clean energy ahead
TURBODEN
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Saint-Gobain, the French Giant Glass Company, signs two Contracts with Turboden, confirming Turboden ORC Technology a Proven Solution for the Energy Efficiency in the Glass Industry

Turboden ORC* technology is the choice of the major glass factories in the world for the recovering of the waste heat to generate electric power. Turboden recently signed two new contracts with one of the biggest glass company, **Saint-Gobain**. The French giant chooses the ORC system for its two plants: a 1.2 MWe unit in India and 1.2 MWe in Italy. In the next weeks, **Düzcecam** glass plant in Turkey (6.2 MWe) will be started-up. Another big player in the glass sector, **AGC Glass Europe**, installed a Turboden ORC plant that is in operation since in 2012.

Some Insights on the Latest Projects Awarded to Turboden in the Glass industry

India: GEA Process engineering and Saint-Gobain choose Turboden ORC technology for a **1.2 MWe** plant that recovers heat from the exhaust gas from the glass production process. Saint-Gobain, through GEA, **reconfirms its trust in Turboden**, purchasing another Turboden ORC plant for its factory in Italy.

Italy: with the **1.2 MWe heat recovery plant installed in Saint Gobain,** Turboden achieves a successful case of optimization in the use of the energetic resources available. This plant produces electric power and compressed air, needed in the glass production plant.

The production of compressed air makes this solution highly innovative and the efficiency is guaranteed by:
- the ORC system recovers waste heat from the process
- production of compressed air without electricity consumption
- the double transformation (from the mechanic one to the electric one and reverse) is avoided
- it is the occasion for the replacement of the old compressors with the new ones

Turboden is able to produce this kind of systems for plants from 400 – 500 kWe.

The strategy of Saint-Gobain aims at limiting its own environmental impact: the company is Official Partner for COP21.

Turkey: the 6 MWe installed at Düzcecam glass plant is ready to be started up. Düzcecam is a large glass producer in Europe with a total capacity of 440.500 ton/year. The ORC system converts the off-gas waste heat from the two float glass production lines into electric power.

The ORC technology is extremely reliable, especially in the flat glass production process, where the furnace works continuously for 10-15 years: this is the ideal solution, because it allows maximizing the energy production.

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Take a look at Turboden projects in the glass production field.

Customer	Location	Gross electric power (MW)	Status
Gea Bischoff/AGC Glass Europe	Italy	1.3	started up in 2012
BDF Industries	Italy	0.5	started up in 2015
Çalbıyık Grup / Düzce Cam	Turkey	6.2	start up in July 2018
GEA Bischoff GmbH / Saint-Gobain India Pvt.Ltd. - Chennai	India	1.2	under construction
GEA Process Engineering S.p.A.	Italy	1.2	under construction
5 projects	**3 Countries**	**About 10 MWe**	**2 plants operational & 3 under construction**

Turboden, a Mitsubishi Heavy Industries company, is an Italian firm and a global leader in the design, manufacture and maintenance of Organic Rankine Cycle (ORC) systems, highly suitable for distributed power generation. ORC systems can generate electric and thermal power exploiting multiple sources, such as renewables (biomass, geothermal energy, solar energy), traditional fuels and waste heat from industrial processes, waste incinerators, engines or gas turbines. Turboden has more than 360 plants in 40 countries and offers turbogenerators up to 20 MWe. www.turboden.com

*Organic Rankine Cycle: The Rankine Cycle is a thermodynamic cycle that converts heat into work. The heat is supplied to a closed loop, which typically uses water as working fluid. The Organic Rankine Cycle's principle is based on a turbogenerator working as a conventional steam turbine to transform thermal energy into mechanical energy and finally into electric energy through an electrical generator. Instead of generating steam from water, the ORC-system vaporizes an organic fluid, characterized by a molecular mass higher than that of water, which leads to a slower rotation of the turbine, lower pressures and no erosion of the metal parts and blades.