



Tidal Interview with Mr Mutso Fukushima of the Nagasaki Prefectural Government

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Mr Fukushima is a guest speaker at ITES 2016

Check out the ITES 2016 website here:
www.tidaltoday.com/tidal-conference/

1. Mr Mutsuo Fukushima, please can you tell me what you do for the Nagasaki Prefectural Government?

I am the leader of the International Coordination Team at the Marine & Environmental Industry Development Division of the Nagasaki Prefectural Government (NPG)'s Industry & Labour Department.

One of my roles has been to translate various technological documents, as well as contractual documents submitted to the NPG by foreign tidal current turbine makers and project developers interested in implementing demonstration projects and commercial projects in Nagasaki's high tidal current-energy straits and channels.

I have also translated into Japanese almost all of OpenHydro Group Ltd.'s technological documents and its PowerPoint files, which were submitted to the NPG in order to facilitate a clear understanding of its high technologies and aspirations by central and local government officers, influential politicians and industrialists.



Figure 1- Japan and Nagasaki prefecture

In addition, I have translated into English NPG brochures designed to invite foreign floating wind and tidal turbine makers and project developers to deploy their turbines at any of three central government-designated demonstration fields at the Goto Archipelago, some 100 kilometers off the prefecture's western coast. I have accompanied Kyushu University Professor Emeritus Yusaku Kyojuka to assist in the academic's ADCP

installment and recovery operations at Naru Strait, one of the fastest-current channels at the Goto Islands, as well as bio-fouling experiments at Hirado Strait. northern Nagasaki.

I have also acted as an interpreter for delegates to Nagasaki from foreign turbine makers, universities, environmental impact assessment companies and test centers, facilitating their cross-border communications with Japanese physicists and NPG officers, as well as engineers and representatives of the Nagasaki Marine Industry Cluster Promotion Association - an industrial body bringing together some 70 Japanese companies seeking to create, and to ensure the success of, Nagasaki's own marine renewable energy industry.

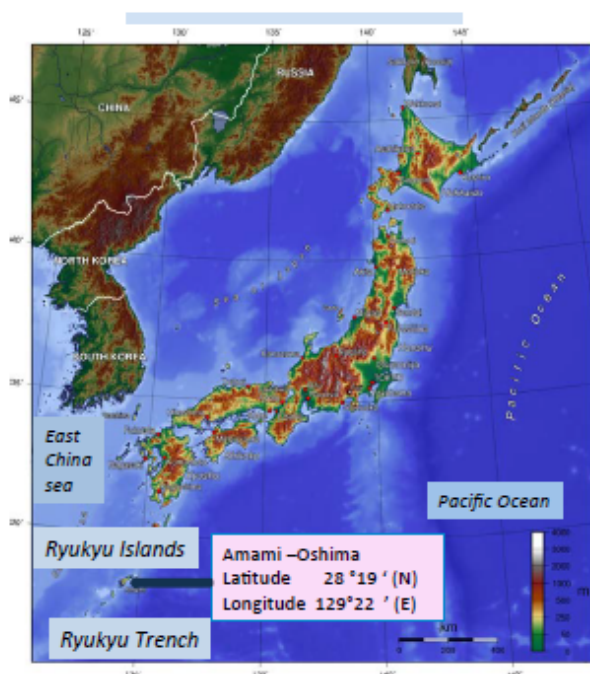


Figure 2- Japan

2. What are the latest developments happening in 2016-2017 in Japan?

On July 25, the Japanese government's Ministry of Environment (MOE) announced that it has decided to give budgetary assistance to a consortium of two Japanese companies - a Nagasaki-based business group and the OpenHydro/DCNS Group - to help the consortium deploy a 2-megawatt OpenHydro turbine at Naru Strait, one of the three most energetic straits in the prefecture's Goto Archipelago, during the four-year period starting in fiscal 2016.

In the announcement posted on the ministry's official website, the MOE said it decided to give the consortium, led by Kyuden Mirai Energy Co., a Kyushu Electric Power Co. subsidiary, a budget allocation of up to 3.6 billion yen for the four-year period to cover the consortium's expenditures for the tidal current-propelled electricity generation demonstration project.

The announcement also included details about the MOE's decision to provide the consortium with the budgetary aid "to expand the volume of electricity generated from renewable energy sources" for consumption in Japan.

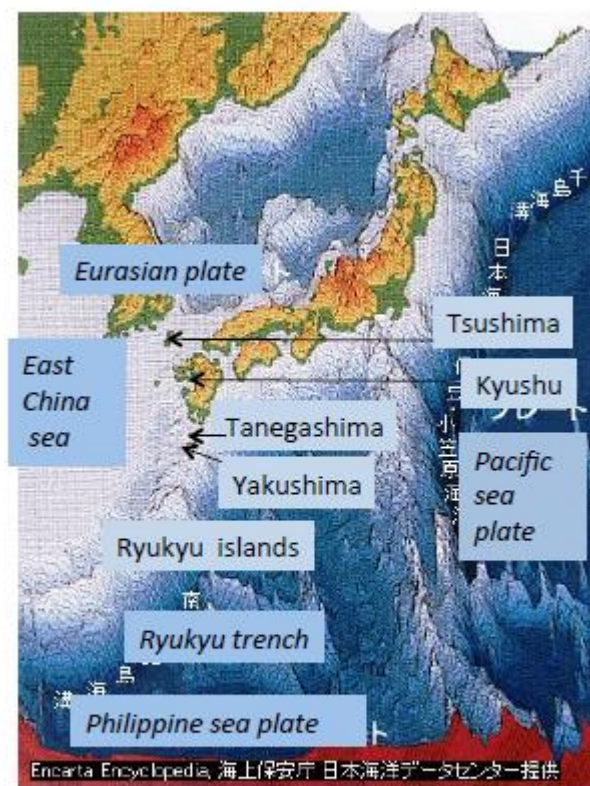


Figure 3- Three dimensional vision of Subsea shelf around Japan

According to the announcement, the government will seek to develop: "the type of tidal current-propelled electricity generation technology suitable for Japan's maritime conditions which would provide the high possibility of being disseminated in Japan and which could limit an impact on the environment through the consortium's demonstration project [in the Nagasaki waters]."

This announcement is consistent with the government's announcement on July 26 2015 that it has decided to adopt a new energy-mix policy goal of bolstering by 2030 the percentage of electricity from renewable energy sources in Japan's annual electricity consumption to "22-24 percent," which is higher than the projected ratio for nuclear power at 20-22 percent for the target year of 2030.

By comparison, the same energy-mix goal calls for limiting the percentage of electricity generated with the combustion of LNG to 27 percent of Japan's annual consumption and that of electricity generated with coal to 26 percent by the same deadline.

Probably, you still remember the vivid newspaper images and television news videos of the Great East Japan Earthquake, and the ensuing devastating tsunamis of March 11 2011, which pounded Japan's northeast, as well as the resultant meltdowns of some nuclear reactors at the Fukushima Daiichi nuclear power plant of Tokyo Electric Power Co. in Fukushima Prefecture, north of Tokyo, and the terrifying consequences.

Japan has since suspended operations of all of its 54 reactors amid voters' wariness of nuclear power. But the government is seeking to restart as many reactors as possible in light of what it perceives as the relatively low generation costs of electricity generated with nuclear reactors. Currently, only two reactors are operating amid lingering voter wariness, despite it being five years since the nuclear disaster.

The horrible post-quake events, voter wariness and annual huge trade deficits stemming from Japan's greater dependency on imported coal and LNG to satisfy its mammoth energy needs have led Japanese policymakers, physicists and journalists to pay keener attention to the appropriateness and necessity of taking advantage of renewable energy resources as far as possible - in lieu of depletable fossil fuels, and nuclear fuels which could trigger a radioactive tragedy if handled carelessly.

In 2014, Japan incurred a trade deficit of 9.1 trillion yen, against a trade surplus of 5.3 trillion yen in 2010, before the nuclear accident. In 2013, Japan's dependency on imported fossil fuels - coal, oil and natural gas - stood at a combined 92 percent of its annual energy consumption, against 81 percent in 2010.

Two years after the nuclear mishap - in April 2013 - the government unveiled a key energy policy announcement entitled, "The Basic Plan on the Use of Oceans," in which it declared that tidal currents are one of the most important renewable energy sources for Japan and that it will

promote the use of ocean renewable energy as a national policy. Voter wariness of nuclear power appears to have encouraged the government to consider the use of ocean renewable energy sources seriously.

Then, on July 15th 2014, after examining data on the hydrographic conditions gathered by the MOE, the national government designated three sea areas off Nagasaki's Goto Archipelago as part of its plan to create six government-endorsed demonstration fields for ocean renewable energy.

I am certain that this archipelago provides the most suitable tidal-current, as well as topographic and other hydrographic conditions, for tidal current-propelled power generation in Japan. It also has suitable social conditions.

This is due to a convergence of multiple favorable factors: its rapid tidal current speed; the idealistic topography of the archipelago, the Kyushu Island and the East China Sea; the archipelago's location in the midst of the open waters of the East China Sea (and the resultant unlikeliness of industrial pollution); its detachment from heavy-traffic shipping lanes; and finally, the understanding of local fisheries cooperatives and the sympathetic attitude of the Goto City Government.

I hope the ITES will give the world's tidal current turbine makers, developers and other industry players a good opportunity to recognise that Nagasaki can provide excellent business opportunities on account of the archipelago being a huge tidal current energy resource, with a vastness that has been verified and validated by voluminous data obtained via four rounds of ADCP investigation campaigns in 2013, 2014, 2015 and 2016, by the Environment Ministry, Kyushu University and by Professor Kyojuka himself.

Generating power with tidal current turbines in the archipelago's straits would give turbine makers and project developers a good reputation, which appears to be an excellent and necessary first step to cash in on the gigantic Asian market, with its vast business potential.

There is the good possibility that turbine makers will be able to profitably generate large quantities of electricity at the archipelago when Japan reaches a stage where large-scale projects are implemented commercially, judging from the results of mathematical integrations stemming from Kyushu University's finite-volume coastal ocean model (FVCOM) outputs on tidal energy resource, which show that the quantity of electricity, once harnessed with a good turbine, would top even 17 megawatt-hours per square meter per year at many Naru Strait locations.

There are many high-energy locations in the archipelago's straits, including Tanoura Strait sandwiched by Fukue and Hisaka Islands, which have so far remained untapped, but which have drawn attention from European tidal energy industry titans like OpenHydro and Atlantis.