

Marine energy

Glen Wright and David Leary, the University of New South Wales provide an overview of New Zealand law and policy

New Zealand currently produces 73 per cent of its electricity from renewable sources, and has an ambitious target to increase this to 90 per cent by 2025 (*National Policy Statement for Renewable Electricity Generation 2011*). There are a number of marine energy projects underway in New Zealand, and marine energy generation is expected to provide 1750 MW of electricity by 2030 (Ministry of Economic Development "New Zealand's Energy Outlook to 2030" (2006) at 130).

This paper will outline the main projects aiming to harness marine energy in New Zealand, as well as examining the key policy and funding initiatives in place supporting the development of this emerging industry. A detailed overview of the current regulatory regime is also provided, along with an outline of some of the issues with the regime.

Energy from the oceans can be converted into electricity in a number of ways. Wave and tidal energy are the most developed worldwide, and it is these sources that are currently being pursued in New Zealand. New Zealand is fortunate to have one of the best wave energy resources in the world, while only limited opportunities exist for tidal energy (Ministry of Economic Development "Emerging Supply-Side Energy Technologies" (2006) at 4). The New Zealand Energy Outlook states that the "potential resource is huge" (at 98): New Zealand's waves contain between 7.5 to 25 MW per km of wavefront and the tides contain 5 to 35 MW per km width ("Emerging Supply-Side Energy Technologies" at 3).

CURRENT PROJECTS

There are a number of marine energy projects currently being undertaken. The key projects are outlined below.

Tidal energy

While tidal resources are limited, they are strong in localised areas, such as Kaipara Harbour and the Cook Strait. Crest Energy is in the advanced stages of developing a tidal power project that will see 200 turbines, capable of producing 200 MW of electricity, installed in Kaipara Harbour (www.crest-energy.com). Crest has received resource consent under the Resource Management Act 1991, the first such approval for commercial tidal power generation in New Zealand (Minister of Conservation "Kaipara Harbour tidal turbine project approved" (press release, 17 March 2011)).

Energy Pacifica is pursuing tidal stream generation in the Tory Channel (Cook Strait) and has applied for resource consent. It plans to install ten turbines, each able to produce up to 1.2 MW (Lindsay Clark "Benign Tides" (2008) 6 *Energy NZ*). Neptune Power Ltd obtained resource consent in April 2008 for a tidal generation turbine off Sinclair Head in the Cook Strait (Power Projects Ltd (PPL) "Development of Marine Energy in New Zealand" (2008) at 58). The plan initially is to deploy a single 1 MW device as a trial ("Green

Light For Ground-Breaking Tidal Energy Project In Cook Strait" *Energy & Environment Business Week* (16 April 2008)). As of April 2010 the turbine had not been deployed, and the current status of the project is unclear (Nick Eldred (presentation to AWATEA Conference, Wellington, April 2010)).

Wave energy

Wave Energy Technology New Zealand (WET-NZ), a research and development collaboration programme comprising Industrial Research Limited and PPL, acquired resource consent, the first for a wave energy project in New Zealand, for deployment of prototypes of its technology in Pegasus Bay. Their device has been deployed since December 2006, but it is for research and development purposes only and it is not intended that it will be developed into a commercial-scale project (John Huckerby (AWATEA Conference)).

Chatham Islands Marine Energy Ltd (CHIME) is pursuing shore-based wave power near Point Durham in the Chatham Islands and has lodged an application for resource consent. The project would supply the Islands with half their electricity needs, lessening reliance on diesel generation (Garry Venus (AWATEA Conference)).

RESOURCE MANAGEMENT ACT

The Resource Management Act 1991 (RMA) is the main legislation dealing with environmental management and approvals in New Zealand and it aims to promote the "sustainable management of natural and physical resources" (s 5). The RMA provides for a regionalised system, whereby national standards, regulations and policies are implemented and supplemented by regional policy statements and plans, made by regional councils (s 65(2); Sch 1). Regional policy statements "set the basic direction for environmental management in the region", while regional plans "tend to concentrate on particular parts of the environment, like the coast, soil, a river or the air" (Ministry for the Environment *An Everyday Guide to the RMA* (series 1.1, 2nd ed, Wellington, 2009) at 5).

A person wishing to undertake certain activities must apply for resource consent under Part 6A of the RMA from the regional council. A coastal permit, a type of resource consent under s 87(c), is a consent to do something in the coastal marine area that would otherwise contravene the RMA. The marine coastal area describes the foreshore, seabed and seawater within 12 km of the low-water mark (see RMA, s 2; Territorial Sea, Contiguous Zone, and Exclusive Economic Zone Act 1977, ss 3 and 25).

Some activities relevant to developing marine energy projects are restricted by the RMA. Unless authorised by law, a person may not "erect, reconstruct, place, alter, extend, remove, or demolish any structure" that is "fixed in, on,

under, or over any foreshore or seabed" without a coastal permit (s 12(1)(b)). A person must not disturb the foreshore or seabed in a way "likely to have an adverse effect" thereon (s 12(1)(c)). A coastal permit is also required to use the water itself, as s 14(1)(a) of the RMA states that a person may not "take or use ... energy from any open coastal water" without consent.

Under s 117 of the RMA, consent must be sought for activities that are designated "restricted coastal activities" under a regional plan. However, cl 9 of the Coastal Policy Statement 2010 (CPS) states, "[t]he Minister of Conservation does not require any activity to be specified as a restricted coastal activity in a regional coastal plan". Under cl 29, local authorities must amend their regional plans in order to give effect to this policy (see also RMA, ss 5 and 55).

The maximum duration of a coastal permit is 35 years (s 123(c)), though practical experience is said to show that granting consent for this time is unusual and generally comes with onerous conditions (Simpson Grierson "Marine Energy Proposals – Resource Management Act 1991" (2005) at 2).

Regional plans

The relevant regional plan must be considered when making an application in order to determine whether there are any specific activities restricted or requirements to be met. The RMA tasks regional councils with, if appropriate, "the establishment of rules in a regional coastal plan to allocate the taking or use of ... energy from open coastal water" and "the establishment of a rule ... to allocate space in a coastal marine area" (s 30(1)(fb)(i) and (ii)).

Regional councils are responsible for the "strategic integration of infrastructure with land use through objectives, policies, and methods" (s 30(1)(gb)). Infrastructure is defined by s 2 of the RMA as "facilities for the generation of electricity, lines used or intended to be used to convey electricity, and support structures for lines used or intended to be used to convey electricity".

Visual impacts

The preservation of the "natural character of the coastal environment (including the coastal marine area)" is a matter of national importance under the s 6 of the RMA and must be considered when assessing resource consent applications. This will be relevant to marine energy systems that are not fully submerged.

Maori issues

Regional councils must consider the "relationship of Maori and their culture and traditions with their ancestral lands [and] water" and the protection of customary rights (see RMA ss 6(e), (f), (g) and 7(a)). There is a "considerable body of case law, some of it conflicting" on these considerations (Simpson Grierson at 10), and much will turn on the specific facts of each case. It is worth noting that Crest Energy was granted resource consent, despite vocal opposition from local iwi (see Robyn Downey "Hui to fight Kaipara wave turbine project" *Dargaville & Districts News*, 23 May 2011).

Where the activity to be carried out is within a customary marine title area, the customary marine title group may give or decline permission, on any grounds, for an activity, notwithstanding that resource consent has been given. Customary marine title has only recently been restored (Marine and Coastal Area (Takutai Moana) Act 2011), and it remains to

be seen whether many Maori groups will gain customary title. The test is difficult to satisfy, as it requires exclusive use and occupation from 1840 to the present day without substantial interruption, and it seems that this is unlikely to be relevant to most marine energy projects.

Consultation

The RMA does not place an obligation to consult stakeholders when applying for a resource consent (s 36A). However, the government recommends consultation, which may be advisable given the potential for opposition to a marine energy project (Ministry for the Environment *An Everyday Guide to the RMA* (series 2.1, 2nd ed, Wellington, 2009) at 9). The RMA does not specify how consultation should be managed, though the Government provides a guide to the process (*An Everyday Guide to the RMA* (series 2.2, 2nd ed)).

TITLE TO THE SEABED

The Marine and Coastal Area (Takutai Moana) Act 2011 repeals the controversial Foreshore and Seabed Act 2004 and restores customary title extinguished by that Act (Marine and Coastal Area (Takutai Moana) Act 2011, s 6(1)).

Importantly for the present discussion, the Act states that "[n]either the Crown nor any other person owns, or is capable of owning, the common marine and coastal area" (s 11(2)). While this does not affect the ability of regional councils to grant resource consents or impose charges under s 5(d), it does mean that a marine energy company cannot actually own, or lease, that part of the seabed upon which their project is situated. A marine energy company can hold only a resource consent in relation to their project. The Act treats a structure in the common marine and coastal area as personal property which does not signify an interest in land or form part of the common marine and coastal area (s 18(2)(a) and (b)).

Submarine cables

The Submarine Cables and Pipelines Protection Act 1996 regulates undersea cables. Sections 6 and 11 give a marine energy project protection through civil and criminal penalties for interference with cables. Section 6 states that the Act places no limitation on civil liability for damage, while s 11 states that any person that "damages, or causes or permits a ship or equipment belonging to a ship to damage" marine cables is liable on summary conviction to a fine not exceeding \$250,000.

However, the Act also places some of the burden of avoiding damage to submarine cables on the owner of the cables. Section 8 states, "if after all reasonable precautions have been taken ... fishing equipment belonging to a ship is sacrificed in order to avoid damaging a submarine cable ... the owner of the ship is entitled to be indemnified for that owner's loss by the owner of the cable or pipeline". To mitigate this risk, a marine energy company may wish to seek a protection area around its cables under s 12. Such an area currently exists in the Cook Strait to protect Transpower's cables (Submarine Cables and Pipelines Protection Order 2009 (SR 2009/41)). Finally, insofar as submarine cables may discharge heat into the water, a discharge permit may be required under s 15(1)(a) of the RMA, as heat is a "contaminant" according to the definition in s 2.

Charges

Under s 64A of the RMA, a regional council decides whether or not to charge a person for its occupation of the marine area, having regard to the public and private benefits rendered by the occupation. Charges may also be levied under Resource Management (Transitional, Fees, Rents, and Royalties) Regulations 1991 (SR 1991/206) for rental of the seabed on which the cables lie (reg 8 and Sch 2).

POLICY AND FUNDING

The government recently released its *National Policy Statement for Renewable Electricity Generation 2011*. Policy E1 requires that regional policy statements and plans include:

objectives, policies and methods (including rules within plans) to provide for the development [of] renewable electricity generation activities using ... tidal, wave and ocean current energy resources.

As the statement was only Gazetted on 14 April 2011, it remains to be seen how this requirement will be incorporated into regional policy. At best it can be hoped that regional plans, the relevance of which is discussed below, will be amended to include specific rules to facilitate the approvals process for marine energy projects.

The Coastal Policy Statement 2010 (CPS), cl 6(2)(a), identifies the need to:

recognise potential contributions ... from use and development of the coastal marine area, including the potential for renewable marine energy.

These policies are encouraging as they show an overarching support for renewable energy in general and marine energy in particular. However, neither directly implements any specific measures to facilitate marine energy development.

Renewable energy target

New Zealand has announced a target for electricity generation from renewable sources that is one of the highest, in terms of total renewable energy percentage, in the world. It is intended that 90 per cent of generation will be from renewable sources by 2025 (NPS at 3).

Marine Energy Deployment Fund

The Marine Energy Deployment Fund (MEDF) aims to bring forward the development of marine energy in New Zealand and provides grants to "deploy devices ... to provide information and practical experience" (Energy Efficiency and Conservation Authority "Marine energy deployment fund" www.eeca.govt.nz/marine-energy-fund). The \$8m fund was established in October 2007 and grants are being allocated in four rounds, from 2008 to 2012. Applications to the fund are assessed by an expert panel, and grants are offered to projects that best meet a number of criteria. Funding is subject to conditions, such as the project receiving the necessary approvals.

The first three rounds of funding have been awarded to Crest Energy (\$1.85m), WET-NZ (\$760,000) and CHIME (\$2.16m) respectively (see AWATEA "Tidal current power project gets the go-ahead" (press release, 22 March 2011); Energy Efficiency and Conservation Authority "Wave energy proposal gets marine energy funding" (press release, 19 May 2009); Gerry Brownlee "Chatham Islands wave project receives backing" (press release, 29 July 2010)). The final round

closed at the end of November 2010 and the recipient is due to be announced presently (Energy Efficiency and Conservation Authority "New Zealand Marine Energy Deployment Fund, Fund Definition Document" (2010) at 3).

POTENTIAL ISSUES

Rights over the seabed

A clear defect in the present regulatory regime is that a marine energy developer cannot hold any title to the seabed, due to the "special status" accorded to the coastal marine area by s 11(1) of the Marine and Coastal Area Act. This lack of security may act as an impediment to the development of the marine energy. Given the controversy over rights to the foreshore and seabed caused by the Foreshore and Seabed Act that gave rise to the 2011 Act, it seems unlikely that situation will be changed. As one commentator noted in relation to Crest Energy's project, a key question is "[w]ho will be the landlord for a \$400m–\$600m project involving 200 marine turbines?" (Garry Venus "Crest Energy Kaipara Harbour Marine Turbine Project" (RMLA (Auckland Branch) Seminar (November 2009)). Looking at the issue from another standpoint, Maori groups have been vocally opposed to Crest Energy's project as they see it as the allocation of a property right and are concerned that this will affect their potential customary rights ("Crest energy claiming de facto harbour property right" *Radio Waatea* (30 May 2011)).

Despite the lack of clarity in this area, the number of projects currently underway would suggest that this is not yet acting as a significant barrier to marine energy projects.

Time and cost

As with any emerging technology, the consent process is not yet fully developed and the initial entrants are "learning by doing". At present, there is substantial cost and time involved in obtaining novel consents in the coastal environment ("Emerging Supply-Side Technologies" at 12). For example, Crest Energy spent five years obtaining the resource consent for its project.

Allocation of marine and coastal area

The current framework allocates space on a first-come-first-served basis. Given the limited number of suitable sites for tidal generation, competition may become intense. In anticipation of this, it may be advisable for regional councils to use their power under s 30(1)(fb)(ii) of the RMA to devise a rule to facilitate a more orderly allocation of space, for example a tender process such as that used by the Crown Estate in Scotland to identify the most effective use of marine energy resources (The Crown Estate "Tenders Invited For Further Wave And Tidal Projects" (press release, 8 December 2010)).

Grid connection

The number of sites suitable for marine energy generation will be limited by grid connection points. Legislation might be considered to defray the costs of extending the electricity grid to connect marine energy projects. Inspiration may come from jurisdictions such as Texas, which has implemented "Competitive Renewable Energy Zones" for this purpose under Senate Bill 20 (2005), and the UK, which has enacted a tendering process for third parties to build offshore electricity infrastructure (Electricity (Competitive Tender for Offshore Transmission Licences) Regulations 2009).

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Environmental impacts

The environmental impacts of marine energy technologies are not as well understood as those of more developed technologies (Craig Stevens (AWATEA Conference)). This may result in caution on the part of regional councils and significant staging and monitoring costs. Crest Energy's coastal permit requires them to introduce turbines to their array over a long time period, with strict monitoring conditions (*Crest Energy Kaipara Ltd v Northland Regional Council* Env Ct Auckland A132/09, 22 December 2009).

Yet there is evidence that the environmental impacts of these devices are low (David Leary and Miguel Esteban "Renewable Energy from the Oceans and Tides: A Viable Renewable Energy Resource in Search of a Suitable Regulatory Framework" (2009) 4 CCLR 417). Crest Energy's project is likely to pave the way for others in New Zealand by demonstrating the low impact of marine energy technologies. It is, however, unfair for such a large burden to be placed on the first mover in the industry, and the National Institute of Water and Atmospheric Research (NIWA) should continue to investigate these environmental impacts in an effort to better understand them and to reduce some of this burden (Stevens (AWATEA Conference)).

More favourable to marine energy projects is that particular regard must be had to the effects of climate change and the benefits of renewable energy in considering a resource consent application under the RMA (s 7(i) and (j)); see also *Genesis Power Ltd v Franklin District Council* [2005] NZRMA 541 (NZEnvC)).

Interaction with other users

It is not yet clear how marine energy consents will interact with other users of the sea. For example, fishermen consider their fishing permits to be property rights and consider any impediment to their ability to fish an interference with these rights. Thus a company wishing to install a marine energy device will have to consider early consultation with fishermen (Simpson Grierson at 9). The same may also be said of oil and gas exploration authorisations, insofar as they may overlap with a coastal permit.

CONCLUSION

New Zealand is set to be a key player in the nascent marine energy industry. Unlike other jurisdictions, such as Australia and the USA (see David Leary and Miguel Esteban "Recent developments in offshore renewable energy in the Asia-Pacific" (2011) 42 *Ocean Dev & Intl L* 94), the current framework for marine energy projects is relatively concise. The MEDF and the ambitious renewables target is likely to help the development of marine energy.

There are, however, some issues which require further research and policy development in order to ensure the smooth development of marine energy in New Zealand, in particular the time taken to obtain consent and the likely future scarcity of, and competition for, suitable marine energy sites. If these issues are not addressed early on in the development of the industry, they may become major barriers to expansion. □