way to integrate valuable, wide-ranging information into the decision-making process.

First results and conclusions from the mature case studies, including quantification of biophysical changes and economic benefits, will be available in late 2015.

Further information as well as precise case study descriptions can be found under: https://dessin-project.eu/.

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State Of The Art Sewage Sludge Handling, Drying, And Incineration

The utilization of sewage sludge and similar waste sludge has been in intense discussion for many years. Besides objective information, emotions often play a role in shaping this discussion.

The agricultural exploitation and the usage of sludge for recultivation of soil will be strongly reduced due to new legislation. This will tighten environmental limits and greatly reduce or fully forbid the landfilling of dried sludge wastes. As a result of this development, the disposal by incineration and the energetic usage of the wastes until they reach inert status will prove to be a simple solution to this complex problem.

The end product which remains after dewatering the sewage sludge may be utilized in many different ways. It is indefinitely storable and requires significantly less transportation and storage volume. It may also be used as common fuel in cement factories, power plants, and diverse industrial incineration facilities.

There are many different drying technologies and systems which have been attempted with varying degree of success. Due to the high requirements of technology used in the drying process, only very few systems have proven to be consistent, long term, and economically viable solutions.

The major contemporary investment in drying technology has been divided between convection driers and contact driers. In the case of convection driers, the main heat source is a hot gas stream (either flue gas or heated air) which is fed over the wet sludge. The hot air transfers heat into the sludge and simultaneously removes the evaporated water as well as the other gasified residues. The moisture is removed in a condensation process while the rest of the flue gas with brine has to be safely burned and inertized.

A very interesting and economical alternative is the contact dryer. It transports the sludge within a screw conveyor while the shaft and the blades of the conveyor are heated to 572 ° Fahrenheit by circulation of thermal fluid. This technical solution makes the drying process very efficient, requiring significantly less floor space in factory settings.

Modular components for the immediate incineration of the dried sludge and flue gas can further improve efficiency, especially when coupled with a power generation module based on ORC technology.

Innovative screw conveyor incinerator devices such as this have already seen adoption in Germany. At the beginning of December 2007 an innovative sludge incinerator began operation in Altenstadt, in Germany. With an annual capacity of 120,000 tons of dewatered sludge, this incinerator has made a substantial contribution to the thermal utilization of municipal sewage sludge in Bavaria, and has played a significant role in helping to meet the objectives of the Bavarian State Ministry for the Environment and Consumer Protection to gradually replace agricultural sewage sludge utilization.

The sludge incineration plant is designed for the thermal utilization of sewage sludge from municipalities within a 60mi radius of the plant. It operates on innovative technology that differs from common sludge grate incinerator designs. Here, the well-mixed fuel (sludge, screenings, fermentation residues from the neighboring biogas plant etc.) is crushed to particle sizes of <2inch and pre-dried to approximately 65% dry matter before being inserted with a spinner on the step grate, despite different grain sizes, the turbulence in the combustion

chamber cause an even distribution of the material. Once on the grate, the fuel smolders, leading to a uniform burning combustion bed. Relatively low temperatures in the combustion zone reduce NOx and slagging. The plant is built in 2 lines each with 13,6 MBTU heat power. Prior to each incineration line, which is heated by thermal fluid, there is a contact dryer. The sludge is then led through screw conveyers to obtain about 65% dry matter. The thermal oil is heated by hot flue gas to around 572° F.

Once in the mud bunker, the delivered sludge is mixed by a process-driven excavator to achieve a relatively homogeneous calorific value of around 2150 BTU/lb x °F. The combustion gases are cleaned in a multi-stage exhaust gas cleaning system with emissions far below the limit values according to 17. BimSchV (according to German emission regulations).

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