



# POWER - Partners Offering a Water Energy Revolution

## POWER

Partners Offering a Water Energy Revolution

**Total budget:** € 2.140.343,-

**EVD contribution:** € 933.910,-

**Duration:** 36 months

**Start date:** 01-01-2012

**Consortium:** 8 Dutch beneficiaries

**Lead:** Strukton (NL)

**Coordination:** ARCADIS (NL)

**Website:** <http://www.powerdtp.nl>

**Key Words:** Dynamic Tidal Power, DTP, hydraulic engineering, China, sustainable energy, tidal energy, business development, innovation

The Dutch are recognized for their excellence in hydraulic engineering and knowledge of sustainable energy. Eight prominent Dutch companies in these sectors have now joint forces in the POWER group - Partners Offering a Water Energy Revolution - in order to secure the Netherlands being leader in the field of coastal energy engineering.

### Objective of the POWER programme

The 3-year POWER programme started in January 2012 and aims to create strong partnerships between the various Dutch disciplines and Chinese parties to establish lasting business for Dutch engineering and energy companies in China, with spinoff leading to global business in coastal and offshore energy engineering.

### The POWER group

The eight leading Dutch companies in the POWER group together can provide full services for science-based maritime energy engineering, due to expertise in hydraulic engineering, sustainable energy technologies, environmental consultancy and coastal planning and management. In addition to the POWER group, Chinese companies and institutions are closely involved in the programme to supply local knowledge, to assure the quality of the studies, and to extend the network of POWER.

### Planning of the POWER programme

The POWER programme is constituted around a feasibility study on the development of Dynamic Tidal Power (DTP) in China, divided into three phases: Phase 1: Proof of principle, which was completed mid 2011; Phase 2: Selection and initial feasibility studies of suitable locations, to be carried out in 2012; and Phase 3: Detailed feasibility study of the most suitable location and a pilot project, scheduled for 2013 and 2014. The feasibility studies cover diverse topics such as design and multiple functions of a tidal energy dam, economic costs and benefits, social and environmental impacts and mitigation measures, and power generation and -conversion.

Parallel to the feasibility study, the POWER group will carry out a broad marketing strategy aiming at business development for the participating companies, initially in China but global spinoff is intended as well. Marketing activities include POWER- and company presentations at relevant conferences, fairs and events in China and elsewhere, participation in Dutch trade missions to China, and visits of Chinese Delegations to the Netherlands will be organized, all in order to strengthen the network of the Dutch partners and to facilitate recognition for Dutch excellence in hydraulic energy engineering.

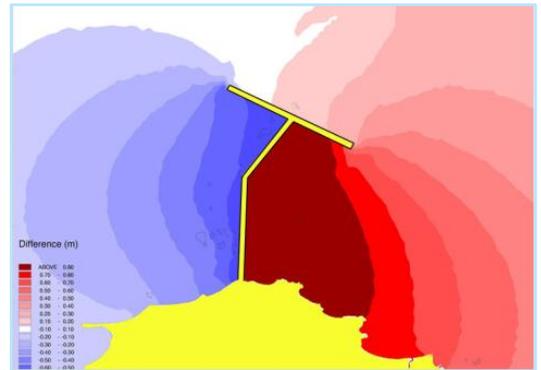


# Dynamic Tidal Power: the flagship of POWER

The POWER group will show its strength in a 3-year programme, constituted around a detailed feasibility study on the development of Dynamic Tidal Power (DTP) in China.

## The DTP concept

DTP is an innovative way to use the natural tidal movement for generating massive amounts of sustainable energy. A dam-like structure of at least 30 km in length with large series of turbines is built perpendicular to the shore in a shallow sea basin. The dam may have a perpendicular barrier at the far end, together forming a large 'T' or 'Y' shape. The dam changes the long-wave dynamics of the tide in such a way that a head difference is created over the dam. This head is much more than the kinetic energy height, because of the acceleration forces which are inherent to tides. Although the head remains relatively small (1-3 m), the discharge (m<sup>3</sup>/s) is enormous, leading to high installed power rates (order of GW). A DTP dam can be combined with various other functions, such as protection against waves and tsunamis, deep sea ports, aquaculture facilities, (controlled) land reclamation and connections between islands and the mainland. As costs barriers, these additional functions help to lower the price per kWh to competitive levels. The concept was invented and patented in 1997 by Dutch coastal engineers Hulsbergen and Steijn. No DTP dam has ever been built, although the technologies required to build a DTP dam are available.



## DTP research and publications

In the development of DTP some important research goals have been reached, leading to several scientific publications of the concept of Dynamic Tidal Power (Hulsbergen *et al.*, 2005; Hulsbergen *et al.*, 2008). Furthermore, a preliminary study in the first phase of the POWER programme summarizes the basic hydraulic principle, the basic construction method, a rough economic analysis of DTP, and its relevance for China.

## References

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