AOTEAROA WAVE AND TIDAL ENERGY ASSOCIATION

SUBMISSION

on the

PROPOSED NATIONAL POLICY STATEMENT

for RENEWABLE ELECTRICITY GENERATION

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Aotearoa Wave and Tidal Energy Association

Submission on the Proposed National Policy Statement for Renewable Electricity Generation

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SUBMISSION

1.1 INTRODUCTION

The Aotearoa Wave and Tidal Energy Association (AWATEA) makes this submission on the Proposed National Policy Statement on Renewable Electricity Generation (NPS for Renewables). AWATEA is New Zealand's marine energy industry promotional organization. It was formed in February 2006 and currently has 54 members, including major electricity utilities, Crown Research Institutes, overseas and domestic marine energy project developers, potential suppliers and interested individuals. AWATEA's primary role is to promote and accelerate the uptake of marine energy in New Zealand. It is also New Zealand's representative on two international committees, the International Energy Agency's Ocean Energy Systems Executive and the International Electrotechnical Commission's Technical Committee 114, which is establishing technical standards for marine energy converters.

1.1.1 Submission Process

This submission is based upon our reading of the Section 32 report, included with the draft NPS documentation and earlier consultation with MfE officials. This submission was presented on 7 November 2008, a deferral which has allowed us to complete a report on the "*Environmental Effects of Marine Energy Devices*", which is attached to this submission.

AWATEA welcomes the opportunity to consult further with Ministry for the Environment officials and others on the final form of the NPS for Renewables before it is enacted.

1.1.2 Opportunity to be Heard

AWATEA appreciates the opportunity to make this submission on the NPS for Renewables. If and when the opportunity arises, AWATEA welcomes the opportunity to be heard by the Board of Inquiry on our submission and the issues raised by the NPS for Renewables.

1.2 OVERALL REVIEW

AWATEA welcomes and **supports** the general direction and terms of the draft NPS for Renewables. It believes that the NPS provides the appropriate guidance for the development of renewable electricity generation. As such it should provide support for other Government policies.

With particular respect to marine energy the Government's four initiatives in the New Zealand Energy Strategy (NZES) are:

1. The establishment of the Marine Energy Deployment Fund (first awarded on 29 May 2008; second round currently in progress with two further rounds anticipated).
2. Marine energy atlas by end-2009
3. Marine energy converter standards by end-2010
4. Support for AWATEA.

Other evidence of Government support for marine energy includes the past R & D funding and the recent announcement by FRST (14 July 2008) of further funding of three R & D projects on various aspects of marine energy. Other Government agencies such as the Ministry of Economic Development, Electricity Commission and Transpower have begun to consider the potential for marine energy in their planning.

The first experimental wave device has been deployed in New Zealand waters since 2006. Greater Wellington Regional Council granted the first consent for a 1 MW prototype tidal current device in April 2008, with the first device to be deployed in 2009-10. The first full-scale (200 MW) commercial tidal current project proposed by Crest Energy Kaipara Limited, was granted consents by Northland Regional Council in August 2008, with recommendation of further consents to be granted by the Minister of Conservation. However, these consents have been appealed and the appeals are at an early stage of review by the Environment Court.

The implementation of a NPS for Renewables is thus well timed. Implementation of the NPS will provide regional councils and the Environment Court guidance on the treatment of marine energy projects proposals. In large part the NPS for Renewables clearly supports and favours the development of marine energy in New Zealand but AWATEA wishes to make some comments and recommendations on issues specific to marine energy.

1.3 POLICY 3: REVERSIBILITY

Policy 3 requires that "*decision-makers must have particular regard to the relative degree of reversibility of the adverse environmental effects associated with proposed generation technologies*".

The concept of reversibility with respect to marine energy converters will depend upon the type of marine energy technology chosen. Whilst marine energy converters may be novel, there is a long history of various devices being put into coastal waters around New Zealand, including breakwaters, harbour walls, navigation buoys and, most recently, significant numbers of aquaculture developments. There are unlikely to be a significant number of new environmental effects created by marine energy converters, as compared with the effects resulting from these pre-existing structures.

1.3.1 Open-ocean Wave and Tidal Current Devices

Offshore wave and swell devices may have no long-term effects other than seabed anchoring systems. Where these are gravity-based, *e.g.,* clump weights, rather than seabed-invasive, *e.g.,* rock anchors, the former may have only limited post-operational effects. Seabed drilling is unlikely to have any significant long-term effects, as long as any surface protrusions are removed prior to final decommissioning. Submarine tidal turbines are similarly unlikely to have any significant irreversible environmental effects, other than seabed drilling.

There are two types of marine energy devices, which may have longer-term environmental effects: tidal barrages and oscillating water column wave energy converters.

1.3.2 Tidal Barrages and Impoundments

Tidal barrages and Impoundments are effectively low-head hydro dams, which delay the natural tidal rise and fall to create a phase difference between water levels on either side of the barrage or impoundment. There are four operational tidal barrages around the world, of which the largest is the well-known 240 MW La Rance barrage in northern France. A larger 254 MW barrage project, at Sihwa in Korea, is being retrofitted to an existing bridge system and will be operational in mid-2010. Two further and even larger barrage projects are under development in Korea. Impoundments are man-made structures, proposed as stand-alone open-sea structures. None has been built to date.

Compared with the location of the La Rance and Sihwa barrages, New Zealand coastlines have only a very low tidal range (2.5 – 3.5 m). A number of harbours or estuaries, could offer significant potential for barrage projects in New Zealand but AWATEA is of the view that barrage projects will be very difficult to consent. The long-term, if not permanent, effects of a barrage are:

- Disruption to the estuarine, harbour or bays' environment
- Effects on migration of marine life into and out of the estuary, harbour or bay
- Accumulation of sediment behind the barrage
- Environmental changes caused by retaining higher water levels behind the barrage for longer periods
- High environmental restoration costs

For these reasons, it is unlikely that barrages or impoundments will be built in New Zealand, particularly as the power produced from the low tidal range might be relatively small compared with overseas locations. However, barrages and impoundments cannot be ruled out, since they are actively being developed overseas and new technologies may emerge that can address the effects listed above.

1.3.3 Oscillating Water Column Wave Devices

Some oscillating water column wave devices have been built, the best examples being the Pico Plant in the Azores Islands in the mid-Atlantic and the LIMPET device on the island of Islay in SW Scotland. Both of these devices are large concrete structures, built into the cliffs with significant rock excavation. If and when these devices are removed, the rock excavations will remain. AWATEA considers that these may be problematic to consent because of the potentially irreversible excavations. However, it should be noted that not all oscillating water column devices are clifftop-based and, indeed, one of the successors to the LIMPET device will be housed in a new harbour breakwater, which is being constructed in the Bay of Biscay. There may be very few additional environmental effects caused by developing this dual-purpose breakwater.

At least one is a nearshore device, which could be expected to have only limited environmental effects during operation and possibly no long-term consequences. An alternative to building a concrete structure on the cliff tops would be the drilling of horizontal tunnels below the wave base, so that there would be little or no long-term surface effects.

1.3.4 Summary

Marine energy converter designs are still widely divergent and there is no single way to extract energy (as has happened with the horizontal axis, upwind rotor, monopole tower design for wind turbines). Indeed, a single convergent design for marine energy converters is unlikely because devices designed to extract energy from open-ocean swells or from breaking waves are likely to be as different as devices to harness tidal currents or tidal rise and fall. There may be designs not yet invented, which may replace some of the current developments.

In summary, almost all open-ocean wave and tidal current devices are unlikely to have significant post-operational environmental effects. Most devices, which are likely to be introduced in New Zealand, will cause no permanent and potentially little post-decommissioning effects. The high-energy environments in which the devices will be deployed may remove evidence of the former occupation by MECs relatively rapidly. Tidal barrages (or impoundments) may have the same effects as low-head hydro dams but AWATEA believes that these are unlikely to be built in New Zealand.

1.4 POLICY 5: <4 MW THRESHOLD

Policy 5 in the document proposes a requirement for plan changes to be introduced by local authorities to enable the development and operation of small- and community-scale distributed generation projects. The aim is to facilitate small- and community-scale generation projects in off-grid applications. The proposal includes a <4MW threshold '"to capture the great majority of small-scale projects that are expected to be viable in rural and island locations...". However, the clause goes on to exclude marine energy from the definition of "*small and community-scale*" projects "*because it has not been possible to clearly establish the scale of effects that could be expected to be associated with a project of less than 4 MW installed capacity*".

AWATEA is concerned that this exemption will unduly and unintentionally disadvantage small- and community-scale marine energy projects. The exemption also seems to contradict the intentions of the Marine Energy Deployment Fund, which expressly states that one of the intentions of the fund is:

> *To support, but not necessarily be limited to, projects near islands or coastal communities currently reliant on diesel-fuelled electricity generation, and/or where grid/local network or direct standalone electricity user connections exist.*

(MEDF Fund Definition Document, page 5)

AWATEA believes that the MEDF documents rightly recognize the potential for marine energy to contribute to island and remote community power supply, *i.e.,* off-grid applications, as well as more conventional on-grid applications. Since all early-stage deployments will be <4 MW and some may remain so, the NPS may have the unintended consequence of hindering or disadvantaging marine energy applications in remote or island applications. The intent of the <4 MW threshold seems to be contrary to the purpose of the New Zealand Energy Strategy and the MEDF, which seek to provide energy security, whilst promoting emerging technologies that can contribute to emissions reductions.

1.4.1 Types and Sizes of Marine Energy Converters

There are a wide range of marine energy conversion methods and technologies, which are reviewed in the report "Environmental Effects of Marine Energy Converters". Not all of these technologies will be appropriate for use in New Zealand and the report identifies three generic technologies, which are most likely to be deployed here. They are:

1. Attenuator devices (floating open-ocean swell wave devices, like the well-known Pelamis device: 140 m horizontal length x 3.5 m diameter)
2. Point absorber devices (submerged open-ocean swell wave devices, like PowerBuoy, Wavebob and WET-NZ's wave device recently deployed in Wellington Harbour: 4 m diameter x ~50 m vertical length).
3. Horizontal axis tidal current turbines (submarine or surface-piercing tidal current devices, such as the OpenHydro device or the SeaGen device: 16 - 40 m wide and 25 – 70 m high).

The common features of these devices are that they are:

- Modular – designed for use in arrays, rather than singly (as with wind turbines). A 4 MW array could contain between 4 and 40 units.
- Moderate generation capacity – individual units have design capacities around 0.1 – 1.0 MW, though larger units are planned in future.
- Mostly or completed submerged – the devices may pierce the surface but the above-surface structures will be short (<2 m).
- Few moving parts – even turbine blades move relatively slowly (10 – 70 rpm; i.e., <1/10 of the speed of a ship's propeller).

Note that wave devices and tidal turbines are physically smaller than the current generation of wind turbines, since the former have to operate in a much denser seawater medium.

1.4.2 Location with Respect to the Shoreline

The generic wave devices listed above are open-ocean devices, whilst the generic tidal current devices could be located in the open ocean or in harbours and estuaries. Open ocean wave devices will be located in water depths of c. 50 m, since bottom friction at shallower depths tends to reduce available nearshore wave energy. Thus wave device arrays are likely to be located at least 1 - 2 km offshore. Early projects will, however, seek to be as close to the coast as possible to reduce submarine cable lengths, which can be a substantial proportion (~30%) of total project costs. Maximum water depths may be 100 m, simply because operating in deeper water increases mooring costs and requirements for larger, more specialized vessels.

Open ocean tidal turbines will tend to be located in water depths of more than 25 m, since device heights range from 25 to over 50 m. They too will be located at least 1 – 2 km offshore with the same countervailing consideration with respect to submarine cables. In Cook Strait the 25 m isobath is located 1 – 2 km from shore. Harbour-based tidal turbines may be limited to those harbours, which have sufficient water depth – usually near their mouths – to accommodate the turbines.

1.4.3 Density of Packing of Marine Energy Converters

The area required for a <4 MW array of wave or tidal current devices will depend on the type of the device selected and the packing density of these devices required. To some extent packing density will be a function of specific sites, particularly for tidal current sites, where individual device siting can be critical, as well as the selection of particular technologies.

To demonstrate how little space might be required, the following ~4 MW arrays will be proposed:

<u>4 MW point absorber array</u>

40 x 100 kW point absorber devices	=	4 MW
Device diameter	=	4 m
Device spacing	=	100 m
Exclusion zone around outer perimeter	=	500 m

The physical area taken up by these devices equates to 0.31 km^2, which increases to 2.46 km^2, assuming the required 500 m exclusion zone on all sides.

<u>4 MW Tidal Turbine Array</u>

4 x 1 MW point absorber devices	=	4 MW
Device diameter	=	16 m blades
Device spacing	=	100 m and 50 m*
Exclusion zone around outer perimeter	=	500 m

*Assuming 2 rows of two turbines with devices 50 m apart across-current, and 100 m apart down-current

In this case, this wholly submarine array will occupy 0.1 km^2, increasing to 1.2 km^2 with the required 500 m exclusion zone. It remains to be seen whether such a navigation exclusion zone will be required for a completely submerged tidal turbine array.

<u>3.75 MW Pelamis Attenuator Array</u>

5 x 0.75 MW point absorber devices	=	3.75 MW
Device diameter	=	3.5 m
Device spacing	=	250 m

Exclusion zone around outer perimeter = 500 m

This array thus occupies 0.14 km^2, increasing to 2.30 km^2 with the required 500 m exclusion zone on all sides.

In summary, small arrays of marine energy converters (<4 MW) will occupy relatively small amounts of open ocean space, ranging from 1.2 km^2 to 2.46 km^2. The unit generation capacity of devices becomes important in the case of small arrays, as can be seen in the difference between the 0.1 MW and 1.0 MW devices in the first two cases. In any event <4 MW wave or tidal device arrays will take up relatively small areas of open sea. Whilst the area taken up may have most impact on competing uses for the sea space, these calculations show that the area that will be impacted by placement of marine energy converters is small and thus the 'scale of effects' will be limited.

1.4.4 Environmental Effects of Marine Energy Converters

As noted New Zealand waters have had a number of structures placed in them: breakwaters, navigation buoys and fish farms. The environmental effects of these structures are now well known or are being addressed through adaptive management. To date in New Zealand there has been only one temporary deployment of a small (2 kW) experimental wave energy converter. No tidal current devices have been deployed. It is therefore difficult to provide a detailed review of the environmental impacts or scale of effects of marine energy converters. However, there are three current international projects that provide guidance:

1. Verdant Power's Roosevelt Island Tidal Energy (RITE) project in the East River in New York. Whilst the East River of New York may not be the best analogue for New Zealand waters, Verdant Power has conducted an extensive monitoring programme there, including a continuous, almost 3-dimensional sonar survey (Corren, D., *pers. comm.,* 2008). During the course of this survey, fish and diving birds have been found to avoid the six in-stream tidal current turbines and no collisions were observed. Further, as might be logically expected, fish and other marine life tends to avoid the higher current velocity flow regions, where the turbines are located, preferring the lower velocity flow regions, thus naturally avoiding the turbines (http://www.verdantpower.com/category/faq).
2. Marine Current Turbines' (MCT) 0.3 MW Seaflow tidal stream generator has been deployed continuously off Lynmouth in Devon, UK, since May 2003 and MCT has reported no significant environmental effects (including an absence of bio-fouling and corrosion of the device itself. MCT's new Seagen 1.2 MW 'commercial demonstrator' was installed in the Strangford Narrows (Northern Ireland) in April 2008 and was extensively monitored before and during installation and subsequently during operation. Environmental monitoring is being conduced by a local university and other contractors. To date no significant environmental impacts have been noted.

   http://www.marineturbines.com/21/technology/29/environmental_impact/.
3. The world's first commercial wave farm became operational on 23 September 2008 at Aguçadoura of Portugal. The three 750 kW Pelamis wave devices are located approximately 5 km offshore in a 'pilot zone' or area designated for marine energy deployment trials (http://www.pelamiswave.com/content.php?id=154).

Environmental effects of open-ocean wave devices are likely to be less significant than restricted channel or harbour projects.

AWATEA acknowledges that, whilst international examples may be instructive, they can only provide guidance on the likely environmental effects of deployments in New Zealand waters. The actual effects will need to be studied, as they may be different, simply on the basis of the different species in the surrounding area. However, AWATEA believes that the '*scale of effects*' and the extent of those effects beyond the deployment site are likely to be small, if not negligible. Visual impact and noise impacts are likely to be very restricted, particularly as open-ocean projects move further offshore (early projects are likely to be close to shore for operational convenience and reduction of cabling costs). Noise impacts are usually transitory and very limited.

1.4.5 Report: Environmental Effects of Marine Energy Converters

AWATEA has completed a report on the "*Environmental Effects of Marine Energy Converters*". This is a summary of the range and likely selection of wave and tidal current devices, which may be deployed in New Zealand with particular reference to <4 MW installations. The potential effects of increasing installation size can be estimated It is only after a number of smaller installations have been put in place and monitored, that.

The report also combines a review of the known effects on the biota that might be caused by the deployment of marine energy converters. With only one temporarily deployed wave energy device and few specific sites for marine energy projects selected, it is difficult to be more certain about the detailed environmental effects. However, comfort can be drawn from the early results of overseas deployments, which have undergone very rigorous operational monitoring – the environmental effects there to date have been slight.

1.4.6 "Scale of Effects"

Marine energy projects <4 MW have been excluded in the NPS for Renewables, because the "*scale of effects*" cannot be assessed, according to the Section 32 report.

AWATEA believes that it has demonstrated that:

1. This exemption is contrary to the intentions of the New Zealand Energy Strategy and the Marine Energy Deployment Fund
2. Wave devices will be located in the open ocean, whilst the tidal current devices may be located there or in harbours and estuaries
3. Only certain types of devices are likely to be deployed in New Zealand.
4. The devices are relatively small (smaller than current generations of wind turbines) and can be relatively closely packed
5. Most devices will be either completely submerged or extend above the surface only 1 -2 m (thus being invisible from the beach)
6. Most devices have unit generation capacities of 0.1 – 1 MW and are thus likely to be deployed in multi-unit arrays.
7. <4 MW arrays of these devices will take up only relatively small areas, even allowing for a 500 m perimeter exclusion zone
8. Devices may have relatively little environmental impact and arrays of <4 MW are unlikely to have any significant cumulative, permanent or long-term effects.
9. Most of the effects will not be permanent and, given the high energy areas in which the devices will be located, natural environments may be restored very quickly after decommissioning.

10. In the absence of domestic deployments, evidence from international projects is encouraging: devices do not have significant effects on the surrounding environment and the environment does not affect the devices to any great extent.

1.4.7 Solution Sought:

AWATEA would like to see the exemption of marine projects from the <4 MW threshold removed from the NPS for Renewables so that marine energy projects can compete on a level playing field with other renewable energy project options in small- and community-scale situations. AWATEA believes that the scale of effects of marine energy projects of <4 MW will be small, albeit not fully known at present. Using adaptive management processes, which current project applicants have proposed, the effects can be mitigated and the scale of these effects minimized.

1.5 POLICY 4: STREAMLINED RESOURCE CONSENTING PROCESS

The <4MW threshold is being introduced to favour renewable energy projects, "without providing a streamlined resource consenting process for those projects that may result in unacceptably significant adverse environmental effects". Whilst AWATEA does not believe marine energy projects – small or large – will fall into this category, it does believe that a streamlined resource consenting process for early-stage prototype marine energy projects should be considered, particularly in association with the development of a marine energy testing centre.

AWATEA takes comfort from the fact that Policy 4 requires local authorities to "…enable activities associated with:

1. Identification and assessment by generators of potential sites and energy sources for renewable electricity generation
2. Research-scale investigation into emerging renewable electricity generation technologies and methods".

This policy therefore seems to allow for such streamlined consenting processes.

1.5.1 Demonstration or Pilot Licences

In the United Kingdom the Department of Trade and Industry (DTI) published a guidance document specifically for early-stage marine energy prototype deployments in 2005 (Appendix 1). The Department of Energy and Climate Change (formerly part of DTI) reports that the guidance is used. In April 2008 the Federal Energy Regulatory Commission (FERC) in the United States introduced a scheme for prototype projects in Federal waters, *i.e.,* <3 nautical miles from the coast (Appendix 2). Uptake has been somewhat slow with some developers preferring to go straight for commercial licences, which have a 50-year life but which require much greater documentation than the pilot licences. Some of the commercial applications may contain proposals for early stage development, similar to the pilot process. A key point of these pilot licences is that they can be revoked by FERC, if unexpected or unmanageable environmental effects are encountered.

1.5.2 Testing Centres and Pilot Zones

Meanwhile a number of marine energy testing centres have been introduced or are under development. Currently there are 2 in the United Kingdom, 2 in the United States, 2 in Ireland, 2 in Denmark and one each in Canada, France and Norway. Portugal has introduced a 'pilot zone', an open-ocean area where consents are facilitated. Each of the testing centres is slightly different in concept and facilities but most have 'blanket' consents for basic prototype testing activities, although consents for project-specific environmental effects are still required.

In New Zealand, a streamlined consenting process for marine energy prototypes, associated with a specific open-ocean testing site or sites (or pilot zone) would facilitate marine energy activity without unduly jeopardizing the local environment.

1.5.3 Solution sought:

Consider the benefits of a streamlined consenting process for prototype device deployments in association with the establishment of an open-ocean marine energy testing centre(s) or pilot zone(s) in New Zealand waters.

1.6 SUMMARY

Marine energy may be an important source of renewable energy in New Zealand, in part because New Zealand is recognized to have world-class wave and good tidal current resources. Tidal current projects have already been proposed in Cook Strait and Kaipara Harbour and other consent applications are imminent. From the large range of marine energy converters currently under development, it seems likely that the ones that will be successfully deployed in New Zealand waters will have limited environmental impacts.

The New Zealand Energy Strategy and, in particular, the Marine Energy Deployment Fund, recognize the potential of marine energy. Indeed, the fund is especially targeted at small island or remote community applications. AWATEA believes that the proposed exemption of marine energy from the <4 MW threshold on the basis that the scale of effects could not be established will disadvantage marine energy. In any event we have sought to show in this submission and in the report that complements it, that the effects may be limited and manageable. Regional councils and project developers should be able to put in place adaptive management processes, including measurement and monitoring, to deal with effects as they arise.

With respect to reversibility, most marine energy technologies will have a 'light footprint' and environmental effects may be geographically limited and reversible on decommissioning. Barrages and impoundments, which may have more permanent impacts are, in AWATEA's view, unlikely to be built in New Zealand for the time being.

If the exclusion of marine energy from the <4 MW threshold remains, small island and remote communities will lose the opportunity to consider small-scale marine energy projects that could have little impact on their communities. Concurrently, marine energy technologies will be disadvantaged against other small-scale generation opportunities, which may have greater environmental impacts. One way of managing small-scale effects may be to introduce a streamlined resource consenting process for small-scale projects, perhaps in association with testing centres or pilot zones.

AWATEA appreciates the opportunity to comment on the draft NPS for Renewables and welcomes the opportunity to speak with the Board of Inquiry in connection with this submission and the wider issues of the proposed NPS.

Attachment 1

United Kingdom: Guidance on Consenting for a Pre-commercial Demonstration Phase for Wave and Tidal Stream Energy Devices

Document	Guidance on Consenting Arrangements in England and Wales for a Pre-commercial Phase for Wave and Tidal Stream Energy Devices
Issued by	UK Department of Trade and Industry
Date	November 2005
Subject	Consenting guidance for small-scale marine demonstration projects: to "test, prove and validate new or innovative uses of technology or combinations thereof"
Target audience	Project developers and stakeholders
Objective of guidance	Balancing stakeholder interests in specific projects against wide public interest in achieving national goals, policies and targets
Projects covered	Small-scale demonstration projects of temporary duration
Target outcomes	Consenting requirements "appropriate and proportionate to risk and scale of effects of device"
Demonstration phase objectives	1. Development and validation of engineering and technical aspects of devices and demonstration of commercial potential 2. Understanding environmental impacts of devices and potential impacts on other uses and users 3. Stakeholder engagement framework to facilitate implementation of commercial phase 4. Adaptation of consents process appropriate to new technologies and their impacts
Additional requirements	1. Site licence or lease from Crown Estate (time-limited to length of demonstration phase) 2. Consent under Electricity Act 1989 for >1 MW facility 3. DEFRA licence 4. Consent for onshore works (DTI and/or local council) 5. Preparation of an Environmental Impact Assessment (EIA)
Location selection	1. Developer's choice 2. Consultation with various statutory and regulatory authorities and bodies 3. Use of test site facilities, such as EMEC and Wave Hub, is encouraged
Environmental regulation	• Environmental Impact Assessment still required • EIA need only be proportionate to perceived risk and scale of adverse effects • If greater effects are identified, assessment, monitoring and mitigation requirements will be more rigorous • Strategic Environmental Assessment (SEA) will be required for any commercial development
Monitoring and research	• Monitoring conditions will be attached to consents • Related research may be carried out by other bodies • Generic research/monitoring may be subject to additional funding
Navigation & decommissioning	Developers must consult with navigation authorities Decommissioning plans must be approved before deployment; with early termination, if environmental effects are unacceptable
Time to consent	Will depend on choice of site, nature of device, environmental impacts and significance of impacts, quality of the EIA
Limits	No limit on number, scale or duration of demonstration projects but not open-ended Policy will be reviewed in Autumn 2008

Attachment 2

United States: Conditioned Licences for Hydrokinetic Projects

Document	Licensing Hydrokinetic Pilot Projects
Issued by	United States Federal Energy Regulatory Commission
Date	14 April 2008
Subject	To establish a regulatory climate that supports development of innovative hydropower projects that use the forces of currents, waves and tides to generate clean renewable electricity
Target audience	Marine energy project developers and stakeholders
Objective of guidance	To shorten the regulatory process and speed the development of meritorious hydrokinetic projects
Projects covered	Small-scale demonstration projects of temporary duration
Target outcomes	To shorten the regulatory process and the involvement of multiple agencies by offering FERC permits in advance of receipt of other permits (still required)
Demonstration phase objectives	1. FERC conditioned licences will have no environmental impacts 2. Conditioned licences do not allow projects to commence until other state and federal permits have been granted 3. FERC permits are designed to speed up the application process for demonstration projects 4. Licensees can proceed with other permit requirements (development of plans, consultation with stakeholders) but not construction until all permits obtained
Time to consent	Objective of conditioned licences is to reduce time for all consents to be granted
Limits	None defined

Note: to date only one conditioned licence has been sought but more applications are expected in early 2009. One reason for slow take-up may be the short-term and small-scale nature of projects covered by the conditioned licences. Applicants (and their financial backers) may prefer to submit full permit applications to secure longer-term licences with the freedom to incrementally grow commercial-scale developments.