Concepts of Thermal Sewage Sludge Utilisation
WORLDWIDE

Thermal waste utilisation plant Dürnrohr, Austria

Upstream facility Dürnrohr, Austria

Thermal waste utilisation plant MSZ3 Moscow, Russia

HUBER Belt Dryer BT on STP Innsbruck, Austria

HUBER Belt Dryer BT on STP Nova Gorica, Slovenia

Digester towers on STP Zagreb, Croatia
Design of a waste incineration plant for 1,000,000 t/a in Kuwait City, Kuwait

Design of the thermal waste utilisation plant MPZ 1 in Moscow, Russia

Decentralised sewage sludge utilisation for 32,000 t/a in Halle-Lochau, Germany

Design of a sewage sludge utilisation plant for 8,000 t/a

Design of a sewage sludge utilisation plant for 200,000 t/a

Sewage sludge utilisation plant on STP Bello, Medellin, Colombia
The sludge2energy system is a sustainable solution which provides security of thermal sewage sludge utilisation. The energy self-sufficient sludge2energy system for sewage sludge utilisation is based on the combination of a sludge dryer and subsequent incineration in a fluidized bed furnace.

- Efficiently combined drying and thermal utilisation of sewage sludge in a fluidised bed furnace
- A wide variety of municipal sewage sludges can be utilised thermally without the need for any external energy.
- Individual planning and modification to suit site-specific conditions
- Compact, modular and functional design with minimum space requirements
- Low invest and operational costs due to the optimised concept of thermal drying and utilisation
- Optimal sewage sludge quantity and mass reduction
- Minimised expenses and costs for sewage sludge transport

▶ Long-term cost and disposal reliability
▶ Production of recycling material that can be reused for the most part
▶ Dry flue gas cleaning process without the need for water and without generation of wastewater
▶ Low pollutant emissions, significantly below legal limits (17. BImSch, TA Luft)
▶ Fully automatic operation 24 h/d, 7 d/week with a high plant availability of 8,000 h/a
▶ High flexibility of sewage sludge utilisation
▶ Production of phosphorus-rich sewage sludge ash, therefore optional phosphorus recovery
▶ Optimised flue gas cleaning meeting specific customer requirements (site demands, P-recycling)
▶ Optional power generation taking into account specific individual conditions and plant size

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**Thermal autarky limit as a function of organic dry substance (oDS) and dry substance content (DS) of the dewatered sewage sludge**

- Autarkic
- Non-autarkic

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Flow diagram of thermal sewage sludge utilisation “sludge2energy”

Steam boiler system

1. Sludge Logistics
2. Sludge Dryer
3. Sludge Storage Tank (Dry)
4. Sludge Mixing
5. Sludge Input
6. Combustion Air System
7. Fluidized Bed Furnace
8. SNCR Process
9. Waste Heat Boiler
10. Ash Pre-Separation, Fabric Filter
11. Reactor, Dry Sorption
12. Fabric Filter
13. Ash Logistics
14. Residue Logistics
15. Chimney, Emission Control
16. Steam Turbine, Power Generator

Hot water boiler system

1. Sludge Logistics
2. Sludge Dryer
3. Sludge Storage Tank (Dry)
4. Sludge Mixing
5. Sludge Input
6. Combustion Air System
7. Fluidized Bed Furnace
8. SNCR Process
9. Waste Heat Boiler
10. Ash Pre-Separation, Fabric Filter
11. Reactor, Dry Sorption
12. Fabric Filter
13. Ash Logistics
14. Residue Logistics
15. Chimney, Emission Control
16. Steam Turbine, Power Generator

Legend:
- **Red**: Hot Water
- **Red**: HP Steam
- **Orange**: LP Steam
- **Green**: Feed Water
- **Green**: Process Water
- **Blue**: Combustion Air
- **Black**: Flue Gas
- **Orange**: Natural Gas
- **Yellow**: Sewage Sludge
- **Gray**: Ash
- **Red**: Sodium Hydrogen Carbonate
- **Red**: Lime Hydrate
- **Blue**: Activated Carbon
- **Purple**: Ammonia Water
Technical description

- Sludge acceptance and storage area for dewatered sewage sludge (1) to balance varying supply volumes
- Sludge dryer (2) for auto-thermal sludge incineration
- Dry sludge storage tank (3) and mixing screw (4) (for full drying variants)
- Flexible combustion control including adjustable conveying line for controlled sludge input (5)
- Condensation of dryer vapours, introduction of vapours/air into the fluidised bed furnace (7) as combustion air
- Stationary fluidised bed furnace (7) with continuous discharge of bed material and contaminants
- Burner for plant start-up and shutdown and balancing unsteady operating states
- Waste heat boiler (9) for heat transmission to useable heat carriers with adjusted and optimised process parameters
- Energetic utilisation of the vapour via a counter-pressure steam turbine (16) with generator (only for variants with power generation)
- Utilisation of (waste) heat for the supply of internal consumers, such as the sludge dryer (2)
- Staged combustion air system (6) to minimize contaminants, such as dioxines, carbon monoxide, organic pollutants and nitric oxides
- Denitrification (8) according to the selective non-catalytic reduction (SNCR) method as first stage of flue gas cleaning
- Fabric filter for pre-separation (10) of the phosphorus-rich flue ash from the flue gas
- Dry flue gas cleaning (11) with sorbent dosing to remove acid pollutants, dioxines and heavy metals (e.g., Hg)
- Fabric filter (12) (sorption filter) to remove reaction products and dust from the flue gas
- Recirculation of the sorption residues to improve separation efficiency and at the same time reduce sorbent consumption
- Measurement station in chimney (15) for the control of all legal emission limits
- Separate discharge of the reaction products (14) and the phosphorus-rich bed ash, boiler ash and pre-separated ash (13)

Portfolio of services provided by sludge2energy GmbH

sludge2energy GmbH offers competent support in all project phases, tailored to the specific requirements and requests of its customers: The comprehensive expertise of HUBER SE and WTE GmbH in planning, building and operating plants in the fields of wastewater and sludge treatment, thermal waste utilisation and especially the know-how and knowledge of process-technical, energetic and logistic synergies in the field of sewage sludge treatment has been used to develop a cost-effective and reliable modular system that meets specific customer requirements.

- Concept development and feasibility
- Preliminary planning, approval planning and detailed planning
- Turnkey supply, installation and commissioning of the complete plant as general contractor
- Operation of plants
- Operation support
- Project financing
- After-sales service
Huber SE is a family-owned, worldwide active company in the field of water, wastewater and sludge treatment. More than 1000 employees worldwide develop and manufacture products, manage projects and work on system solutions for municipalities and industries.

HUBER supports its customers in about 60 countries around the world through subsidiaries, offices or representatives by providing know-how and innovative products for water, wastewater and sludge treatment.

To ensure the customer’s long-term benefit, the HUBER Global Service guarantees the problem-free and reliable operation of the customer’s plants through close cooperation with the local HUBER representations around the world.

WTE Group provides designing, construction, financing and operation of engineering plants for wastewater disposal, water supply, energy production and thermal waste utilisation. As one of the leading full-range suppliers in Europe WTE possess unique know-how. They use their expertise to develop future-proof solutions which set the international standards in terms of energy efficiency, consumption of resources and investment costs.

Through the effective combination of the elements water and energy they achieve their goal to build efficiently operating yet environment-friendly plants.

We utilise all energy sources in the process chain to ensure the energy self-sufficient operation and environmental sustainability of our plants. Furthermore, our plants produce excess energy which can be fed to the power network.

We feel committed to a sustainable approach and have executed almost 100 sustainable projects in 16 countries, for the benefit of our customers and the environment.

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