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Open future for sewage sludge disposal in many regions

The current supply bottleneck and the compulsory recycling of phosphorus have led to a boom in the planning of sewage sludge mono-incineration plants. Overcapacities are already impending in some regions whereas viable solutions do not yet exist in other regions. This is the result of a new study published by the consultancy ecoprolog.

At the moment, the sewage sludge supply bottleneck is irresistibly coming to a head. In the past four years, the average contractual price for the disposal of municipal sewage sludge in Germany has risen from about 60 to currently almost 100 EUR per tonne of original material. Existing disposal contracts have been terminated, in part at short notice, by disposal companies because disposal channels are no longer available in the field of material recycling. Occasionally, municipal invitations to tender in the industry of sewage sludge disposal were concluded without any offers.

The reason for this disposal crisis is the tightening of the fertilizer legislation. Above all, the amendment of the fertilization ordinance (DüV) in mid-2017 has aggravated the application of sewage sludge in the agricultural sector. In March 2020, the fertilization ordinance was tightened once again. Consequently, increasing pressure can be expected in the market.

The impact of the Corona crisis on the disposal of sewage sludge is still unclear. Especially in the case of waste incineration plants, it can be hoped that decreasing quantities of commercial waste will lead to an increasing readiness when it comes to accepting sewage sludge, given that the necessary technical and regulatory-approval requirements are met. But then again, decreasing cement production and reduced power consumption might possibly lower the co-incineration of sewage sludge in the cement industry and in coal-fired power plants.

In the years to come, the structures of sewage sludge recycling in Germany will be fundamentally changed, especially due to compulsory recycling of phosphorus in the course of the Sewage Sludge Ordinance (AbfKlärV).

The supply bottleneck as well as the increase in prices have entailed a boom in the planning of mono-incineration plants for sewage sludge. As of today, there are 40 projects for new mono-incineration plants known to ecoprolog. This also includes projects which, as a matter of fact, are planning to implement gasification technologies. In total, all known projects have a capacity of about 1.1 million tpy of dry matter. Together with the active mono-incinerators for sewage sludge, these add up to a technical capacity of approximately 1.8 million tpy of dry matter, which is slightly more than the amount of sewage sludge available.

“The significance of this aggregate information for the future market, however, should be treated with caution”, says Mark Döing, ecoprolog’s managing director. In many municipal plants in particular, the technical capacities are not fully exploited for reasons of disposal reliability. This is in addition to technical problems in individual plants.

What's more, some projects incorporate replacement investments, facing future decommissioning of plants. Furthermore, we do not expect every project to be realized, with some of the plans being in direct competition. But nevertheless, we do assume that further projects exist which are not yet known. Some players are still monitoring the market or are in cooperation talks at municipal level."

This is why ecoprolog has conducted a detailed analysis of the German market for sewage sludge disposal, now presenting an updated version of its market model of the future development, for the first time available as a multi-client study. While assessing the situation at federal-state level, potentials for additional plans are also pointed out in some of the regions. In other regions, on the contrary, the capacities which are likely to be realized, are significantly exceeding the regional need.

If overcapacities occur in some regions it would be comparatively difficult to balance them – unlike in the case of thermal waste treatment, for example. "The market for sewage sludge is comparatively inflexible", as Döing puts it. "Volume fluctuations here are less pronounced; at present, the majority of the sewage sludge is disposed in dehydrated form. Across greater distances, its transport turns out to be relatively expensive. Due to the statutory regulations pertaining to the recycling of phosphorus, the use of co-substrates in mono-incineration plants is virtually impossible."

ecoprolog assumes that as of approximately 2029, mono-incineration will represent a market share of considerably more than 80 % throughout Germany in the field of sewage sludge disposal. "Besides the decrease of soil-related recovery, we also expect a significant decline in co-incineration", Döing explains. This is due in particular to the fact that the so-called wet depletion of phosphorus, in the current context, is not legally recognized as recycling. But in most cases, this would be a prerequisite for co-incineration."

At least the pressure on disposal prices will decrease in the years to come in the course of the commissioning of new mono-incineration capacities. In certain years though, deviations from this trend are possible. This holds true above all if individual coal-fired power plants with high input of sewage sludge are shut down.

After discussions with numerous operators of municipal sewage treatment plants, ecoprolog assumes that these practical constraints are not yet known to everybody. "Especially operators of small-scale and medium-scale sewage treatment plants still believe that the recycling of phosphorus only concerns plants of size categories 4b and 5, that is those with a capacity of more than 50,000 population equivalents. With a view to the well-known LAGA enforcement aid, this is not true and in fact applies to all plants as well as to all plants as of 2029. All of these have to set out until the end of 2023 how they plan to implement these regulations", Döing underlines. "Thus, all operators are keen to make provisions early on. In doing so, it can only be determined in the respective regional contexts which strategy is the best to adopt."

It is certain that the current investments will create considerable market distortions. In the future, plant operators will assume a significantly more prominent role while the market share of intermediate disposal companies who do not possess infrastructures of their own is bound to shrink.

Uncertainties result, not least, from the technical realization of the projects. “In the past ten years, not a single mono-incineration plant with a capacity exceeding 6,000 tpy of dry matter has been put into operation in Germany. This raises the question of how the construction of a great number of plants with a capacity of 30,000 tpy or more is going to proceed within a period of 6 to 7 years”, according to Döing.

ecoprolog is an independent consultancy specialising in the fields of environmental and energy technology. As a respected industry expert, ecoprolog accompanies clients from Germany and abroad in dealing with implementation-oriented management issues with political, technical or economic backgrounds in the environmental and energy technology industries. A main focus of ecoprolog is placed on the analysis of the waste management industry, especially in waste and biomass recovery.

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