Executive Summary

This report is an examination of relevant international law which Australia has ratified and its relationship to Australia’s renewable energy sector. The objective of the report is to identify the barriers that this international law may present to the uptake of renewables, and how these barriers may be mitigated or removed.

The report examines six key areas: three general issues (trade, investment and the Clean Development Mechanism) and three technology-specific areas (wind/hydro, biomass and offshore facilities), the barriers created by international law in these areas, and opportunities for mitigation of those barriers.

Trade

This section considers Australia’s existing and future trade agreements and their effects on the development of the domestic renewable energy industry and the international trade in renewable energy and its associated products and services. The section identifies renewable energy barriers and opportunities under core concepts of key international instruments such as World Trade Organisation Agreements and Bilateral Free Trade Agreements. The core concepts include general trade obligations, tariffs, regulations and standards, government procurement, subsidiaries and taxes and energy specific provisions and there is a particular focus on renewables technologies and services such as solar, wind, geothermal, and biofuels.

Other trade related issues such as concern for development of domestic policies, protection of intellectual property when exporting and commercial difficulties faced in other jurisdictions are also canvassed following discussions with representatives of Australia’s renewables technologies industry.

In general, discussions indicated that, to date, the Australian renewable energy industry has encountered few trade barriers. Instead, their primary concern was for domestic policies that would foster development of a robust Australian industry,
which could then expand its export potential. Major concerns for doing business internationally include protection of their intellectual property when they export renewables technology or site facilities abroad, and the frustration of dealing with myriad local requirements (or their selective non-enforcement) when doing business in certain countries, including China. These problems of intellectual property protection and enforcement are not unique to the renewables sector and, while they can be a priority issue in FTA negotiations they would not often lead to renewables-specific terms.

**Investment**

This section considers how Australia’s existing and future investment agreements with other nations may facilitate or restrict the implementation of policies to encourage investment in renewable energies. While it would seem that international investment agreements (IIAs) would be designed to encourage and promote investment in renewable energy, the core concepts in IIAs may in fact unintentionally restrict the ability of host country governments to adopt policies for that purpose. In addition, concerns have also been raised that the protections in IIAs may not extend to the full range of “investments” associated with renewable energy. For example:

- the specifics of the definitions in IIAs can have significant implications related to renewable energy policies by potentially excluding coverage of tradable renewable energy certificates (TRECs);
- the concepts of “national treatment,” “most-favoured nation” and “non-discrimination” under the general standard of treatment may limit a host country’s ability to implement Renewable Portfolio Standards if they are interpreted as discriminating against investments in energy projects that are not included in the RPS; and
- provisions relating to expropriation may be used by fossil fuel energy investors to challenge newly adopted incentives for renewable energy on the grounds that they reduce the value of its investment and therefore constitute a ‘regulatory taking’.

These concerns can be largely overcome by effective treaty design and proper consultation with all relevant parties prior to entry into new IIAs.

**Clean development mechanism**

As Australia has now ratified the Kyoto Protocol, Australian companies will be eligible to fully participate in the Clean Development Mechanism (CDM) once Australia has satisfied the eligibility criteria (namely, the establishment of a designated national authority and the fulfillment of certain methodological and reporting requirements, including:

- Implementing a national system for estimating greenhouse gas emissions from sources and removals of emissions by sinks; and
● Submitting an annual inventory covering all emissions and removals of greenhouse gases not covered by the Montreal Protocol; and

● Providing all necessary supplementary information required to ensure that Parties do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments.

Until that time, under the international rules Australian companies are still permitted to take advantage of the opportunities offered by the CDM:

● As project participants in an approved project, provided approval can be obtained from an Annex I party that has satisfied the eligibility criteria and has indicated that it will approve the participation of companies from anywhere in the world (for example, the Netherlands and Switzerland).

● As a project developer in a joint venture arrangement, under which the Australian company supplies technology, equipment or intellectual property to its joint venture partner; or

● By purchasing and trading CERs through a national registry account.

Wind/hydro

Wind and hydro are grouped together for the purpose of this study because they are both large scale electricity generators that rely on environmental features in specific locations, and therefore face similar barriers to development (i.e. conflicts with the competing objective of biodiversity protection).

Wind energy is the most rapidly growing source of renewable energy worldwide, and the fastest growing renewable energy industry in Australia. However, while wind energy development does result in substantial environmental benefits compared to traditional fossil fuel-fired electric generation, the construction and operation of both onshore and offshore wind turbines may result in potential negative environmental impacts on birds, bats and cetaceans, landscapes, sustainable land use (including protected areas), and the marine environment.

The hydro-electricity industry has the largest installed capacity in the Australian renewable energy sector. Since hydro-electric resources typically require a large dam, or series of dams, to store the water required to generate electricity, such installations may bring about considerable environmental change, as local flora and fauna are displaced and habitat is flooded. Dams may also change groundwater flows, which can change the ecology of surrounding areas. No new large dams have been built in recent times in Australia for hydro-electric storage.

In light of these environmental effects, certain provisions of international biodiversity conventions (and the legislation that implements these provisions in Australia) may create significant barriers for the development of these industries, by requiring governments to take action to conserve biodiversity and therefore prevent the construction and operation of wind and hydro facilities. Concrete planning and development guidelines that take into account the reduced impacts of best practice technology, and that are formulated in consultation with all relevant stakeholders, is
particularly important in minimising the impacts of these conventions on the uptake of wind and hydro energy.

**Biomass**

The environmental effects of biomass operations have the potential to raise two distinct issues under international law. Firstly, biomass installations that use municipal solid waste or other industrial or chemical waste as a raw material may produce hazardous waste within the meaning of the Basel Convention, which must be transported and disposed of according to the provisions of that convention. As this Convention applies only to *transboundary* movements of hazardous wastes, it is not currently relevant for the Australian biomass industry.

Secondly, biomass firing installations produce gases containing chemicals whose production is restricted by the Stockholm Convention. The Convention obliges state parties to take measures to eliminate or reduce the release of persistent organic pollutants (POPs) into the environment, and imposes specific obligations on parties to reduce the use of biomass fuels where they do in fact produce POPs. The obligations under the Stockholm Convention may thus create a significant barrier for the development of biomass renewable energy industries within State Parties. However, through early support mechanisms, the government may be able to ensure compliance with the Convention while not disadvantaging the emerging biomass industry.

**Biofuels**

This section provides an overview of the two key biofuels with commercial prospects in Australia, ethanol and biodiesel. Currently, ethanol and biodiesel are classified separately and differently under the World Customs Organization’s Harmonized Commodity Description and Coding System (HS).

Ethanol is deemed an agricultural good under the HS. It is also included in the coverage of the WTO Agreement on Agriculture (AOA) by inclusion in Annex I. As such, it will be easier to maintain higher tariffs and higher subsidies on ethanol than it would if it were considered an industrial or environmental good. Some WTO members have expressed an interest to have ethanol classified as an environmental good which would result in the reduction of subsidies available under Paragraphs 31(iii) and 16 of the Doha Ministerial Declaration (DMD). As an environmental good, the protection of the domestic market of ethanol could be justified as within the ‘green box’ under the AOA.

Biodiesel is considered a chemical good under Chapter 38 of the HS and is not currently included in the Agreement on Agriculture Annex I. It is therefore not eligible for the same market protections as ethanol. It is possible that biodiesel could be considered an environmental good or to be of export interest to developing countries, thereby liberalising the trade of biodiesel under Paragraphs 31(iii) and 16 of the DMD.
Offshore facilities – wind and ocean energy

Considerable environmental benefits arise from the use of offshore wind energy and ocean energy, as they are produced with zero emissions of greenhouse gases and other pollutants such as nitrogen oxides and sulphur oxides. At the same time, however, the construction and operation of offshore wind turbines is alleged to result in potential negative environmental impacts on cetaceans, landscapes and the marine environment. Similarly, taking energy from ocean movements and currents may cause changes to flow patterns as well as shoreline and seabed disturbance due to construction of inter-tidal and above sea structures, sedimentation and erosion, and impacts of wave, tidal and ocean current hydro installations on marine wildlife resulting from collision has also produced some concern.

The international conventions that seek to deal with the protection of the marine environment may therefore pose barriers to the development of offshore renewable energy industries. For example, the United Nations Convention on the Law of the Sea (UNCLOS) imposes restrictions on the rights of states to use and exploit ocean resources, including by prohibiting pollution, regulating the disposal abandoned structures and creating safety zones for sea lane navigation. Appropriate design and careful removal of renewable energy installations at the end of their lifetime may serve to remove the barriers posed by these conventions for the expansion of the offshore wind and wave hydro industries.

INTRODUCTION

This report is an examination of relevant international law which Australia has ratified and its relationship to Australia’s renewable energy sector. The objective of the report is to identify the barriers that this international law may present to the uptake of renewables, and how these barriers may be mitigated or removed.

The report will review a variety of international law documents and the corresponding domestic legislation to address the following major questions:

(a) What are they key international legal instruments ratified by Australia that are relevant to the renewable energy industry, and how have these instruments been enacted into Australian legislation?

(b) What barriers, intended or unintended, do these international instruments, as well as the domestic laws that enact these instruments, create for the development of the renewable energy industry?

(c) How can these barriers be managed or removed?

SECTION I: OVERVIEW OF THE AUSTRALIAN RENEWABLE ENERGY INDUSTRY

Australia has a diverse and innovative renewable energy industry which produced around 8% of the nation’s electricity in 2006, the latest date for which industry-wide figures are available.1 The industry also has annual sales of almost $2 billion (how to
indicate Australian dollars?) and an estimated $8 billion invested in assets that generate electricity. Approximately $257 million has been invested per annum over the past five years, and a further $369 million in investment is anticipated over the next three years under the Mandatory Renewable Energy Target (MRET). With the change in Australia’s Government, the Coalition’s proposed Clean Energy Target has been abandoned. The new Labor Government has set a target for 20% of the national electricity supply to be generated from renewable sources by 2020. Labour plans to expand MRET targets from 9,500 GWh of renewable energy by 2010 to 45,000 GWh by 2020 and utilise existing renewable energy capacity to ensure Australia reaches its 20% renewable energy by the 2020 target.

Prior to the commencement of the MRET scheme, Australia’s renewable energy industry was primarily focused on large hydro-electricity production facilities. Several small-scale biomass generation projects were also developed in this period. Since 2001, hydro-electric and biomass capacity has continued to experience slow growth, fed in part by the realisation of efficiency gains and the refurbishment of infrastructure at existing generation sites. By contrast, solar PV and wind capacity has experienced rapid growth. However, while the installed capacity of renewable energy has grown, the actual percentage of electricity delivered to the national market from renewable energy sources has steadily fallen from around 11.5% in 1998 to around 8% currently.

Australian industry’s strong focus on research and development, however, has enabled the development of world-leading technologies, including in the field of thin film and silicon silver photovoltaics, hydrogen cells, photovoltaic concentrator technology, wind industry services, geothermal and wave hydro technology.

In addition to technological advances, several Australian companies have built successful manufacturing businesses around renewable energy products and components. Key examples include BP Solar and Origin Energy’s solar PV manufacturing plants, Szencorp’s energy conservation systems, Energetech Australia’s wave energy devices, Keppel Prince and Air-ride Technologies tower manufacturing as well as a number of major manufacturers of solar water heaters led by Rheem Solahart.

Finally, there are a number of successful consulting and project development companies participating in the renewable energy services sector both internationally and at home.

SECTION II: LEGAL ISSUES

This section will review the manner in which Australia’s domestic legislation implementing its international law obligations may impact on the Australian renewable energy industry.

First, we will consider some general issues that may impact upon all Australian renewable energy sector participants (notably trade, including the Australia-US Free Trade Agreement, investment, and the Clean Development Mechanism).

We will then examine each renewable technology exploited by Australian industry in turn (wind, biomass, hydro, solar and geothermal), and consider the issues for the
commercialisation and development of these technologies posed by domestic implementa-
tions of international law.

1. TRADE

This section will consider how Australia’s existing and future trade agreements with
other nations may facilitate or restrict the development of the domestic renewable
energy industry and the international trade in renewable energy and its associated
products and services. It focuses on renewables technologies and services such as
solar, wind, geothermal, and biofuels, but does not address trade issues posed by
cross-border trade in electricity, in the expectation that for Australia such trade is
unlikely.

Key international instruments

Australia is a party to the World Trade Organization (WTO) agreements, as well as a
number of bilateral free trade agreements (FTAs), as set out in the table below.

Australian free trade agreements (FTAs)

<table>
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<th>Party</th>
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<td>United States</td>
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<td>Thailand</td>
<td>1 January 2005</td>
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<tr>
<td>New Zealand</td>
<td>1 January 1983</td>
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</tbody>
</table>

In addition, Australia is in the process of negotiating a regional agreement with
ASEAN & New Zealand and bilateral FTAs with China, Japan, Chile, the Gulf
Cooperation Council, and Malaysia. The Australian Government is also considering
an FTA with Korea.

Bilateral FTAs are arrangements where two countries have granted each other
extensive access to each other’s market – zero or very low tariffs across almost all
product sectors, elimination of barriers to providing services, ability to bid on each
others’ government contracts, etc. FTAs are a WTO-legal mechanism for giving
particular trading partners more favourable market access than that otherwise
required to be offered equally to all fellow WTO Members under ‘Most Favoured
Nation’ principle (as described below).

Core concepts in the WTO and FTAs

a) General trade obligations

The core obligations of the multilateral trading system (as found in the WTO General
Agreement on Tariffs and Trade (the GATT)) are that Member States are to accord
the goods and services of fellow WTO Members 1) National Treatment (that is, give
them the same treatment as domestic goods and services); and 2) Most Favoured
Nation Treatment (MFN) (that is, give the same treatment to the goods and services of all other Members, rather than favouring some Members over others).

The WTO Agreements (and FTA agreements) provide a variety of exceptions to these obligations. For example, in services, government procurement and investment, Parties can carve sectors out of coverage, so that the general obligations do not apply. In the GATT itself, Article XX creates exceptions for otherwise illegal measures, provided that they are directed to certain public policy objectives (e.g., public morals, human health and safety, the conservation of exhaustible natural resources) and that such measures are not applied in a manner that is arbitrary, unjustifiable, or a disguised restriction on trade.

b) Tariffs

In the WTO, Members bind themselves to cap tariff rates for product sectors at set levels. They may lower their tariffs below those bindings, so long as they do so for products from all WTO Members. FTAs are, as noted above, a WTO-legal exception to this obligation. In FTAs, Parties commit to eliminate or substantially reduce tariffs on goods; this is usually across all sectors, though certain sensitive products can sometimes be excluded (for example, the US exclusion of sugar from the Australia-US FTA).

The FTA parties negotiate which products’ tariffs will go to zero immediately, and which will be phased out (sometimes over many years, in sensitive sectors).

With numerous FTA negotiations underway, Australia can determine, for each agreement, those renewable energy exports for which it seeks immediate access to the negotiating partner’s market (for immediate or near term tariff elimination), and, conversely, for which imports from those negotiating partners a long term phase out of tariffs would be preferable.

Australian tariffs are generally low, and tariffs on products from developing countries (including China and Malaysia) are given an additional preference of 5% under Australia’s WTO Generalized System of Preferences (GSP) program for imports from developing countries, so the issue of phasing out Australia’s tariffs on renewables is not likely to figure large in those FTA negotiations. (A possible exception might be biofuels feedstocks, if classified as agricultural products for tariff purposes.) The issue of zeroing out Australia’s tariffs might be more significant in an FTA with Japan, a fellow significant producer of renewable energy technologies.

Renewable energy products present the following tariff classification issues, among others, in the WTO, and can do so in FTA negotiations as well:

- Biofuels: how to classify the fuels themselves, and whether to classify them and their feedstocks as agricultural goods or industrial goods. For example, should feedstock materials be given different tariff classifications, and thus potentially different tariff treatment, based on whether they are intended for use in biofuels or in the food industry? The biofuels issue is discussed in a separate section of this report.

- Environmental goods: the current Doha Round of WTO negotiations includes a mandate to liberalize trade in environmental goods and services.
WTO Members are bogged down in disagreements over how to define environmental goods and services. There is, however, broad support for including various renewable energy products and services in the scope of any such sectoral liberalization agreement (one exception is biofuels, as questions have come to light over the relative environmental benefits of various biofuels).

WTO tariff liberalization of renewable energy technology would benefit Australian industry, by opening export markets for Australian products.

(c) Regulations and standards

In addition to the basic National Treatment and MFN obligations described above, the WTO Agreements also set certain requirements for national standards and regulations concerning goods (in the Technical Barriers to Trade (TBT) Agreement), and for national measures directed at health, safety, and pest introduction from imported goods, mostly food and agricultural products (the Sanitary and Phytosanitary Standards (SPS) Agreement).

(i) The WTO Technical Barriers to Trade Agreement (TBT)

The TBT Agreement’s main requirements are:

- that international standards be used as a basis for technical regulations (Art. 2.4), and
- that technical regulations not constitute an “unnecessary obstacle to trade” (Art. 2.2); in other words, that the measure must not be more trade restrictive than is required to meet a Member’s legitimate objective. There is a non-exhaustive list of “legitimate objectives” that includes, among other things, “protection of human health or safety, animal or plant life or health, or the environment”.

(ii) The WTO Sanitary and Phytosanitary Standards Agreement (SPS)

The SPS Agreement (which is of particular relevance to biofuels) allows WTO Members to place restrictions on imports from particular other WTO members, provided that such measures be based on scientific principles and evidence and be supported by risk assessment. It, like the TBT Agreement, also favors measures based on international standards.

In bilateral FTAs, governments who are both also WTO members usually address regulatory issues by incorporating the WTO SPS & TBT Agreements’ obligations by reference. In addition, they often agree to endeavor to harmonize their standards, treat each others’ standards as equivalent to their own, and/or cooperate on international standard setting.

As a general matter, FTAs are binding on federal level governments, but whether subnational governments are also bound is an issue that varies with the parties’ constitutional structure and what is negotiated. For example, the Australia-US FTA’s TBT chapter simply calls upon each Party to “provide information to authorities of

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4 See, e.g., US-Australia FTA Art. 7.3 (Affirmation of the SPS Agreement) and Art. 8.2 (Affirmation of the TBT Agreement).
regional governments to encourage their adherence to this Chapter, as appropriate” (Art. 8.3). It is, however, usually the case that one FTA party can still bring a dispute action against the other for a non-complying state level measure, and, if successful, impose trade sanctions.

The renewables sector to date has few international standards, an unfortunate situation given that international standards facilitate trade and shield national measures based on them from WTO challenge. Moreover, the diversity of standards created by subfederal governments can create unnecessary barriers to trade. FTA negotiations may present opportunities for Australia to encourage cooperation on setting international standards in the renewables area (e.g., standards that define what is a renewable energy source, PV technical standards, and norms of reliability, safety, etc. for renewable energy technologies and operations).

Example: Australia – Singapore FTA provisions call for the parties to endeavor to work toward harmonization of their respective mandatory requirements (i.e., their standards), taking into account relevant international standards, recommendations and guidelines (Article 4). The agreement also requires the countries to give “favorable consideration” to each others’ mandatory requirements, and sets up a process of negotiating sectoral annexes for recognizing each others’ standards as equivalent to their own (Article 5). There is not presently an annex for renewable energy technology standards; whether one would be useful might be worth exploring.

(iii) General Agreement on Trade in Services (GATS)

The WTO General Agreement on Trade in Services (GATS) requires WTO member governments to accord each others’ service providers national treatment and most favored nation (MFN) treatment. WTO member governments also negotiate sector specific liberalization commitments, e.g., with respect to financial services, environmental services, or telecommunication services. FTA agreements similarly contain market access commitments for the parties’ service providers while reaffirming the GATS obligations.

FTA services negotiations can benefit the Australian renewable energy industry by helping open trading partners’ markets. More specifically, services negotiations can help

- reduce trade barriers and discrimination which impede Australian companies from working or setting up offices in other countries, such as foreign equity and joint venture partner restrictions;
- improve regulatory transparency associated with licensing and approval procedures;
- reduce barriers that impose additional costs; and
- create opportunities for Australian investment in the FTA partner’s services sector.

One possible issue with respect to financial services is how Australia’s FTAs might treat tradeable renewable energy certificates (TRACs), assuming Australia anticipates
an interest in these certificates at some point. There is a strong argument for characterizing TRACs as financial instruments, as they are essentially intangible assets.\(^5\)

For instance, in the NAFTA, the agreement’s benefits are extended to a trading partner’s new financial services that are developed after the agreement went into effect only if the new service is “of a type similar” to services that domestic institutions are permitted to provide. This sort of constraint raises the question of whether TRACs would be sufficiently “similar” to an existing service to come within the FTA’s coverage, and parties may thus wish to avoid such language in new FTAs. Under the US-Australia FTA, although “similar” is not used, the agreement’s benefits only extend to new financial services that would be permitted to be supplied by domestic institutions.\(^6\)

(d) Government procurement

Government procurement provisions in the trade agreements may also have bearing on renewable energy policies – e.g., government transportation fleet requirements for biofuels.

Australia is not a member of the WTO Government Procurement Agreement (GPA). It has, however, included GPA chapters in some of its FTAs (Australia-US; Australia-Singapore; placeholder for future negotiations on GP in the Australia-Thailand FTA (Chapter 15), and is negotiating the inclusion of government procurement provisions in future FTAs, including China and Japan.

Government procurement obligations include non-discrimination (national treatment and MFN) in the awarding of government contracts. The agreements’ coverage, however, is not comprehensive: countries negotiate over which government agencies are included, and over such exceptions as for small and medium-sized enterprises, and procurement of research and development services.

For example, under the Australia-US FTA, neither country may apply local preference arrangements, including price preferences, for procurements to which the government procurement chapter applies. In Australia these cover procurements by all Commonwealth and State Government central departments plus a range of agencies, statutory authorities and government authorities.

The Australia-US FTA opened the huge US government procurement market to Australian companies, which could have positive implications for providers of renewable energy products or services. Australia has also, in the Australia-US FTA, protected its small and medium sized businesses from competition from US procurement bidders.

How GPA provisions are negotiated can be relevant to Australia’s renewable energy programs from either an export or an import perspective:

- by providing access to government procurement contracts of trading partners (US, China, Gulf States, etc), they can help build export markets for domestic industry (e.g., for solar technology);
- by carving out certain sectors or programs, they can shield from foreign competition certain Australian domestic programs as they get off the ground; or encourage the development of domestic small renewable energy businesses.

\(^5\) REIL, Howse & van Bork, Opportunities and Barriers for Renewable Energy in NAFTA, February 2006, at 34.

\(^6\) Article 13.6, US-Australia FTA.
It is important to identify those renewable energy-related exclusions or carve outs that Australia might want to take in the area of GP while a particular FTA is being negotiated, since, as with services, it is difficult to revisit such exclusions once the agreement has entered into force.

(e) Subsidies and taxes

Subsidies and tax measures are widely used policy instruments in the realm of renewable energy. Determining these instruments’ consistency with international trade rules often requires a complex and fact-specific analysis.

Under both the GATT and bilateral FTAs, subsidies and taxes are, like other internal measures, subject to such disciplines as National Treatment, which the FTAs incorporate by reference from the GATT (Article III(2) (taxation) and Article III(4) (other internal measures)). FTAs often do not, however, address subsidies as such, leaving much of their regulation to the terms of the WTO.

The WTO Agreements specifically address subsidies thus:

- The GATT itself, in Article III(8), exempts from the National Treatment obligations the “payment of subsidies exclusively to domestic producers”. Note that payments to users or consumers, however, would still be subject to National Treatment.

- The Subsidies and Countervailing Measures (SCM) Agreement prohibits outright two kinds of subsidies: (1) export subsidies, and (2) subsidies contingent upon the use of domestic products over imported products. A WTO Member adversely affected by other kinds of subsidies may be able to bring a WTO dispute settlement challenge or to impose “countervailing measures” if certain conditions are met. These include:
  - that the subsidy entail a “financial contribution” by the government and a “benefit” to the recipient, where the “benefit” confers a competitive advantage on the recipient;
  - that the subsidy be “specific” to particular industries or firms; and
  - that the subsidy causes certain “adverse effects”.

- The Agreement on Agriculture addresses agricultural subsidies (of particular relevance to biofuels and their feedstocks) by committing WTO members to adhere to limits on their overall financial support for agriculture. Not counted against those limits are certain kinds of subsidies for public policy purposes, such as for research and development, or for environmental programs (the “green box”).

New disciplines on subsidies are thus not likely to be a particularly significant issue for FTA negotiation. FTAs can, however, be a vehicle for agreeing to cooperate on subsidies-related issues in other fora, such as the WTO negotiations.

If there are concerns that current or planned renewable energy subsidy programs could raise WTO or FTA compatibility issues, the government might consider exploring the merits of an agreement on a specified set or definition of
environmentally beneficial renewable energy subsidies, that the FTA partners would agree between themselves to “green box”, i.e., to shield from complaint or countervailing measures.

(f) Energy-specific provisions
None of Australia’s FTAs include specific chapters on energy (in contrast to, for example, the NAFTA). Japan has requested consideration of an energy chapter in the Australia-Japan FTA currently under negotiation, but has not yet made clear the contours of what it would be proposing.

Conclusions – barriers and opportunities for renewable energy in free trade negotiations
Many of the barriers and opportunities inherent within the core FTA issues are set out above. In addition to those comments, below are some issues that have emerged from discussions with representatives of Australia’s renewables technologies industry (not including biofuels representatives) in the course of researching this report, as well as trade issues affecting negotiators.

In general, discussions indicated that, to date, the Australian renewable energy industry has encountered few trade barriers. Instead, their primary concern was for domestic policies that would foster development of a robust Australian industry, which could then expand its export potential. Major concerns for doing business internationally include protection of their intellectual property when they export renewables technology or site facilities abroad, and the frustration of dealing with myriad local requirements (or their selective non-enforcement) when doing business in certain countries, including China. These problems of intellectual property protection and enforcement are not unique to the renewables sector and, while they can be a priority issue in FTA negotiations they would not often lead to renewables-specific terms.

In general, when considering the trade issues affecting renewable energy policies, negotiators should keep in mind whether the renewables regulations, subsidies, non-tariff barriers or government procurement requirements of concern are at the federal or sub-federal level. For some issues (including standards) trade agreements usually cover state and local level measures (even though, as noted above, only the federal government assumes the obligation). For others (such as government procurement and some investment issues) states and provinces may be able to choose whether to include their programs in the agreements’ coverage. In preparing for negotiations, the advantages and disadvantages of coverage should be identified both for Australia’s domestic measures and for the FTA partner’s measures and practices of concern.

2. INVESTMENT
This section will consider how Australia’s existing and future investment agreements with other nations may facilitate or restrict the implementation of policies to encourage investment in renewable energies.
Key international instruments

Australia is a party to a number of bilateral investment treaties, as set out in the table below.

**Australian Bilateral Investment Treaties**

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<th>Signature</th>
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<td>3 September 2001</td>
<td>12 December 2002</td>
</tr>
<tr>
<td>United States of America (Free Trade Agreement)*</td>
<td>18 May 2004</td>
<td>1 January 2005</td>
</tr>
<tr>
<td>Vietnam</td>
<td>5 March 1991</td>
<td>11 September 1991</td>
</tr>
</tbody>
</table>

* Australia does not have a Bilateral Investment Treaty with Singapore, Thailand or the United States of America.

In addition, Australia’s Free Trade Agreements with Thailand, Singapore and the United States contain investment chapters with provisions comparable to those in the
above free-standing bilateral investment treaties. In this part, the bilateral investment treaties and investment chapters in free trade agreements will all be referred to as International Investment Agreements (IIAs).

Core concepts in IIAs

(b) Definitions and scope

The definitions section of an IIA usually defines key terms, such as what constitutes an “investment”, an “investor”, a “national”, a “company” and “returns”. It may also include definitions for things like “protected information”, “regional level of government”, “state enterprise”, “territory”, and others.

The specifics of these definitions have far-reaching implications related to the rights and obligations of the contracting parties. For example, many agreements include a broad definition of “investment” that can include just about any kind of asset, while others purposely limit the definition in various ways to support the host country’s economic and development policies. “Investment” can also be defined as only including “direct investment” or may also include “portfolio investment” and “intangible assets” such as intellectual property. The specifics of the definitions can have significant implications related to renewable energy policies. For example, the definition of tradable renewable energy certificates (TRECs) can influence which laws apply.

The scope or application provisions of an IIA describe the parties to the agreement and define the geographic coverage of the agreement. In addition, the scope section often includes exceptions to the agreements, usually for critical sectors such as energy and certain types of finance. These could potentially present barriers to investment in renewable energy. Conversely, plurilateral sectoral agreements typically limit the coverage of the agreement based on the sector the agreement is designed to address. For example, at the WTO Doha Round negotiations, requests were made for negotiations for liberalisation of sectors such as energy and construction. APEC has also investigated the potential for Early Voluntary Sectoral Liberalisation. Some IIAs also stipulate that investments are subject to the approval of the host country, although this is often limited by clauses for “national treatment” or “most-favoured nation status” (see below).

(c) General standards of treatment

The general standards of treatment in IIAs are typically based on the concept of “fair and equitable treatment” or “non-discrimination” that is a standard under customary international law. “Fair and equitable treatment” is frequently tied to provisions of “national treatment” and “most-favoured nation status.” “National treatment” requires that foreign investors be accorded no less favourable treatment than that accorded to investors from the host nation. It is not uncommon for there to be exceptions from the “national treatment” standards for:

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9 Ibid.
12 Ibid.
- National security
- Highly regulated industries
- Industries where there are monopolies or significant government ownership
- Industries that are central to the economy
- Other politically sensitive industries

There are differences in how these exceptions are noted across different IIAs. In some IIAs, there is a clear list of exceptions, while all other “investments” (and possibly “investors”) are granted “national treatment.” In other agreements, there is a list of industries and areas that are granted “national treatment,” with no a priori general right to “national treatment.” In addition, in most IIAs “national treatment” is a standard that applies post-establishment — i.e. after an investor has obtained access to a market. The Association of South-East Asian Nations (ASEAN) Agreement for the Protection and Promotion of Investments is notable because it does not grant national treatment.

“Most-favoured nation” status requires that the agreement signatory be accorded treatment no less favourable than it accords investors from other countries in “similar circumstances.” Because most agreements include both “national treatment” and “most-favoured nation status,” this allows investors to use the more favourable of the two standards of treatment. The “most-favoured nation” clause can be used as a way to circumvent requirements of high-level agreements.

Because the energy sector is typically highly regulated, often with significant government ownership, and central to the economy, it is not unusual for IIAs specifically to exclude the energy sector. These agreements may confuse an already complex investment market, but also may “facilitate the horizontal integration across policy areas; thus investment policy-trade policy and investment policy — technology policy linkages can be addressed on a sectoral basis.”

(d) Performance requirements

Early IIAs commonly included “performance requirements,” or standards or conditions that investors had to meet, often included as obligations to purchase local goods and services. These “performance requirements” were frequently combined with incentives that required a company to behave in a certain way, such as exporting a minimum amount of production or buying local goods. Host countries would screen investors by using these “performance requirements” and incentives.

However, most recent IIAs include a “prohibition on performance requirements” and thereby limit a host country’s ability to restrict imports of foreign goods or services, and do not allow host countries to require or prefer domestic goods or services. Some agreements with prohibitions on performance requirements specifically allow measures that require investments to use a technology to meet generally applicable health, safety or environmental requirements.
(e) Transfers of funds and currency

This section describes the protocols for transferring funds. Transfers may occur because of income generated from invested capital, refunds, compensation, loan payments, proceeds from sales, and other sources. This clause is typically based on the principle that capital should move freely and without restrictions\textsuperscript{9} by requiring that the transfers be allowed to be made in “freely usable currency” at “current rates of exchange.”

(f) Expropriation

IIAs typically protect foreign investments from “takeings” by host country governments without the payment of fair compensation.\textsuperscript{20} At the same time, such protections need to be balanced against the government’s ability to protect its interests through regulation and the more general exercise of its police and taxing authorities. Finding this balance has proven to be one of the most contentious issues under IIAs.

In customary international law, States have the legal right to “take” or “expropriate” foreign investments in their territories as long as three conditions are met: 1) the “expropriation” is for a “public purpose;” 2) it is done in a “non-discriminatory” manner; and 3) it includes “fair and equitable compensation.”\textsuperscript{21,22} Some IIAs also have a fourth requirement that the “expropriation” be done with “due process.”\textsuperscript{23}

Of major concern are the types of government measures that will trigger the expropriation clauses in an IIA. There are a wide variety of definitions for expropriation across various investment agreements. Some agreements narrowly define expropriation as “direct takings,” such as “nationalization” (the state’s taking control of an economic sector or industry) or “expropriations” (the state assuming control of a business or property) by taking title to or possession of the property. Others have broader definitions of expropriation that include “indirect takings,” also called “regulatory takings,” or “creeping expropriation” where government actions such as taxation or regulation may diminish the value of an investment.\textsuperscript{24} With indirect takings, government action results in “the effective loss of management, use or control, or a significant depreciation of the value, of the assets of a foreign investor.”\textsuperscript{25}

There is no clear, consistent legal definition to determine what constitutes an “indirect taking” that requires investor compensation versus a legitimate exercise of the government’s right to regulate that does not. For example, most host states retain the right to tax the investments (within reason) and to assess monetary penalties if there is a violation of a law without compensation to the investor. Some IIAs even define a government’s right to protect the environment as non-compensatory.\textsuperscript{26} In other instances though, “regulatory takings” have been determined to be compensatory.\textsuperscript{27} This could be problematic if supply-side renewable energy promotion policies were to be seen as “taking” from traditional energy sources.

(g) Dispute resolution

IIAs would not be effective if there were not some mechanism to resolve disputes over their terms outside of the courts in the host country. Therefore, nearly all IIAs include


\textsuperscript{22} ibid.


\textsuperscript{26} ibid.

provisions for dispute resolution at the initiation of either the host country or the investor. There are many different ways that dispute resolution might be addressed, such as diplomacy, court systems and binding arbitration. Some agreements establish institutions for dispute resolution, but most IIAs rely on external organisations such as ICSID.

It is through the dispute resolution process that interpretations are made on conflicts that arise related to issues such as coverage and scope, discriminatory practices and expropriation. Because there is no standard method of dispute resolution in IIAs, questions arise as to the consistency between both the resolutions of various disputes and of the choice of the law applied in individual disputes, particularly when there are conflicts between different laws.

(h) Environmental clauses
It is only recently that IIAs have begun to address environmental issues. Environmental clauses have been included in some IIAs, such as the investment chapter in the Australia-USA Free Trade Agreement, in an attempt to ensure that investment instruments do not impede a state’s “right to regulate” the environment, as well as to prevent the state from failing to enforce its environmental regulations in order to attract new investment. These clauses may also provide a framework for the transfer of “clean” technologies. Environmental clauses are typically written in general terms, supporting the principles of environmental protection and sustainable development.

(i) Other clauses
Other clauses address topics such as: agreements that governments will not interfere with the operation and management of the industry; an acknowledgement that the agreement covers not just the “investment” but also activities associated with the investment; and tax measures. Few of these have major implications for renewable energy policies, although the tax measures could have implications for taxes relating to the energy sector.

Potential barriers to policies promoting investments in renewable energy
IIAs are expressly designed to help promote foreign investment, including in renewable energy. As such, one would not expect to find that they create many barriers to efforts to expand such investment. A number of questions have been raised, however, about whether the core concepts in IIAs may unintentionally restrict the ability of host country governments to adopt policies promoting investment in renewable energy – as opposed to other sources of the energy. In addition, concerns have also been raised that the protections in IIAs may not extend to the full range of “investments” associated with renewable energy.

(a) Coverage and scope
Questions of coverage can be more complicated than might first be thought. For example, what precisely constitutes an “investment?” While there seems to be little
doubt that investments made in legally recognised property or contractual rights are covered by IIAs, questions have been raised about the status of so-called “hybrid property” such as TREC. Depending on the definitions used, a TREC can be regulated as a commodity, service, or security. If TREC and other tradable allowances are not considered property, the question has been raised as to whether they will be afforded the same protections as other investments under IIAs. This question suggests that care should be taken in any renegotiation of an existing IIA or negotiation of a new IIA to make sure that investments in TREC and other tradable allowances are covered.

(b) General standards of treatment
IIA core concepts of “national treatment,” “most-favoured nation” and “non-discrimination” under the general standard of treatment have also been discussed as possibly limiting a host country government’s ability to use some of the key policy tools. For example, Renewable Portfolio Standards (RPS) may present a problem under national treatment rules if they are interpreted as discriminating against investments in energy projects that are not included in the RPS. Arguably, however, if the RPS discriminates only on the basis of energy source and not geographical origin, it is likely to survive a challenge under non-discrimination provisions.

(c) Expropriation
The tension between the rights of investors to have their investments protected against “takings” by government and the right of a host state to regulate the impacts of any such investments is increased under IIAs that include “indirect” or “regulatory takings” in the definition of expropriation. The key question appears to be the extent of the impact on the value of an investment that is required before a legitimate exercise of regulatory authority becomes a taking. While this issue has not yet arisen in the renewable energy context, it is hypothetically possible that an investor in a non-renewable energy source might challenge newly adopted incentives for renewable energy on the grounds that they reduce the value of its investment. Host country policies designed to encourage investments in renewables seem unlikely to have a sufficiently large impact on the operations of non-renewable power sources to constitute a regulatory taking under the provisions of IIAs. Renewable power, while growing rapidly, remains a small percentage of total power production in Australia. While legislation banning outright the continued operation of non-renewable energy sources might well constitute a regulatory taking, support for expanded use of renewable energy seems unlikely to qualify.

(d) Environmental clauses
Environmental clauses in IIAs are not intended to protect investors’ rights. Their purpose is to clarify and make explicit host states’ rights to regulate environmental issues in a non-discriminatory manner. Therefore, strong environmental clauses in IIAs can be helpful in supporting a host country’s right to adopt policies that encourage investment in renewable energy projects.
Opportunities to use international investment agreements to overcome barriers to investments in renewable energy

In addition to their potential impact on national policies, IIAs may also offer opportunities to help overcome the major barriers to investments in renewable energy identified above.

There are two major areas of potential linkages. First, the general provisions protecting investors’ rights (coverage, expropriation, fund transfers, dispute resolution and others) can be of immense benefit to all investors, including those in renewable energy. Second, if the non-discrimination provisions of an IIA were held to prohibit a host country government from providing special incentives to renewable energy sources that were not also available to non-renewable sources then presumably the reverse would also be true – that countries could not provide special treatment to non-renewable sources that are not also available to renewables.

Given that many of the issues facing renewables stem from the existing web of institutional structures and incentives supporting non-renewable energy, a finding that those existing programs were in violation of the non-discrimination clause of an IIA could be of major value to investors in renewable energy sources.

In addition to these opportunities under generic IIAs, energy-specific investment agreements could also be used as a platform for encouraging investment in renewable energy. Since many of the investment barriers to renewable energy identified above stem from the special characteristics of the electricity sector in general and renewable energy technologies in particular, they are most directly addressed through sector specific policies, rather than the more general provisions of most investment IIAs.

Adopting such renewable energy specific policies in an international investment agreement, however, would be a major change from the traditional approach to IIAs. First, the core concepts of IIAs are mostly negative in nature – prohibiting certain actions by governments – as part of an effort to protect foreign investors against discrimination and other unfair treatment. The key policies to promote renewable energy, however, are mostly positive in nature – reflecting a commitment by governments affirmatively to do something, whether that be restructuring their power sectors, changing their taxation systems, spending their tax revenues in new ways or making new types of information available. Such affirmative commitments are much harder for governments to make in international agreements given their political sensitivity in general and the concerns over loss of sovereignty that any such agreements raise.

Second, most IIAs are just that – agreements to protect “investments,” no matter what sector any particular investment is in. Such protections are of great use to investors in renewable energy projects, but by their very nature, do not address the more specific barriers facing investments in the renewable energy sector. As such, efforts to use international investment law to promote investments in renewable energy projects should be placed in a wider context, embracing traditional IIAs (where some areas for work do remain), sectoral energy and environmental agreements, initiatives by multilateral development agencies, as well as efforts to inform and coordinate national policies. Some suggestions for areas of further work in these areas are discussed in the next section.
Conclusions and suggested next steps for using international investment law to promote investments in renewable energy

Encouraging more private investment in renewable energy is a key policy goal for Australia and a growing number of other countries. International investment law – broadly defined – has a major role to play in helping to create the predictable and profitable market conditions needed to attract such investment.

If a decision was taken to pursue a new multilateral or bilateral investment treaty in a manner that best promotes investment in renewable energy, the following are key issues that may be considered:

- Identify clearly the benefits of the potential investment agreement for:
  - Businesses (increase predictability of host state action and investor responses thereto);
  - Host states (affirm right to regulate within traditional boundaries, attract more private investment); and
  - Civil society organizations (more investment in cleaner energy solutions) so that the negotiations have broad and strong support.

- Include clear definitions of “investment”, “investor” and “expropriation” so that parties to the agreement can understand the balance being created between private and public interests.

- Include a broad enough definition of “investment” to ensure that investments in “hybrid property” such as TREC’s and greenhouse gas emission allowances are protected.

- Clearly support the host states’ “right to regulate” in a non-discriminatory (at least with respect to foreign investors) manner on matters relating to climate protection and cleaner energy.

- Expressly provide that energy from renewable sources or low emissions sources (such as ‘clean coal’) is not “like” energy from non-renewable sources for purposes of government support.

3. Clean Development Mechanism

The Australian renewable energy industry has the potential to take advantage of rising global demand to rapidly increase its market share both domestically and globally. Significant future growth will occur in the Asia-Pacific region, particularly in the two fastest growing economies of China and India. These countries, which have abundant renewable energy sources and rapidly growing energy demand, represent an enormous potential for the export of renewable energy technologies. The technologies most suited to manufacturing export are likely to be solar PV panels, solar water heaters and wind energy components such as pylons. A vast potential for the export of services also exists in terms of technical expertise and consulting for the hydro-electric, wind and solar PV sectors.\(^\text{36}\)

One important way that the Australian renewable energy industry can participate in these rapidly growing renewable energy markets is through the Clean Development Mechanism (CDM). Generally speaking, companies may participate in the CDM as a project participant in an approved project, as a project developer in a joint venture arrangement whereby it supplies technology, equipment or intellectual property to its joint venture partner, or by purchasing and trading CERs through a national registry account. This section will consider how Australian companies can participate in these ways.

**Project participants in a CDM project**

Project participants in a CDM project are listed in the Project Design Document (PDD), and may include Parties (states), public bodies or private entities. As Australia has now ratified the Kyoto Protocol, Australian companies will be eligible to fully participate in the Clean Development Mechanism (CDM) once Australia has satisfied the eligibility criteria – namely, the establishment of a designated national authority and the fulfillment of certain methodological and reporting requirements, including:

- Implementing a national system for estimating greenhouse gas emissions from sources and removals of emissions by sinks; and
- Submitting an annual inventory covering all emissions and removals of greenhouse gases not covered by the Montreal Protocol; and
- Providing all necessary supplementary information required to ensure that Parties do not exceed their assigned amounts calculated pursuant to their quantified emission limitation and reduction commitments.

Until that time, under the international rules Australian companies are still permitted to take advantage of the opportunities offered by the CDM:

- As project participants in an approved project, provided approval can be obtained from an Annex I party that has satisfied the eligibility criteria and has indicated that it will approve the participation of companies from anywhere in the world (for example, the Netherlands and Switzerland);
- As a project developer in a joint venture arrangement, under which the Australian company supplies technology, equipment or intellectual property to its joint venture partner; or
- By purchasing and trading CERs through a national registry account.

Some Australian companies have already begun to develop renewables projects under the CDM in China. The Chinese CDM rules present a unique set of considerations for project developers in terms of corporate structuring, project approval, taxation and other related issues. Firstly, there are restrictions on the involvement of foreign companies in Chinese CDM projects. Under the Chinese rules, CDM projects must be structured as equity joint ventures, and Chinese parties must hold a controlling interest in the project (meaning that there must be at least 51% Chinese ownership). This has implications for the level of control Australian companies can have in these ventures.
partners can exercise over assets, including intellectual property, and the extent to which interests can be transferred.

Secondly, specific project approval requirements limit the flexibility of CDM projects. In China, all major investment and infrastructure projects are subject to approval by the appropriate Chinese authority. For CDM projects, the Chinese government must approve the terms of CER sale arrangements, and generally approval will only be given where all or no CERs are sold at the time of approval. In addition, the Chinese government must also approve specific buyer and specific price. The current “floor price” is €8.00 or US$10.00 per CER, but this may vary during lengthy negotiations and sufficient flexibility should be retained in contractual documents to accommodate this. It should be noted that renewables projects are subject to preferential treatment under the standard (i.e. non-CDM-related) project approval procedures and are classified as “Encouraged Projects” and under Chinese renewable energy law are entitled to a preferential feed-in tariff. The advantages may offset any disadvantage from more onerous project approval requirements from CDM authorities.

Finally, renewables projects receive preferential tax treatment under China’s CDM rules as compared to other types of CDM projects. For example, industrial gas projects are subject to a 65% tax on CDM revenues, compared to just 2% on renewables CDM projects.

**Service providers to CDM project participants**

Australian companies have also been involved in CDM projects by providing project inputs, such as technology, equipment, services and expertise through contractual arrangements with a listed project participant.

**Emissions trading**

In order to engage in the buying and selling of CERs, a company must have access to an electronic account within a national registry established under the Marrakech Accords. The Australian national registry has not yet been established, but Australian companies may open such accounts where the domestic rules of Kyoto Protocol Parties permit private entities from non-Party countries to do so.

### 4. WIND AND HYDRO

**Industry overview**

(a) Wind energy industry

Wind energy is the most rapidly growing source of renewable energy worldwide, and the fastest growing renewable energy industry in Australia. Between 1996 and 2004, a period when other forms of renewable energy experienced comparatively modest growth in Australia, the generation capacity of the wind energy industry in Australia grew exponentially from just 2MW to 252MW. Total installed generation capacity is now 817MW, with a further 6785MW of capacity already proposed to be installed at

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new wind farm sites. Most of Australia’s domestic wind generation capacity is grid-connected, with approximately 15% off-grid or embedded generation.40

The size of individual wind energy projects has also increased significantly in this period, from around 10-20 turbines and 10-15MW capacity in 2000, to 30-50 turbines and 50-90MW capacity in 2005.41 Capacity factors at Australian wind farms are significantly higher than at comparable farms in Europe – typically around 30-35%. A 70MW wind farm operating at 35% capacity is able to produce around 215,000MWh per year – enough energy to power around 40,000 homes.42

The wind energy industry operates a number of wind farms around Australia, particularly in South Australia, Western Australia, Tasmania and Victoria. In addition, the industry produces wind towers, tower foundations, composites and components, cast metals and machining, high voltage electrical design and construction, controls and ancillary equipment, many of which are for export.43

In the face of this rapid expansion in the use of wind energy, some opposition has developed. What complicates the debate is that the shift to wind energy can result in both environmental benefits and costs. Wind energy development does result in substantial environmental benefits compared to traditional fossil fuel-fired electric generation because it is produced with zero emissions of greenhouse gases, hazardous pollutants (e.g., mercury), and conventional pollutants (e.g., nitrogen dioxide and sulphur dioxide). At the same time, however, the construction and operation of wind turbines is alleged to result in potential negative environmental impacts on birds, bats and cetaceans, landscapes, sustainable land use (including protected areas), and the marine environment.

(b) Hydro-electricity industry

The hydro-electricity industry has the largest installed capacity in the renewable energy sector, but is experiencing relatively slow rates of growth (less than 1% per annum) based on existing water storage and plant efficiency improvements. This trend is expected to continue, with just 0.4% growth per annum predicted over the next 25 years. The Snowy Mountains Hydroelectric Scheme is Australia’s most extensive hydroelectric complex, comprising seven power stations with a combined capacity of 3,740,000kW (10% of Australia’s electricity requirements if there was not a constraint on available water). Tasmania also has extensive hydro-electric generation.

Australia’s hydro-electric resources are typically large-scale developments that require a large dam, or series of dams, to store the water required to generate energy (though there exists significant potential for small-scale and micro-hydro systems in Australia44. These dams bring about considerable environmental change, as local flora and fauna are displaced and habitat is flooded. Dams may also change groundwater flows, which can change the ecology of surrounding areas. Finally, damming rivers reduces the amount of silt carried downstream and increases the amount deposited in the dam, reducing the fertility of downstream soil.45 As a consequence, the development of new large-scale hydro-electric projects (or significant amendments
to existing projects) may conflict with Australia’s international obligations to protect and conserve biodiversity.

An offshore (wave only) hydro industry is also developing in Australia, with several pilot projects under development or already in operation. This industry will be discussed separately below.

**International instruments**

(a) **Convention Concerning the Protection of the World Cultural and Natural Heritage (CWCNH)**

The CWCNH is an international treaty which aims to protect places around the world that exhibit outstanding natural or cultural values by listing them on a world heritage register. It was adopted and opened for signature by the United Nations Educational, Scientific and Cultural Organisation in Paris on 16 November 1972 and came into force in 1975.

The CWCNH establishes a list of properties that have outstanding universal value and is called the World Heritage List. These properties are part of the cultural and natural heritage of States that are Parties to the Convention. There are currently 851 properties on the World Heritage List.46

Australia was one of the first countries to ratify the CWCNH on 22 August 1974. As a party to the CWCNH, Australia recognises that it has a duty to ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage situated in Australia.

(b) **Convention on Biological Diversity (CBD)**

The CBD is the major international agreement in the field of biodiversity. It was adopted and opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992, and entered into force on 29 December 1993. Its objective is the development of national strategies for the conservation and sustainable use of biological diversity, which is accomplished either through in-situ47 or ex-situ48 means.

There exists one optional protocol to the CBD, the Cartagena Protocol on Biosafety (Cartagena Protocol), which covers the field of biotechnology, including technology development and transfer, benefit sharing and bio-safety issues.

Australia signed the CBD on 5 June 1992 and ratified it on 18 June 1993. The Australian Government has not signed the Cartagena Protocol.

(c) **Convention on the Conservation of Migratory Species of Wild Animals (CMS)**

The CMS is a multilateral treaty which aims to conserve terrestrial, marine and avian species throughout their migratory range. It is a framework convention, which encourages Range States to conclude global or regional agreements for the protection of listed migratory species threatened with extinction. The CMS was adopted and opened for signature in Bonn on 23 June 1979 and entered into force on 1 November 1983.

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47 ‘In-situ conservation’ is defined as the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties: Article 2. The obligations of parties in respect of in-situ conservation are set out in Article 8.

48 ‘Ex-situ conservation’ the conservation of components of biological diversity outside their natural habitats. CBD, art 2. The obligations of parties in respect of ex-situ conservation are set out in CBD, art 9, which states explicitly in the chapeau that ex-situ measures serve to complement in-situ measures.
Australia ratified the CMS on 1 September 1991. The Government has also ratified two subsidiary instruments, the Agreement on the Conservation of Albatrosses and Petrels (ACAP) and the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats on the Indian Ocean and South-East Asia (MT-IOSEA).

(i) Agreement on the Conservation of Albatrosses and Petrels (ACAP)
ACAP was opened for signature in Canberra on 19 June 2001, and entered into force on 1 February 2004. It aims to stop or reverse population decline of the 21 species of albatrosses and petrels listed in the Annex 1, and covers all the areas of land or water that any albatross or petrel inhabits, resides in temporarily, crosses, or over-flies at any time on its normal migration routes. ACAP obliges parties to implement certain conservation measures (set out in the Action Plan) directed towards this objective.

(ii) Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats on the Indian Ocean and South-East Asia (MT-IOSEA)
MT-IOSEA concluded under the auspices of the CMS and became effective on 1 September 2001. It is intended to combat the major threats to the survival of marine turtle species, including unsustainable exploitation, destruction of nesting and feeding habitats and incidental mortality in fishing operations. It is unlikely to be of significance for wind or on-shore hydroelectricity installations.

(d) Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)
The Ramsar Convention is a multilateral treaty which provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources. It is the only global environmental treaty that deals with a particular ecosystem. The Convention aims to protect a range of wetlands, including swamps and marshes, lakes and rivers, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.49

The Ramsar Convention was adopted in Ramsar, Iran on 2 February 1971, and entered into force on 21 December 1975. The Ramsar List of Wetlands of International Importance now includes over 1,616 sites (Ramsar sites) covering around 1,455,000 km². 64 of these sites are in Australia, covering an area of approximately 7.3 million hectares. Australia was among the first nations to ratify the Ramsar Convention on 21 December 1975.

JAMBA is the agreement between the governments of Australia and Japan governing the protection of migratory birds with an established flight path between their two territories. The bird species to which JAMBA applies are listed in the Annex, and there is a provision allowing the Annex to be reviewed and amended as appropriate. JAMBA was signed in Tokyo on 6 February 1974, and ratified by Australia on 30 April 1981.


CAMBA provides the framework for cooperation between the Australian and Chinese governments on issues relating to protection of migratory birds with a flight path between the two countries. The Annex sets out a list of 81 bird species to which CAMBA applies (which excludes birds that have been introduced by humans to either country), and provides that the Parties may review the Annex and include further species as appropriate. CAMBA was signed in Canberra on 20 October 1986 and entered into force on 1 September 1988.

(g) Agreement with the Government of the Republic of Korea for the Protection of Migratory Birds

In 1992, during negotiations between Australia and Korea, the two countries agreed to prepare an agreement relating to the protection of migratory birds. The purpose of the bilateral agreement is, like JAMBA and CAMBA, to protect birds which fly the East Asian-Australasian Flyway which extends from the Arctic through Asia to Australia and New Zealand. This treaty has not yet entered into force.

**Domestic framework**

The primary legislation giving effect to Australia’s obligations under the various biodiversity conventions is the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act provides the framework for environmental conservation in Australia and sets out the national assessment and approvals for matters of national environmental significance. The EPBC Act covers:

- World and National Heritage (sections 12-15C), implementing the provisions of the CWCNH;
- Ramsar wetlands (sections 16-17B), implementing the provisions of the Ramsar Convention;
- Listed threatened species and endangered communities (sections 18-19), implementing the provisions of the CBD; and
- Listed migratory species (sections 20-20A), implementing the provisions of the CMS (including ACAP and MT-IOSEA), JAMBA and CAMBA.
Barriers to renewable energy

(a) Convention Concerning the Protection of the World Cultural and Natural Heritage

The aim of the CWCNH is to promote the cooperation between nations and encourage the implementation of systems to identify, protect, conserve, present and transmit to future generations, cultural and natural heritage that is of outstanding universal value. Properties that are identified to have cultural and/or natural heritage of outstanding value are placed on the World Heritage List.

As a party to the CWCNH, Australia is obligated to take effective and active measures to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to take the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage. This has been achieved through the implementation of a domestic cultural and natural heritage conservation system where places demonstrating adequate cultural and natural heritage significance are placed on a National and/or Commonwealth Heritage list and protected under the provisions of the EPBC Act.

The EPBC Act enhances the management and protection of Australia’s heritage places, including World Heritage properties. It provides for the listing of natural, historic or Indigenous places that are of outstanding national heritage value to the Australian nation as well as heritage places on Commonwealth lands and waters or under Australian Government control. Once a heritage place is listed under the EPBC Act, it becomes a matter of national environmental significance which is subject to the stringent assessment and approval processes outlined in the Act. For example, for each heritage place listed, it is a requirement that management plans are prepared which set out the significant heritage aspects of the place and how the values of the site will be managed. Under the EPBC Act, it is a criminal offence to have a significant impact on the values of a heritage place without first obtaining the permission of the Commonwealth environment minister. In preparing and seeking approval for a proposal for a new wind or hydro-electricity project, it must be checked whether there will be a heritage listed place affected and if so, how the project can be carried out in compliance with the management plan to ensure there is no significant impact on its values.

(b) Convention on Biological Diversity

The CBD requires parties to integrate the conservation and sustainable use of biodiversity into relevant sectoral or cross-sectoral plans, programmes and policies, as well as national decision-making processes, including in relation to the energy sector.

The conservation of habitats is provided for in Article 8 (in-situ conservation), which requires the establishment of a system of protected areas. Where necessary, parties are to develop guidelines for selection, establishment and management of protected areas, and must regulate the conservation and sustainable use of biological diversity whether inside or outside the protected area. Parties have a duty...
to promote sustainable practices in areas adjacent to protected areas to guard against spill over effects.55

CBD COP decision VII/2856 on protected areas (in tandem with decision VII/357 on marine and coastal biodiversity) reaffirms the importance of protected areas to attaining the objectives of the convention. This was further reinforced in CBD COP 8 decision VIII/2458 on protected areas and decision VIII/2259 on marine and coastal biodiversity.

To the extent possible and where appropriate, the CBD requires parties to introduce environmental assessment procedures for proposed projects that may have adverse impacts on biodiversity.60 The potential negative impacts of programmes and policies should also be considered.61 Activities taken by one party that may adversely affect the biodiversity of another party are subject to notification, information exchange and consultation as agreed by the parties;62 and where the actions of one party put the biodiversity of another party in imminent harm or danger, a system for immediate notification and mitigation must be in place.63 Measures for dealing with national emergencies should also be in place and parties should encourage international co-operation as a supplement to national efforts.64

Australia’s obligations under the CBD are implemented by the National Strategy for the Conservation of Australia’s Biological Diversity, developed in 1996. Under that strategy, Australia has established a system of protected areas,65 and has put in place legislative mechanisms (primarily the EPBC Act and related regulations) to fully implement the provisions of international agreements relating to biodiversity conservation and to regulate the conservation and sustainable use of Australia’s biological diversity as required by the CBD. The EPBC Act identifies listed threatened species and communities as matters of national environmental significance which are subject to the strict assessment and approvals process set out in the Act. In accordance with Australia’s international obligations and the requirements of the Act, therefore, a proposal for a new wind farm or hydro-electricity plant may not be approved where it is likely to significantly impact an area or species that falls under the protection of the CBD and the EPBC Act.

The CBD has ‘joined forces’ with four other biodiversity-related conventions to explore the inter-linkages between the issues each addresses, and the potential complementarities in their monitoring and implementation processes.66 The CBD at COP 8 in March 2006 in Brazil, welcomed the revised joint work programme with the CMS (2006-2008). To the extent that the joint work programme results in the incorporation of CMS initiatives into national biodiversity strategies and action plans, it could provide an entry point for CMS guidelines on migratory species and wind farms (see below).

(c) Convention on Migratory Species

Currently, the CMS is the only international agreement to which Australia is a party that imposes specific obligations in relation to wind farms. To the extent that dams created for hydro-electricity projects may destroy habitat required for migratory species, the CMS may also create barriers to the development of such projects.

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55 Id. at 8(e).
56 CBD COP 7 decision VII/28: Protected areas (articles 8(a) to (e)), available at, http://www.biodiv.org/decisions/default.asp.
57 CBD COP 7 decision VII/5: Marine and coastal biological diversity, id.
59 CBD COP 8 decision VIII/22: Marine and coastal biological diversity: enhancing the implementation of integrated marine and coastal area management, id.
61 Id. at 14.1(b).
62 Id. at 14.1(c).
63 Id. at 14.1(d).
64 Id. at 14.1(e).
CMS Article 3.4(b) requires parties that are Range States of a migratory species “to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species.” The question of whether wind farms could constitute an activity that seriously impedes or prevents the migration of species has clearly been answered in the affirmative.

The Conference of the Parties (COP) of the CMS has recognised that climate change may significantly affect the behaviour, distribution and abundance of migratory species and may change the ecological character of their habitats. At its fifth meeting, the CMS COP, in Recommendation 5.5 (Climate Change and its Implications for the Bonn Convention), requested the CMS Scientific Council to review the results of past and present scientific work on the ecological and other effects of climate change, assess the relevance and importance of such work for the conservation of migratory species, review existing scientific links between the CMS and other bodies undertaking work in this area, formulate proposals for improving and strengthening such links, and report its conclusions and make recommendations to the next meeting of the Scientific Council.

Recognising also that the measures taken to mitigate climate change can themselves pose a threat to these species, the CMS Scientific Council recommended the adoption of a resolution on wind turbines and migratory species at the seventh meeting of the CMS COP. Resolution 7.5 (Wind Turbines and Migratory Species) acknowledges the environmental benefits of wind energy, “especially for addressing climate change,” as well as the significance of reducing climate change for the long-term survival of migratory species. Nevertheless, the resolution notes that wind turbines, especially those in marine areas, represent a new method of large scale energy production whose actual effects on nature and on the different components of biodiversity cannot be fully assessed or predicted at present.

The resolution goes on to list some of the negative potential impacts of wind turbines on migratory species of mammals and birds, as well as on their food sources and habitats, which include:

- Destruction or disturbance of permanent or temporary feeding, resting and breeding habitats;
- Increased collision risk for birds in flight, noting especially the potential risk that several hundred offshore wind turbines with heights of up to 150 metres may present as obstacles in flyways;
- Risks arising from electric and magnetic fields of connecting power cables; and
- Emission of noise and vibrations into water.

In view of these concerns, CMS Resolution 7.5 calls upon parties to take the following specific measures:
To identify areas where migratory species are vulnerable to wind turbines and where wind turbines should be evaluated to protect migratory species;

- To apply and strengthen, where major developments of wind turbines are planned, comprehensive strategic environmental impact assessment procedures to identify appropriate construction sites;

- To evaluate possible negative ecological impacts of wind turbines on nature, particularly migratory species, prior to deciding upon permission for wind turbines;

- To assess the cumulative environmental impacts of installed wind turbines on migratory species; and

- To take full account of the precautionary principle in the development of wind turbine plants, and to develop wind energy parks taking account of environmental impact data and monitoring information as it emerges and taking account of exchanges of information provided through the spatial planning process.

Relevant intergovernmental organizations, as well as the European Community and the private sector, are also invited to cooperate with the CMS in efforts to minimise possible negative impacts of offshore wind turbines on migratory species.

The issue of migratory species and wind farms also found its way into CMS Resolution 8.18, Integration of Migratory Species into National Biodiversity Strategies and Action Plans and into On-Going and Future Programmes of Work under the Convention on Biological Diversity. Annex II lists information on measures to regulate or manage processes or activities that represent a significant adverse effect on migratory species and details of relevant impact assessment measures designed to avoid or minimize adverse impacts of proposed projects on migratory species, including those potential threats from power transmission lines and wind farms, among the categories of information on migratory species to be considered in the development of a national biodiversity strategy and action plan under the CBD. In addition, CMS Resolution 8.22, Adverse Human Induced Impacts on Cetaceans, acknowledges that human induced impacts on cetaceans are increasing.

Many of the migratory species listed in the CMS are protected under the EPBC Act, which came into force on 17 July 2000. Approval is required under the Act for any actions that will have or are likely to have a significant impact on listed migratory species. The Act then provides for a “comprehensive strategic environmental impact assessment”, in accordance with the requirements of CMS Resolution 7.5 set out above. As has been recently demonstrated, the need to protect migratory species as required by the CMS and its implementing legislation in Australia may prevent the approval of certain wind farm projects.

A proposal for a National Wind Farm Code is also under development. The Australian Greenhouse Office has released the National Code for Wind Farms Discussion Paper, which identifies the environmental challenges posed by wind farm developments, particularly in relation to bird and bat species, noting that “there is...
often a correlation between the preferred siting of wind farms on wind-prone ridges and the flight paths of certain bird species. In September 2007 the Australian government appointed a working group whose aim is to establish a National Wind Farm Code.

The Discussion Paper also notes that there is currently considerable variation between the key elements of assessment regimes for wind farms across different states. One of the objectives of a National Code would be to unify the environmental and other criteria for the approval of new wind farm projects. The Code would be underpinned by the Principles for Wind Farm Environmental Assessment developed by the World Wind Energy Association, and would presumably take into account Australia’s obligations under the CMS (particularly Resolution 7.5) in relation to assessment and approvals processes for new wind farm projects, as outlined above.

(d) Ramsar Convention

The main aim of the Ramsar Convention is habitat protection, and more specifically, the conservation and wise use of wetland habitats. Wise use is defined as ‘sustainable utilization for the benefit of mankind in a way compatible with the maintenance of the natural properties of the ecosystem’. ‘Sustainable utilization’ is understood to mean ‘human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations’.

Wetlands are protected through a listing process. Parties designate wetlands to be listed on the basis of their international significance. International significance is determined using the following criteria: ecology, botany, zoology, limnology or hydrology. Changes to listed wetlands must be reported, including those resulting from technological developments, pollution or other human interference. Where possible, parties must compensate for losses to wetland resources.

The fundamental importance of wetlands as habitats for waterfowl is considered in the Preamble, and the international importance of wetlands to waterfowl is one of the key criteria for designating wetlands for protection. Where a listed wetland is deleted or restricted in the national interest, compensation for any loss to wetland resources should be made, in particular for the protection of waterfowl. Parties to Ramsar must endeavour to increase the population of waterfowl on appropriate wetlands.

The EPBC Act provides a procedure for the designation and management of Ramsar wetlands. Ramsar wetlands are identified in the Act as a matter of national environmental significance to which the strict assessment and approvals procedures set out in the Act apply. In addition, the Australian Ramsar Management Principles (ARMPs) have been developed to further guide the management of Ramsar wetlands. To the extent that a proposed wind farm or hydro-electricity project may impact on a Ramsar wetland, the obligations under the Ramsar Convention, the EPBC Act and the ARMPs may prevent its approval.
(e) JAMBA

Article III of JAMBA obliges the Parties to “take special protective measures, as appropriate, for the protection of species or subspecies of birds which are in danger of extinction.” Article VI requires Parties to “take appropriate measures to preserve and enhance the environment of birds protected under the provisions of this Agreement.” JAMBA does not specifically address wind farms, but implementation of the provisions in the Agreement are likely to have implications for the approval of wind farm projects in Australia if a new wind farm is proposed to be located in the path of a listed migratory bird.

(f) CAMBA

Article IV of CAMBA provides that the Parties must establish sanctuaries and other facilities for the management and protection of migratory birds and also of their environment, and take appropriate measures to preserve and enhance the environment of migratory birds. Similarly to JAMBA, while the Agreement does not specifically address wind farms, it is arguable that it would operate to prevent the approval of a wind farm which would adversely affect efforts to protect migratory birds and their environment.

Opportunities for mitigation and removal of barriers

In considering opportunities to mitigate the barriers outlined above, the first question to be asked is whether the provisions of the resolutions described above will in fact present barriers to the development of the wind energy or hydro-electricity industries. If these provisions are considered barriers, then the next question is whether they are unreasonable barriers. Finally, we must ask how these barriers can be reconciled with the challenge of fully harnessing the potential of wind and hydro energy as alternatives to fossil fuel generation.

The development of guidelines under these agreements (such as the proposed National Code for Wind Farms) deserves careful scrutiny. Based on arguments raised by opponents to wind farms in several national siting controversies, it can be expected that certain language that seems balanced on its face could be construed by such opponents to impede wind and hydro industry development. Therefore, the wording of guidelines under these resolutions should be carefully crafted with the full recognition of this fact.

In particular, in relation to the wind-farm provisions in the CMS, it should be noted that the wording of these resolutions is very general in nature. This suggests that when it comes to implementation, parties have some latitude in interpreting their obligations under either the CMS, especially relative to other policy considerations and obligations under other international, regional or bilateral agreements. Without the benefit of clarifying guidelines, which, in the case of the CMS, may not be available until 2008, the potential for uneven application of the wind farm provisions among parties may give rise to uncertainty which may adversely impact on investment in the sector. The implementation of a clear and
national code for the development of wind farms should assist in alleviating this uncertainty.

One approach of wind farm and hydro-electricity opponents has been to argue that governments should not approve any new projects until extensive additional study is completed on avian and wildlife impacts. Some have asserted that site-specific pre-construction and post-construction monitoring is not adequate and that comprehensive regional studies and comprehensive studies of cumulative environmental impact of multiple projects must be completed prior to the construction of individual developments. In some cases, the opponents argue for an assessment of cumulative negative impacts without undertaking a balanced assessment of cumulative positive benefits, including reduced greenhouse gas emissions by replacing fossil fuels with renewable energy.

Therefore, in order to avoid unreasonable barriers to renewable energy development, concrete implementing guidelines for the above agreements and conventions should involve input from all relevant stakeholders, including not only environmental groups and wildlife experts from academia and government but also the wind and hydro industries. The guidelines to implement the following language from the CMS are particularly important:

- “evaluation of possible negative ecological impacts of wind turbines on nature, particularly migratory species, prior to deciding upon permission for wind turbines;”
- “assessment of the cumulative environmental impact of installed wind turbines on migratory species;” and
- “taking full account of the precautionary principle in the development of wind turbine plants.”

Another important question relates to the issue of the acceptable threshold – that is, whether the aim of approvals processes is to ensure “zero mortality” of wildlife (e.g. “prevention” of any adverse impacts), or to assure the “mitigation” of adverse impacts on wildlife through the implementation of “best practices.” Of course, the latter option would involve tolerance of a certain level of mortality.

A “mitigation”/“best practices” approach would be more beneficial to the development of the wind and hydro industries than a “zero-tolerance” approach in most cases. For example, if expanding wind energy and hydro-electricity use leads to a reduction of greenhouse gas emissions and a slow down of climate change, the net positive effect on migratory species over the long term may justify individual short-term losses.

At least in relation to wind energy, known measures are available to reduce the impact of wind farms on migratory species. Careful siting, retrofitting of power poles to prevent electrocution of birds, construction of turbines on taller towers (above flight paths), re-powering of older sites to use fewer (but more efficient) turbines, and the emission of audible signals to birds and other species may all assist in minimizing the impact of wind farms on species. In this regard, the National Code for Wind
Farms Discussion Paper notes that “significant effort has been made to identify and manage the issues through comprehensive studies . . . As research leads to improved turbine design and wind farm location, the impact on bird and bat populations can be expected to decrease.”

Finally, it is important that wildlife experts, environmental organizations, and wind and hydro developers collaborate in considering the issues raised by biodiversity agreements for the development of wind energy and hydro resources and in developing guidelines (such as the National Wind Farm Code) to govern project development. In 2004, the Australian Wind and Energy Association and the Australian Council of National Trusts released a draft issues paper, Wind Farms and Landscape Values, which explored ways in which wind farms can be sited and designed in order to reduce their negative impact. The paper discusses factors including the siting, layout, height, spacing, density, colour and materials of the wind turbines and ways in which to enhance positive attributes and manage negative attributes of the wind farms. The paper concludes that the typical treatments for minimising the visibility of development on the landscape such as integrating the development with topography or borrowing line, form, colour and texture from the surrounding landscape, are difficult to achieve in the case of wind farm turbines and are may be inappropriate. The more effective approach to mitigate the impact of a wind farm is to implement a careful layout which avoids particularly sensitive features, and enhances its positive attributes. The paper suggests that landscape assessments should be carried out to identify and determine the value, character and significance of a landscape, and the extent to which a proposed wind farm is likely to impact on this character or significance, taking in a range of values including social, indigenous, cultural, artistic and environmental values to produce a holistic assessment.

More specifically, national and regional authorities should designate areas suitable for wind farm and hydro-electricity development in their planning as well as “no-go” areas, and should develop Geographic Information System (GIS) tools to map environmentally sensitive areas as well as areas suitable for wind farm and hydro-electricity development and should make the maps readily accessible to the wind industry. This has been achieved in the Renewable Energy Atlas project. The Renewable Energy Atlas project has completed renewable resource maps on the west of the United States and more particularly on 11 western US States. The Renewable Energy Atlas covers wind, solar, biomass and geothermal resources and includes regional maps of the locations and installed capacity of existing renewable energy facilities, as well as state-level policies that are in place to stimulate the development of renewable energy. It also addresses the important issues that should be considered in developing new renewable energy projects, including transmission capacity, load growth, land use and environmental impacts. New environmental assessment guidelines for wind farms and hydro-electricity projects, including the guidelines under development pursuant to Resolution 7.5 of the Convention on Migratory Species and Wild Animals (CMS), should:
- Involve input from all relevant stakeholders;
- Seek to limit the adverse impact on projects already approved by national authorities;
- Incorporate a mitigation/best practices approach rather than a zero-tolerance approach for reducing potential adverse impacts of projects, except where endangered or threatened species are involved. A mitigation/best practices approach is appropriate in recognition of the comparative benefits of renewable energy compared to fossil fuel generation in reducing greenhouse gas emissions and the related adverse climate change impacts on the ecosystem;
- Reconsider the usefulness of requirements for pre-construction monitoring at comparative reference sites;
- Provide for updating of guidelines as new research becomes available; and
- Eliminate requirements for assessment of research on certain species if generic research has demonstrated no (or minimal) adverse effects and the effect are not site-specific.

Research priorities relating to the environmental and cultural impacts of wind turbines and dams as well as successful mitigation measures should be established on a collaborative basis by national and state governments, academic experts, environmental organizations, and the renewable energy industry, and this cooperative effort should result in a prioritised research “roadmap.” Increased funding should be made available to pursue the proposed research “roadmap,” and the results of such research should be peer-reviewed and made publicly available.

5. BIOMASS

Overview of the biomass industry

Biomass, as a renewable carbon resource, encompasses a wide range of organic and inorganic materials which can be used to generate energy. Included in most definitions are all water- and land-based organisms, vegetation and trees (“virgin biomass”), as well as all dead and waste biomass such as municipal solid waste, biosolids (sewage), animal wastes (manures) and residues, forestry and agricultural residues, and certain types of industrial wastes.\(^2\)

The technologies available to use waste biomass for energy generation include a range of thermal and thermochemical processes, including combustion, gasification, liquefaction and the microbial conversion of biomass to obtain gaseous and liquid fuels by fermentative methods.\(^3\) For example, wood wastes may be combusted to form steam, which is passed through a steam turbine to produce electricity; and anaerobic processing of municipal solid waste can generate methane, which can be captured and used to generate energy.

The diverse biomass industry in Australia encompasses feedstock producers and suppliers, forestry companies, waste management companies, project developers,
energy producers, equipment suppliers, investors and research bodies. The range of operations in which these companies are engaged includes agricultural production, forestry and waste management, plant construction, transport and distribution, bio-refining and energy generation.

The environmental effects of biomass operations have the potential to raise two distinct issues under international law. Firstly, biomass installations that use municipal solid waste or other industrial or chemical waste as a raw material may produce hazardous waste within the meaning of the Basel Convention, which must be transported and disposed of according to the provisions of that convention. Secondly, biomass firing (of both virgin and waste biomass) produces gases containing chemicals whose production is restricted by the Stockholm Convention.

Key legal instruments

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention), adopted 22 March 1989, is the major international agreement dealing with waste. The Basel Convention requires state parties to establish a licensing system for persons transporting or disposing of hazardous and other wastes, as well as a system for packaging, labelling, transportation and documentation where the waste is to be subject to a transboundary movement. These requirements have the potential to create significant costs for the waste biomass industry where waste raw materials used in installations are transported across a state border. The Basel Convention is of limited significance for the Australian bio-energy industry, however, since all domestic firing installations currently utilise virgin or waste biomass produced in Australia.

The Stockholm Convention on Persistent Organic Pollutants (the Stockholm Convention) is a multilateral treaty designed to protect human health and the environment from “persistent organic pollutants” (POPs). It obliges State Parties to take measures to eliminate or reduce the release of POPs into the environment. The Stockholm Convention was adopted and opened for signature on 23 May 2001 and entered into force on 17 May 2004. Australia signed the Convention on 23 May 2001 and ratified it on 20 May 2004.

In accordance with its obligations under Article 7, the Australian Government has developed a National Implementation Plan (the NIP) for the implementation of measures required by the Stockholm Convention. The NIP sets out, among other things, Australia’s obligations under Article 5 to take certain measures in relation to the chemicals listed in Annex C (those chemicals unintentionally produced by the operation of biomass firing installations, as discussed below).

The NIP refers to the National Action Plan for Addressing Dioxins (the NAP) which is designed to implement some of Australia’s obligations under Article 5.

The next section will examine the barriers to the development of the biomass renewable energy industry presented by the Stockholm Convention, the NIP and the NAP.
Barriers to renewable energy

(a) Stockholm Convention

The Convention defines POPs as pollutants that

“...possess toxic properties, resist degradation, bioaccumulate and are transported through air, water and migratory species, across international boundaries and are deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems.”

The Convention identifies 12 particularly toxic POPs which are the subject of reduction and elimination measures. The most important in relation to the biomass industry are:

- Dioxins: produced unintentionally due to incomplete combustion, and have been found in wood smoke;
- Furans: produced unintentionally from the same processes as dioxins;
- Hexachlorobenzene: produced unintentionally from the same processes that produce dioxins and furans; and
- Polychlorinated biphenyls: compounds found in industry and heat exchange fluids, and a by-product of biomass firing installations.

Forms of these chemicals, namely polychlorinated dibenzo-p-dioxins and dibenzofurans, hexachlorobenzene and polychlorinated biphenyls, may be unintentionally formed through firing installations for wood and other biomass fuels. These POPs are listed in Annex C of the Convention.

Article 5 requires Parties to take certain measures to reduce the total releases derived from anthropogenic sources of each of the chemicals listed in Annex C:

- Develop a national action plan within 2 years of the date of entry into force of the Convention and implement it as part of its National Implementation Plan (required by Article 7). The NAP should be designed to identify, characterise and address the release of chemicals listed in Annex C;
- Promote the application of available, feasible and practical measures to reduce the release of Annex C chemicals or eliminate source processes (including firing of biomass installations);
- Promote the development of alternative source processes that do not result in the release of Annex C chemicals; and
- Promote and require the use of best available technologies and best environmental practices for new and existing source processes.

Part V of Annex C sets out the general prevention measures which Parties are required to adopt in relation to the specified POPs (i.e. measures to satisfy the obligations set out in Article 5(b)). It states that priority should be given to consideration of approaches to prevent the formation and release of the chemicals listed in Annex C, including:
- The use of low-waste technology;
- The use of less hazardous substances; and
- The replacement of feed materials which are POPs or where there is a direct link between the materials and the release of POPs from the source (which may include, for example, wood in biomass installations).

In addition, Part V notes that where proposals to construct new facilities or significantly modify existing facilities are being considered, consideration should be given to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of such chemicals (which may include alternative (non-biomass) energy generation facilities).

The Convention therefore imposes specific obligations on parties to reduce the use of biomass fuels (or to modify the way in which they are used, for example by gasifying instead of combusting biomass fuels) where they do in fact produce POPs. The formation of national implementation plans and national action plans to implement these obligations may thus create a significant barrier for the development of biomass renewable energy industries within State Parties.

(b) Australia

As noted above, the specific measures that have been adopted by the Australian Government in relation to its Article 5 obligations are set out in the NAP. The NAP sets out measures only in relation to dioxins (polychlorinated dibenzo-p-dioxins and dibenzofurans) and not in relation to hexachlorobenzene and polychlorinated biphenyls; further measures are likely to be implemented in future to deal with these chemicals.

The NAP sets out measures to control the emission of dioxins from combustion facilities based on the goal of 0.1 ng TEQ/m³ of dioxins, accepted internationally as the best practice for dioxin emissions from combustion sources. In Australia, this standard has already been adopted by most States and Territories. The table below indicates how this goal has been implemented in each jurisdiction.

The implementation of this aspect of the NAP will therefore not create any new barrier for the biomass industry. As noted above, however, the NAP currently implements only some of Australia’s obligations under the Stockholm Convention (i.e. the obligation to promote best available technologies and best environmental practices in relation to combustion installations). Future implementation of other obligations, including the obligation to take measures to reduce or eliminate sources processes (including biomass installations) may create barriers for the biomass industry, as explained in the section above.
Table 1 Jurisdictional regulations for dioxin emissions to air

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<tr>
<th>Level</th>
<th>ACT</th>
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<th>QLD</th>
<th>SA</th>
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<td></td>
<td>New facilities and upgrades</td>
<td>New facilities and upgrades</td>
<td>New and upgrade of old facilities. Permit conditions to reflect best practice.</td>
<td>New facilities</td>
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</tbody>
</table>

* The new figure of 0.0037 ng/m³ at ground level came into effect on 1 June 2005 under the *Environment Protection Policy (Air Quality) 2004* Legend: Leg: Prescribed through legislation Lic: Prescribed through licensing agreements

Opportunities to mitigate or remove barriers

While the obligation to take measures to reduce or eliminate POPs source processes may pose a barrier to Australia’s biomass industry, other obligations (namely, to promote the development of alternative source processes and best available technologies) may in fact provide a benefit to industry, by encouraging government policy that stimulates research and development into more efficient and less polluting biomass technologies. Through early support to the industry, the government may be able to ensure compliance with the Stockholm Convention while not disadvantaging the emerging biomass industry.

6. BIOFUELS

Industry overview

The two key biofuels with commercial prospects in Australia are ethanol and biodiesel. Although ethanol can be produced from a variety of feedstock, renewable ethanol is predominantly produced from agricultural sources such as waste starch, C molasses, maize, sorghum and feed wheat. Fuel ethanol production in Australia has fallen from approximately 75 ML in 2002–2003 to 23 ML in 2004–2005, which represents less than 0.1% of the automotive gasoline market. Currently, the three commercial producers of fuel ethanol in Australia are the Manildra Group, CSR Distilleries, and the Rocky Point Sugar Mill and Distillery. Other proposed ethanol projects have the potential to increase fuel ethanol production capacity by up to 930 ML. Three projects have recently been offered funding under the Australian Government’s Biofuels Capital Grants Program and are expected to provide 77.5 ML of new capacity. On the user side, ethanol is being sold by BP, Caltex, Manildra Park Petroleum, Neumanns, Queensland Fuel Group, United Petroleum, Evolve and a
number of other independent service stations. In the United States, Brazil, Sweden and the United Kingdom, flexible fuel vehicles are available that run on up to 85% ethanol. These vehicles are not currently available in Australia since the maximum ethanol blend allowed is 10%.

Currently utilised feedstocks for biodiesel include vegetable oils, animal fats and recycled cooking oils. Biodiesel has only recently been made commercially available in Australia. There are ten licensed producers, who collectively produced approximately 1 ML in 2003–2004 and 4 ML in 2004–2005. Four projects are being supported by the Biofuels Capital Grants Program, with the potential to produce 157 ML of biodiesel. The bulk of biodiesel in Australia is sold in blends of 20% or less with petroleum diesel.97

It is important to bear in mind that the combustion of biofuels produces significant quantities of carbon dioxide. They are classified as a “renewable energy” based on a life cycle analysis. As the crops which are used to produce biofuels grow, they remove carbon dioxide (of the same quantity that will be produced by their combustion) from the atmosphere. The result is a zero net output of atmospheric carbon dioxide, offset to varying degrees by the use of fossil fuels in production and transport. In terms of environmental impacts, a primary issue associated with the production of biofuels is the loss of biodiversity resulting from any land-clearing that might be necessary to grow feedstock crops. Related to this is the potential for desertification. Where genetically modified crops are used in biofuel production (for example, genetically modified canola in biodiesel production), issues may arise under the Cartagena Protocol on Biosafety if and when Australia becomes a party.

**International instruments**

(a) General Agreement on Tariffs and Trade (GATT)

The GATT was developed from 1947 to 1994 through trade rounds. The last trade round was the Uruguay Round. The main purpose of the GATT is to facilitate open global trade through the reduction of tariffs and non-tariff trade barriers.

(b) World Trade Organisation (WTO) Uruguay Round

The WTO was formed during the Uruguay Round on 1 January 2005 as the successor to the GATT as the organisation dealing with international trade. Although the GATT trade rules are still relied upon by the WTO in relation to goods, additional rules regarding trade in services (General Agreement on Trade in Services (GATS)), relevant aspects of intellectual property (Trade Related Aspects of Intellectual Property Rights (TRIPS)), dispute settlement and trade policy reviews were created.

(i) Agreement on Agriculture (AOA)

The AOA was formed during the Uruguay Round and adopted on 15 April 1994. The objective of the AOA is to reform trade policies in agriculture to be more market-oriented by eliminating trade barriers that distort the market such as subsidies and
quotas. The AOA obligates members to reduce domestic support to agriculture, reduce the use of export subsidies, and improve access to domestic markets. Excluded from these obligations are subsidies for public policy purposes or for environmental programs included in the “green box”.

(ii) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)

The SPS was entered into force with the formation of the WTO. The SPS sets out the basic rules on food safety and health and plant standards. The aim of the SPS is promote the harmonisation of standards, based on science, to ensure the trade of safe products on the basis of consistent standards internationally and to prevent countries from using arbitrary and unjustifiable health and environmental regulations as disguised barriers to trade in agricultural products.

(iii) Technical Barriers to Trade Agreement (TBT)

The TBT was entered into force with the formation of the WTO. The TBT aims to ensure that regulations, standards, testing and certification procedures are based on legitimate purposes and are not used as a means of protectionism by creating unnecessary obstacles to trade. The TBT covers legally binding technical requirements relating to SPS measures, such as product content requirements, processing methods, and packaging and promotes the adoption of international standards.

(c) WTO Doha Ministerial Declaration (DMD)

The DMD was adopted on 14 November 2001. Under the DMD, parties agreed in Paragraph 31(iii) to eliminate tariff and non-trade tariffs to environmental goods and services and in Paragraph 16 to eliminate tariffs and non-tariff barriers on non-agricultural products of export interest to developing countries.

Barriers to renewable energy

The use of biofuel as a renewable resource is not wide-spread and there is still concern over the validity of the perceived environmental benefits of biofuel as a fuel source. The market of biofuels in Australia and internationally is not established. The Australian Government has made an attempt to promote the domestic production of biofuels through the introduction of subsidies and tariffs. Biodiesel production is encouraged under the Cleaner Fuels Grant Scheme through a grant that offsets the excise for biodiesel which is usually payable on fuel until 2011. The grant will be progressively phased out between 2011 to 2015. The subsidies for ethanol include significant capital grants for the construction of ethanol production facilities and the Ethanol Production Grants (EPG) program where a fuel excise rebate of 38.14 cents per litre of Australian ethanol production is granted until 2011. A tariff of 38 cents per litre of imported ethanol has been implemented to give domestic ethanol producers a competitive advantage.
The Australian Government is also considering the introduction of a mandate that 10% of fuel contains ethanol to guarantee a market for domestic ethanol producers.\textsuperscript{98} The New South Wales (NSW) Government has already implemented a minimum ethanol content requirement of 2% of fuel sold in NSW.\textsuperscript{99} There is the view that mandating the use of Australian ethanol content of fuel or volumes of production would be in conflict with obligations under the WTO. The trade of Australian biofuel internationally could also be subject to trade barriers from other countries not wishing to import Australian biofuel but rather protect their own domestic biofuel industries.

As a member of the WTO, Australia is subject to the negotiations and instruments created under the WTO. The applicability of these instruments and the effect they have on the trade and policies regarding biofuel is dependant on the classification of ethanol and biodiesel. Currently, ethanol and biodiesel are classified separately and differently under the World Customs Organization’s Harmonized Commodity Description and Coding System (HS).

(a) Ethanol

Ethanol is deemed an agricultural good under the HS. It is also included in the coverage of the AOA by inclusion in Annex I. As such, it will be easier to maintain higher tariffs and higher subsidies on ethanol than it would if it were considered an industrial or environmental good. Some WTO members have expressed an interest to have ethanol classified as an environmental good which would result in the reduction of subsidies available under Paragraphs 31(iii) and 16 of the DMD. As an environmental good, the protection of the domestic market of ethanol could be justified as within the ‘green box’ under the AOA.

(b) Biodiesel

Biodiesel is considered a chemical good under Chapter 38 of the HS and is not currently included in the Agreement on Agriculture Annex I. It is therefore not eligible for the same market protections as ethanol. It is possible that biodiesel could be considered an environmental good or to be of export interest to developing countries, thereby liberalising the trade of biodiesel under Paragraphs 31(iii) and 16 of the DMD.

The Australian Government has developed standards for the quality of biodiesel, regulated through the Fuel Quality Standards Act 2000 (Cth). The Australian Government is considering developing standards for the quality of ethanol. These regulations and standards would need to be consistent with the principles and the agreements in the GATT, SPS and TBT.

The largest barrier to the production and use of biofuel is that its perceived environmental benefits are not unequivocally accepted. If it is not established that the use of biofuel is better for the environment than non-renewable fuels then the Australian Government’s actions to support a domestic market for biofuel is unjustified. The current uncertainty in the biofuel markets, government legislation

\textsuperscript{98} If implemented, the ethanol limit in fuel would be regulated under the Fuel Quality Standards Act 2000 (Cth).

\textsuperscript{99} Regulated by the Biofuel (Ethanol Content) Act 2007 (NSW), which came into effect on 1 October 2007.
and consumer acceptance of biofuel in the Australian market have slowed the development of biofuel projects in Australia and in some cases deferred development until more certainty is developed.\(^\text{100}\)

**Opportunities to mitigate or remove barriers**

The impact of the obligations under the WTO depends on the classification of biofuels for trade purposes. The biofuel industry in Australia would prefer classification of biofuels as agricultural products as it will enable the continuance of tariffs allowed under the AOA that support the domestic production of biofuel in Australia. Parties that desire free trade in biofuels will want to see them qualify as both industrial and environmental goods.

The production and trade of biofuels will be further facilitated by research into the environmental impact of biofuels and evidence of the benefit of using biofuel over current conventional, non-renewable fuels to the environment. This will encourage the development of the biofuel market and increase consumer acceptance of biofuel as a fuel product.

### 7 OFFSHORE FACILITIES – WIND AND WAVE HYDRO

**Industry overview**

(a) Offshore wind energy industry

As noted above, the wind energy industry is the most rapidly growing renewable energy industry in Australia. Indeed, between 1996 and 2004, Australia’s total wind energy capacity grew from 2 MW to 252 MW.\(^\text{101}\) The total installed generation capacity is 817 MW, with a further 6785 MW of capacity currently proposed.\(^\text{102}\) There are no offshore windfarms proposed in Australia at present.

In a similar fashion to onshore wind energy, some environmental opposition has developed in other parts of the world in relation to offshore installations. There are considerable environmental benefits arising from the use of offshore wind energy compared with traditional fossil fuel-fired electricity generation because it is produced with zero emissions of greenhouse gases and other pollutants such as nitrogen oxides and sulphur oxides. At the same time, however, the construction and operation of offshore wind turbines is more expensive and is alleged to result in potential negative environmental impacts on cetaceans, landscapes and the marine environment.

(b) Ocean energy industry

An ocean energy industry is under development in Australia, with several pilot projects in progress or already in operation. The North West of Australia has some of the highest tides in the world (up to 10 metres) making it a particularly attractive location for tidal hydro installations. In recent years, a proposal to construct a 50 MW tidal plant near Derby in Western Australia was developed by Derby Hydro Power. This project received a substantial grant from the Australian Greenhouse Office under the

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\(^{100}\) An example of a company that has deferred the development of biofuel projects is Agri Energy Limited which decided to defer any development of biofuel projects in Australia in October 2007 pending a rationalisation of the biofuel industry.


Renewable Energy Commercialisation Programme but was not undertaken due to challenges with cost and construction. To make use of the energy generated, a 500 kilometre transmission line would be needed to take the electricity to Broome and Fitzroy Crossing as well as a number of remote Aboriginal communities. Consequently, a natural gas powered system has been adopted for most of the regional power needs. There are no tidal energy facilities currently operating in Australia.

During July 2006, an Oceanlinx wave energy plant at Port Kembla off the coast of NSW was deployed in the open ocean and operated successfully. The plant is expected to produce 1 GWh of electricity per annum and result in greenhouse emission reductions of approximately 1000 tonnes of CO₂ per annum. The electricity produced is connected to the electricity grid via Integral Energy’s network through an 11 kV cable. Oceanlinx is also in the advanced permitting stage for the deployment of eighteen 1.5 MW wave energy units in Portland, Victoria, giving a total capacity of 27 MW. This will be the largest wave energy project in development in the world and will have the potential to supply the power needs of about 15,000 homes in the local area. Carnegie Corp is trialling undersea mounted wave technology and is planning to install a small array of its CETO II units off Fremantle, WA, by the end of 2008.

In terms of greenhouse gases, ocean hydro plants are an attractive energy source since their operation does not result in any emissions. However, taking energy from the ocean may cause changes to the shoreline where tidal flows are empedged, as well as flow patterns causing seabed disturbance due to sedimentation and erosion. Impacts of ocean hydro installations on marine wildlife resulting from collision may also be of some concern, but studies have shown that both device design and animal behaviour can adapt to such risks.¹⁰⁴

**Key legal instruments**

(c) UN Convention on the Law of the Sea

The 1982 United Nations Convention on Law of the Sea (‘UNCLOS’) aims to establish a legal order for the seas and oceans that will, among other things, promote “the equitable and efficient utilisation of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment.”¹⁰⁵ Australia ratified UNCLOS in October 1994 and became legally bound by its provisions when it entered into force in November of that same year.

(d) London Protocol

Upon its entry into force in March 2006, the 1996 London Protocol superseded the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (‘London Convention’) and became binding on those parties to it that were parties to the original Convention. As an original party, Australia domestically implemented the London Convention via the Environment Protection (Sea Dumping) Act 1981 (Cth). It has since ratified the Protocol, and the Environment Protection (Sea Dumping) Act has been amended to reflect this.


¹⁰⁵ UNCLOS, preamble.
(e) Noumea Convention and its Dumping Protocol

Australia’s international legal obligations in relation to the protection of the marine environment are supplemented by the 1986 *Convention on the Protection of the Natural Resources and Environment of the South Pacific Region* (‘Noumea Convention’) and associated Protocols, which have been ratified by Australia and entered into force in 1990. Amendments in 1993 to the *Environment Protection (Sea Dumping) Act* (Cth) 1981 have given partial domestic effect to the agreements.

(f) UN Convention on Biological Diversity

The 1992 *UN Convention on Biological Diversity* (‘CBD’) came into force in 1993, and has been ratified by Australia and implemented in part by the *Environmental Protection and Biodiversity Act 1999* (Cth).

(g) Apia Convention

Australia has acceded to the 1976 *Convention on Conservation of Nature in the South Pacific* (‘Apia Convention’), which entered into force in 1990.

**Barriers to renewable energy**

(h) UN Convention on the Law of the Sea

UNCLOS codifies the rights of states to use and exploit the resources of the ocean. At the same time, it imposes restrictions on those rights and introduces obligations in relation to the protection of the marine environment and the prevention of pollution. As a result, UNCLOS both facilitates and potentially inhibits offshore wind energy and wave hydro plants.

UNCLOS divides the ocean into zones: the territorial sea, the exclusive economic zone (‘EEZ’), the continental shelf and the high seas. Consequently, states’ rights and responsibilities will vary depending on the location of renewable energy activities. In accordance with UNCLOS, Australia has declared sovereignty over a territorial sea of 12 nautical miles, an EEZ of 200 nautical miles and its continental shelf under the *Seas and Submerged Lands Act 1973* (Cth).

Along with requirements relating to safety of fishing and freedom of navigation, the sovereign right of states to exploit their natural resources is qualified by a duty to protect and preserve the marine environment. States are obliged under article 194(1) to take all measures consistent with UNCLOS that are necessary to prevent, reduce and control pollution of the marine environment from any source. The definition of ‘pollution’ is:

“The introduction by man, directly or indirectly, of substances or energy into the marine environment . . . which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate use of the sea, impairment of quality for uses of sea water and reduction of amenities.”

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106 UNCLOS, article 1(1)(4).
Depending on operating characteristics and design, energy may enter the ocean as a by-product of wind or wave hydro installations. This may be a result of energy losses during the generation of electricity or its transfer to the mainland. Whether such energy would be classified as “pollution” depends on the likelihood of damage to the marine environment.

The definition of “pollution” may also encompass the removal and disposal of abandoned structures. Furthermore, the removal of structures will fall within the ambit of Article 60(3), which provides that any installations that are abandoned or disused must be removed to ensure safety of navigation. Such removal must also have due regard to fishing, the protection of the marine environment and the rights and duties of other states.

Safety zones for both wind energy and wave hydro installations may also be mandated under UNCLOS. According to article 60(5), the breadth of safety zones are to be determined by the coastal state and must be designed to ensure that they are reasonably related to the nature and function of the installations. The distance of each safety zone must not exceed 500 metres.

(i) London Protocol

The objective of the London Protocol is to protect and preserve the marine environment from all sources of pollution. Subject to several exclusions, certain types of dumping activities are prohibited. Parties to the Protocol must prohibit the dumping of any wastes or other matter with the exception of those listed in Annex 1, which may be dumped where a permit is granted.\(^\text{107}\) The abandonment or disposal at sea of wind energy or wave hydro installations appears to fall within the definition of dumping, which — according to article 1 — expressly includes “any abandonment or toppling at site of platforms or other man-made structures at sea, for the sole purpose of deliberate disposal.”

However, “vessels and platforms or other man-made structures at sea” are included in Annex 1 as matters which may be considered for dumping. State parties must nonetheless comply with article 2 of the Convention, which requires parties to protect and preserve the marine environment from all sources of pollution and take effective measures to prevent, reduce and, where practicable, eliminate pollution caused by dumping at sea of wastes or other matter.

(j) Noumea Convention and its Dumping Protocol

The Noumea Convention aims to protect and manage the marine and coastal environment of the South Pacific Region. It applies to the 200 nautical mile zones established off the states that are bounded by the Pacific Ocean, as well as “those areas of high seas which are enclosed from all sides by the 200 nautical mile zones.”\(^\text{108}\) This includes the EEZ off the east coast of Australia and its eastward islands.

The 1986 Protocol for the Prevention of Pollution of the South Pacific Region by Dumping (‘Noumea Dumping Protocol’) was created pursuant to the London Convention and the Noumea Convention. It reiterates the Conventions’ general
obligation that parties must take all appropriate measures to prevent, reduce and control pollution by dumping. Following the trend of the superseded London Convention, Annex I of the Noumea Dumping Protocol contains a list of substances the dumping of which is prohibited. Annex II lists substances which may only be dumped after the issue of a special permit. Renewable energy installations do not appear to fall within Annex, and may therefore be dumped if a general permit is issued. Thus, while the permit requirement imposes a logistical obstacle to offshore renewable energy development, it does not constitute an outright barrier.

(k) UN Convention on Biological Diversity

The objectives of the CBD include the conservation of biological diversity and the sustainable use of its components. ‘Biological diversity’ means the variability among living organisms from all sources, including marine and other aquatic ecosystems. The Jakarta Mandate on Marine and Coastal Biological Diversity and its associated programme of work adopted by the Conference of the parties, highlight the importance of marine biodiversity conservation in the context of the Convention.

Article 8 of the CBD requires parties, as far as possible and as appropriate, to manage biological resources important for the conservation of biological diversity with a view to ensuring their conservation, and to promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings. Marine ecosystems are often rich in biological diversity and have a potentially high value as ‘biological resources’ within the objectives of the Convention. Australia is therefore obliged to promote the protection of such ecosystems and manage them with a view to ensuring their conservation.

Under article 14(1), state parties must, as far as possible and as appropriate, introduce procedures requiring environmental impact assessments of their proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimising such effects. The impact of wind energy and wave hydro installations on marine biodiversity should therefore be assessed, although this will simply serve as a consideration in decision-making rather than an outright bar to renewable energy activities.

The CBD also requires parties, as far as possible and as appropriate, to establish a system of protected areas where special measures need to be taken to conserve biological diversity and to promote environmentally sound and sustainable development in areas adjacent to protected areas. The Australian Government has established fourteen marine protected areas, the largest of which is the Great Barrier Reef Marine Park. Renewable energy activities which may affect these areas are likely to be restricted. However, the Convention provides Australia with discretion in terms of what, if any, measures are to be taken to protect biodiversity in the protected areas.

(l) Apia Convention

The Apia Convention establishes a broad framework for nature conservation in the South Pacific region, including Australia. Its provisions are largely discretionary and

109 Noumea Dumping Protocol, article 3(1).
110 Noumea Dumping Protocol, article 6.
111 Convention on Biological Diversity, article 1.
113 Convention on Biological Diversity, articles 8(a),(e).
encourage the creation and conservation, where possible, of national parks and reserves. They do not appear to present a barrier to offshore renewable energy development. At most, a ‘full examination’ of such development would be required.

**Opportunities for mitigation and removal of barriers**

Subject to the rights of other states to innocent passage for their vessels, Australia has the right to exploit the waters of, and geological storage facilities beneath, its territorial sea pursuant to articles 2 and 17 of UNCLOS. Within its EEZ, Australia has sovereign rights of exploration, exploitation and management of natural resources in both the seabed and waters above it. Accordingly, UNCLOS facilitates the production of energy from the water, currents and wind by Australia in its territorial sea and EEZ. Appropriate design and careful removal of renewable energy installations may serve to remove the barriers posed by UNCLOS in relation to pollution and safety zones.

Under the London Protocol, structures at sea may only be considered for dumping if any material capable of creating floating debris or otherwise contributing to pollution of the marine environment has been removed to the maximum extent possible. The material dumped must not pose a serious obstacle to fishing or navigation. Again, these limitations may be reduced through prudent design and operation. Similarly, the risks to biodiversity which may pose a barrier under the CBD may be mitigated by ensuring that stringent planning and assessment procedures are followed. Wave hydro installations should be engineered so as to avoid collisions with marine life by, for example, enclosing turbine entry-points in protective meshing.

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115 Apia Convention, articles II(l), III(l) and IV.

116 UNCLOS, article 56.