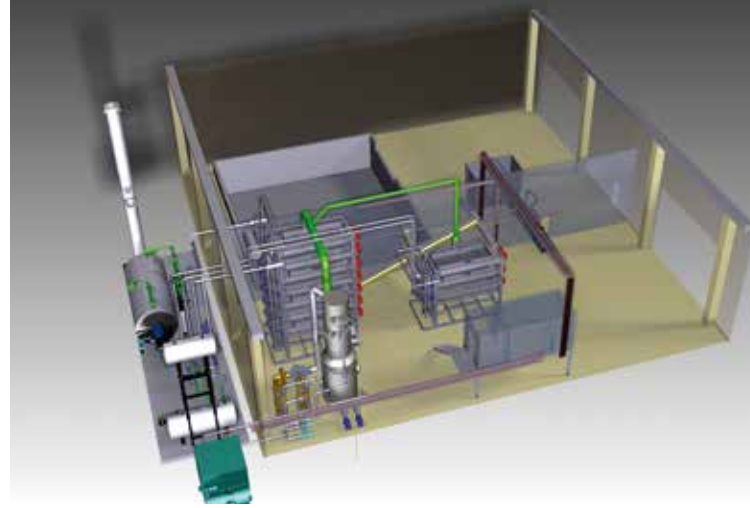


## Sewage sludge disposal with INTEC and KonTroTec

### Customised plant design - Maximum efficiency

The INTEC solid material firing plants combined with KonTroTec contact drying plants can be adapted to any volume requirement. The plant's modular design allows it to be extended and added to at any time as requirements change.

The advantages of the INTEC KonTroTec process make thermal sewage sludge disposal not just a future-proof utilisation method but one that is also future-orientated, biologically safe and environmentally friendly.



#### The advantages:

- Long-term safe disposal and cost stability
- Economical operation thanks to using the internal energy
- Maximum energy efficiency
- Long service life of the plant modules thanks to great experience potential and robust technology
- Neutralisation of contaminants, no environmental pollution
- Ash utilisation as an option for refinancing
- No soil pollution, CO2-neutral, exhaust air low in contaminants
- Modular plant concept, flexible plant design
- Power generation by ORC

### INTEC - weltweit vor Ort



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### INTEC Products

- Solid material firing plants
- Thermal oil heaters
- Waste heat recovery boilers
- Steam generators and hot water heaters
- Natural circulation boilers
- Plant engineering, including turnkey
- Conception and planning of process heat plants and energy generation plants
- Services



## INTEC Engineering

### Thermal sewage sludge utilisation



**Innovative supply via utilisation**  
**Use of internal energy** (in the process)  
Impressive **economy**  
**KonTroTEC contact drying**  
**INTEC solid material firing**  
**Maximum energy efficiency**  
**INTEC process heat generation**  
**Modular plant concept** Flexible plant design  
Long-term **safe disposal**  
**Hygienisation and neutralisation** of contaminants  
**Cost stability**  
**Environmentally neutral Emissions**  
**High-quality ash-products**



## INTEC Energy Systems

### Energy generation from residues and biomass

#### INTEC Engineering GmbH

is a dynamically growing group of companies doing business all over the world. INTEC plans, designs, manufactures and supplies process heat generation plants. INTEC plants are state-of-the-art. INTEC sets standards in the development and construction of process heat plants through state-of-the-art and efficient use of waste heat recovery boilers and thermal oil heaters. INTEC develops innovative plant technologies for energy generation from biomass and residues, showing the way of the future.

#### INTEC stands for individual complete solutions:

INTEC advises, draws up plant concepts, produces and if required delivers turnkey solutions. All over the world. The production side - INTEC Rohrtechnik GmbH - is synonymous with the highest level of quality. Construction management, commissioning and maintenance are undertaken by experienced INTEC Service GmbH technicians.

#### Sewage sludge - the new challenge

### INTEC - Your partner for innovative complete solutions

In the future, the agricultural disposal of sewage sludge on fields will be prohibited throughout the EU. This is in response to increasing environmental pollution and the harm to people that is caused by bacteria, heavy metals and left-over pharmaceuticals.

The anticipated halt to using sewage sludge in agriculture and the prohibition of the dumping of sewage sludge under the technical directive covering domestic waste is aimed at completely removing the contaminant that is sewage sludge from the economic cycle. In addition to municipal sewage sludges, this also applies to residues from waste water purification, biogenic sludges, residual sludges and liquid waste from industrial processes. In all, this represents an extremely complex disposal challenge for local authorities, industry and disposal companies.

Economically and environmentally, thermal utilisation - incineration - is the only appropriate way of utilising sewage sludges and other problematic biomasses.

Along with KonTroTec, INTEC possesses the experience and the technologies for the innovative thermal treatment, disposal and economic use of biogenic, contaminated sludges and residues.



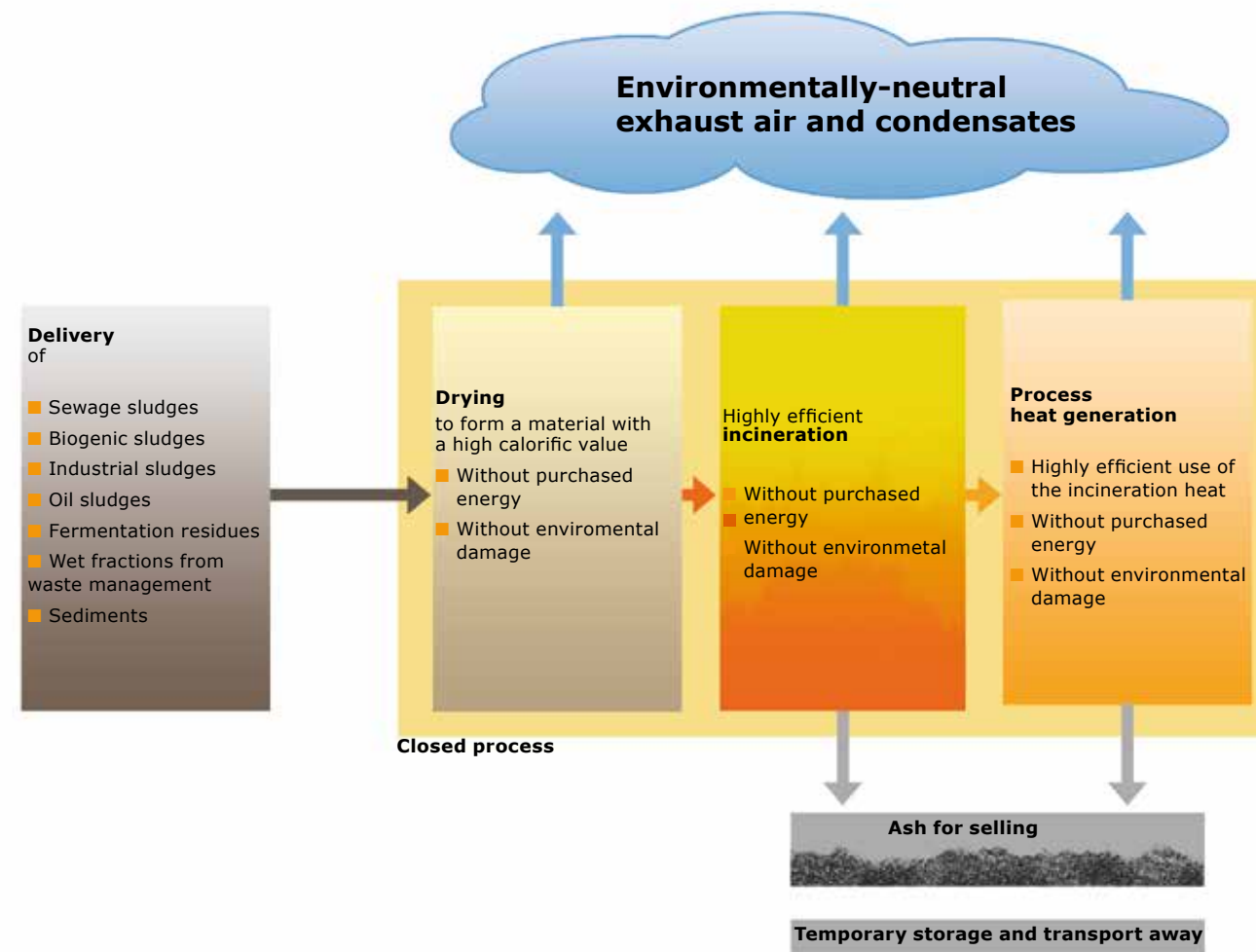
## The INTEC-KonTroTec concept

### Thermal utilisation - Efficient energy generation

The innovative disposal and utilisation concept is based on a combination of the KonTroTec drying plants with INTEC solid material firing plants and process heat generation plants. During the process, the complete plant that results from this combination does not release any environmentally harmful substances into the air or soil. It is not necessary to purchase any energy or fuel in order to dry the sludges and wet residues, or for their incineration. The energy released by the incineration is used to generate process heat for the drying process. In addition, the optional partial generation of electricity enables electricity costs to be further reduced.

#### INTEC-KonTroTec

KonTroTec is a leading manufacturer of contact drying plants for drying, hygienising and increasing the calorific value of domestic and industrial sewage sludges, biogenic sludges, fermentation residues and wet fractions, oil sludges and aquatic sediments. KonTroTec has many years of experience, along with the practical know-how gained on the basis of that experience. The KonTroTec technologies therefore complement the INTEC solid material firing methods by processing the starting biomasses to produce fuel that can be stored and that is suitable for the firing process.

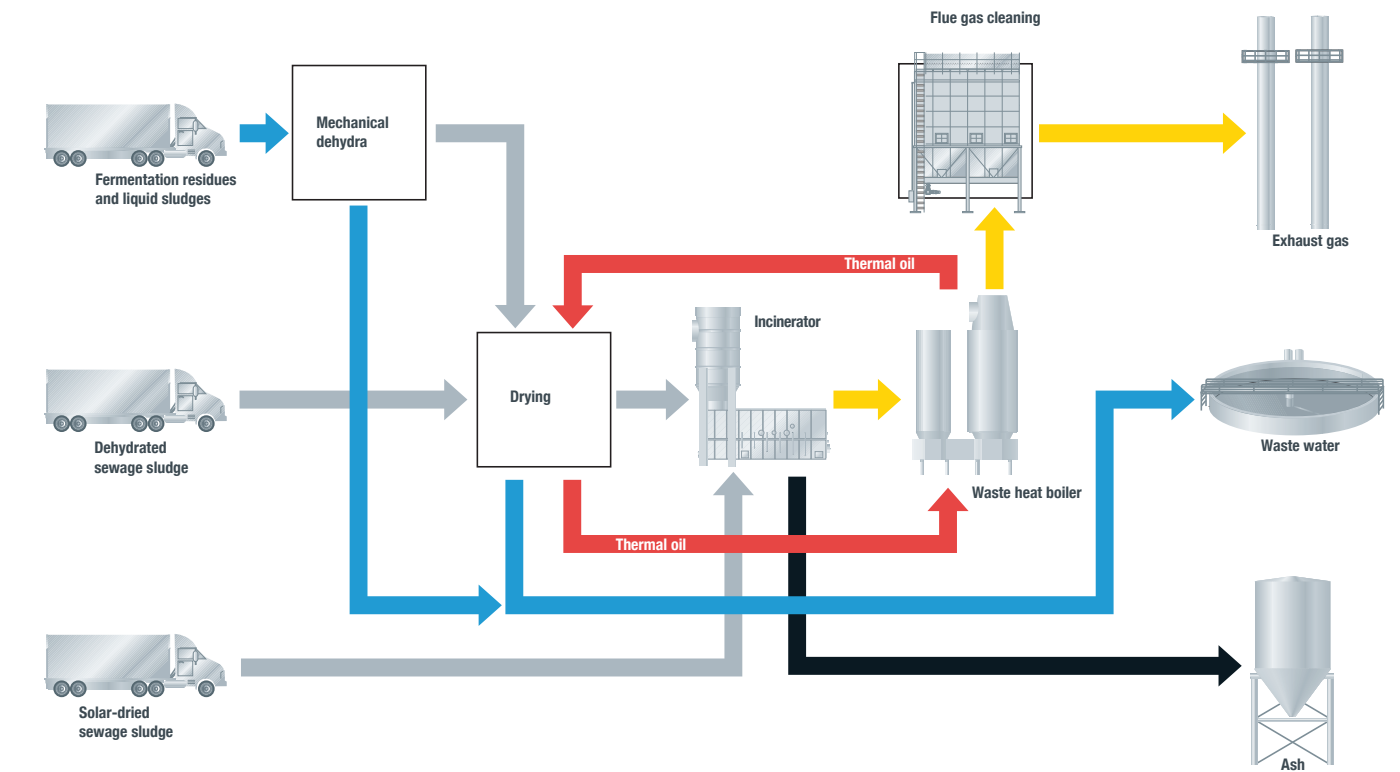


The greatest possible efficiency and economy are therefore achieved in the closed plant and process concept. However, thanks to the modular plant components, the concept is open to future changes based on new requirements.

The storable ashes produced in the overall process are the only remaining disposal residual materials. Free of biogenic contaminants and with a high phosphate content, they are superbly well suited to industrial further processing in the fertiliser industry for example.

## Der Prozess

### Intelligent, environmentally safe, economical



The delivered sewage sludges with an approximately 25% DS (dry substance content) are unloaded into bunkers with dosing technology. Pumps transfer the filter cake into the KonTroTec contact drying plant. Self-cleaning, heated and continuously counter-rotating shafts evaporate the water and overcome the adhesion phase of the sludges. The result: Volume and mass reduction to a new, grainier substance quality with 75 - 85% DS and hygienisation. (Stepless full and partial drying possible). The drying brings about an extreme increase in the calorific value and makes the material storable. The drying granulate is incinerated by a combination of INTEC rotary wheel firing and grate firing. The exact amount of material required is fed to the grate firing system via the centrifugal rotary wheel. This ensures incineration temperatures of 850°C - 900°C, in accordance with German and international standards.

The heat obtained operates an INTEC thermal oil heater, which heats the KonTroTec contact drying plant in the closed heating circuit. To increase the incineration efficiency, the remaining waste heat is used to preheat the incineration air, and optionally also for power generation by a low-temperature turbine.

Flue gases are cleaned, heavy metals and bound and NOx is removed by denitrification, so that only clean CO<sub>2</sub>-neutral exhaust air enters the environment.

The extremely phosphate-rich ashes that remain from the firing and flue gas cleaning are free of biogenic residues and can be used for treatment and industrial further processing, for example in fertiliser production. Intelligent, environmentally safe, economical.

