Tethys Blast

January 9, 2015

Happy New Year and welcome to the first Tethys Blast of 2015!

Tethys Blasts will keep you updated with new information available on Tethys, new features on Tethys, and current news articles of international interest on offshore renewable energy. We hope that this becomes a valuable tool to help you stay connected to your colleagues and to introduce you to new research, new contacts, and ongoing milestones in renewable ocean energy development.

WREN Integrated into Tethys

Tethys is partnering with an international collaborative known as WREN, which is dealing with the environmental effects of offshore and land-based wind. Over the last two weeks, **463 land-based wind documents** were added to the Tethys knowledge base. The Tethys Blast will continue to focus on offshore wind energy and marine energy for the time being, but it should be noted that land-based wind is slowly being integrated into Tethys.

New Articles on Tethys

A total of 21 new documents have been added to Tethys in the last two weeks. These documents have been hand-selected for their relevance to the environmental effects of offshore renewable energy. The listings below are short introductions to several popular documents that can be accessed through the accompanying Tethys links:

Towards a Numerical Model to Simulate the Observed Displacement of Harbour Porpoises *Phocoena phocoena* Due to Pile Driving in Belgian Waters – Haelters et al

> In Belgian and adjacent waters, specific concerns exist about the impact of underwater sound generated during pile driving on the harbour porpoise *Phocoena phocoena*, the most common cetacean in these waters. The results of visual aerial line-transect surveys performed before and during pile driving at the Thorntonbank (Belgian waters, North Sea) suggested a displacement of porpoises to a distance of around 20 km from the piling location. Such an apparent large-scale avoidance reaction is similar to the one observed in other countries' waters in the North Sea. Using survey data, we developed a simple numerical model that could reproduce the harbour porpoises' redistribution pattern during disturbance.

The Challenging Life of Wave Energy Devices at Sea: A Few Points to Consider – Tiron et al

> Wave power devices offer great prospects for the marine renewable energy sector. But in comparison to wind energy, wave power is still in its infancy, mainly prototype-based, with technological gaps akin to those experienced in the wind sector some 15 years ago. Several aspects that did not seem significant at a first glance in the design phase, such as the interaction with the marine environment, turned out to be important when the first prototypes were put in the water. In fact, these devices have to face great challenges once at sea and several prototypes have not survived.

The new noise mitigation system 'Hydro Sound Dampers': history of development with several hydro sound and vibration measurements – Burns et al

> For some years, a noise prevention concept for the protection of marine animals exists in Germany. Based on that, the underwater sound exposure level (SEL) due to pile driving at offshore wind farms (OWF) is required to be less than 160 dB re 1 µPa²s at a distance of 750 m. This value, however, is often exceeded so that the use of a soundproofing system is necessary. The Hydro Sound Damper (HSD) is a new, versatile method to reduce noise levels during offshore pile driving. To achieve this, elements of different sizes and materials which are fixed to fishing nets are used.

The Influence of Large Offshore Wind Farms on the North Sea and Baltic Sea - A Comprehensive Literature Review – Clark et al

> This literature review summarizes research on the environmental impacts of offshore wind farms, identifies gaps in current knowledge related to offshore wind energy, and makes recommendations for future research. The offshore wind energy industry in Europe is expected to grow rapidly: in the European Union, 69 wind farms in 11 countries have a combined capacity greater than 6.5 gigawatts (GW), and some projections predict a capacity of 40 GW by the year 2020. Despite expectations for the construction of large-scale offshore wind farms, little research has studied the effects of offshore wind farms on oceanography.

Experimental Study of the Turbulence Intensity Effects on Marine Current Turbines Behaviour. Part II: Two Interacting Turbines – Mycek et al

> The future implantation of second generation marine current turbine arrays depends on the understanding of the negative interaction effects that exist between turbines in close proximity. This is especially the case when the turbines are axially aligned one behind another in the flow. In order to highlight these interaction effects, experiments were performed in a flume tank on 3-bladed 1/30th scale prototypes of horizontal axis turbines.

Current News

Current news articles of international interest on offshore renewable energy include:

400 MW Scottish Tidal Energy Farm To Begin Construction

> In January, construction of a 400 MW tidal energy project will begin in northeast Scotland. Yes, you read that correctly, 400 MW or enough to power almost 175,000 homes. (Most marine energy projects don't have this capacity.) When it is completed the tidal farm will have 269 sunken turbines of 1.5 MW. The first phase will have 60 and will be completed by 2020 and will have a capacity of about 90 MW.

Senvion Completes Offshore Wind Farm over Christmas

> Senvion completed the installation of wind turbines for the Nordsee Ost offshore wind farm during Christmas. Over the holiday, Senvion was able to successfully install the last of the 48 wind turbines that make up the project, located around 30 kilometers to the north of the island of Heligoland. The first turbine for the Nordsee Ost project was installed on July last year (see related story). Upon completion and start of commercial operations in the coming spring, the Nordsee Ost offshore wind farm will have an installed capacity of around 295 megawatts and supply enough power for around 320,000 households.

Isle of Wight Tidal Energy Farm Plans Submitted

> Plans to transform a section of seabed off the Isle of Wight into a tidal energy farm have been submitted.The Perpetuus Tidal Energy Centre (PTEC) facility would allow developers to build underwater turbines off St Catherine's Point. PTEC claim it would be the first of its kind in the world and generate enough electricity to power 15,000 homes.

Modec’s Skwid Hybrid Wind/Tidal Offshore Turbine Sunk Again

Mid-December, the Japanese company MODEC, a general contractor specialising in engineering, procurement, construction and installation of floating production systems, confirmed that its 500kW Floating Wind & Current Hybrid Power Generation System (SKWID) sank off the coast of the Japanese island of Kyushu before being installed. This is the second time that this happens, marking the latest obstacle in the Japanese marine contractor’s plans to test its ambitious prototype.