

## Turboden to supply a 6 MW ORC unit for a glass factory in Turkey

*A Turboden ORC system will be installed to recover waste heat from the glass production process at  
Düzcecam glass plant*

Brescia, April 5<sup>th</sup> 2017 – **Turboden**, a group company of Mitsubishi Heavy Industries (MHI) and a leader in Organic Rankine Cycle (ORC) turbogenerators for distributed power generation employing renewable sources and waste heat, signed an order with **Çalbiyık Group** for a new waste heat recovery ORC unit to be installed at the **Düzcecam Glass Plant** in Düzce, Turkey.

Düzcecam is a large glass producer in Europe with a total capacity of 440.500 ton/year.

The Turboden 65 HRS ORC unit, designed for 6.2 MW nominal capacity, **converts the off-gas waste heat from the two float glass production lines into electric power.**

The heat recovery system configuration includes a set of thermal oil boilers (one for each line) with a heat carrier circuit to convey the heat from the exhaust gas to the ORC unit.

The two waste heat boilers to be installed at the bottom of the float glass production lines, in parallel to the existing quenching tower system, will produce thermal oil up to 315°C.

The hot thermal oil (heat carrier) transfers thermal power to the ORC turbogenerator working fluid, which then expands in the turbine to convert incoming thermal energy into electric power by means of an electric generator.

Start of commercial operation is scheduled for the beginning of 2018.

The project extends the Turboden ORC fleet in **waste heat recovery application** (mostly cement and steel), where Turboden is the world leader with **27 plants and 60 MWe installed**. As for the glass segment, Çalbiyık-Düzcecam plant is the third Turboden reference after a 1.3 MWe plant installed in 2013 for AGC and a 0.5 MWe plant installed in 2015 for BDF Industries, both in Italy.

**In Turkey, Turboden realized 6 plants** in biomass, waste to energy and geothermal applications, with a total power production of about 20 MWe. After being awarded a 7 MWe project (three ORC turbines in landfill gas application) by Ortadoğu Enerji, with Düzcecam project the installed power rises to 33 MWe by the beginning of 2018.

In 2015, Turboden established a local subsidiary company in Turkey, Turboden Turkey ORC Turbo Jeneratör Sanayi Anonim Şirketi, aimed at locally producing components of the ORC system, in order to give its customers access to the local content related incentives provided by the Turkish Government for renewable energy generation.

Turboden Turkey ORC Turbo Jeneratör Sanayi Anonim Şirketi also conducts onsite works and allows to offer a superior after-sales assistance in Turkey.

**Turboden**, a Mitsubishi Heavy Industries company, is an Italian company and a global leader in the design, manufacture, and after-sales of Organic Rankine Cycle (ORC) turbogenerators, which harness heat to generate electric and thermal power from renewable sources, including biomass, geothermal and solar energy and waste heat from industrial processes, waste incinerators, engines or gas turbines. Turboden has more than 335 plants in 35 countries and offers turbogenerators from 200 kWe to 20 MWe. [www.turboden.com](http://www.turboden.com)

**Çalbiyık Group**, is a group of companies active since 1996 in the industrial automation, electronics, design and software-based controlling systems. It has provided consultancy and engineering services for cement, energy, mining, glass and iron-steel industries, and performed various technological equipment manufacturing and services in automation, electricity, and SCADA and PLC systems and successfully carried out many turn-key projects. It has been the first EPC in Turkey to build a Waste Heat Recovery system in the cement industry and has 4 references in the sector between 5 and 18 MWe. Moreover, ÇALBIYIK GRUP is building a biomass power plant, which will be the 7th in the world, will allow producing electricity from the small cattle wastes in Turkey. [www.calbiyik.com](http://www.calbiyik.com)

**Düzcecam**, which is the main company of the Okan Cam Group, has been established in 2010 in Düzce, Turkey. After having installed its second float glass production line in 2016, Düzcecam has reached a production capacity of 440.000 ton/year, making it one of the biggest glass production facilities in Europe. <http://duzcecam.com.tr/>