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ORIGINAL PAPER

High level Antarctic EIA under the Madrid Protocol: state practice and the effectiveness of the Comprehensive Environmental Evaluation process

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Abstract The 1991 Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol), the latest instrument of the Antarctic Treaty system (ATS), establishes environmental standards to manage 10% of the planet. Under the Madrid Protocol, all activities subject to advance notice reporting obligations under the 1959 Antarctic Treaty are required to undergo prior Environmental Impact Assessment (EIA). The highest level EIA—termed a Comprehensive Environmental Evaluation (CEE)—requires international scrutiny. This is the only form of EIA where such scrutiny occurs and the only context under the Madrid Protocol or any other part of the ATS where the proposed actions of State Parties, or operators subject to their jurisdiction, are subject to formal international review. Whilst this review does not provide a veto, it has been viewed as an important development in the Antarctic multilateral regime. To date, there have been 19 CEEs. This article reviews the Antarctic CEE process and evaluates its application in practice against the environmental obligations established in the Protocol. Whilst most CEEs are substantial documents and processes, which have raised the standard of environmental care in the area, there are significant generic limitations. Not one CEE appears to have led to substantial modification of the activity as first elaborated by the proponent, let alone a decision not to proceed with the activity, despite this being a mandatory consideration. There are indications that the imperatives in the CEE process are often administrative and diplomatic rather than environmental and that notwithstanding the international scrutiny of draft CEEs, state action may not be significantly changed. Suggestions are made on improvements to the CEE process. The Madrid Protocol is a framework convention, designed so that its technical annexes, including that addressing EIA, may be periodically updated.

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Twelve years after its entry into force, and almost 20 years after its adoption, such updating may now be useful.

Keywords Antarctica · Antarctic Treaty system · International environmental management · Environmental impact assessment · Effectiveness of multilateral environmental agreements

Abbreviations

ATCM	Antarctic Treaty Consultative Meeting
ATCP	Antarctic Treaty Consultative Party
ATS	Antarctic Treaty system
CEE	Comprehensive Environmental Evaluation
CEP	Committee for Environmental Protection
IEE	Initial Environmental Evaluation
EIA	Environmental Impact Assessment

1 Introduction

The Antarctic Treaty system (ATS)[1] provides the core mechanism for international cooperation and management for ~10% of the planet and has held at bay the fundamental juridical problems around the unresolved territorial status of Antarctica for the past 50 years. The latest component instrument of the ATS is the 1991 Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol) that entered into force on 14 January 1998. This instrument arose in response to a decade-long debate about the acceptability of mineral resource activities in Antarctica—a debate that it resolved through a specific prohibition on this activity, apart from scientific research.[2] With the Protocol, Antarctica was designated "a natural reserve, devoted to peace and science",[3] and a substantive array of environmental obligations were entered into. The Madrid Protocol may reasonably be seen as a high water mark of the second wave of international environmental development, which broke in the early 1990s. By virtue of the gigantic area of its application, the global public goods residing in Antarctica, the involvement of the world's major developed and developing states, and the new life that this multilateral environmental agreement breathed into the ATS, the operational success of the Protocol is of some import. One particularly significant element has been its enhancement of the Environmental Impact Assessment (EIA) system. This has evolved, with the Madrid Protocol, into the de facto gatekeeper for Antarctic activity, and (at its highest level) the most developed area of international scrutiny by states of other states' activities there. How this has turned out in practice is the focus of this article.

[1] The term coined to encompass the 1959 Antarctic Treaty, the 1972 Convention on the Conservation of Antarctic Seals, the 1980 Convention on the Conservation of Antarctic Marine Living Resources, the 1991 Protocol on Environmental Protection to the Antarctic Treaty, all of which are in force; the 1988 Convention on the Regulation of Antarctic Mineral Resource Activities, which is not in force nor likely to become so; and the subsidiary obligations under these instruments.

[2] Article 7.

[3] Article 2.

The Madrid Protocol established generic obligations for all activities (governmental and non-governmental) planned in Antarctica, and subject to the Antarctic Treaty, to undergo an appropriate level of EIA prior to commencement. Whaling activities, which are subject to the International Convention for the Regulation of Whaling (ICRW) that entered into force on 10 November 1948, and fishing activities, subject to the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) which entered into force on 7 April 1982, are not covered by this EIA system. The Protocol establishes a three-level EIA regime under Article 8, reflecting the potential level of impact of the proposed activity: less than minor or transitory; minor or transitory; more than minor or transitory. Annex I of the Protocol outlines specific EIA standards and processes for the three EIA levels: a Preliminary Stage, sometimes termed a Preliminary Assessment (PA) or Preliminary Environmental Evaluation (PEE); an Initial Environmental Evaluation (IEE); and a Comprehensive Environmental Evaluation (CEE). After Preliminary Stage investigations have taken place, an activity can either: proceed (if the potential impacts of the activity are determined to be less than minor or transitory), or be preceded by an IEE, if predicted impacts are likely to be minor or transitory; or be preceded by a CEE, if the impacts may be more than minor or transitory.

Preliminary stage evaluations are left to appropriate national procedures (Annex I, Article 1). The actual operation of this lowest level of Antarctic EIA has been subject to little examination, aside a New Zealand paper, written by one of the present authors, examining its national practice (New Zealand 1996) and a consideration of the domestic legal basis for it in the Protocol-implementing legislation of a small number of Consultative Parties (Bastmeijer 2003). Limited guidance on scope and process is provided for IEEs, which are again left to national procedures (Annex I, Article 2), excepting only that there is a duty to advise on procedures and that an IEE has in fact been undertaken, and that any IEE shall be made available on request (Annex I, Article 6).

Only with CEEs, the highest level EIA, are substantial obligations in relation to content and process specified; and critically, only at the draft CEE stage is there a legal obligation to international scrutiny of the EIA. CEEs are substantial documents containing large amounts of information about the proposed activity and, generally, some serious attempt to evaluate the environmental consequences of this activity. They have usually been subject to domestic scrutiny—in some states involving other agencies than the proponent—and often constitute the EIA document required under domestic legislation, before they enter the formal process required under the Protocol.

Over the decade since the Protocol entered into force a substantial case-history of IEE and CEE practice has been accumulated. At mid 2009, 724 IEEs and 19 CEE processes (with draft and final CEEs, comprising 32 documents) were recorded (Antarctic Treaty Secretariat 2009a).[4] An excellent overview of Antarctic EIA is provided by Bastmeijer and Roura (2008) and studies of domestic implementation of the EIA system are found in Bastmeijer (2003) and Fallon and Kriwoken (2005).

This article reviews the CEE process and evaluates its application in practice. The central argument is that whilst some, perhaps many, of the CEEs to date are substantial documents and processes, which are likely to have raised the standard of environmental care in the Antarctic Treaty area, some significant generic limitations are evident. These include the surprising finding that not one of the 19 CEE processes appears to have led to

[4] A cumulative listing of IEEs and CEEs from 1988 to date is provided on an EIA database maintained by Antarctic Treaty Secretariat http://www.ats.aq/devAS/ep_eia_list.aspx?lang=e (last visited 10.1.10 at which time there were still 32 CEE documents).

substantial modification of the activity as first elaborated by the proponent, nor to a single decision not to proceed with the activity, despite this being a mandatory consideration (Annex I, Article 3.2.a). Unless it were clear that the initial proposals subject to CEE were so exemplary that EIA would have no material effect on their end form, this finding might reasonably raise the question whether the environmental management imperatives of the Antarctic CEE process (and perhaps by extension the wider Antarctic environmental management system provided by the Protocol) are in fact delivering the outcomes that were hoped for at the time the Protocol was adopted. It may also suggest that notwithstanding a manifest improvement in the standing of environmental considerations in Antarctica over the 20 years since the Protocol was adopted, in a largely unfettered arena for state action, national administrative and diplomatic considerations still trump environmental considerations when high status projects are at stake.

2 The roots of Antarctic EIA

In 1983, Recommendation XII-3 Man's Impact on the Antarctic Environment made the distinction between preliminary determination and detailed environmental assessment for activities that may have a significant impact on the environment. Benninghoff and Bonner (1985), supported by the Scientific Committee on Antarctic Research (SCAR), produced draft guidelines outlining procedures for evaluating impacts from scientific and logistic activities. Two years later in 1987, XIV ATCM adopted Recommendation XIV-2, addressing EIA and XIV-3, on Safeguards for Scientific Drilling (Brazil 1987). Recommendation XIV-2 established a duty to identify environmental effects for scientific research or associated logistics activities and established a two-tiered EIA scheme based on the IEE and the CEE, and Recommendation XIV-3 mandated CEE for scientific drilling.

From adoption of the Protocol in 1991, EIA was to play an increasingly important role in practical environmental management and the annual consideration of the new duties incurred under the Protocol. It not only codified a set of environmental obligations on Parties, but established through Article 11 an advisory Committee for Environmental Protection (CEP) whose functions (specified in Article 12) are critical to Protocol implementation. At the XVIII ATCM in Kyoto in 1994, Parties considered how they might effect practical implementation of the Protocol, pending its entry into force. They decided that from the next ATCM "those items … which, under Article 12 of the Protocol, would be dealt with by the Committee for Environmental Protection, should be considered by a Transitional Environmental Working Group (TEWG)" (Japan 1994, paragraph 42). Accordingly, from XIX ATCM in 1995, until the formal establishment of the CEP at XXII ATCM in 1998, TEWG operated as an interim CEP.

3 Purpose and problems of Antarctic EIA

Underpinning Antarctic EIA is the requirement in paragraph 2(c) of Article 3 (Environmental Principles) of the Protocol that activities:

> shall be planned and conducted on the basis of information sufficient to allow prior assessments of, and informed judgements about, their possible impacts on the Antarctic environment and dependent and associated ecosystems and on the value of Antarctica for the conduct of scientific research.

Judgements are to take "full account" of six criteria identified in paragraph 2(c) of Article 3. These considerations suggest the application of the precautionary principle, enunciated in Principle 15 of the Rio Declaration (UNCED 1992) in the Protocol, albeit not explicitly as in some recent multilateral environmental instruments (see Triggs 2006, pp. 811–812), and its first appearance in any ATS instrument.

The formal duty to conduct prior EIA under the Protocol is coupled with the advance notice obligations of Article VII (5) of the Antarctic Treaty in both paragraph 4 of Article 3 and in paragraph 2 of Article 8 (Environmental Impact Assessment). This linkage has been used to restrict the duty to EIA to those activities explicitly covered by the Protocol and not to either fishing or whaling (Hemmings et al. 2007).

A number of ATCPs appear to have domestic Protocol-implementing legislation, which focuses on compliance with an administrative process, rather than objective environmental standards through the "planning and conduct" of the activity. In these states, EIA obligations are met by compliance with a procedure—usually by the submission of a document, which is then signed off on by the competent authority. The substance of the document—what the proposed activity might mean in the real world of the Antarctic—is here of less significance than the fact that the proponent has met the procedural obligation. Some jurisdictions appear to have no legal capacity to modify, restrict or otherwise impose any conditions upon the operator, so long as they have completed the paper trail.

Various hortatory guidelines have been developed since the Protocol's adoption to assist, and perhaps encourage consistency of, its application. The earliest were developed by the Council of Managers of National Antarctic Programs (COMNAP 1992) but a number of states also tabled ATCM papers on EIA through the 1990s resulting in the codification of guidelines in a Resolution at XXIII ATCM (Peru 1999) and updated at XXVIII ATCM (Antarctic Treaty Secretariat 2005). Whilst useful, the guidelines have not resolved some inherent ambiguities in the interpretation of the EIA obligations.

The level of EIA undertaken for a proposed activity has always been a vexed question in Antarctica. Specific triggers for each of the three tiers have not been enshrined in the Protocol, nor agreed subsequently. There are no specific guidelines on when IEEs should become CEEs and how the triggering mechanisms are instigated. Lyons (1993) argued soon after the adoption of the Madrid Protocol that this ambivalence stems from the fact that the terms "minor" and/or "transitory" are difficult to define and even harder to operationalise. One of the present authors was intimately involved in intersessional discussion of these terms and can attest to the difficulties in arriving at any consensus (New Zealand 1997a, b, c).

In practice, this has meant some unease when an activity for which a prima facie case for CEE treatment exists has been subject to only an IEE, or only an IEE is planned. At XXIII ATCM in 1999, Russia's IEE for a proposed compacted snow runway in the Larsemann Hills, East Antarctica raised questions in the CEP about whether the project was border-line between an IEE and CEE (CEP 1999, paragraphs 44–46). At XXVI ATCM in 2003, Estonia's report on plans for its first station led some CEP Members to suggest a CEE and others that an IEE was required (CEP 2003, paragraph 48). When Italy presented two IEEs for activities at its station in the Ross Sea at XXX ATCM in 2007, for construction and operation of an ice runway, and restructuring work on a pier, some Members felt that the runway warranted a CEE (CEP 2007, paragraph 84).

In other instances, it has been suggested that the EIA should be at a lower level than that proposed by the responsible state. Thus, following a Ukrainian presentation on the draft CEE process for the replacement of station fuel tanks, it was suggested that an IEE would suffice (CEP 2007, paragraph 77). This may explain why no final CEE has appeared for this project.

Whilst some states are concerned to see more standardisation on EIA level, others prefer to leave this to national process (CEP 2007, paragraph 108).

4 Development and process of the CEE

As elsewhere in the Protocol, the EIA Annex codified and expanded existing Antarctic obligations—here duties under Recommendations XIV-2 and XIV-3. However, whereas these were restricted to "scientific research or associated logistic activities", the Protocol applied them to:

> any activities undertaken in the Antarctic Treaty area pursuant to scientific research activities, tourism and all other governmental and non-governmental activities in the Antarctic Treaty area for which advance notice is required under Article VII (5) of the Antarctic Treaty, including associated logistic support activities (Article 8.2).

But it is the existence of the earlier Recommendations (particularly XIV-2) that explains the existence of CEEs prior to 1991. Until the entry into force of the Madrid Protocol in 1998, notwithstanding the commitment of many Parties to act as if it was in force, these were the sole international legal basis for CEEs.

Paragraph 2, Article 3 of Annex I outlines specific requirements for what shall be included in the CEE document. Paragraphs 3–6 specify the process to be followed, including who is to receive the draft CEE and the timelines for the process:

- The draft CEE is to be circulated to all Parties and to the CEP at the same time, and made publicly available. Receiving Parties are also to make it publicly available. A period of 90 days is to be allowed for the receipt of comments.
- The draft CEE is to be circulated to the Parties and CEP at least 120 days before the next ATCM.
- No final decision to proceed with the activity shall be taken unless the ATCM has had a chance to consider the draft CEE on the advice of the CEP. There is an opt-out clause to ensure that no decision to proceed with the activity can be delayed for longer than 15 months from the date the draft CEE was circulated. To date, this clause has not been triggered.
- The final CEE is to address and include or summarise comments received on the draft CEE.
- The final CEE, and any decisions and evaluations of impacts, is to be circulated to all Parties (who are again to make them publicly available) at least 60 days prior to the commencement of the activity in the Antarctic Treaty area.

5 Evaluating the process of the CEE: general assessment

This high level of transparency has no equivalent in any other Protocol-related duty. It is the closest approximation yet to international decision-making in relation to an operational activity in the Antarctic Treaty area. But it is still an approximation, not a realisation of international decision-making. The ATS remains a system of states operating in a juridically complex region. States guard what they still regard as their national prerogatives carefully. Whilst the CEE process involves other Parties and the Parties as a collective, in

the last resort the proponent's state remains sovereign. There are both procedural and diplomatic constraints on what State Parties and the CEP feel able to do, even within the field allowed to them by the Protocol. This is not to say that the international scrutiny that is possible with the CEE is without effect; but the effects are constrained and may be more constrained than is now helpful, given the purposes of the Protocol.

It might seem that the effect of international scrutiny by ATCPs and the CEP at the draft CEE stage would be to impose a significant quality control on this level of EIA. In practice, this is not necessarily so. Comments received tend to have a narrow technical focus, addressing specific points rather than considering the overall rationale for the activity. Most draft CEEs prompt substantive comments from no more than half a dozen ATCPs (of 28) and usually the Antarctic and Southern Ocean Coalition (ASOC). The half dozen ATCPs are those few ATCPs active in the CEP. But in the case of any one draft CEE, there are generally only three or four substantive examinations of the document, since review is a major and time-consuming task. Often, in our experience, powerful states get an easier time than less powerful states. Non-Consultative Parties seeking to build research stations have probably been subject to proportionately greater scrutiny than their station proposals warranted, whereas powerful ATCPs often receive only perfunctory scrutiny of their draft CEEs. This reflects the still essentially "diplomatic" context in which commentary upon the proposed activities of other states occurs.

Table 1 lists the 19 CEEs undertaken between 1988 and 2009. The first 6 CEEs were submitted before the Protocol came into force in January 1998, predicated on an informal interim application of the Protocol and the legal obligations of Recommendations XIV-2 and XIV-3. Table 1 shows the years that the draft and final CEEs were submitted for comparison. For the 13 CEEs where a draft and final CEE has been completed, the interval varies from under a calendar year (19—China) to 4 years (4—New Zealand). In eight cases, the interval is 1 year, and in three it is 3 years. For six CEEs (17—India, 15—Ukraine, 9—Czech Republic, 8—Russian Federation, 6—France and 3—South Africa) only one version of the CEE has been submitted to the ATCM. In some of these cases, the CEE process may still be underway with a final CEE to be tabled. Of the 19 CEEs, 10 are associated with the construction, maintenance or dismantling of a station. There are six CEEs associated with a science activity, one for a surface traverse, one for a research programme and one for a rock airstrip. The USA has submitted three CEEs. A further US CEE, a draft CEE for the rebuilding of the South Pole, is not listed in the ATS database, for reasons outlined in Sect. 6. There have been two CEEs each from France, Germany, New Zealand and the United Kingdom and a single CEE from each of eight other ATCPs.

The positive picture that emerges is that 13 ATCPs, including some of the largest operators in the Antarctic Treaty area, have conducted EIA at the highest level, and five have done so more than once. The projects subject to CEE have included what are clearly major activities, and the EIA process has been, generally, completed over a relatively short period. On the negative side, only 13 of 28 ATCPs have done CEEs, despite a larger number carrying out large scale construction activities or major scientific programmes, which appear to justify CEE-level examination. Furthermore, a fairly restricted range of activities are in practice subject to CEEs—those conducted by national Antarctic programmes. There have been no CEEs for any activity (including tourism) undertaken by a non-state operator in Antarctica (Hemmings and Roura 2003).

Most obviously, of the 19 CEE processes, not one has resulted in a decision not to proceed with the activity, despite this consideration being a mandatory part of the CEE. Indeed, not one has been substantially modified as a result of the CEE process either. To put this in context, from a far smaller number of high level EIAs roughly analogous to

Table 1 List of CEEs (1988–2009)

No.	Year		CEE title	Activity	Proponent
	Draft	Final			
19	2007	2007	Proposed Construction and Operation of the new Chinese Station at Dome A	Construction of a new station	China
18	2005	2006	Construction and Operation of a new Belgian Research Station, Dronning Maud Land	Construction of a new station	Belgium
17	2006[a]		New Indian Research Base, Larsemann Hills	Construction of a new station	India
16	2002	2006	ANDRILL McMurdo Sound Portfolio	Science: climatology	New Zealand
15	2006		Technological Binding of a tank with capacity $V = 200$	Construction of new fuel tank	Ukraine
14	2004	2006	Proposed Construction and Operation of Halley VI Research Station and Demolition and Removal of Halley V Research Station, Brunt Ice Shelf	Construction and operation of facilities	United Kingdom
13	2004	2005	Construction of the Neumayer III station, Operation of the Neumayer III Station, Dismantling of the Existing Neumayer II Station, Final CEE	Construction of a station, operation and removal	Germany
12	2003	2004	Upgrading of the Norwegian summer station Troll, Dronning Maud Land	Station upgrade	Norway
11	2003	2004	Development and Implementation of Surface Traverse Capabilities	Operational: infrastructure	United States
10	2003	2004	Project IceCube	Science, astronomy construction of neutrino telescope	United States
9	2003		Czech Scientific Station in Antarctic: Construction and Operation	Station construction and operation	Czech Republic
8	2002[b]		Water sampling of the subglacial Lake Vostok	Science: climatology	Russian Federation
7	1999	2000	European Project on ice Coring in Antarctica (EPICA)—Dronning Maud Land, Final CEE	Ice drilling	Germany
6		1994	Concordia project—Drilling activity at Dome C	Ice drilling	France
5	1992	1994	Concordia project. Construction and operation of a scientific base at dome C	Construction, operation and maintenance of facilities	France
4	1992	1994	Antarctic Stratigraphic Drilling east of Cape Roberts in South West Ross Sea	Rock drilling	New Zealand
3	1993		Proposed new SANAE IV facility at Vesleskarvet, Queen Maud Land	Construction, operation and maintenance of facilities	South Africa
2	1990	1991	Supplemental Environmental Impact Statement for the U.S. Antarctic Program	National Antarctic programme	United States

Table 1 continued

No.	Year		CEE title	Activity	Proponent
	Draft	Final			
1	1988	1989	Proposed construction of a crushed rock airstrip at Rothera Point, Adelaide Island	Construction of air facilities	United Kingdom

[a] Final due prior to commencement of construction in 2010–2011 season (India 2009)

[b] Referred to as a "revised draft" in paragraph 19 of the Report of CEP VI in the Final Report of XXVI ATCM (Spain 2003)

Antarctic CEEs, in the sub-Antarctic outside the Antarctic Treaty area, at least one (for an airstrip) has resulted in a decision not to proceed (Heymann et al. 1987).

To a considerable extent, the situation in Antarctica is that a proposal by an operating agency to conduct a financially and logistically feasible activity leads inexorably to its realisation. Even the high level EIA provided by the CEE affects the outcome only at the margins. One of our anonymous reviewers pointed out that in the case of the proposed Czech station (an instance of only a draft CEE having appeared in 2003), informal discussions with other states before that EIA was submitted resulted in a decision to build it not in the South Shetland Islands, as anticipated, but on James Ross island. Whilst this is plainly a substantive change in outcome, it did not arise as a consequence of the CEE process per se.

Who characterises and describes what is intended, and who actually writes the evaluative document referred to as the EIA is critical. Invariably, the EIA is written by, or for, the proponent of the activity. Operative decisions about the appropriate level of EIA are generally made (or influenced) by the proponent, although in many jurisdictions, non-government activities are required to prepare IEEs (Kriwoken and Rootes 2000; Hemmings and Roura 2003).

The fact that the proponent of the activity guides the preparation of the CEE document makes it inherently unlikely that serious consideration will ever be given to not proceeding with the activity, notwithstanding the fact that precisely this possibility is mandated at paragraph 2(a) of Article 3 of Annex I. To expect this is, frankly, to have unrealistic expectations about the capacity of the proponent (or the consultant preparing the CEE document) to detach themselves from self-interest. If the mandated option of not proceeding is to be given serious consideration, this will fall to the competent authority assessing the draft CEE. But, in many jurisdictions, the competent authority—the domestic mechanism for reviewing the CEE and making a decision in relation to the activity—is often the proponent agency (or the agency for whom the activity is ultimately carried out) since these powers are frequently assigned to the state's national Antarctic operating agency.

The CEP, as seen earlier, has been the forum in which hortatory guidelines for EIA have been developed. It also developed guidelines for itself in relation to how it should consider draft CEEs (CEP 1999, Annex 4), which established, inter alia, that there would be a CEP agenda item concerned with draft CEEs, and allowed the establishment of an Intersessional Contact Group (ICG). A coordinator and terms of reference for such an ICG would then be agreed. But the CEP is very conscious of its limited advisory role in relation to the draft CEE. At the Special Consultative Meeting in 2000, the CEP "noted that in considering the draft CEE its role was to examine the adequacy of draft CEEs and to provide advice on

draft CEEs to the ATCM. The Committee had no responsibility for the nature or timing of the planned programme, or for approving the CEE. Such actions rested solely with national authorities" (CEP 2000, paragraph 27).

The CEP's capacity to seriously engage with draft CEEs at its annual 5 day meeting is plainly limited, and so ICGs have become the prime mechanism for CEP CEE consideration. They work via electronic communications between the annual meetings of the CEP. Invariably, now an ICG is established for each draft CEE. Whilst this has undoubtedly streamlined and systematised CEP examination of draft CEEs, it does pose risks of a zero-sum-game in terms of comments on draft CEEs from the active ATCPs, since it is likely to be those ATCPs (and their key personnel) who will constitute the ICGs. ICGs have clear and often restricted terms of reference. The more fundamental questions that might ordinarily form a part of EIA review elsewhere—questions about the underlying purpose and value of the activity, examination of the degree of novelty or redundancy of what is proposed against other existing activities, the consequences of the proposal for human footprint over a wider area than just the focal site, and the implications of the proposal for other uses and values in the Antarctic Treaty area, are all generally not addressed.

The end result of the application of the CEE process, with its domestic and international phases, may often be improvement in the environmental standards attaching to a particular proposal. It seems fairly clear that transparency and international engagement with CEEs has improved the knowledge base across ATCPs around EIA in general. These are positive developments. But it is also the case that many Parties, and their environmental management experts, have concerns about some activities, which have formally and (so far as administrative and legal obligation goes) satisfactorily completed the CEE process. This is a disquieting finding—that a mechanism that it was hoped would assist in the comprehensive protection of the Antarctic environment, indeed a mechanism that is at the heart of modern Antarctic environmental management post-Protocol, may be flawed in practice. The difficulty appears to be that in some sense we have a neutered CEE process, more focussed on compliance with administrative process than with the best environmental outcome.

The highest profile example of these concerns is the proposed Russian drilling into subglacial Lake Vostok, in relation to which virtually nobody outside the Russian programme is sanguine, notwithstanding the CEE process and in-parallel debates over more than a decade. Similarly—although here with the concerns being more focussed on process and attitudes than environmental impact per se—the issue of the rebuilding of the US station at the South Pole. These two projects form the case studies to which we now turn.[5] As the largest operators in Antarctica, with the geographically most dispersed programmes, the US and Russia are important Antarctic players. There are other CEE processes that might also be adduced as useful case studies—most recently perhaps the seemingly vexed issue of Indian station plans in the Larsemann Hills and concerns expressed by other states, including Australia, China, Russia and Romania, who found their plans for an Antarctic Specially Managed Area (ASMA) overtaken by the Indian initiative and CEE process. However, the Indian EIA process only commenced relatively recently, and accordingly it is too early to examine that case.

[5] Bastmeijer and Roura (2008, pp. 210–217) also use Lake Vostok as a case study, although the cut-off point for their study is late 2006, and there have been discussions about the activity since then.

6 Evaluating the process of the CEE: case studies

6.1 USA: South Pole station CEE

The United States has maintained a station at the South Pole since the International Geophysical Year (IGY) in 1956–1957. Periodically, the station needs upgrading or replacement. In the 1990s, it became clear to the Office of Polar Programs of the National Science Foundation (OPP-NSF) that a new station was required. The project would require reconstruction and replacement of facilities to commence in 1999. In January 1998, a draft CEE—identified in US domestic EIA parlance as a "Draft Environmental Impact Statement"—entitled "Modernization of the Amundsen-Scott South Pole Station Antarctica" was released (OPP-NSF 1998a).

XXII ATCM was held in Tromsø, Norway from 25 May to 5 June 1998. The Protocol entered into force on 14 January 1998 (United States 1998), and consequently this ATCM was the first at which the Protocol and Annexes I–IV (a fifth, adopted through a different mechanism did not enter into force until 2002) were legally in effect. This saw the first meeting of the CEP and an expectation that amongst its business would be consideration of any CEEs in compliance with Article 3 of Annex I of the Protocol. The date of the ATCM meant that the US could meet the 120-day circulation requirement of paragraph 4 of that article—but it would have been a reasonable expectation that given the essential unpredictability of the Protocol's entry into force, other Parties would in any case have been flexible on this.

The US circulated the draft CEE to states party to the Protocol under cover of a diplomatic note from the Department of State dated 23 January.[6] That note indicated that the US did indeed view the document as a draft CEE, and noted the 90-day requirement for public comment. It made no reference to the CEP. Receiving states were thus able to review the draft CEE and offer comments to the US.

In Tromsø, it became evident that there was some disquiet about the manner in which the US was said to be handling the draft CEE process. This appeared to resolve around two issues: a belief that the US had not provided a copy of the draft CEE to the CEP; and concern that the US was blocking discussion of that draft CEE in the CEP.

On the first point, it is unclear whether the US really did not provide the CEP with the draft CEE or whether there was just confusion about the route by which it was provided. Substantively, since all the Parties that constituted the CEP received it, the CEP clearly had it. The US may not have formally met its Protocol obligations to forward the draft CEE "to the Committee at the same time as it is circulated to the Parties" (paragraph 4, Article 3, Annex I), but it need not have become the rate-limiting step other Parties allowed it to become. However, as we note in the following paragraphs, the US subsequently failed to meet it obligations in relation to any feedback that might have arisen from the CEP and ATCM. The second point (the attempt to block discussion in the CEP) is perhaps more substantive and resulted in a difficult discussion in the CEP at its opening meeting. Whilst the debate was de-fanged for the formal report language, the angst is still evident there:

> (25) New Zealand raised some matters of principle and practice regarding recent experience with the submission of a draft Comprehensive Environmental Evaluation (CEE). The majority of delegations expressed the view that given the potential significance of major activities the CEP should provide advice to the ATCM on all

[6] Copy on file with authors.

> draft CEEs. The US was of the view that the CEP should take the opportunity to review draft CEEs only when a member of the Committee believed that there was a particular scientific, technical, or procedural matter requiring consideration. Chile was concerned with the need for the future practice of the CEP in this matter to conform strictly with the provisions of the Protocol and its Annex I.
>
> (26) The Committee agreed that the Protocol gives the CEP the opportunity to consider and give advice on scientific, technical or procedural issues on draft CEEs. Furthermore, as laid down in Article 3(4) of Annex I, the Committee recognised that draft CEEs are to be forwarded to the CEP, at the same time as they are circulated to the Parties, and at least 120 days before the next ATCM for consideration as appropriate. Norway offered, as host country of the chair, to receive and make such documents available electronically on its CEP HomePage.… (CEP 1998).

The UK "was unsure as to whether the EIA was an IEE, draft CEE or final CEE", to which the US responded that it "was a draft CEE as explained in the covering letter" (CEP 1998, paragraph 31).

The ATCM recorded its understanding of the discussions in the Final Report (Norway 1998, paragraph 47) and endorsed the understanding reached at the previous ATCM that draft CEEs would be sent to the CEP (New Zealand 1997d, paragraph 32).

Interestingly, the US final CEE (OPP-NSF 1998b) was dated May 1998—i.e. prior to the conclusion of the ATCM and attendant CEP meeting at which its handling of the draft CEE had caused such a stir. On that timeline, the final CEE could not have addressed any comments from the CEP or ATCM in Norway, and unsurprisingly the final CEE does not in fact reflect any comments. It did include in its Appendix A, in addition to comments from domestic reviewers, the complete comments received from two Parties (UK and Japan) and the expert organisation ASOC, which had sent comments in March or April and responses to these. Other Parties' comments clearly arrived too late to inform the final CEE because of the unreasonably short interval between the circulation of the draft CEE and the drafting of the final CEE. This appears to us to show a failure on the part of the US to comply with its obligations in relation to paragraphs 5 and 6 of Article 3 of Annex I. The US formally circulated the final CEE under cover of a diplomatic note from the Department of State dated 16 June 1998.[7] Although again called an "Environmental Impact Statement", the State Department note declared that "the Secretary of State hereby transmits a final Comprehensive Environmental Evaluation". It is clear then that the US viewed the documents and process as involving a CEE.

However, this US CEE has never been included in the cumulative listing of CEEs maintained by the Antarctic Treaty Secretariat, and one cannot get a copy of the draft or final CEE from the Secretariat website. Presumably (there appears no conclusive statement on this in any ATS report that we are aware of), the failures of process so clearly recognised by other Parties at the Tromsø ATCM rendered these documents (the draft and final CEEs) non-CEEs so far as Protocol obligations are concerned.

So what is the take-home message from this episode and why have we selected it as a case study here?

In the first instance, the fact that the very first CEE process to occur after the Protocol's entry into force was such a debacle is unfortunate. That the responsible state, the US, was, as depository state for the Antarctic Treaty and Protocol, in the best position to assess progress towards the entry into force of the Protocol (and the consequential triggering of

[7] Copy on file with authors.

formal processes around any CEE), makes it particularly regrettable. No state would have less excuse for being overtaken by events than the US. Further, as the largest operator in the Antarctic, the state with the greatest experience of EIA, domestically and (via domestic legal obligations, since the 1969 National Environmental Policy Act) in Antarctica, and the most powerful player in the ATS, there was a very serious risk that a most unfortunate precedent might have been set for CEE processes. Fortunately, in a departure from the usual situation of powerful states receiving more lenient treatment than smaller and newer Parties in the ATS, the US met near universal opposition at XXII ATCM and thereafter (as the exclusion from the cumulative list of CEEs attests). The general concern about the US approach was given particular edge by the active stances of three original signatory (and claimant) ATCPs with strong relations with the US: New Zealand, Norway (at a meeting in Norway, in a CEP chaired by a Norwegian and with database and electronic system support for the CEP provided by Norway) and the United Kingdom.

The US has learnt from this experience and the particular process failings seen in relation to the South Pole station CEE have not been seen in its two subsequent CEEs for Project IceCube and the Surface Traverse. However, in one respect at least the South Pole station CEE continues to serve as a model for US approaches to CEEs (and EIA generally in Antarctica). The US appears to see its primary duty in relation to Antarctic EIAs in terms of domestic legal obligations, processes and audiences. The South Pole station was a classic US Environmental Impact Statement (EIS) marketed as a CEE. Indeed, they did not even alter the title of the EIS to CEE on the document for the Antarctic audience. The re-branding as a CEE only occurred in the transmittal notes accompanying the draft and final CEEs.

Subsequent US CEEs at least call themselves "CEEs", and now formally address the mandatory requirements for a CEE under paragraph 2 of Article 3 of Annex I. US CEEs contain substantial amounts of information, generally of a very high quality. But they remain the most procedural of CEEs, reflecting the relatively long and entrenched US administrative approach to EIS. The process is all. Nowhere in the document does one encounter any real evidence that fundamental assumptions are likely to be challenged, and the US domestic process for scrutinising the CEE seems unable (both legally and administratively) to substantially challenge any part of the proposed activity described therein. To revisit a point made generally in relation to the complete set of Antarctic CEEs, so far the four US CEE processes (including the South Pole case) have not come close to a decision not to proceed. They are not intended to realistically lead to this possibility.

The US is the state with the greatest technical capability, the longest practical application of EIA and the largest Antarctic programme. That even its CEE processes seem problematical therefore has some weight in evaluating the present state of system-wide CEE consideration under the Protocol.

6.2 Russian Federation: Lake Vostok CEE

As with the US at the South Pole (and for similar geopolitical and nationalist, as well as scientific, reasons), the Soviet Union and then the Russian Federation have maintained a station (Vostok) at the South Geomagnetic Pole, on the high polar plateau, since IGY. Three kilometres (km) beneath Vostok is the largest subglacial lake known, some 250×50 km in area. This subglacial lake has attracted immense interest. Originally thought to be an ancient and long isolated body (more recent research suggests that a huge array of subglacial bodies are connected in a system that sees movement of water and periodic discharges), it was seen variously as a potential gold mine of biodiversity of

interest for evolutionary studies and bioprospecting, or a testing ground for technologies that would then be used in planetary research (Zotikov 2006). Through the 1990s in particular as the post-Soviet Russian Antarctic programme struggled for financing and international dignity, it was a talisman of Russian commitment and the jewel in the crown of Russian Antarctic research.

Drilling towards Lake Vostok commenced in 1990 (Bastmeijer and Roura 2008) in the dying days of the Soviet Union, before even the adoption of the Protocol. Despite Recommendations XIV-2 and XIV-3 no EIA appears to have been prepared. At XX ATCM in 1996, Russia tabled a paper on its investigations of the lake (Russia 1996). SCAR noted that technical issues and EIA needed attention before lake sampling occurred. The ATCM "urged Russia to take the necessary steps to ensure that the planned ice coring is stopped at a safe distance above the reported lake so that there is no risk of polluting it" (Netherlands 1996, paragraph 108).

The concerns about plans to drill into the lake have, from inception, centred on the risks of contamination and have played out within discussions in both TEWG and the CEP and in the international scientific community (e.g. Nature 2004).

At the first CEP meeting, at XXII ATCM in 1998, Russia tabled a paper on the environmental impact of drilling at Lake Vostok (Russia 1998). The CEP noted that it "raised a number of questions related to science and environmental impact assessment" and Russia agreed to table a draft CEE before the next CEP (CEP 1998, paragraph 32). In fact, at the following ATCM (XXIII), Russia advised the CEP that although a draft CEE would be prepared before lake penetration, they faced technical difficulties, and it would be some time yet (Russia 1999). SCAR announced it would hold a meeting on Lake Vostok later in 1999 (CEP 1999). No papers or discussion of Lake Vostok appeared at the Special Consultative Meeting in 2000. At XXIV ATCM in 2001 in St. Petersburg Russia tabled a paper on "clean technology" for penetrating the lake (Russia 2001), on which it requested comments, but still no draft CEE, although it again said one would be submitted at a later stage. At XXV ATCM in 2002, Russia tabled a draft CEE (Russia 2002) but the CEP concluded that it was "not submitted in accordance with Article 3 of Annex I to the Protocol" and agreed that it would be considered at their next meeting in 2003 (CEP 2002, paragraph 14).

Russia circulated what it termed a "revised" draft CEE to Parties and the CEP on 6 February 2003, and tabled it at XXVI ATCM (Russia 2003). This document formed the basis for discussion in the CEP at XXVI ATCM in June 2003 (CEP 2003). The ICG convened to consider the draft CEE tabled its report (France 2003), which concluded that "the document does not adequately address the description of the activity, the drilling technique, contingency plans for environmental accidents or alternative solutions including testing the technology in similar but less critical situations" (CEP 2003, paragraph 22). This seemingly significant, critique stimulated further comments. The Netherlands saw the document complying with Annex I but not analysing worst-case scenarios, SCAR suggested that the project was at the current limits of both technology and glaciology and advised caution, and New Zealand canvassed whether high pressure beneath the ice (the focus of "blow-back" concerns) was in fact likely, and suggested SCAR review this. The CEP provided a page of advice to the ATCM (CEP 2003, Appendix 2) reflecting the critical analysis of the draft CEE and concluding with the recommendation that Russia carefully consider the advice and revise the final CEE to make it consistent with Annex I of the Protocol. It recommended that the ATCP endorse this view, which it did (Spain 2003, paragraph 61). Whilst it made no comments in the plenary of the ATCM, Russia responded, in the CEP report, that the comments:

> are of a generic nature and do not contain any specific proposals on the use of alternative technologies and methods to take water samples from Lake Vostok. Russia has an established procedure to consider applications for Antarctic activities, which allows it to meet all the requirements of the Protocol. The Russian Interministerial Commission will review the responses of Russian experts to the comments received, and this will occur within the context of deciding about the Permit required for the Lake Vostok water sampling project.

No discussion of Lake Vostok occurred at XXVII ATCM (2004) or at XXVIII ATCM (2005); but at XXIX ATCM (2006), Russia tabled two papers, a review of work over the 2005–2007 period (Russia 2006a) and an IEE for drilling a further 75 metres towards the lake (Russia 2006b). Both the UK and SCAR noted recent research suggesting the interconnection of subglacial lakes and the implications for penetration of Lake Vostok. A quite detailed discussion occurred in the CEP and concluded with a Russian statement that a final CEE would be presented at the next CEP meeting (CEP 2006, paragraphs 40–46).

Once again, this proved not to be the case. In addition to tabling a paper on preliminary results of research (Russia 2007), Russia reported to the CEP at XXX ATCM that in January 2007, in the course of further drilling, at 3,658.26 m the drill had become stuck. Extracting it had required use of "about 200 litres of antifreeze", which was later recovered. It undertook to provide details of that recovery at the next meeting of the CEP and said that the final CEE would also be presented at that ATCM (CEP 2007, paragraphs 86–90). Again, this proved not to be the case, and no discussion of Lake Vostok occurred in either the CEP or the main meeting at XXXI ATCM (CEP 2008). In July 2008, a senior Russian official was reported as saying that for "technical and legal reasons, penetration is not yet possible this coming season" and indicating that the final CEE would be tabled at the ATCM in 2009 and that they would "definitely drill into the lake in 2010" (Nature 2008). In fact, no discussion, let alone a final CEE, was evident at XXXII ATCM in 2009.

Meanwhile, international attention has if anything increased and the implications of getting it wrong in relation to Lake Vostok are increasingly situated in a wider debate about the integration of, and duties towards, what are now termed "Antarctic subglacial aquatic environments", the operative focus of a major study by eminent international scientists for the US National Research Council (Committee on Principles of Environmental Stewardship for the Exploration and Study of Subglacial Environments 2007).

The picture presented by the Lake Vostok EIA process, and specifically that part that has occurred since the need for a CEE was first recognised, is somewhat different to the US South Pole CEE process, not least in the extraordinary period over which it has now run, without producing a final CEE. Whereas the South Pole case was the first CEE process substantially to post-date entry into force of the Protocol (although clearly some parts of the planning and much of the draft CEE preparation occurred before this), the Lake Vostok process starts in the late 1980s, with the first drilling in 1990 before the adoption of the Protocol. To expect the early phases of a drilling project at Lake Vostok to fully comply with the Protocol would therefore be unreasonable. But of course, there were pre-Protocol obligations specifically addressed to such scientific drilling, in Recommendation XIV-3. A CEE should have been prepared under that recommendation. It was not.

From the entry into force of the Protocol in 1998, there was active consideration of the drilling project in both the CEP and ATCM and the wider international scientific community (involving papers, news reports and workshops) and Lake Vostok became probably the highest profile scientific activity in Antarctica, and certainly the most-

discussed EIA project. It has stimulated a quite thorough examination of the adequacy of current practice and legal obligation in relation to Antarctic subglacial systems generally (see Scott 2008 and references therein). Russia's draft CEE of 2002 (formally circulated in 2003) was submitted after the entry into force of the Protocol and the coming into effect of the CEE obligations in Annex I. The profile of the issue and this timing mean that from 2003, whatever the previous situation, the CEE process should have been back on track.

The substantive problem has been the fundamental difference in assessment of the project between Russia and other Parties. Cutting through all the niceties and diplomatic language, most in the international community have seen the penetration of Lake Vostok as potentially very environmentally risky, with significant potential losses to science if the lake was contaminated or otherwise damaged. In part, this is because as the first project and one involving the largest known lake and at the cutting edge of technical and scientific knowledge, it was seen as inherently problematical. But in part, it is also about what are perceived to be specific limitations in the technology, approach and sensitivity of the Russian project. No doubt part of this second view is rooted in chauvinism, but it also seems based on some cold-eyed assessment of Russian practices, capabilities and priorities. And here lays the rub.

Because they contest these concerns, and the prestige of the Russian state is at stake (in the way that the prestige of the US state was at stake when its South Pole CEE processes were contested) and the Protocol does not allow other Parties to veto an activity, ultimately the decision remains one for Russia. They have on one view been very tolerant of the successive critiques of their proposed activity and the various documents that they have tabled at ATCMs. As Bastmeijer and Roura (2008) noted in their examination of developments until late 2006, Russia has in fact complied with all the procedural requirements of the Madrid Protocol. So, it is not the case that Russia has blatantly ignored the concerns and pushed the project through—not yet anyway. What they have done is fractionate the project and sought to address parts of it in separate EIAs below the level of CEE, as they did through an IEE for a 75-m drilling section (Russia 2006b). Meanwhile, the promised point of delivery of the final CEE is forever next year. The risk must be that this putative final CEE arrives coincident with the actual penetration of the lake (intentional or inadvertent as that penetration may be).

So, the take-home message from this case study is not only what it reveals about a protracted and problematical process, and the inability of the EIA process at the highest level to stop what is plainly viewed as an environmentally very risky activity, but that in the end we may not even see the final CEE before the activity which it is supposed to address is essentially completed. We concur with Bastmeijer and Roura (2008) that this case study "shows the limitations of EIA in terms of environmental protection in Antarctica". Like everyone else, we hope that if Lake Vostok is penetrated, it will not be contaminated, that it will prove a brilliant scientific breakthrough providing major new scientific knowledge, and that the Russian scientists behind it get the recognition they deserve. The concern must be that this positive outcome occurs despite the very poor EIA process. In the event that the worst-case scenarios of contamination are realised, the ATS, the Antarctic science community, and not just the Russians, will wear the international disapprobation that results. Damaging the largest known subglacial lake on the planet would not be a slight failing, and its implications for confidence in the Antarctic EIA system and the environmental protection afforded by the Protocol will be considerable.

7 Conclusion: improving the CEE process

The Madrid Protocol aims to "enhance the protection of the Antarctic environment and dependent and associated ecosystems" (Preamble) and the Parties commit themselves to this in Article 2. As we have noted earlier, the environmental principles of Article 3 underpin the operational mechanism of EIA, whose specifics are established under Article 8 and Annex I. So, to the extent that one identifies limitations or deficiencies in any part of the EIA system—and we suggest that there are such in relation to CEE—one is pointing to deficiencies in the Protocol which ought, if possible, to be attended to.

Our proposal is a modest one. Almost 20 years after the adoption of the Protocol, and a decade after its entry into force, on the basis of the practice of CEE application, it is time to look at improving the CEE process. The Protocol was structured as a framework convention, with substantive issues of principle in the main text, and technical issues of the sort that might warrant subsequent development to reflect best practice dealt with in annexes. Accordingly, each of the five annexes in force, and Annex VI on liability still to enter into force, has a final identical article "Amendment or Modification". One annex (Annex II: Conservation of Antarctic Fauna and Flora) has just (after an admittedly problematical and extended review period) been amended through Measure 16 (2009) at XXXII ATCM (Antarctic Treaty Secretariat 2009b). Annex I (Environmental Impact Assessment) can also be amended. The CEP has anticipated a rolling review of other annexes, and we believe that the CEE process warrants attention when Annex I is examined. In anticipation of that review, in light of our foregoing analysis of the functioning of CEE to date, we suggest here five specific areas where the CEE process can be enhanced.

7.1 Earlier advice of CEE proposals

Part of the difficulty with CEEs is that by the time the draft CEE circulates internationally, the entire project that it examines will likely be well underway. The US South Pole rebuild project was underway for some years before the draft EIS/CEE was produced for domestic and Protocol processes, and this is probably typical for most large Antarctic projects. This means that quite fundamental decisions about the project have already been made, and there are significant stakeholders in particular outcomes in the proponent agency and elsewhere. There may be great resistance to change at this point. Logistics planning, dependent science programmes and people's careers are by now tightly coupled to the proposal.

There may, accordingly, be merit in examining mechanisms in advance of the circulation of a draft CEE, which would flag the intent to assess a particular proposal. During the floor discussions at the first session of the 1990 XI Antarctic Treaty Special Consultative Meeting in Viña del Mar, Australia mooted a notification to the ATCM in advance of the commencement of EIA that a proposal was under consideration. Advance notification to Parties and the CEP has some merit. Whether this is best done by adding to the existing advance information menu or is run as a quite separate information stream would be a matter for the ATCM to decide. The purpose of this advance notification would be to provide a heads-up that would allow first responses to reach the proponent (or their responsible state) before the project became too entrenched or inflexible. Whilst the particularities of the case may justify caution in drawing general conclusions from it, the example of the Czech station site changing as a result of discussion with other states before

it submitted its draft CEE suggests that early engagement may allow greater flexibility in relation to even quite substantial construction activities.

7.2 Enhanced CEP engagement with CEE proposals

The CEP will, as noted earlier, generally only be able to engage with a draft CEE via an ICG; there simply is not the time, nor often the expertise, to examine complex documents or processes at the annual 1-week session during the ATCM. But rather than waiting until a draft CEE is circulated before constituting the ICG there could be an opportunity to assign a CEP representative to the project at the time the drafting of the CEE starts—which should be known through the earlier advice suggested above. This would not alter the fact that prime responsibility for the process still resides with the proponent state, but it would allow an iterative process between the proponent, their state, and the CEP to commence much earlier. The CEP can now also engage through information technologies increasingly such as the online CEP Forum, which has recently been used to discuss CEEs.

As a result, the nature and form of CEP engagement with the CEE would change. The operator or responsible state would be the beneficiary of CEP-wide expertise, and the CEP would be the beneficiary of expertise from the CEE-conducting state. The CEP's capacity to offer useful comment would be strengthened; and by its earlier injection, the difficulties of accepting change to the project might be eased.

All of the CEEs to date have been available in English (some are probably also available in the native tongue of proponents for domestic purposes). Generally, only the non-technical summary of the draft CEE is translated into the four Antarctic Treaty languages (English, French, Russian and Spanish). Some Parties have argued that procedurally, discussion should not occur in the ATCM fora unless the whole document is translated, and it has been further argued that this is also a constraint on some forms of intersessional discussion of CEEs. The difficulty, of course, is that since CEEs are large documents and address complex issues in technical language (which of course is a key argument for having them available in one's familiar language) that the costs of translation would be very high. There would likely also be impacts on the draft CEE review timelines, since these documents will hardly be translated overnight. Unless and until either Parties are prepared themselves to provide their CEEs (at least draft CEEs) in the four languages, or sanction and finance the Antarctic Treaty Secretariat to do this, this issue will recur. We can offer no sensible resolution beyond the options canvassed, but since it has been a recurrent issue we feel it should be noted here.

7.3 Broadening the application of CEE

There is an argument for broadening CEE coverage beyond the continental fixed-point, land-based activities to which it is currently overwhelmingly confined. This argument goes to judgements that the objective risk posed by a broader range of activities (e.g. some sorts of scientific seismic traverses; major research cruises involving potentially intrusive technologies or encompassing very large areas; circumpolar or semi-circumpolar tourist cruises; very large tourism vessels) may also require consideration at the CEE level. But the point here is a slightly different one. It is that if CEEs are not confined to the prime activities of Parties directly or indirectly as national programme operators, it may be easier to get franker international scrutiny. It is unavoidably the case, unfortunately, that Parties see their engagement with other Parties over CEEs as involving diplomatic as much as environmental management issues.

In the case of CEEs applying to tourist activities or research vessel activity in Antarctic Treaty waters, this sensitivity might be slightly lessened. This could help build confidence that engagement on CEEs need not create tensions between Parties in relation to core geopolitical interests. We are not suggesting that the tensions evident in relation to stations and main science programme activities will be entirely absent in these instances, merely that they have a sufficiently different complexion that they might be less problematical.

7.4 Strengthening the CEP's advisory function

Recognising that Parties will be cautious about giving the CEP a capacity to veto an activity on the basis of its CEE, we nonetheless believe it is necessary to give the ATCPs some greater collective responsibility for activities subject to CEEs. At the point where Annex I is reviewed, Parties should explore ways to modify Article 3 so as to require the CEP to positively assent to a decision to proceed with an activity on the basis of the final CEE. It would of course, as an advisory body, have to do this in the form of its advice to the ATCM.

This, however, relies upon Parties establishing EIA at the CEE level when this is warranted by the potential environmental impact of the proposed activity. Existing practice suggests that the threshold of environmental impact for which a CEE is considered necessary has been pushed upwards in a number of cases. As a result, only about 5% of EIAs produced to date have been CEEs, even for projects involving the construction of new bases, buildings or infrastructure that have arguably resulted in "more than minor or transitory" impacts (Bastmeijer and Roura 2008).

7.5 Broadening the use of environmental assessment tools

Many ATCPs now have domestic and international experience of Strategic Environmental Assessment (SEA) outside the Antarctic Treaty area. SEA is a process of assessing the environmental effects of policies, plans and programmes preceding the process of EIA (and any subsequent authorisation) conducted for particular activities. Although distinct from EIA, its application in Antarctica represents a logical development of the EIA system established in Annex I. Ricardo Roura has, for ASOC, provided useful examinations of the SEA option in Antarctica (ASOC 2000, 2001, 2002). With Scott (2008), we see one of the generic limitations uncovered by the Lake Vostok affair as "the virtual absence of long-term holistic strategic and spatial planning". SEA would help address this.

The case for wider application of environmental auditing has been previously argued (Kriwoken and Rootes 2000). An environmental audit reviews activities, which have been subject to an EIA, analysing, inter alia, whether the activities were carried out as proposed, whether identified mitigation measures were in fact implemented and determining whether the actual impacts of the activity were as predicted in the EIA. In other words, it is a quality control on the original EIA.

New Zealand, in the CEP at XXXI ATCM, outlined an independent audit undertaken for the ANDRILL project previously subject to CEE (New Zealand 2008). In this case, the audit concluded that the programme was undertaken in compliance with the Protocol and largely in accordance with the CEE and that the impacts were believed to be within the environmental limits established in the CEE.

The Antarctic EIA system, and the category of CEE, has been with us for 23 years, with its present form determined in 1991. Over the two decades since much has been learned about

the conduct of EIA in Antarctica, and also about the potential, there as elsewhere, for human activity to impact upon the natural environment. The level of human activity in Antarctica has increased, and the nature of that activity has broadened. The Madrid Protocol set a new level for environmental standards in Antarctica in 1991, not least in agreeing to the first environmental management tool that would involve some level of international scrutiny of the actions of individual sovereign states there—the CEE process considered here. Twenty years is a reasonable period over which to evaluate state practice in relation to such a specific process. The picture is not an entirely dismal one to be sure, but there seems to us evidence of some systemic limitations that can no longer be explained away as bedding-in of new obligations. Since the Madrid Protocol was designed so that technical measures for environmental protection could be updated, and since a large part of the annual Antarctic Treaty Consultative Meeting is directed to environmental management, some serious international attempt to improve the CEE process seems entirely reasonable.

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