁵ See, e.g., *Environment Protection (Impact of Proposals) Act*, 1974, § 5 (Cth).

⁷⁶ See, e.g., NEPA, § 102(2)(c)(ii). For a review of consideration of alternatives in

particularly where EIA processes are largely discretionary, such as in Australia, the consideration of alternatives is a poorly performed step of EIA. Invariably few alternatives are considered, and those that are considered often are done so inadequately. This is because a developer will typically focus on its primary proposal, and momentum for the proposal is generated by the process itself.⁷⁷ Consideration of alternatives is the heart of a precautionary EIA process and should not merely be a *pro forma* procedural requirement. The focus should be to consider reasonable alternatives to the proposed action to enable identification and selection of less potentially harmful activities as a way of minimizing or reducing harm during the early design stage of the project. Precautionary decision-making would be facilitated by rigorous qualitative alternatives analysis. It would encourage evaluation of the purpose of the proposed activity in the first instance, rather than assuming that the activity will be approved and focusing on the best way to proceed.⁷⁸

The step focused on in this part is the assessment of uncertainty of the proposal and of practical alternatives. Determining *how* to assess and communicate uncertainty is the current challenge. In 1994, the Commonwealth Environment Protection Agency (EPA) advised the Australian Federal government to adopt the process the U.S. National Environmental Policy Act of 1969 (NEPA) utilizes for dealing with incomplete information and scientific uncertainty.⁷⁹ These include disclosure requirements of incomplete information and consideration of more distant and uncertain effects.⁸⁰ Added to this should be a number of national EIA processes, see Christopher Wood, *Environmental Impact Assessment: A Comparative Review* (1995).

⁷⁷ Including, for example, financial commitments to the project already made by this stage of the process and the often predetermined outcome of large scale projects which take on a political import. For discussion of the political nature of development issues in Australia, see e.g., David Mercer, 'A Question of Balance': *Natural Resources Conflict Issues in Australia* (2d ed. 1995).

⁷⁸ See Mary O'Brien, *Alternatives Assessment: Part of Operationalizing and Institutionalizing the Precautionary Principle*, in *Protecting Public Health and the Environment: Implementing the Precautionary Principle* 207 (C. Raffensperger & J. Tickner eds., 1999).

⁷⁹ Environment Protection Agency, *Analysis of Environmental Impact Assessment Practice and Procedures in other Countries* 109 (1994). Among other things, NEPA requires that project or policy proponents look at "the relationship between local short-term use of man's environment and the maintenance and enhancement of long-term productivity" (§ 102(c)(IV)).

consideration of cumulative and synergistic effects. An important area here is for ELAs to analyze the potential for irreversible impacts from a proposed development. Despite the opportunity presented to the Federal government in 1998-99 to reform the federal EIA process according to the EPA's comprehensive review based recommendations, it failed to do so.⁸¹

Another necessary step for ELAs to give effect to the essence of the principle that there be a shift in the "burden of proof"⁸² is that proponents should be required to establish that the uncertainties which attach to the predicted environmental effects of proposals are within predetermined precautionary "acceptability" criteria or "margin-of-safety" standards. This burden would be more onerous to discharge where there is conflicting scientific evidence and may call for a sliding scale of required proof according to the predicted likelihood and severity of harm. It may be necessary, at minimum, to require a developer or potential polluter to establish that no safer way to conduct the activity is possible.

Determining suitable ways to justify making decisions where uncertainty exists — typically anathema to decision-makers who invariably seek uncontested and "objective" information — is an area where more attention is needed in order to give the precautionary principle more cogency in decision-making generally, and in EIA in particular. Critical issues here are how to determine and express thresholds for appropriate precautionary responses and how best to communicate evidence of uncertainty to decision-makers who may not be well-informed about the nature of risk. For example, reason to believe that a causal link between an activity or pollutant and a negative environmental or health consequence can be expressed in different

⁸⁰ See 40 C.F.R. §§1502.22, 1508.27 and Mary K. Fitzgerald, *Small-Handles, Big Impacts: When Should the National Environmental Policy Act Require an Environmental Impact Statement?*, 23 Boston College Env'tl. Affairs L. R. 437, 464 (1996).

⁸¹ Under *EPBC Act*, 1999, § 102(2), the Minister must merely "seek to ensure" that the environmental impact statement will "contain enough information about the [development] and its relevant impacts to allow the Minister to make an informed decision whether or not to approve."

⁸² The principle is generally understood as shifting the burden of proof from environmentalists (that of proving that a development would cause significant harm) to developers (to prove that it would not cause such harm).

ways, depending on the strength of the evidence.⁸³ This can range from statements such as “the evidence indicates/is consistent with a causal relation” through to areas of greater uncertainty about a connection expressed in statements like “there is no evidence bearing on a causal relation” or “the evidence does not indicate a causal relation.” However, more appropriate ways to express the same degree of confidence about causal relations can facilitate the making of decisions based on them. Rather than stating that the evidence “is consistent with” a causal relation, this could be expressed as the evidence “favors acceptance of” a causal relation. Similarly, where the evidence is “insufficient to indicate” a causal relation, this could be expressed as the evidence “is inadequate to accept or reject” a causal relation.

One area where risk assessment can improve is to provide for uncertainty in degrees of confidence to be expressed in statement form. This is to be preferred to assigning numbers to predictions of harm where uncertainty exists because numerical values create a false impression of precision where often none exists. This in turn can contribute to decisions being made more on political grounds where numbers, rather than meaning, tend to be focused upon.⁸⁴ Statements about uncertainty have the benefit of compelling consideration being given to the nature of the evidence relied upon, for example, by specifically addressing issues such as the adequacy of the data and the level of scientific consensus about data analysis. As such, it is argued that the final document produced in the EIA process should express the degree of confidence of predictions and severity of harm in statement form so that rigorous uncertainty analysis and consideration is more amenable to the environmental approvals process. Although it is argued here that it is necessary for more attention to be devoted to assessing the uncertainties which attach to project options, it is important to recognize that uncertainty itself cannot be overcome because of its pervasive and cumulative nature in the environmental arena.⁸⁵

⁸³ These arguments are drawn from David A. Butler, *Communicating Uncertainty in Health Risks to Policy-Makers*. Paper presented at the Second Biennial International Meeting of the Risk Assessment and Policy Association, Alexandria, Virginia, Mar. 25-26, 1999.

⁸⁴ For discussion of the discrepancies that exist between experts and the public in risk perception, see Ann Bostrom, *Risk Perceptions: 'Experts' vs. 'Lay People'*, 8 *Duke Env'tl. L. & Pol'y F.* 101 (1997).

Therefore, the crucial task that follows that of assessing and conveying uncertainty in EIA is that of how to ensure that decisions are influenced by the uncertainty.

Step 3: Substantive Influence on Decision-Making

To achieve the stated aim of implementing precaution, it is imperative that a procedure is adopted whereby precaution actually influences or governs decisions. This task strikes at the core of the precautionary principle. In an era in which decision-making is aimed to be rational — particularly in the fields of law and public administration — any attempt to base decision-making in part on the *absence* of information is bound to cause concern. Yet, this is exactly what the principle instructs us to do. It is unsatisfactory to have a process whereby uncertainty is assessed, but not considered adequately in final determinations.

Australian EIA processes, being far more discretionary than, for example, the EIA process contained in NEPA requires considerable attention in this regard.⁸⁶ A legal rule needs to be formulated requiring the prohibition of an activity or the implementation of other appropriate precautionary measures where the threshold for application of the principle is met, unless there is sufficient evidence that the level of uncertainty involved (not merely risk) is acceptable. This could take the form of a legislative presumption that the responsible decision-maker adopts the appropriate precautionary response, preferably recommended in the environmental impact statement itself or possibly determined by an expert independent review panel.⁸⁷

⁸⁵ See R. Michael M'Gonigle, *The Political Economy of Precaution*, in *Protecting Public Health and the Environment: Implementing the Precautionary Principle* 123 (C. Raffensperger & J. Tickner eds., 1999).

⁸⁶ Despite being modelled on NEPA, the Australian federal EIA process (as well as most state processes) dispensed with mandatory procedural requirements because the government was anxious to avoid the adoption of provisions which might enable the courts to be the common forum to resolve development disputes, thus causing delays and increasing the cost of the process. For statutory reform proposals for NEPA in relation to guiding political decisions and requiring agencies to justify decisions, see Philip Michael Ferester, *Revitalizing the National Environmental Policy Act: Substantive Law Adaptions from NEPA's Progeny*, 16 *Harvard Env'tl. L.R.* 207 (1992) and Lynton K. Caldwell, *Beyond NEPA: Future Significance of the National Environmental Policy Act*, 22 *Harvard Env'tl. L.R.* 203 (1998).

⁸⁷ This could be achieved in a manner similar to the "bounded" decision-making established in Canada under the innovative *Canadian Environmental Assessment Act*, 1995, § 37(1)(b). See Gullett, *supra* note 11 at 154.

However, to enable a utilitarian approach to the principle, this presumption would be displaced if compelling reasons are given as to why, in the instant case, precautionary recommendations should not be followed. This process would be a combination of indirect and direct precautionary measures. Steps one and two would assist in creating a climate fostering precautionary thinking, while step three would be more direct by presumptively requiring application of precaution in appropriate circumstances.

Although in some cases this procedure would enable precautionary recommendations to be avoided because it allows contra arguments to be raised, the principle has never been considered to have mandatory application in all situations. A threshold for application does need to be determined below which non-precautionary decisions can be taken.⁸⁸ However, even where the threshold is met, it would be too arbitrary to allow precaution to be the sole criterion for decision-making. Rather, it should be a significant criterion with presumptive application in appropriate circumstances with the level of precaution required being related to the level of uncertainty involved. The approach outlined here would ensure that uncertainty is expressly taken into account and that the necessary balancing act of environmental, economic and social issues is undertaken not simply by considering available scientific evidence, but also by being critical of such evidence and taking into account the absence of scientific data, uncertainty and indeterminacy. This would create more coherence where decision-making is, and will remain, subjective, and EIA would become a truly precautionary process.

Conclusion

In Australia, the precautionary principle has been adopted widely in environmental policy and legislation, and it has been accepted tentatively by the courts as a factor that should be taken into account in appropriate circumstances. In this respect, Australia is a leading country in the adoption of the principle as a main plank of environmental protection. However, although other countries can draw from the Australian experience with the principle (particularly in relation to the

⁸⁸ See James Cameron, Will Wade-Gery and Juli Abouchar, *Precautionary Principle and Future Generations*, in *Future Generations and International Law* 93, 100 (E. Agius & S. Busuttill eds., 1998).

inclusion of it in legislation), it is submitted that the Australian approach needs to be more rigorous to ensure that environmental practice is informed by precaution and to ensure that the precautionary principle amounts to more than a “guiding” principle.

Australian environmental protection measures do not as yet evince any remarkable degree of innovation in attempting to move away from conventional regulatory approaches — targeting actors, establishing causes of action, and apportioning liability in a procedural manner — to embracing novel methods of dealing with fundamental causes of environmental harm (which involve profound uncertainty and complex, poorly understood structural issues). The principle needs to be expressed in such a way that it can be applied in specific environmental management and resource decisions. Formulations such as those contained in the Rio Declaration and the IGAE, although useful for advancing precautionary thinking, will not enable us to meet the principle’s most important test — implementation. Formulations which are imprecise, although popularizing precaution, inhibit the development of operational strategies. Reform options are available to implement precaution within existing decision-making structures. An effective approach would be to enshrine the principle in EIA legislation — a task which is not procedurally difficult. However, while many precautionary principle advocates lament the fact that implementation of it is poor, it is imperative to recognize its revolutionary character so that suitable operational strategies can be devised.

