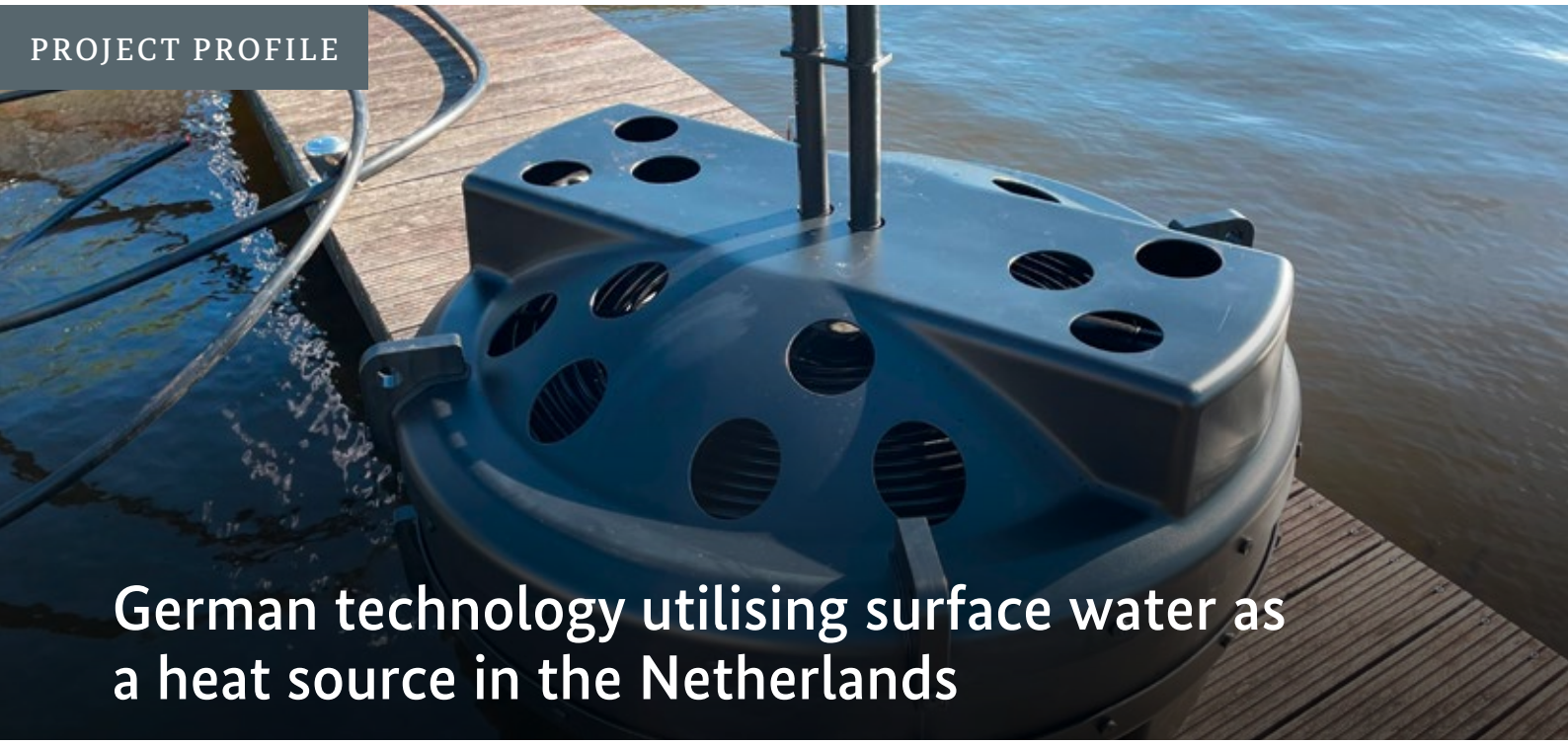
Federal Ministry
for Economic Affairs
and Climate Action

MITTELSTAND
GLOBAL
ENERGY SOLUTIONS
MADE IN GERMANY

PROJECT PROFILE



German technology utilising surface water as a heat source in the Netherlands

Many buildings in the Netherlands are traditionally equipped with gas heating systems, which are harmful to the climate and have also become significantly more expensive to operate since the war in Ukraine. Additionally, the Netherlands is pursuing the goal of achieving a climate-neutral building infrastructure by 2050. In order to realise this goal, the Dutch government has taken various measures to promote the expansion of energy-efficient heating systems in its building stock. One of these is the targeted funding of heating systems with heat pump technology.

Frank GmbH, a company in Germany, took advantage of this development and installed a heat pump system in a detached house in Loosdrecht, southwest of Amsterdam, as part of the Renewable Energy Solutions (RES) programme. Heat pump systems usually extract the required heat energy from the ambient air or the ground. However, there is also great potential for utilising surface water as a sustainable heat supply in the Netherlands, in particular. Lakes, rivers and the sea harbour are previously little-used sources of energy that are available all year round. In order to tap this potential, Frank GmbH developed special surface water-source heat exchangers for heat pumps that can be installed in bodies of water.

Heat pump for heating and cooling the building and insulated modular type-3060 brine distributor from Frank GmbH

Installation of the FRANK WET surface water-source heat exchanger using a sturdy protective housing attached to the outer shell of the system with stainless steel cables

The FRANK WET is the company's surface water-source heat exchanger. The compact, highly efficient heat exchanger extracts the amount of energy required for the heat pump from the surrounding water. It is then converted into thermal energy in combination with a heat pump. The FRANK WET surface water-source heat exchanger can also be used effectively for cooling buildings. To do so, the heat exchanger releases excess heat from buildings into the surrounding water.

The technology is attractive for all types of buildings located on rivers, lakes or larger bodies of water. It does not require any complicated excavation work, in contrast to geothermal heat exchangers. And compared to heat pump systems, which extract heat from the ambient air, the FRANK WET surface water-source heat exchanger is completely silent and maintenance-free. This new technology from Frank GmbH was installed in a large detached house in Loosdrecht, built in 2010, that has direct access to a lake and its own small pier. The house (roof and walls) is very well insulated, and all windows are triple-glazed. The heating system consists of underfloor heating and modern low-temperature radiators with fans.

'Our life after one year with two FRANK WET surface water-source heat exchangers: It works perfectly. We heat at 27 degrees to max 35 degrees during freezing periods. The WET's keep delivering power even when fully frozen (literally 2 large blocks of ice). We have 2 FRANK WET surface water-source heat exchangers rated at 4 kW at 4.4 degrees water temperature, but once frozen (–8 degrees) both together still delivered enough to heat the house. It saves a lot of money. We did not use any gas for heating. Once connected they just work (no real tuning needed). The source is the lake. It does not loose energy capacity (it is a huge buffer) and recovers almost instantly.'

Huub Goosens, homeowner

A brine-to-water heat pump with an output of up to 9 kWth was retrofitted as part of this RES project. In this case, two type-1 FRANK WET surface water-source heat exchangers were used due to the minimum temperature of the Loosdrecht lake of approx. 4°C and the local conditions.

These each deliver approx. 4 kWth with a flow rate of 1,000 l/h. Buoyancy control devices were attached to the FRANK WET surface water-source heat exchangers in the lake at a depth of approx. 2 metres to hold it in place. In addition, the complete pipework was installed with the distributor and collector as well as the heat pump in the garage.

All parts of the FRANK WET surface water-source heat exchanger are made of environmentally friendly, high-quality polyethylene, which can therefore ensure a long service life. The robust, UV-resistant housing protects against external mechanical forces. There are no wear parts that need to be replaced, meaning that no spare parts are required either. The inside of the FRANK WET is protected from aquatic vegetation covering due to the black outer shell. This means that the heat exchangers only need to be cleaned from the outside from time to time.

The RES project in the Netherlands was carried out with the support of German Energy Agency (dena) on behalf of the Federal Ministry for Economic Affairs and Climate Action as part of the German Energy Solutions Initiative.

Company Description

FRANK GmbH has produced pipe systems, fittings and containers made of thermoplastics since 1965. The systems enable the loss-free transport and safe storage of liquids and gases. Frank GmbH also supplies high-quality plastic welding technology and innovative systems for geothermal and surface water-source heat utilisation. It is part of the FRANK Group, which currently has around 600 employees.

System Information	
Installed capacity	Two type-1 FRANK WET surface water-source heat exchangers, each with 4 kW and a flow rate of 1,000 l/h
Brine-to-water heat pump	Manufacturer: alpha innotec alterra WZSV series 92K3M (up to 9 kW output)
Heated living space	150 m²
CO_2 savings:	1,100 kg/year

This project is supported by the German Federal Ministry for Economic Affairs and Climate Action as part of the Renewable Energy Solutions Programme of the German Energy Solutions Initiative.

Imprint

Publisher
Federal Ministry for Economic Affairs and Climate Action (BMWK)
Public Relations
11019 Berlin
www.bmwk.de

Current as of
June 2024

This publication is available for download only.

Design
PRpetuum GmbH, 80801 Munich

Picture credits
Frank GmbH