The use of science in environment-related investor-state arbitration

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1. INTRODUCTION

Scientific evidence and expertise have long been a feature of the international legal resolution of disputes raising environmental issues. Some of the earliest arbitrations in the history of international environmental law – the Bering Fur Seal Arbitration and its more famous arbitral cousin Trail Smelter – involved the consideration of scientific materials on factual questions. The technical nature of many environmental issues has made the resort to science essential for international decision-makers seeking to understand the facts of an environmental case. This was aptly illustrated by the Trail Smelter Arbitration, where a key question was whether any causal link existed between fumes emitted from the zinc smelter at Trail in British Columbia and damage to forests and farmland across the border in Washington State. Lacking physical evidence of any such connection, scientific findings were crucial to the Tribunal’s holding that gaseous sulphur dioxide in fumes emitted from the smelter generated acid rain that harmed plant life.

As the nature of environmental issues of societal concern has shifted over time towards ‘invisible’ harms that cannot be readily perceived by use of our senses – climate change,

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1 Pacific Fur Seal Arbitration (Great Britain v United States), Moore’s International Arbitrations, vol. I, 755 (1893); Trail Smelter Arbitration (US v Canada), 3 RIAA (1941) 1905.
2 Trail Smelter, ibid. Interestingly, the Tribunal was little impressed by the evidence presented by the parties’ experts in this regard given their conflicting views and the potential for bias in an adversarial setting. On this issue see further section 4.3 below.
ozone depletion, the accumulation of toxic chemicals, and contamination of waterways by pollutants – science has become ever more important to understanding these harms, how they arise, and the effects that they have on communities and the environment. This is reflected in the extent to which international environmental disputes embrace the consideration of scientific evidence, as well as the discussion of legal standards to be applied in assessing that evidence. These questions have preoccupied international adjudicators across a wide array of dispute settlement fora, including the International Court of Justice (ICJ), the International Tribunal for the Law of the Sea (ITLOS), and the Appellate Body of the World Trade Organization (WTO).  

It has been in the context of WTO dispute settlement that the use of science has attracted the most attention and debate. This stems primarily from the explicit appeal to science as a standard for judging the legitimacy of trade measures in agreements such as the Sanitary and Phytosanitary Measures Agreement (SPS Agreement). All SPS disputes to date have featured extensive consideration of scientific evidence, an approach that has bled into WTO disputes under other agreements such as the General Agreement on Tariffs and Trade (GATT) and the Technical Barriers to Trade (TBT) Agreement. This has forced WTO decision-makers to engage closely with questions about the relationship between law and science: What is scientific evidence? What level of scientific evidence is necessary to justify a particular trade measure? How should decision-makers deal with situations of scientific uncertainty? With what degree of rigour should decision-makers review scientific evidence put forward in support of a measure? How should decision-makers weigh scientific versus non-scientific inputs in decision-making? Other international tribunals – looking for answers to similar questions in their own contexts – have seen WTO practice as a model to follow.

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6 For discussion see Peel, above n4, chapter 5.

7 Ibid, chapter 6.

Investor-state arbitrations over environment-related regulatory measures have the potential to raise many of the same kinds of questions about the appropriate use of science as have been seen in the WTO SPS case law. As in the SPS context, where the state adopting a trade-restrictive measure is called upon to justify the measure by resort to scientific evidence and a risk assessment, a host state whose environmental regulation is challenged by an investor may put forth scientific arguments to establish the risks that animated the measure, or to substantiate its claim that those risks warranted particular action. Unlike the SPS Agreement, however, most treaties governing investor-state arbitration do not contain explicit reference to science or risk assessment – the field of inquiry into the role of science in international investment law thus ‘still presents embryonic features.’ Nonetheless, recent environment-related arbitrations show that science is playing an increasingly important role in the resolution of these disputes and raising similar questions for arbitrators as have been encountered in the WTO and other international dispute settlement settings. As investor-state arbitrations continue to gather pace in the environmental field, we can expect questions over the role of science to become more prominent as they have in other international dispute settlement fields.

This chapter takes stock of scholarly discussion and existing practice regarding the use of science in environment-related investor-state arbitrations. While this topic has not attracted the same degree of debate and discussion as in other international dispute settlement fora, ‘the issues are no less pressing’ as ‘the outcome of arbitrations involving challenges to health, safety and environmental measures may turn on the treatment given to science and scientific evidence by tribunals.’ Considering emerging practice in international investment law in the context of approaches taken in other areas of international dispute settlement also provides a basis for identifying likely future challenges and evaluating proposed approaches.

9 SPS Agreement, article 2.2 and article 5.1.
10 Valentina Vadi, Public Health in International Investment Law and Arbitration (Taylor & Francis, 2013), at 153.
The first part of the chapter discusses the circumstances in which questions over the use of science are likely to arise in environment-related investor-state arbitrations. The second part of the chapter turns to analyse case studies of environment-related investment arbitrations, which exemplify different approaches to the role of science. In general, arbitrators have shown reluctance to take a position on disputed scientific issues but vary in the way they then go about evaluating scientific evidence and risk conclusions put forward by a host state. The final part of the chapter expands on the challenges arbitrators face in using science to assess the justification for environmental regulations that affect investors’ rights. Key questions concern the standard of review to be applied in assessing governments’ risk evaluations and whether review should be limited to the acceptability of the process followed in reaching particular scientific conclusions. Other questions raised by the use of science in environment-related investment arbitrations include the role of the precautionary principle in dealing with scientific uncertainty and proof of harm, and the part experts play in advising arbitrators and informing arbitral decisions. Similar challenges are shared by other international adjudicators determining environment-related disputes, providing significant scope for learning from the more extensive experience in other dispute settlement fields.

2. INTERNATIONAL INVESTMENT LAW AND SCIENCE

Unlike international trade law under the WTO, international investment law lacks a centralised set of norms governing investor-state rights and obligations. Even so, the combination of customary international law, together with influential agreements such as the North American Free Trade Agreement (NAFTA) (that has served as a model for many bilateral investment treaties), means environment-related investor-state arbitrations tend to confront arbiters with a common set of questions, the resolution of which may require reference to scientific evidence. Science in this context is looked to

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12 On the international definition of the precautionary principle see further section 4.2 below.
for the same reason as it is in other international dispute settlement arenas; it provides a putatively objective basis for assessing the reasonableness of state measures alleged to harm investors’ rights.\(^{15}\)

Where a state measure affecting foreign investment is imposed for environmental or public health reasons, investors challenging the measure are likely to frame their claim in one of two key ways. First, an investor may claim the measure amounts to an expropriation – most usually indirect – of their investment.\(^{16}\) Second, an investor may allege a failure to accord it a required minimum standard of treatment. Depending on the relevant treaty context, this minimum standard of treatment may equate to the customary law standard requiring the avoidance of manifest injustice or gross discrimination, or to broader notions of ‘fair and equitable’ treatment.\(^{17}\) Often both types of breach of investment law rules are included in a single claim.

In justifying the need for its measure, the host state may produce scientific evidence or risk assessments that support the existence and extent of the public health or environmental risks involved. The investor challenging the measure may seek to show that this scientific material is simply a pretext for discriminatory motives or expropriation, or that the risk assessment process followed by the state prior to imposing the measure was not adequately science-based. The following sections describe, in more depth, these two main types of claims and ways that science might be used in these settings.

2.1 \textit{Science and expropriation claims}

New environmental regulations or other environmental decisions taken by host states often impact foreign investors adversely. Governments may seek to restrict or ban a product produced by an investor, may impose environmental protections on areas that


\(^{16}\) A direct expropriation involves a taking of title whereas indirect expropriation, which is more common, involves a taking of value or control of the investment: see Krista Nadakavukaren Schefer, \textit{International Investment Law: Text, Case and Materials} (Edward Elgar, 2015).

\(^{17}\) Ibid.
were to be the subject of development by an investor, or may refuse permits for an investment activity on the basis of its environmental impact. Such actions by host states may give rise to challenges to the environmental regulation concerned on the basis that the regulation constitutes an indirect expropriation of the investor’s investment. These claims navigate the fraught boundary between the regulatory sovereignty of host states and investors’ rights.\(^\text{18}\)

The *Metalclad* and *Methanex* NAFTA Chapter 11 cases discussed further in part 3 below illustrate the different ends of the spectrum arbitrators may reach in decisions on this issue. While the *Metalclad* tribunal endorsed a very broad view of what amounts to indirect expropriation of an investment, the *Methanex* tribunal concluded that ‘as a matter of general international law, a non-discriminatory regulation for a public purpose, which is enacted in accordance with due process and, which affects, inter alios, a foreign investor or investment is not deemed expropriatory and compensable.’\(^\text{19}\)

The tension between regulatory sovereignty and investors’ rights is most evident in arguments over the possibility for justification of the measure by the host state. Here the argument put is that any expropriation is legal because it is done for a public purpose and/or within the scope of the police powers of a state.\(^\text{20}\) Evaluating whether or not a measure serves a legitimate public purpose can pose substantial difficulties for an international tribunal,\(^\text{21}\) and it is common for arbitrators to afford deference to the host state.\(^\text{22}\) Scientific evidence will frequently play a crucial role in helping decision-makers define the line between valid regulation and a compensable taking. Indeed, as Orellana

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\(^\text{18}\) *Marvin Feldman v Mexico*, Doc. ARB(AF)/99/1 (16 December 2002).


\(^\text{20}\) See, e.g. *Saluka Investments BV (The Netherlands) v Czech Republic*, UNCITRAL Partial Award, 17 March 2006, para. 262: ‘the principle that a State does not commit an expropriation and is thus not liable to pay compensation to a dispossessed alien investor when it adopts general regulations that are ‘commonly accepted as within the police powers of States’ forms part of customary international law today.’

\(^\text{21}\) *Saluka*, ibid, referring to the lack of a bright line test in international law between non-compensable regulations and measures that have the effect of depriving foreign investors of their investment and are thus unlawful and compensable: at para. 263.

\(^\text{22}\) *Schefer*, above n16.
points out, ‘[i]n investment disputes concerning environmental measures, a defence based on police powers may appear spurious if not supported by scientific evidence.’

Just as the host state will often rely on scientific evidence and risk assessments to establish a legitimate public health or environmental purpose for its actions, so an investor is likely to utilise science in its armoury of legal arguments against the state measure. For instance, in respect of a product ban that affects the value of an investment, an investor might argue that the ban is arbitrary on the basis that it can provide scientific evidence showing its product is safe, or as safe as alternatives accepted by the host state. Scientific evidence presented by an investor might also seek to establish that the measure taken by the state is disproportionate to the risk it addresses, which in turn might suggest that the host state is acting in bad faith or in a discriminatory fashion.

2.2 Science and the minimum standard of treatment
Beyond measures said to amount to expropriation of an investment, an investor may claim that an environmental regulation violates required standards of host state behaviour towards the investor or its investment. Many investment treaties contain a requirement for the host state to afford national treatment so that foreign investors and investments do not receive less favourable treatment than domestic counterparts. NAFTA Article 1102, for example, requires national treatment in ‘like circumstances.’ This invites questions as to whether circumstances are ‘unlike’ where the public health or environmental risks associated with an investor’s products are not present for domestic product equivalents, hence providing a rational justification for differential treatment.

Science is key to arguments on both sides of this issue. Investors will seek to use scientific evidence to show that less favourable treatment cannot be objectively justified and therefore provides evidence of discrimination. The host state, on the other hand, will

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23 Orellana, above n15, 60.
24 Lévesque, above n11.
25 Ibid.
seek to defend its measure using science to show the different risks associated with the investor’s product that justify different treatment.

Investors may also raise arguments that a host state measure violates the customary law minimum standard of treatment (MST). The contours of the minimum standard have evolved over time.\(^{27}\) The essence of MST today is non-arbitrariness, i.e., that the action of the host state represents a reasonable and proportionate reaction to objectively verifiable circumstances.\(^{28}\) In general, breach of the MST requires conduct by a government amounting to gross misconduct, manifest injustice, or bad faith.\(^{29}\) As described by the arbitral tribunal in *Waste Management*:

*[T]he minimum standard of treatment of fair and equitable treatment is infringed by conduct attributable to the State and harmful to the claimant if the conduct is arbitrary, grossly unfair, unjust or idiosyncratic, is discriminatory and exposes the claimant to sectional or racial prejudice, or involves a lack of due process leading to an outcome which offends judicial propriety – as might be the case with a manifest failure of natural justice in judicial proceedings or a complete lack of transparency and candour in an administrative process.*\(^{30}\)

While some investment treaties contain a reference to MST only, others such as NAFTA Article 1105, also include a requirement for fair and equitable treatment (FET). It is not clear to what extent FET places more onerous requirements on a host state than MST. However, in the substantial litigation on FET there is the suggestion in several cases that the threshold for breach may be lower than in the case of a MST clause.\(^{31}\) Schefer argues that the content of the FET standard is solidifying in recent case law around elements of arbitrariness, denial of justice, violation of legitimate expectations, failure to afford due process, lack of transparency, and bad faith.\(^{32}\)

\(^{27}\) *Mondev International Ltd v United States*, ICSID Case No. ARB(AF)/99/2 (11 October 2002), 42 ILM 85 (2003), at paras. 116-117.

\(^{28}\) Schefer, above n16.

\(^{29}\) See *Glamis Gold Ltd v United States*, Award, NAFTA Chapter 11 Arbitral Tribunal, 8 June 2009, para. 627.


\(^{31}\) Lévesque, above n11.

\(^{32}\) Schefer, above n16.
For an arbitral tribunal evaluating these questions in the context of an environment-related case, the role of scientific evidence is likely to be important in two main respects: (1) evaluation of the risk and (2) determining the relationship between the measure and scientific evidence of risk.\(^{33}\) In evaluating risk, a key focus is often whether the host government has undertaken or relied upon a proper scientific evaluation or risk assessment. Arbitrators will be heavily reliant on expert evidence – whether provided by the parties or through independent experts appointed by the tribunal – in determining whether there has been a ‘proper’ risk evaluation underpinned by ‘sound’ science. Alternatively, arbitrators may seek to rely on procedural criteria, such as due process, transparency and compliance with scientific conventions of peer review, to avoid getting involved in questions over the scientific validity of alternative risk theories put forward by the host state and investor.

Equally difficult is the task of deciding whether a sufficient relationship exists between the state’s measures and an underlying risk evaluation. As WTO SPS practice has demonstrated, there is an important difference between adjudicative approaches that seek to determine the relationship between measures and *scientific evidence* (approaches that tend to invite a harder look at the underlying science) and those that seek to evaluate the relationship between measures and *a risk evaluation* (an approach which can be more deferential because risk assessments generally incorporate socio-economic considerations alongside scientific information).\(^{34}\) Lévesque suggests that investor challenges on the basis of the FET standard (as opposed to obligations relating to national treatment or expropriation) are likely to involve ‘frontal’ attacks on the underlying science in an effort to expose arbitrariness or unfairness in a host government’s conduct of regulatory science.\(^{35}\)

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\(^{33}\) Orellana, above n15.

\(^{34}\) Peel, above n4, chapter 5.

\(^{35}\) Lévesque, above n11, at 268.
3. **Role of Science in Environment-Related Investment Arbitrations**

Environment-related investment arbitrations make up a growing proportion of the investment arbitration case load and cover a wide range of topics from mining to renewable energy development, waste treatment and the control of hazardous chemical pollution. Reflecting the lack of an explicit reference to science or risk assessment in investment treaty language, there is no parallel to the detailed jurisprudence on the law/science interface that has developed in the context of disputes under the WTO SPS Agreement. There have been, however, a number of important investor-state environmental arbitrations that highlight the different roles science can play in this context and in the decision-making processes of arbitral tribunals.

The following sections highlight three such arbitrations: the early environment-related investor-state arbitration in *Metalclad v Mexico*, the prominent arbitration over Californian reformulated gasoline regulations in *Methanex v United States*, and one of the most recent environment-related arbitrations concerning environmental assessment of a mining proposal in *Bilcon v Canada*. These case studies illustrate three broad approaches that investor arbitral tribunals have taken to reaching decisions on the legality of state measures under international investment law in circumstances of disputed scientific facts. In all three cases, non-expert arbitrators have avoided dealing with the merits of different scientific claims. However, they differ in the method used to reach this result.

3.1 *Taking no position on disputed scientific facts: the Metalclad arbitration*

One approach that arbitrators may take when confronted with different positions on the environmental risks at stake in a dispute is simply to avoid reaching a decision on the

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underlying scientific issues. This was the tactic employed by the WTO Panel in the EC-Asbestos dispute, which concerned a French trade ban on asbestos and asbestos-containing building products, challenged by Canada under the GATT. While the parties disputed the extent of health risks posed by asbestos products, the Panel declared that it was ‘not its function to settle a scientific debate, not being composed of experts in the field of the possible human health risks posed by asbestos’ and hence that it did ‘not intend to set itself up as an arbiter of the opinions expressed by the scientific community.’ This approach has the advantage that it prevents arbitrators delving into questions over which is the better scientific argument – matters that they will generally be unqualified to adjudicate. The drawback, however, is the tribunal may end up implicitly taking a position on the science in reaching a decision on the legal issues in the dispute without any testing of different scientific arguments. The Metalclad arbitration discussed below illustrates this conundrum.

The Metalclad case was an early environment-related investment arbitration under the NAFTA that generated a lot of disquiet in the environmental community because of the broad definition it articulated of a measure ‘tantamount’ to expropriation. The Metalclad Tribunal held that:

… expropriation under NAFTA includes not only open, deliberate and acknowledged takings of property, such as outright seizure or formal or obligatory transfer of title in favour of the host State, but also covert or incidental interference with the use of property which has the effect of depriving the owner, in whole or in significant part, of the use or reasonably-to-be-expected economic benefit of property even if not necessarily to the obvious benefit of the host State.

41 Viñuales, above n38, at 120.
42 Metalclad Corporation v The United Mexican States, ICSID Case No. ARB(AF)/97/1, at para. 103 (Metalclad).
As Sands has remarked, this understanding of investment law rules regarding expropriation is ‘not premised on an approach which treats the protection of private property rights and the protection of the environment in an integrated manner.’

The *Metalclad* case concerned a U.S. company’s investment in a hazardous waste landfill in Mexico. Much of the case turned on deficiencies in the permitting processes for the facility at state and local government levels. The Tribunal found that Mexico breached the NAFTA FET standard by failing to provide an orderly and transparent process for Metalclad’s investment. It further held that, by tolerating the conduct of local authorities that denied the company the right to operate the landfill despite having received the necessary federal approvals, Mexico engaged in actions tantamount to expropriation.

A subsidiary claim raised by Metalclad related to an Ecological Decree issued by the State Governor in the final days of his administration declaring a Natural Area for the protection of rare cactus. This Decree covered the landfill site and effectively barred its operation. Although it was not necessary for the Tribunal to reach the question of whether the issue of the Decree amounted to expropriation, it nonetheless found that implementation of the regulation also amounted to conduct tantamount to expropriation.

The Tribunal reached this conclusion without explicitly examining the state government’s motivation and intent in adopting the Ecological Decree, and without considering any scientific evidence regarding the need for such biodiversity conservation measures. Instead the Tribunal seemed to regard the Decree as a pretext for preventing the operation of the landfill, stressing the fact that the Governor issued the declaration just three days before the expiration of his term after a protracted dispute over the landfill site.

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46 Ibid, para. 111.
Although scientific evidence did not feature prominently in the Metalclad arbitration and the Tribunal made no explicit statement – like the EC-Asbestos Panel – that it wished to avoid acting as a scientific arbiter on the environmental justification for the Ecological Decree, its decision on this issue can be seen as akin to that of the Asbestos panel. Implicit in the Tribunal’s ruling that the Ecological Decree amounted to an expropriation seemed to be an assumption that the Decree was a political sham unsupported by proper (scientific) evidence.

3.2 Adjudicating scientific process rather than science: the Methanex arbitration

The approach of the tribunal in the Methanex arbitration sits at the opposite end of the spectrum from that taken in Metalclad, perhaps reflecting some of the criticisms directed at the latter tribunal in the wake of the award.\(^{48}\) Like the Metalclad Tribunal, the arbitrators in the Methanex case eschewed making judgments on the scientific merits of the parties’ arguments. Leaving the correctness of competing scientific conclusions to one side, the Tribunal instead focused on the adequacy of the process by which those scientific conclusions were reached. This approach is similar to that adopted by the WTO Appellate Body in Continued Suspension of Obligations, the Appellate Body’s second decision in the long-running trans-Atlantic dispute over the health risks of hormone-treated beef.\(^{49}\) The Appellate Body in that case described the appropriate standard of review for scientific evidence as ‘not to determine whether the risk assessment undertaken by a WTO Member is correct but rather to determine whether that risk assessment is supported by coherent reasoning and respectable scientific evidence and is, in this sense, objectively justifiable.’\(^{50}\)

The Methanex case was brought by a Canadian company, Methanex, under NAFTA chapter 11, alleging breach of various provisions, including the expropriation and FET

\(^{48}\) The Tribunal’s Award was appealed to the Supreme Court of British Columbia which partially set aside the award but upheld the Tribunal’s findings on Article 1110 and its application to the Ecological Decree: see The United Mexican States v Metalclad 2001 BCSC 664.


\(^{50}\) Ibid, para. 590. A similar approach was taken by the ICJ in the Whaling decision. For discussion see Jacqueline Peel, ‘Introductory Note to Whaling in the Antarctic (Australia v. Japan; New Zealand Intervening) (ICJ)’ (2015) 54(1) International Legal Materials 1 (the text of the decision follows this note).
The company is the world’s largest producer of methanol, a feedstock for the fuel oxygenate, MBTE. Fuel oxygenates like MBTE were originally introduced in the United States as a way of reducing harmful emissions in automobile exhaust that contribute to smog and air pollution. However, MBTE subsequently became a source of environmental concern itself due to the threat of contamination of drinking water supplies.

In 1997, California – conventionally a state leader on environmental regulation in the United States – passed legislation requiring ‘a thorough and objective evaluation of the human health and environmental risks and benefits, if any, of methyl tertiary-butyl ether (MBTE)’ in comparison with ethanol-based alternatives. The legislation also called on the State Governor ‘to ensure that the air, water quality, and soil impacts of the use of MBTE are fully mitigated.’ The Californian legislation appropriated a half a million dollars to allow the University of California (UC) to undertake an assessment that was to be submitted to the Governor by 1 January 1999. The Governor was required to determine, on the basis of the assessment and any testimony presented at public hearings, whether using MBTE as a fuel additive posed a significant risk to human health or the environment and if so to take appropriate protective action.

The UC report assessing the health and environmental risks posed by MBTE was prepared by a multidisciplinary scientific team. The five-volume, 600-page report comprised seventeen independently prepared papers contributed by more than sixty researchers. The report concluded that the use of MBTE posed significant risks and costs associated with water contamination and recommended the phasing out of MBTE over a period of several years. The report was reviewed by relevant Californian and federal agencies and was also the subject of public hearings.

51 Methanex Corporation v United States of America, NAFTA Chapter 11 Arbitral Tribunal (2005) 44 ILM 1345 (Methanex)
52 Methanex, Part II, Ch D, para. 9.
53 Ibid, para. 10.
54 Ibid, para. 11.
55 Methanex, Part III, Ch A, para. 3.
Based on the UC report, together with its peer review by Californian and federal agencies, other experts, and findings from the public hearings, Governor Gray Davis issued an executive order in 1999 certifying that ‘on balance, there is significant risk to the environment from using MTBE in gasoline in California.’ \(^{57}\) He cited the ‘environmental threat to groundwater and drinking water’ due to ‘leaking underground fuel storage tanks.’ \(^{58}\) The Governor directed relevant Californian agencies to develop a timetable for the removal of MBTE from gasoline at the earliest possible date but no later than 31 December 2002. Regulations subsequently introduced to implement this executive order banned the sale or supply in California of gasoline produced with the use of MBTE. \(^{59}\)

Methanex’s case against the United States challenged the Californian MBTE ban and sought substantial compensation for resultant economic losses to the company’s methanol production business. According to Methanex, the real source of the problems of water contamination cited by California was leaking gasoline from underground storage tanks and the state’s inadequate regulation thereof. The company alleged that it was more cost-effective for the state to remedy the leaking tanks than to ban MBTE. By choosing ‘its irrational course of action,’ Methanex argued that California demonstrated ‘its intent to effectuate a discriminatory transfer of the oxygenate market from (a) methanol and MTBE producers to (b) ethanol producers.’ \(^{60}\)

Extensive scientific evidence regarding issues of health and environmental risk was presented to the Tribunal in the case, both on behalf of the defending state and Methanex. \(^{61}\) The Tribunal requested that, in their reports, experts comment on each other’s analyses and opinions, ensuring a form of peer review of that evidence. \(^{62}\) Most of the expert evidence focused on the strengths and weaknesses of the UC report and its constituent parts. The Tribunal described the expert testimony as ‘extremely important in

\(^{57}\) Ibid, para. 22.
\(^{58}\) Ibid, para. 21.
\(^{59}\) The full, complicated regulatory history is discussed in Part III, Ch A of the Award, paras. 20-36.
\(^{60}\) Methanex, Part II, Ch. D, para. 24.
\(^{61}\) This evidence was summarised by the Tribunal in Part III, Ch A of the Award.
\(^{62}\) Methanex, Part III, Ch A, para. 41.
this arbitration, going to the heart of the question of whether the US measures, as alleged by Methanex, constitute a “sham environmental protection in order to cater to local political interests or in order to protect a domestic industry”.'

For its part, Methanex sought to demonstrate that the Californian risk assessment underlying the MBTE ban was technically unsound. It described the UC report as ‘under funded, incomplete, and simply wrong on many critical points’. By contrast, the U.S. government defended the report as one reflecting ‘substantial scholarship,’ arguing that the risk assessment ‘constituted a thorough, multi-disciplined and academically sound scientific foundation for the measures thereafter adopted in California.’ In other words, the Tribunal was presented with diametrically opposed views of the scientific quality of the risk assessment underlying the Californian regulations.

Following a similar process-based approach to that later adopted by the Appellate Body in the Continued Suspension of Obligations case, the NAFTA Arbitral Tribunal in the Methanex Arbitration did not undertake a detailed review of the scientific merits of the UC report or the competing views presented by the parties’ experts respecting matters of environmental risk. Instead it pointed to the fact that the assessment – albeit open to the possibility ‘for other scientists and researchers to disagree in good faith with certain of its methodologies, analyses and conclusions’ – had been subjected to ‘open and informed debate,’ including ‘public hearings, testimony and peer-review.’ According to the Tribunal, the assessment’s ‘emergence as a serious scientific work’ from such a process was ‘the best evidence that it was not the product of a political sham engineered by California.’ In any case, the Tribunal also went on to hold that it was not persuaded that the risk assessment was scientifically incorrect, having been ‘much impressed by the scientific expert witnesses presented by the USA and tested under cross-examination by Methanex.'

63 Ibid.
64 Ibid, Part III Ch. A, para 38
67 Ibid.
68 Ibid.
The process-oriented approach of the Methanex Tribunal has been lauded by several commentators as a viable method to ‘relieve a tribunal from becoming ensnared in deciding the truth of scientific claims.’

Underlying this view is often a concern that stringent review of the scientific underpinnings of state measures would intrude too greatly on the regulatory sovereignty of host states. Hence confining review to issues of process is seen as a more deferential approach. However, as part 4 below explores in more detail, discerning the dividing line between science and scientific due process can be difficult in practice. In addition, the approach is not a guarantee that state measures will have an objectively justifiable basis: regulations can be adopted via a transparent and deliberative process but still be based on poor or speculative science. Equally, a process-based approach might operate adversely against measures soundly based in science but adopted via a deficient process.

3.3 Privileging technocratic risk assessment: the Bilcon arbitration

The Bilcon arbitral decision, issued in March 2015, illustrates that a reliance on evaluating process, rather than the merits of scientific claims, does not always translate into deferential review of a host state’s environmental decision-making. The approach adopted in this case has some echoes of that of the WTO Panel’s decision in the EC-Biotech case. In the Biotech case, the panel was adjudicating the WTO legality of the European Union’s (EU) scheme for the approval of genetically modified crops and goods. The Panel came to the conclusion that the EU regulatory scheme failed SPS requirements because of certain procedural defects in its implementation. It also found

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69 Orellana, above n15, at 72. See also Lévesque, above n11.
70 Viñuales, above n38.
that Member States’ ‘safeguard’ measures, banning genetically modified crops in their territories, failed to evaluate properly purported health and environmental risks, largely because measures were not supported by ‘a complete, self-contained, scientific evaluation’ of risks.\textsuperscript{74}

The core claim of investors in the \textit{Bilcon} case related to a decision of provincial and federal authorities in Canada to reject the investors’ proposal for a quarry and marine terminal at Whites’ Point in Nova Scotia. The focus of the investors’ challenge was the environmental assessment process conducted under provincial and federal law, which relied on recommendations of a specially-constituted Joint Review Panel (JRP). A key aspect of the JRP report and its recommended rejection of the project was the Panel’s reliance on the project’s conflict with ‘community core values,’ which the Tribunal understood as a combination of majority public opinion on the project, values enshrined in planning documents, local self-determination in planning matters, and inconsistencies with ‘community DNA.’\textsuperscript{75}

In the Tribunal’s view, ‘the “community core values” approach by the JRP … was at the very least a highly problematic basis’ for the panel to base its recommendations upon.\textsuperscript{76} Indeed, the Tribunal commented that the ‘community core values’ approach went beyond just being problematic and of itself did not warrant a finding of ‘likely significant adverse effects on the environment after mitigation,’ the standard referred to under relevant Canadian environmental assessment laws.\textsuperscript{77} According to the Tribunal, the decision of the JRP was in effect a ‘zoning decision’ that found the area concerned to be a ‘no go’ zone for projects of the kind proposed rather than including, at least as a major part of the process, a ‘proper assessment’ of the likely significant effects of the project on the environment and means for mitigating them.\textsuperscript{78} The Tribunal concluded on this basis that

\begin{itemize}
\item \textsuperscript{74} \textit{Biotech}, para. 7.3188.
\item \textsuperscript{75} \textit{Bilcon}, paras 502-504ff. The investors also raised arguments with respect to misapplication of the precautionary principle and the assessment of cumulative impacts but these points were not specifically reached by the Tribunal in its decision (paras. 728-730).
\item \textsuperscript{76} \textit{Bilcon}, para. 534.
\item \textsuperscript{77} Ibid, para. 535.
\item \textsuperscript{78} Ibid, paras. 454, 592, 740.
\end{itemize}
the approach to the environmental assessment adopted by the JRP and Canada breached the minimum standard of treatment guaranteed by Article 1105 of NAFTA.\textsuperscript{79}

The Tribunal’s findings on Article 1105, and its interpretation of ‘community core values,’ were strongly disputed in the dissenting opinion issued by Professor Donald McRae.\textsuperscript{80} Professor McRae, engaging more closely with the JRP report than the majority, saw the panel’s references to core values and community core values as part of its assessment of the socio-economic impacts of the project on the human environment, an element of the analysis that was within the remit of its authority. He warned that the majority’s approach had the potential to impose ‘a chill’ on environmental review panels ‘which will be concerned not to give too much weight to socio-economic considerations or other considerations of the human environment in case the result is a claim for damages under NAFTA Chapter 11.’\textsuperscript{81} Rather than a ‘problematic’ approach to environmental assessment, Professor McRae noted:

\begin{quote}
In this day and age, the idea of an environmental review panel putting more weight on the human environment and on community values than on scientific and technical feasibility, and concluding that these community values were not outweighed by what the panel regarded as modest economic benefits over 50 years, does not appear at all unusual.\textsuperscript{82}
\end{quote}

Accordingly he described the majority’s decision as ‘a remarkable step backwards in environmental protection.’\textsuperscript{83}

In its concluding remarks, the Tribunal was at pains to stress that an analysis of ‘likely significant effects after mitigation’ was not one that places ‘economics or technology above human concerns’ and that ‘[s]cientific and technical concerns, along with public input, inform an assessment of potential effects and the exploration of options for

\textsuperscript{79} Ibid, para. 604.
\textsuperscript{80} The Claytons and Bilon Inc v Canada, Dissenting Opinion of Professor Donald McRae, available at http://www.pca-cpa.org/Dissenting%20Opinion%20of%20Professor%20Donald%20McRae956b.pdf?fil_id=2905.
\textsuperscript{81} Ibid, at para. 51.
\textsuperscript{82} Ibid.
\textsuperscript{83} Ibid.
reducing or eliminating them.”\textsuperscript{84} However, its comments on the deficiencies of the JRP process and report throughout the Award give substance to Professor McRae’s criticism that the majority adopted a narrow approach to the nature of environmental assessment necessary to meet NAFTA standards. For instance, the Tribunal referred to its understanding ‘that the whole purpose of a JRP process was … precisely to engage in a \textit{thorough, methodical, evidence-based, consultative and deliberative planning exercise}, and thereby address the risks of the project, assess their magnitude and likelihood and help find ways to mitigate them.’\textsuperscript{85} At another point in the judgment, the Tribunal noted its ‘concerns about the JRP’s failure to fulfil its mandate under federal Canada’s environment laws to conduct a \textit{rigorous analysis of the specifics of a project}, including careful and comprehensive information-gathering, estimation of risks, and identification and evaluation of means of preventing or mitigating adverse effects.’\textsuperscript{86}

These remarks correlate well with a technical, science-based environmental risk assessment. The Tribunal, similarly to the WTO Panel in the \textit{Biotech} case, thereby seemed to be setting such an assessment as the default standard for appropriate treatment of investors’ projects, rather than a broader assessment of the kind undertaken by the JRP, which incorporated consideration of the socio-economic impacts of the project on the human environment. Like other approaches to the use of science in investment arbitration considered in the previous case studies, the \textit{Bilcon} Tribunal’s approach avoids entanglement of arbitrators with difficult questions around the validity of particular scientific conclusions; it does so by deferring the decision of whether those scientific conclusions are correct to the technical rigour of the process followed to reach them. The disadvantage, as Professor McRae’s dissenting opinion in \textit{Bilcon} highlights, is that a technical environmental risk assessment may be too narrow to capture the full range of impacts considered relevant by democratic regulatory states.

\textsuperscript{84} \textit{Bilcon}, para. 736.
\textsuperscript{85} Ibid, para. 530 (emphasis added).
\textsuperscript{86} Ibid, para. 548 (emphasis added).
4. Challenges for Using Science in Environment-Related Investment Arbitrations

The case studies considered in the previous part highlight the challenges arbiters face concerning the use of science in environment-related investment arbitrations, even in circumstances where arbiters avoid detailed engagement with the scientific issues in dispute. Indeed, on this point, investment arbitration practice so far seems to be diverging from the WTO SPS jurisprudence. The latter has featured much more stringent scientific review, most likely driven by the direct textual reference to science in the SPS Agreement as a standard of legitimacy for trade-restrictive SPS measures. While investment arbitral tribunals seemed to have avoided the perils of overly stringent scientific review – that can raise question marks over the competence and legitimacy of international tribunals to undertake such an assessment – alternative approaches have their own drawbacks as the case studies highlight.

The question of how tribunals should approach the assessment of scientific evidence in investment disputes is often cast in terms of the appropriate ‘standard of review’ to be adopted by arbitrators, with several commentators calling for ‘due process’ review of the kind used by the Tribunal in the Methanex case. Other potential issues relevant to the use of science in investment arbitrations have not (yet) been a significant feature of arbitral practice, although comparative experience from other areas of international dispute settlement suggests they are likely to be encountered in future disputes. One example concerns the question of how arbiters should approach issues of scientific uncertainty and whether the application of the precautionary principle is appropriate in these circumstances. Another is whether tribunals should incorporate greater reliance on independent expertise to buttress their assessment of scientific evidence in complex environmental arbitrations. These issues are canvassed in more depth in the following sections.

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87 E.g., Orellana, above n15; Lévesque, above n11; Vadi, above n10, at 157-158 (comparing this approach with the ‘margin of appreciation doctrine’ developed by the European Court of Human Rights).
4.1 Standard of review

The concept of ‘standard of review’ is one borrowed from WTO law and has also been a feature of domestic law and practice on the evaluation of science-based regulations.\(^{88}\) The standard of review refers to the degree of scrutiny to be applied by arbiters to disputed issues of fact (and law).\(^{89}\) A deferential standard of review gives substantial scope to a host state to apply its own interpretation of scientific facts and to reach its own conclusions on environmental risk.\(^{90}\) Therefore, a deferential standard of review is often seen to be protective of regulatory sovereignty in this field. By contrast, a less deferential standard of review – or application of a ‘hard look’ standard as it is referred to in U.S. regulatory practice – involves much closer examination of the available scientific evidence and the relationship of state measures to that evidence.\(^{91}\) Because it requires an international tribunal to take a ‘hard look’ at the scientific underpinnings of regulatory measures, the concern is often raised that this approach may trespass unduly on the regulatory sovereignty of the host state.

Advocates of a process-based approach to review of contested scientific facts in WTO and investment law disputes frequently see this as an optimal means to balance concerns over protecting the regulatory sovereignty of states with the need for some disciplining of the way that states decide on measures that will affect the rights of traders or investors.\(^{92}\)

In the real world, however, the dividing line between scientific due process and scientific facts can be difficult to discern. For instance, if a tribunal insists on peer review of scientific conclusions or that the evaluation process involves qualified scientists and reputable science this will tend to privilege some kinds of information over others in

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\(^{88}\) As Vadi notes (above n10, at 155-156), most bilateral investment treaties do not explicitly define the standard of review to be adopted by arbitral tribunals thus leaving this issue to adjudication.


\(^{90}\) In Chemtura v Canada, Ad Hoc NAFTA Tribunal under UNCITRAL Rules, Award, Aug. 2, 2010, at http://www.worldcourts.com/pca/eng/decisions/2010.08.02_Chemtura_v_Canada.pdf, the Tribunal noted that it was ‘not its task to determine whether certain uses of lindane are dangerous’ and that ‘the role of a Chapter 11 Tribunal is not to second-guess the correctness of the science-based decision-making of highly specialized regulatory agencies’ (para. 134). However, the Tribunal did not advocate total deference stating review ‘must be conducted in concreto’ (para. 98) taking ‘into account all the circumstances, including the fact that certain agencies manage highly specialized domains involving scientific and public policy determinations’ (para. 123).


\(^{92}\) E.g., Orellana, above n15; Lévesque, above n11.
determining whether there was a reasonable basis for the measures taken. There is also no guarantee, as U.S. risk regulatory review practice illustrates, that process-based review will afford more deference to states than hard look review. In the United States, judicial review of risk regulation over time imposed such stringent procedural standards for science-based regulatory action that it led to concerns of regulatory ‘ossification.’

Onerous procedural requirements may also be as difficult for some states – particularly developing states – to observe as stringent scientific requirements (indeed, the latter may be easier to meet if a developing country is drawing on international standards and risk assessments to justify its measures).

Ultimately normative judgements are still required in order to determine what amounts to an adequate process. In the investment context this involves judgements – whether implicit or explicit – about whether to emphasise environmental protection and the regulatory sovereignty of states, or investor rights. This is one way to understand the different decisions in the Metalclad and Methanex cases. In the former dispute, protection of investor rights seemed to be at the forefront of the Tribunal’s mind, a perhaps not surprising preoccupation given that it was being asked to arbitrate on questions of the breach of investment treaty law requirements. For the Methanex Tribunal, however, it seemed that its decision to uphold the challenged Californian regulations was underpinned by a preference for the normative claims of public interest environmental protection over those of private investors. If international investment institutions are committed to ensuring democratic legitimacy, this would supply a credible normative basis for upholding state environmental measures that are underpinned by assessments that are produced via a transparent process and embrace wide-ranging participation (including, arguably, from outside the polity concerned).

As the author has argued elsewhere, simply shifting the focus of international review of state measures from matters of scientific substance to those of regulatory process will not

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do away with the need for value judgments about environmental risk. It may be possible though to construct a framework around the arbitral process that allows arbiters to better justify decisions according to the characteristics of the risk situations they face in any dispute. For example, in situations where there is strong public backing for a host state measure and contested understandings of the extent or nature of the environmental risks involved a more deferential standard of review, confined to procedural aspects, might be warranted. On the other hand, in circumstances where a technical understanding of risk accords with social values and issues of scientific uncertainty are not significant, a harder look by the tribunal at the adequacy of the underlying scientific support for a measure may be the better approach.

4.2 Role of the precautionary principle
Host state measures taken for environmental purposes are not always supported by conclusive scientific evidence. Particularly in situations where the host state is trying to respond to emerging risks associated with new technologies, novel development proposals, or activities taking place in poorly characterised ecosystems, there may be significant areas of uncertainty in the available science. In the broader field of international environmental law, the response to issues of scientific uncertainty has been guided by application of the precautionary principle. In its most widely cited international legal form in Principle 15 of the Rio Declaration, the precautionary principle provides:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

The precautionary principle has given rise to a number of disputes in international environmental and trade law, particularly over the circumstances in which it applies and

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94 Peel, above n4, at 355.
the nature of the response required.\textsuperscript{97} While it has not been a feature of international environmental investment arbitrations to date, it would seem to be only a matter of time until arbiters are called upon to adjudicate questions over the role of the precautionary principle in assessing the justification for host state regulatory measures.

Unfortunately, there is little clear guidance from other areas of international dispute settlement on questions concerning application of the precautionary principle. International tribunals have generally been reluctant to pronounce on the customary law status of the precautionary principle\textsuperscript{98} (though in the writings of jurists this position is often advanced)\textsuperscript{99} and where tribunals have applied a ‘precautionary approach’ they have often done so in a cautious fashion framing it as a call for ‘prudence and caution’ where issues of scientific uncertainty arise.\textsuperscript{100} What is evident from the international case law as it stands is that there is little appetite currently for strong applications of the precautionary principle. A strong interpretation of the precautionary principle might, for example, reverse the burden of proof so it falls to an investor to show that there is insufficient scientific evidence to support a particular host state measure, rather than to the host state to justify its measure on the basis of science and a risk assessment. In the case of \textit{Pulp Mills}, the International Court of Justice reinforced this view declaring:

\begin{quote}
… the Court considers that while a precautionary approach may be relevant in the interpretation and application of the provisions of the [treaty in dispute], it does not follow that it operates as a reversal of the burden of proof.\textsuperscript{101}
\end{quote}

A more probable interpretation of the precautionary principle that could be applied by international investment arbitrators is one that adjusts the relevant standard of proof to

\textsuperscript{97} Philippe Sands and Jacqueline Peel, \textit{Principles of International Environmental Law} (4\textsuperscript{th} ed, Cambridge University Press, 2012) at 223-228.


\textsuperscript{99} See particularly, Arie Trouwborst, \textit{Evolution and Status of the Precautionary Principle in International Law} (Kluwer, 2002).

\textsuperscript{100} E.g., \textit{Southern Bluefin Tuna Case (Australia, New Zealand v Japan), Provisional Measures} (1999) 38 ILM 1624.

compensate for the absence of conclusive evidence of harm. This is arguably what the International Tribunal for the Law of the Sea did in the Southern Bluefin Tuna Provisional Measures case when faced with incomplete scientific evidence on the status of fisheries. Despite scientific uncertainty over tuna stock levels in that instance, the Tribunal took the view that there was a serious threat to the marine environment and called on the parties to apply ‘prudence and caution’ in determining appropriate catch limits. ¹⁰² Similarly, an investment tribunal faced with uncertain evidence of environmental risk could adopt a precautionary approach in evaluating that evidence by requiring a less stringent standard of proof from the host state adopting the measure. ¹⁰³ This might involve, for instance, accepting preliminary scientific studies or findings that are suggestive of risk rather than insisting on published scientific evidence that meets conventional scientific standards of proof.

4.3 Experts

Another issue that has not featured significantly in environment-related investment arbitrations to date but which is likely to come to the fore as the case load continues to increase is the role of independent experts as advisors to an arbitral panel. In cases to this point, like the Methanex case, where scientific evidence has been disputed, tribunals have been reliant on the scientific information and expertise provided by the parties. The adversarial system adopted in international arbitrations pits parties’ experts against one another and can frequently lead to distortions in the scientific evidence put to decision-makers as experts are pressured to put their best case in support of their side. There are some techniques available to ameliorate potential biases in these circumstances, such as ‘expert conferencing,’ which encourages experts to identify areas of agreement and narrow points of remaining disagreement. ¹⁰⁴ In the Methanex Arbitration, the Tribunal applied a similar approach by asking the experts from either side to review and comment on each other’s reports. This approach allows for a form of peer review of the scientific

¹⁰² Southern Bluefin Tuna Case (Australia, New Zealand v Japan), Provisional Measures (1999) 38 ILM 1624, at para. 77.
¹⁰³ See also Viñuales, above n38, at 377-380.
¹⁰⁴ See further Foster, above n5.
evidence presented by parties that may help to check the potential for exaggerated scientific claims on either side.

An alternative approach, which has been used extensively in the WTO SPS context, is for the tribunal itself to appoint an independent expert or experts to assist the tribunal in its assessment of the scientific evidence. Provisions for the appointment of independent experts already exist in several bodies of arbitral rules that are frequently used in investment arbitration. Drawing on independent experts has the advantage that the tribunal is not dependent on the parties’ (potentially biased) experts to inform its opinion of the scientific merits of a case. Again though, the WTO SPS experience suggests the need for caution in going down this path. There remains a substantial risk that non-expert arbiters will feel the need to defer to expert assessments of scientific evidence, which may effectively delegate their decision on the legality of a measure. Use of independent experts also raises a number of complex procedural questions for tribunals, including how many experts to appoint, across what disciplines, how experts are to be selected and what criteria are to be used in assessing their qualifications and independence. This is not to say that the use of independent experts as advisors to a tribunal should be avoided in all cases – it may be very helpful, particularly where a case involves a lot of technical evidence that would otherwise be difficult for the tribunal to digest – but it requires vigilance on the part of the tribunal to ensure that deference to experts on scientific matters does not displace their role as arbiters on the legal questions in dispute.

5. CONCLUSION

Study and practice concerning the role of science in environment-related investment arbitrations is at an early stage of development. Scientific issues have tended to remain in the background of most environment-related cases, with rare exceptions like the

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105 Pauwelyn, above n40.
106 For instance, Viñuales, above n38, discusses Article 27 of the UNCITRAL Arbitration Rules, Article 6(1) of the IBA Rules and Articles 27(1) and 24(4) of the PCA Optional Rules as examples in this regard.
107 The complexity of these issues was illustrated by the Appellate Body’s decision in United States – Continued Suspension of Obligations in the EC-Hormones Dispute, Report of the WTO Appellate Body, WT/DS320/AB/R, 16 October 2008.
Methanex Arbitration. That arbitration pointed the way to one viable method for investment arbitral tribunals to approach the role of science in environmental cases without themselves becoming entangled in difficult scientific judgments. The Methanex Tribunal’s process-based approach has several advantages, especially in situations where there are contested understandings of the risks at hand and an overriding concern to safeguard democratic regulatory processes. As the chapter has illustrated, however, there are a range of other approaches that can and have been taken by tribunals in evaluating environmental measures and their underlying scientific basis. As this area of law evolves further we might expect that it will begin to encounter more complex questions around the use of science and expertise to justify regulatory measures, such as those that have been seen in other areas of international dispute settlement, particularly in the WTO SPS jurisprudence. These include not only questions around the appropriate standard of review to be applied by tribunals in assessing scientific material, but also how to manage issues of scientific uncertainty and how best to structure processes for gathering and assessing expert opinion.