



**SIERRA
CLUB**
FOUNDED 1892

**MASSACHUSETTS
CHAPTER**

Massachusetts Sierra Club
10 Milk Street, Suite 632
Boston MA 02103-4621
www.sierraclubmass.org
office@sierraclubmass.org
(617) 423-5775

July 12, 2011

Chairwoman Anne M. Gobi
Joint Committee on Environment, Natural Resources and Agriculture
State House, Room 473F, Boston, MA 02133

Chairman Marc R. Pacheco
Joint Committee on Environment, Natural Resources and Agriculture
State House, Room 312-B, Boston, MA 02133

Re: Testimony in Support of H.2013, An Act Relative to Studying Tidal Turbines

Dear Chairwoman Gobi, Chairman Pacheco, and Members of the Committee,

Thank you for providing this opportunity to offer our comments on H.2013, An Act Relative to Studying Tidal Turbines. We wish to express our strong support in favor of H.2013.

The Sierra Club is the oldest and largest non-profit, non-partisan organization environmental organization in the country. With over a forty year history in this chapter, the Massachusetts Sierra Club represents about 22,000 members and supporters throughout the state and 1.4 million nationwide. We fight for clean air, clean water, the preservation of the Commonwealth's most precious natural spaces, and healthy, vibrant communities.

In order to meet our goals under the Renewable Energy Portfolio Standards and to provide energy beyond this upcoming goal, we will need to obtain energy from a variety of sources. One such potential source is tidal energy. This bill would provide the ability to study this source and to potentially local underwater turbines in appropriate areas.

As the Commonwealth needs to create viable alternative energy solutions as power consumption continues to climb and transmission lines from power plants upstate struggle to keep up. The turbines will invariably be part of our future energy solution, along with wind and solar energy.

The study permits for locations identified as promising sites for in-stream tidal turbines. The tidal turbines look like wind turbines but have a much smaller diameter of only 15 feet to 60 feet. In-stream tidal turbines sitting under the water's surface and rotating at very low speeds, the potential environmental impact and threat to fish and marine mammals is showing to be extremely low.

Although not yet widely used, tidal power has potential for future electricity generation. Tides are more predictable than wind energy and solar power. Among sources of renewable energy, tidal power has traditionally suffered from relatively high cost and limited availability of sites with sufficiently high tidal ranges or flow velocities, thus constricting its total availability. However, many recent technological developments and improvements, both in design (e.g. dynamic tidal power, tidal lagoons) and turbine technology (e.g. new axial turbines, crossflow turbines), indicate that the total availability of tidal power is much higher than previously assumed, and that economic costs may be brought down to competitive levels. Additionally, new designs alleviate many of the environmental concerns that had existed in earlier designs.

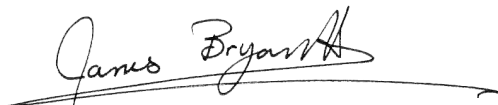
Tidal power generation is by no means theoretical.

- The first tidal power station was the Rance tidal power plant built over a period of 6 years from 1960 to 1966 at La Rance, France.¹ It has 240 MW installed capacity.

- The first tidal power site in North America is the Annapolis Royal Generating Station, Annapolis Royal, Nova Scotia, which opened in 1984 on an inlet of the Bay of Fundy.[8]² It has 20 MW installed capacity.
- The Jiangxia Tidal Power Station, south of Hangzhou in China has been operational since 1985, with current installed capacity of 3.2 MW. More tidal power is planned near the mouth of the Yalu River.³
- The first in-stream tidal current generator in North America (Race Rocks Tidal Power Demonstration Project) was installed at Race Rocks on southern Vancouver Island in September 2006.^{4 5} The next phase in the development of this tidal current generator will be in Nova Scotia.⁶
- A small project was built by the Soviet Union at Kislaya Guba on the Barents Sea. It has 0.4 MW installed capacity. In 2006 it was upgraded with a 1.2MW experimental advanced orthogonal turbine.
- Jindo Uldolmok Tidal Power Plant in South Korea is a tidal stream generation scheme planned to be expanded progressively to 90 MW of capacity by 2013. The first 1 MW was installed in May 2009.⁷
- A 1.2 MW SeaGen system became operational in late 2008 on Strangford Lough in Northern Ireland.⁸
- 254 MW Sihwa Lake Tidal Power Plant in South Korea is under construction and planned to be completed in 2011.⁹
- The contract for an 812 MW tidal barrage near Ganghwa Island north-west of Incheon has been signed by Daewoo. Completion is planned for 2015.¹⁰
- A 1,320 MW barrage built around islands west of Incheon is proposed by the Korean government, with projected construction start in 2017]¹¹
- Other South Korean projects include barrages planned for Garorim Bay, Ansanman, and Swaseongho, and tidal generation associated with the Saemangeumreclamation project. The barrages are all in the multiple-hundred megawatts range.¹²
- The Scottish Government has approved plans for a 10MW array of tidal stream generators near Islay, costing £40 million, and consisting of 10 turbines – enough to power over 5,000 homes. The first turbine is expected to be in operation by 2013.¹³
- The Indian state of Gujarat is planning to host South Asia's first commercial-scale tidal power station. The company Atlantis Resources is to install a 50MW tidal farm in the Gulf of Kutch on India's west coast, with construction starting early in 2012.¹⁴

In view of the enormous potential, recent advances in tidal turbine technology, and our commitments under the Renewable Energy Portfolio, the Sierra Club respectfully requests this Committee report H2013 favorably. This proposed study could result in a significant impact on our energy needs.

Respectfully,



James McCaffrey
Director, Massachusetts Sierra Club

¹ L'Usine marémotrice de la Rance, http://membres.lycos.fr/chezalex/projets/rance/sommaire_rance.htm

² 8."Nova Scotia Power - Environment - Green Power- Tidal". Nspower.ca. Retrieved 2011-04-05.

³ 9."China Endorses 300 MW Ocean Energy Project". Renewableenergyworld.com. Retrieved 2011-04-05.

⁴ 10."Race Rocks Demonstration Project". Cleancurrent.com. Retrieved 2011-04-05.

⁵ 11."Tidal Energy, Ocean Energy". Racerocks.com. Retrieved 2011-04-05.

⁶ 12."Information for media inquiries". Cleancurrent.com. 2009-11-13. Retrieved 2011-04-05.

⁷ 13.Korea's first tidal power plant built in Uldolmok, Jindo

www.korea.net/news/News/newsView.asp?serial_no=20090518009&part=101&SearchDay=2009.05.18&page=1

⁸ "Tidal energy system on full power". BBC News. December 18, 2008. Retrieved March 26, 2010.

⁹ "Hunt for African Projects". Newsworld.co.kr. Retrieved 2011-04-05.; Tidal power plant nears completion

¹⁰ "Hunt for African Projects". Newsworld.co.kr. Retrieved 2011-04-05.;

¹¹ 17.\$ 3-B tidal power plant proposed near Korean islands, <http://ecoseed.org/en/general-green-news/green-politics/green-policies/asia-pacific/3457>

¹² "Microsoft PowerPoint - presentation_t4_1_kim" (PDF). Retrieved 2011-04-05.

¹³ "Islay to get major tidal power scheme". BBC. March 17, 2011. Retrieved 2011-03-19.

¹⁴ 20."India plans Asian tidal power first". BBC News. January 18, 2011.