

Tocado *T-series*



Tocado International BV

"hydropower from Holland"



In-stream hydro energy

Rapidly increasing world energy demand, “peak oil” problems, climate change and security of energy supply all indicate: the world urgently needs to acquire new energy sources to deliver secure and renewable energy. As none of the currently available “clean energy sources” will be able to provide in the world’s energy demand alone, a broad mix of renewable sources should be tapped from. Ocean renewable energy and specifically tidal energy will provide a substantial, predictable and stable part, combined with in-stream solutions in rivers and other types of fast flowing waterways. Engineering has started over a decade ago leading to turbines that are available today. In fact if your order now you can have a Tocardo turbine producing electricity in 6 months.

Tocado products

Tocado has developed scalable concept utilising the same core technology for all turbines. Currently, turbines are available in three different sizes: T50, T100 and T200 series. The larger T800 will be available in 2013, as the market develops.

The Tocardo series offer complete water to grid solutions for both rivers and tidal sites, designed to operate in speeds ranging from 2 to 4 m/s with a power output varying from 30 kW to 200 kW, pending available water depth and speed. The system is designed for a long life with minimal need for service and maintenance. Thanks to its compact size and versatile deployment options the system is ideal for river and near-shore applications and retro-fitting to bridges and barrages. The system can be used on regular power grids, but is also highly suitable for off-grid deployment in remote areas. Tocardo turbines are available today for commercial projects with a positive ROI. Proof of product has been demonstrated in The Netherlands at the IJsselmeer barrage, where a T100 unit has been operational since summer 2008.

Tocado Technology

The Tocardo free flow, in-stream turbines can be compared to “underwater wind turbines”; free standing underwater units, generating energy from sea currents, tidal and river flows. The scale is different from wind however: in-stream energy devices can be significantly smaller than wind turbines, as water is much denser than wind. And because they are under water, there is no visual impact. The Tocardo turbine series are variable speed horizontal axis turbines with a two bladed fixed pitch rotor. To eliminate a maintenance intensive gearbox, the turbines are equipped with an in-house developed Permanent Magnet Direct Drive (PMDD) generator. A smart and simple (patented) blade reversing mechanism allows the turbine to operate efficiently in bidirectional (tidal) flows. The Tocardo scaling and tuning approach ensures all turbines will be fully site optimised.



TOCARDO T100 TURBINE IN ACTION



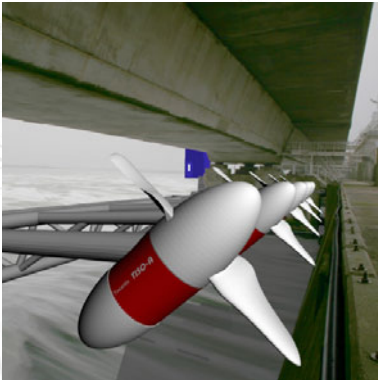
T100 TURBINE BEING INSTALLED



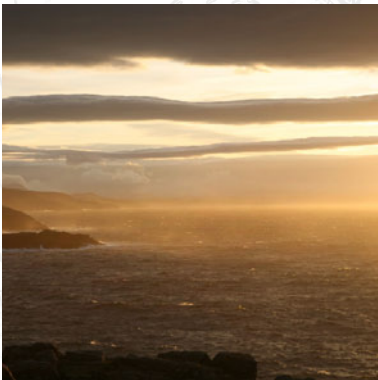
PATENTED BI-DIRECTIONAL BLADE



T100 ON DEN OEVER SITE, NL



T200 TURBINES IN OOSTERSCHELDE, NL



OFFSHORE IN-STREAM ENERGY

Tocado markets

Tocado is active in three market segments, all served with the same core turbine device: Inshore, River and Off shore markets.

Inshore turbines are applicable in locations where high speed tidal flows meet bridges, sluices, dams and where the devices can be connected to these structures.

River turbines can be deployed in river situations, either suspended from bridges or with its own foundation system.

Off shore turbines can be installed in off shore high speed waters all over the world, sea-bed mounted or floating.

As installation, foundation and maintenance form a substantial and crucial part of the projects, Tocardo teams up with experienced players in off shore and civil market, to ensure a top quality integrated energy solution is delivered.

Projects world wide

Tocado teams up with local companies to pump-prime the market and develop projects where Tocardo turbines can be applied.

Since 2007, Tocardo has been very active in Scotland, developing a 10MW offshore farm in the Pentland Firth. Since then, Tocardo has expanded activities to projects in Canada, USA, Japan, South Korea and elsewhere in the UK. In the Dutch Oosterschelde storm barrier, development activities have resulted in a fully consented 1 MW turbine array with the possibility of further expansion, based on arrays of five T200 units. The project will be installed in summer 2012. In Nepal local project developer Glow Tech and Tocardo have closed contracts to deploy a 100 kW water turbine in a river by December 2011. In February 2012, this will be followed by a 6 turbine demonstration project. Furthermore the companies expect to announce various projects in early 2012 ranging over 100 MW to be installed in 2012 - 2014.

Tocado International BV

Tocado is a highly ambitious Dutch company dedicated to deliver the best and most economical turbines to harvest the oceans' and rivers' energy. Tocardo International BV has a successful track-record of 12 years in off shore engineering and the development of ocean renewable energy devices. Key personnel all have a background in shipping or naval architecture and know the force of the sea by experience. Tocardo turbines offer the lowest possible kWh price, through minimized maintenance and maximized power generation technology.



TOCARDO T100 IN ACTION - IN-STREAM HYDRO ENERGY

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*"Tocardo technology -
robust and reliable in-stream
hydro power - from Holland!"*