

Green Car Congress

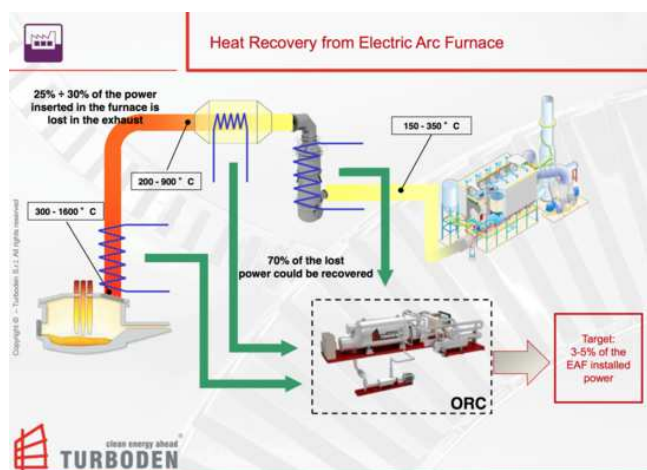
Energy, technologies, issues and policies for sustainable mobility

Turboden to supply a 10 MW heat recovery ORC unit for Arvedi steel plant in Italy

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[Turboden](#), a group company of Mitsubishi Heavy Industries (MHI), leader in Organic Rankine Cycle (ORC) turbogenerators for distributed power generation employing renewable sources and waste heat, has signed an order with Acciaieria Arvedi for a 10 MW waste heat recovery ORC unit to be installed at the Arvedi Steel plant in Cremona, Italy.

The Turboden 100 HR ORC unit, designed for 10 MW nominal capacity and operated at 7.5 MW for the first years, will convert the off-gas waste heat from the steel-melting Electric Arc Furnace (EAF) to electric power. The heat recovery system configuration includes a saturated steam heat carrier circuit to convey the heat from the furnace exhaust gas to the ORC unit.



This new system will be coupled to the existing Tenova Consteel system, which heats and feeds metallic charge to a 250-ton Electric Arc Furnace (EAF), one of the largest in the world, for a combination of heat recovery and environmental sustainability. The heat recovery system will be put in operation at the beginning of 2017.

The waste heat boiler, to be supplied by TENOVA, will be installed on the primary EAF off-gas line in parallel to the existing quenching tower and will produce saturated steam.

During the EAF process, the saturated steam (heat carrier) will transfer 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.

The main drivers for this project are the energy production valorization, with a consequent reduction in CO₂ emissions of approximately 23,300 t/y, and the access to Italian White Certificates. [White Certificates](#) (Energy Efficiency Certificates) are tradable certificates on the GME's (Gestore del Mercato Elettrico, the exchange for electricity and natural gas spot trading in Italy) market released by the [GSE](#) following energy efficiency interventions in energy end-uses. GSE is the state-owned company which promotes and supports renewable energy sources (RES) in Italy.

Other Turboden heat recovery ORC references in the steel industry: a 700 kW unit for NatSteel in Singapore; a 2.7 MW unit for Elbe Stahlwerke Feralpi in Germany; and a 2.2 MW unit for ORI Martin in Italy. Turboden also has been selected as ORC technology provider of a further 2 MW net waste heat recovery plant for an Aichi Steel plant in Japan.