

Sustainable future usage or disposal possibilities of sewage sludge -based biomasses in Latvia

Summary of a Good Water IP Life project report

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1. Introduction

Project Sustainable Biogas is financed by the Interreg Central Baltic programme and aims at promoting the sustainability of biogas from a water protection perspective. Activity T4.6 of the project involves analysing alternative national future use or disposal possibilities of sewage-based biomasses in Latvia. Towards this end, invitations to tender for such a study were sent to 21 consultancies and research organisations, but unfortunately, no proposals were received. Instead, information was received from Latvia that a similar study had just been completed for the Latvian water and wastewater works' association LWWWA in the Good Water IP Life project (<https://goodwater.lv/en/home/>).

Realising that a reassessment of the scope of the activities is needed, it was agreed with the project officer of the Interreg Central Baltic that instead of preparing a second, fringe strategy it would be best to wait until the Latvian strategy is public, to study it carefully and to contribute towards sustainable nutrient management in Latvia in the public hearing of the plan.

To facilitate this process, this paper gives a brief summary of the sludge strategy the Good Water IP Life project developed for Latvia in 2021. The full strategy report in Latvian, with a summary in English, can be found at <https://www.lwwwa.lv/projekts-life/>.

2. Sewage sludge strategy for Latvia

Current situation on sludge use and disposal in Latvia

According to the strategy report, sewage sludge is most often mechanically drained, stored for 12 months in a sludge field (cold fermentation), composted or delivered to outsourced service providers for mesophilic anaerobic processing in biogas plants. In some cases, sewage sludge from smaller wastewater treatment plants (WWTPs) is transferred to larger WWTPs for processing. In some small WWTPs, the most probable treatment is long-term storage, which is considered as a noncompliant management method.

Vision and objectives for future sludge management

As a vision, the strategy outlines that “All the sewage sludge in Latvia is processed in a compliant manner and used in an environmentally safe way by following the principles of circulation”.

The strategy objectives include

1. Management of sewage sludge is accurately defined, environmentally safe and economically justified
2. The process of sewage sludge management is simple and monitored
3. Processed sewage sludge is continuously demanded and available

Alternative sludge management options

In the Latvian strategy, the starting point is to determine A) the organisation of sludge management (either by a public service provider or outsourced), B) the end use and C) processing method for sludge, and D) the degree of centralisation of operations (number of processing centres) (Figure 1).

Figure 1. A framework for Latvian sewage sludge management options. Source: Latvian sewage sludge strategy

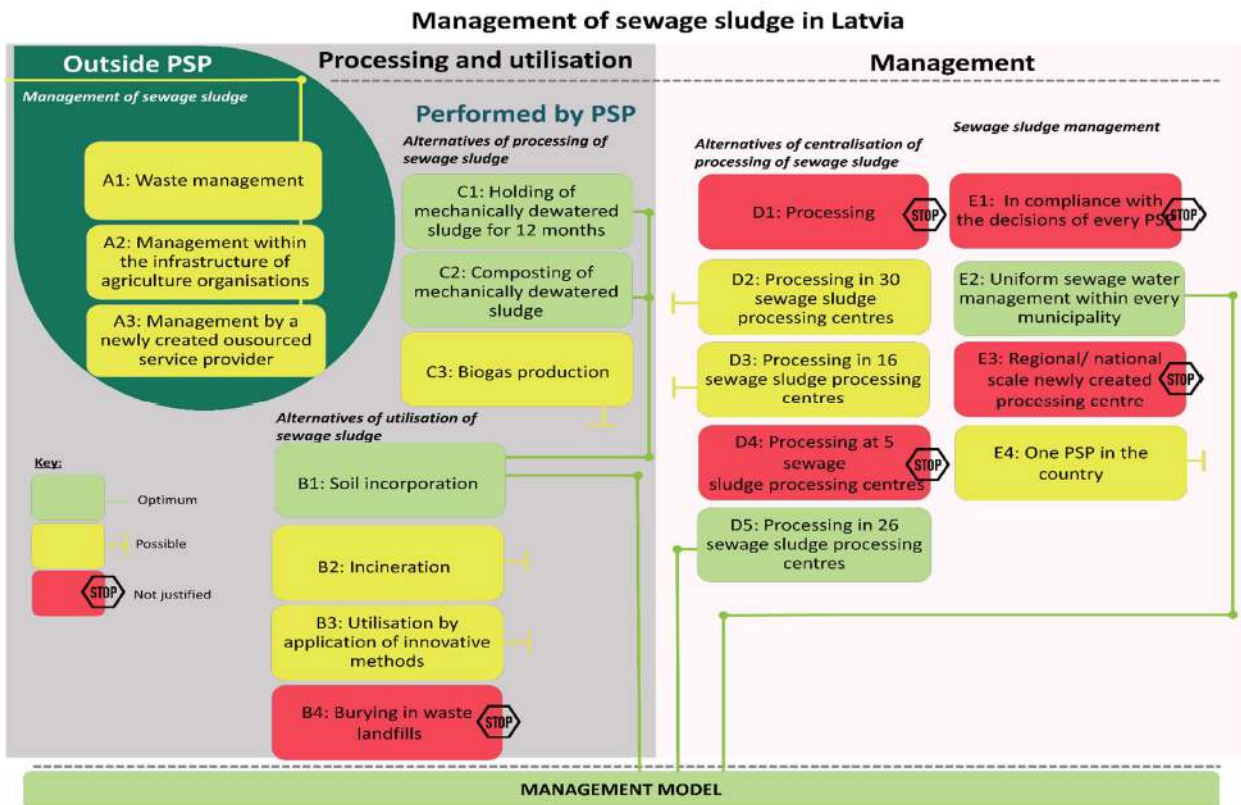


Figure 1. Summary of assessment of alternatives

Criteria for the selection of the preferred option

The strategy report discusses the following criteria when considering the sludge management options

- Meets the long-term goals of the EU and national strategies
 - The transition to a circular economy
 - The re-use of local resources without harming the environment and public health
- In line with the vision and mission set out in the strategy
- Lower investment and operating costs
- Simpler implementation scenario
- The alternative is not limited by a certain amount of sludge
- External control of sludge management monitoring is easy to implement and does not require large resources
- Possibilities for long-term agreements & other risks

Conclusions on sludge management

In conclusion, the report outlines that the most preferred sludge management option is to treat sludge in 26 sewage sludge processing centres and to assign a single public service provider in charge of sewage sludge management within one municipality. Wet sludge from small WWTPs is to be delivered to the largest WWTP in the municipality (in total 41 WWTPs) for mechanical drying. The public service provider in charge of sewage sludge management delivers all the collected and drained sewage sludge from the district to one of the 26 sewage sludge processing centres located at the biggest Latvian

WWTPs. From 15 WWTPs, drained sludge is transported to a nearest sewage sludge processing centre outside of the municipality.

In the strategy, it is not defined what kind of processing happens at the sewage sludge processing centre. The operator of the sewage sludge processing centre is to decide on the technological solution of sewage sludge processing or outsourcing of the sludge processing function based on a separate technical economic analysis. After processing, the strategy assumes that sludge or sludge compost is tested, and a quality certificate is issued. Thereafter, the sludge is applied to soil (20 000 ha/a).

3. Current status of the strategy

The strategy was delivered to the Ministry of Environmental Protection and Regional Development for review in 2021 and a public hearing was expected to be organised in 2022. By the time of writing this report (June 2022), the hearing has not yet been announced.

In late June 2022, however, the Ministry of the Environmental Protection and Regional Development signed an agreement with the company SIA "Reģionālie projekti" (Regional projects) about a strategic environmental impact assessment for the sewage sludge strategy. The contractor will

- prepare an environmental assessment and report;
- organise a public hearing for the sewage sludge strategy, and summarise all comments received during the public hearing;
- evaluate the potential negative impact of the strategy according to the conditions of the "Do no significant harm" principle; and
- prepare the drafts of an informative report and an announcement for the Cabinet of Ministers.

As the contract duration is 25 weeks, the public hearing is likely to take place in the autumn and the informative report is likely to be submitted at the end of the year 2022.

4. Contribution to the public hearing

From the point of view of contributing to the public hearing of the Latvian sludge strategy, project Sustainable Biogas can provide the following remarks and advice:

- The chosen preferred sludge processing option (aging or composting) for Latvia is not optimal from the climate change mitigation point of view. If a carbon footprint analysis had been made, it would have indicated that the lowest greenhouse gas emissions are related to options incineration and anaerobic fermentation. On the contrary, land application of sewage sludge after aging or composting does not take benefit of the energy content of sludge. In aging/composting, a considerable share of carbon in sludge is lost to the atmosphere while the rest contributes to the soil organic matter content after land application.
- In the light of experience gained in project Sustainable Biogas, it is of utmost importance that in the location planning of nutrient processing activities, it is considered if the processing centres are located in nutrient surplus or nutrient deficient areas and if there actually are suitable field areas for sustainable land application of aged/composted sludges. For more information on mapping of nutrient balances, see e.g. the nutrient maps for Zemgale region (https://sustainablebiogas.eu/wp-content/uploads/2022/06/Report_Mapping_LSES.pdf).
- There are anticipated changes in the EU level regulation as Urban wastewater treatment directive (91/271/EEC) and Sewage sludge directive (86/278/EEC) are under revision.

- The Latvian strategy fails to consider that in many European countries, there is growing resistance to the use of sludge in agriculture and international food companies have prohibited the use of sewage sludge -based soil improvers from their contract farmers. In this context, it is not sufficient to guarantee that the sludge conforms to set limit values for heavy metals, but also e.g. pharmaceutical residues, brominated flame retardants and PFOS will be subject to debate.

Climate-friendly biogas may lead to nutrients entering the watercourses if the treatment of digestates and wastewater from biogas plants is not carefully planned.

The goal of the Sustainable Biogas project, funded by the EU's Interreg Central Baltic programme, is to promote the sustainability of biogas from a water protection perspective.

The project is implemented by the John Nurminen Foundation, the ELY Centre for Southwest Finland, the Finnish Biocycle and Biogas Association, Latvian State Environmental Services, and the Latvian Biogas Association.

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