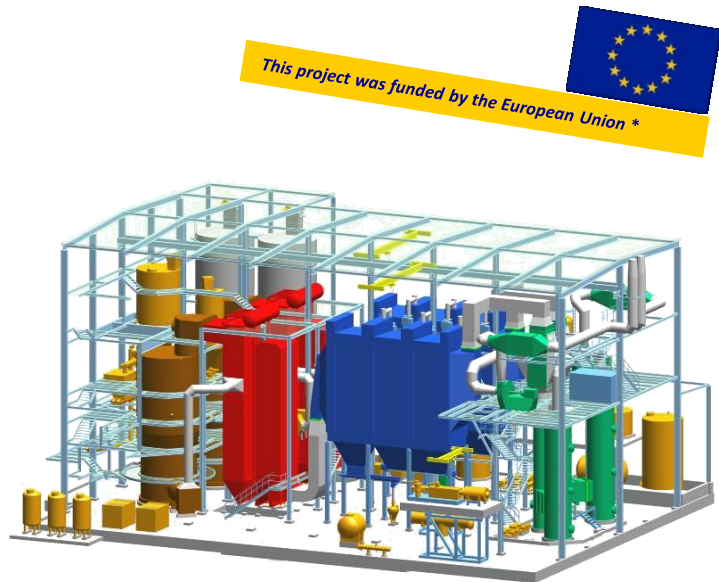


Plant Portrait: St. Petersburg, Russia Vodokanal St. Petersburg / EU

Thermal Sewage Sludge Treatment

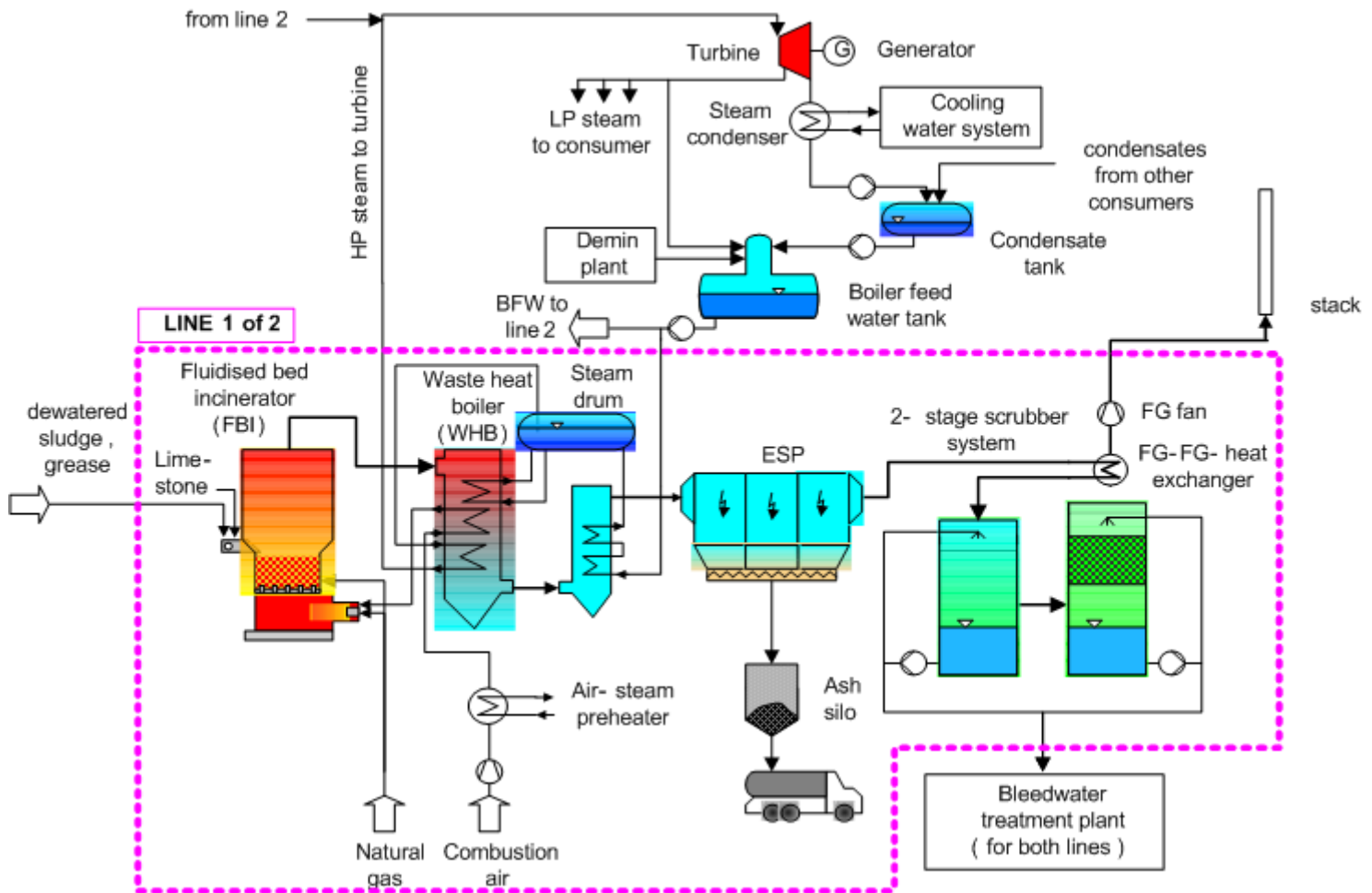
We received a contract from Vodokanal St. Petersburg, which was funded by the European Union, for the construction of a new sewage sludge incineration plant.

The incineration plant, which complies with the most stringent up to date EU Environmental Standards, is a major element for ensuring reliable and environmentally friendly disposal of sewage sludge from the wastewater treatment plant (WWTP).



* This publication has been produced with the assistance of the European Union. The content of this publication is the sole responsibility of Envirotherm and can in no way be taken to reflect the views of the European Union.





1. Objective

Engineering, delivery, construction and commissioning of two incineration lines, each line equipped with a BAMAG bubbling fluidised bed incinerator, a heat recovery boiler, a dry and a wet flue gas treatment system. The steam of both lines is routed to one common turbine for electricity production.

2. Process Description

- The dewatered sludge from the WWTP is transported to the fluidised bed incinerator. Natural gas is intentionally used as additional fuel.
- In the refractory lined cylindrical fluidised bed incinerator the fuels are burnt at more than 850 °C, leaving a fine residual ash, which is carried over to the heat recovery system. At the bottom of the incinerator a sand bed is kept in fluidisation mode by pre-heated air. This ensures good heat and mass transfer during the combustion process.
- The combustion air is preheated with steam and flue gas.
- The waste heat of the incineration process generates superheated steam at 66 bar in a three pass boiler.

- The superheated steam of the two heat recovery boilers is routed to one common steam condensing turbine / generator set for electric power production.
- The flue gas leaves the boiler at approx. 210 °C and is passed to a multi-stage flue gas treatment which consists of the following cleaning processes:
 - A three field electrostatic precipitator (ESP) removes the ash of the flue gas; the ash is conveyed pneumatically to the ash silo.
 - Downstream the ESP the flue gas passes a FG-FG-heat exchanger, which cools down the flue gas, while the cold, cleaned flue gas from the scrubber system is heated up prior to emission to atmosphere via the stack.
 - A wet scrubbing system removes heavy metals like mercury and acid gases like SO₂ and HCl. The system consists of the following two steps: a first acid step of the quench scrubber type with a droplet separator and a second neutral step as a packed column scrubber with a final droplet separator.

- The scrubber blow down of both lines is treated in the bleed water treatment (BWT) plant.
- The flue gas fan ensures negative pressure along the whole flue gas train and vents the cleaned flue gas to the stack.

3. Key Data per line

Design capacity:	1.85 t DS/h sludge 1.2 t/h grease
Flue gas flow:	29,000 Nm ³ /h
Combustion air flow:	18,100 Nm ³ /h
Steam production:	approx. 8 t/h
Steam pressure:	66 bar (a)
Steam temperature:	450 °C
Power generation:	approx. 2.5 MW
Plant availability:	8,000 h/a

4. Time Schedule

Start of order execution:	Dec. 2004
Start of construction:	June 2005
Start of commissioning:	Feb. 2007
Acceptance:	Feb. 2008