



Position paper

Enabling the circular potential of sewage sludge within the EU legislative framework

A critical analysis of the current urban waste water treatment sludge legislation with respect to the circular economy

Summary

Enabling the circular economy for waste water services requires the alignment of a set of directives regulating the sector. The Urban Waste Water Treatment Directive (UWWTD), the Industrial Emission Directive (IED), the Waste Framework Directive (WFD) and the Sewage Sludge Directive (SSD) are key to the collection and treatment of urban waste water and subsequent treatment and re-use of urban waste water treatment sludge (UWWTS).

In this paper we identify some gaps in the Directives that generate hurdles for the good management of UWWTS and that should be resolved in the various reviews ongoing. In this way, the European water services could make an even greater contribution to the circular economy. We also propose an approach to facilitate the recovery of resources from UWWTS to maximise the value, efficiency and resilience that can be achieved for society while protecting public health and the environment. This approach would protect the quality of waste water through stronger requirements on industrial discharges into sewers under the IED and clarify that the processing of UWWTS falls under the UWWTD, except for incineration, rather than under the IED, to facilitate and optimise the recovery and recycling of materials from UWWTS. Bundling all requirements in one legal text, i.e. the UWWTD, would streamline compliance efforts and costs and, hence, encourage more investment in circular options. End-of-Waste criteria for materials recovered from sludge should be defined at EU level in order to facilitate the reuse of these materials and more readily achieve the objectives of the Green Deal.



1. Introduction

Both the quality and the management of urban waste water treatment sludge (UWWTS) depend on the policies regulating what water services can do with the materials generated by urban waste water treatment. The Urban Waste Water Treatment Directive (UWWTD), the Industrial Emission Directive (IED), the Sewage Sludge Directive (SSD) and the Waste Framework Directive (Waste FD) are four directives regulating the generation, use, treatment, transport and recycling or discarding of UWWTS in Europe. The first three Directives are currently undergoing a process of evaluation or revision by the European Commission and the fourth is undergoing a process looking at defining European End-of-Waste criteria from different waste streams. This is an opportunity to clarify some of the provisions within the four Directives to enable the circular economy and overcome some inconsistencies regarding the implementation of the Directives relating to the treatment of (urban) waste water and associated by-products.

The waste water sector is under pressure due to the presence of degradable and non-degradable pollutants entering our sewers and from the increased flow to sewers caused by climate change and urban development. We are asked to deliver clean water by removing these pollutants from waste water and this process generates an increasing amount of UWWTS and treatment efforts, as well as higher costs to customers and carbon emissions. Improved control of pollution at source is therefore crucial and urgently needed for all non-biodegradable pollutants, if we are to truly embrace the circular economy. We therefore welcome the new EU Zero Pollution Action Plan with the concept of a so-called zero pollution hierarchy. This concept is based on the EU Treaty (Article 191.2) which stipulates that preventive action should be taken, that environmental damage should - as a priority- be rectified at source and that the polluters should pay to rectify any pollution they cause. Hence, good source control and polluter pays mechanisms are key facilitators for a circular water sector and the safe and sustainable use of UWWTS. Cleaner waste water provides more potential for cost-effective successful recycling of UWWTS, the recovery of materials from it and the increasing need for the reuse of water in agriculture. It also helps to avoid expensive upgrade of WWTPs, which keeps waste water services affordable and avoid greenhouse gas emissions.

In order to reach the full circular economy potential for UWWTS management, we ask for:

- ~ strict pre-treatment of industrial effluent for industries connected to a urban sewers to protect the downstream environment, waste water treatment, workers and the quality of UWWTS with the view of improving its recycling in agriculture and the quality of recovered products and materials from it
- ~ a better application of the 'polluter pays' principle, recovering the costs of any extra treatment for waste water and UWWTS from polluters
- ~ regrouping all stages of sludge treatment, except incineration, under the UWWTD
- ~ enhancing the Sewage Sludge Directive to better support and encourage the use of



- UWWTS in agriculture and other land applications, where possible, without jeopardising drinking water abstraction interests and the environment
- ~ a European End-of-Waste status for materials recovered from UWWTS.

The aim of this paper is to clearly explain why these steps are key to reach the full potential of the circular economy for UWWTS management and allow the waste water sector to use its full potential and close the loop for the benefit of the environment, the water consumer and the society as a whole.

2. Policy context

The UWWTD, the IED, the SSD and the Waste FD tackle different topics as it is clearly mentioned in their scopes (Annex - Table 1) and they comprise certain exclusions (Annex - Table 2), to avoid overlaps. The status of UWWTS is unclear across the Waste FD, IED, SSD and UWWTD. The latter is the principal instrument responsible for the collection of waste water leading to the generation of UWWTS. It banned the dumping of sludge in surface waters and encourages the recycling of sludge without giving any details about where or how this should be done. The SSD defines how UWWTS can be used in agriculture and the quality it needs to have to be spread on agricultural land only. The IED does not specifically talk about it but some of the UWWTS treatment facilities might fall under the IED. Finally a Commission Decision (see Annex Table 1) related to the Waste FD allocates a category of waste to 'Sludge from treatment of urban waste water'.

Urban waste water treatment plants (UWWTP) are not industrial entities as they do not produce any goods and their core activity is to remove pollution from urban waste water. It is clear that these activities covered by the UWWTD should not be covered by the IED, as confirmed by the exclusions in Annex I of the IED (Annex – Table 2). However, the term “activities covered by the UWWTD” leaves space for interpretation and needs to be clarified. In practice, in some countries, WWTPs processing their own UWWTS with anaerobic digestion on their own sites are not covered by the IED but, if the UWWTS is mixed with UWWTS coming from another UWWTP, the anaerobic digester is covered by the IED to operate. Two digesters working the same way with similar input are therefore covered by two different directives. For example, in France, about 25% of UWWTS (expressed in DS) are treated in WWTPs for which the anaerobic digesters are covered by IED (about 20 WWTPs) which leaves 75% of sludge treated in facilities covered by the UWWTD.

It would be clearer to consider anaerobic digestion of all UWWTS, originating from one or multiple UWWTPs, to be covered by the UWWTD only. Bundling all requirements in one legal text would streamline compliance efforts and costs and, hence, encourage more investment in circular options.

As certain industrial sectors are covered by the UWWTD, the biowaste, organic waste or sludge they are generating should be authorised under this Directive to be co-digested with UWWTS in centralised anaerobic digestion facilities, provided appropriate pathogen standards are set, monitoring is undertaken and identification is done for traceability purposes. To ensure that co-digestion is allowed everywhere in Europe and safety is



guaranteed, the interpretation of the Waste FD (2018/851) must be clarified as certain Member States exclude co-digestion and co-composting with UWWTS from the possible waste treatment processes.

Some materials recovered from the UWWTS are also still considered as waste even if they are of good quality and have a market value. At the moment, European legislation does not favour the recycling of these materials in the economy. The example of the Fertilising Products Regulation, explicitly defining the conditions or processes under which struvite or ashes produced from UWWTS could cease to be a waste and become a product, is a good starting point. However, this route is very slow and there is a need to include more valuable products than fertilisers or fertiliser components, for example biogas.

EurEau wants to clarify the role of the different legal instruments with regards to UWWTS management. Specifically, we want this clarification in order to find the best solution to recycle and recover the good resources we produce and to use UWWTS as secondary raw material. **We therefore ask the co-legislators to give clear guidance to promote circular economy goals by including requirements related to the processing of UWWTS, especially digestion in the UWWTD.**

3. Protecting the quality of urban waste water treatment sludge

The reuse of UWWTS is essential for a number of Member States, especially in the south of Europe where soils are very poor in organic matter¹. A prerequisite for this reuse or the recovery of material from UWWTS is its good quality from the beginning. In order to ensure this quality, the control of the discharges to sewers is essential. Most WWTPs are not designed nor sized to treat or remove harmful or potentially harmful substances. The UWWTD provides provisions in its Article 11 and Annex I C to pre-treat industrial waste water entering collecting systems and urban WWTPs in order to:

- ~ protect the health of staff working in collecting systems and treatment plants
- ~ ensure that collecting systems, WWTPs and associated equipment are not damaged
- ~ ensure that the operation of the WWTP and the treatment of sludge are not impeded
- ~ ensure that discharges from the treatment plants do not adversely affect the environment, or prevent receiving water from complying with other Community Directives
- ~ ensure that sludge can be disposed of safely in an environmentally acceptable manner.

These provisions are good, but could be reinforced in the revised UWWTD and need stronger implementation in Member States². If we want to achieve the circular economy for the waste water sector, **the IED needs to reinforce those by requiring an agreement between industry and municipalities/waste water operators to define**

¹ <https://www.eureau.org/resources/briefing-notes/5629-briefing-note-on-sludge-management/file>.

² EurEau (to be published Autumn 2021): Position Paper on Control of industrial discharges in sewers.



the necessary level of pre-treatment before industrial water may be allowed to be released into the municipal sewer system. In other cases, the industrial waste water should be treated to comply with high standards allowing its direct discharge into the receiving water body, instead of increasing the load of the municipal waste water system. These requirements should be aligned with the objective of the Water Framework Directive³, especially Article 7 requiring the protection of the quality of the drinking water resources.

Often, the waste water operators do not know which chemicals are used on industrial sites. It is therefore very difficult to trace the origin of pollution and to take action to protect the quality of sludge. **Therefore, for traceability reasons, the IED should require that the waste water operator is informed about the chemical products/substances used on the industrial site so he is aware of any risk that could hamper the future use of UWWTS and/or its by-products.** The onus to disclose information regarding **the chemical products/substances used on the industrial site** and the contents of waste discharges to sewer should be fully on the industrial site in question.

Furthermore, the cost for industrial discharge monitoring, polluter identification in case of pollution event in an urban waste water collection system or the extra cost for sludge contamination by specific substances should be charged to the identified industry and included in the operating permit.

Finally any IED-installation using substances of very high concern should not be allowed to connect to a sewer network by default and should have appropriate waste water management options to protect the receiving waters, the drinking water resources and UWWTS disposal routes, especially in agriculture. This will also help to reach the objectives of the Water Framework Directive.

4. About the End-of-Waste status of the material recovered from urban waste water treatment sludge

Waste water operators across the EU remain supportive of continuing to make the waste water sector part of the circular economy. EurEau is concerned that some key actors see UWWTS only as a source of pollutants. We would like to reiterate that UWWTS should be considered as a valuable source of nutrients and trace elements, and not as a waste only because it is the material resulting from the waste water treatment. The principle of reusing UWWTS is firmly set out in the UWWTD and **we think that it should be reinforced in the SSD by extending the scope to uses other than agriculture.** However, certain criteria may need to be revised to reinforce the protection of the environment and human health and the evaluation of the SSD should demonstrate it on a scientific basis.

According to the Waste Framework Directive, waste waters are excluded from its scope but not UWWTS (Annex – Table2). However, some technical solutions enable the recovery of

³ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.



materials from UWWTS like phosphorus, nitrogen, biopolymers, biogas, biochar, biofuel, struvite and even recovered products from ashes. A market is not always available for these innovative materials because the recovery costs are often too high compared to primary raw materials. This is because fossil oil based material or extraction techniques and transportation are cheaper. The environmental constraints and EU's climate targets will put pressure on fossil oil based material and transportation at some point and then the recovered material market will become more competitive. These materials often comply with the conditions defining the End-of-Waste status under the Waste Framework Directive (Annex – Table 2) and the legal framework needs to be ready at that time. The Fertilising Products Regulation already defines conditions to obtain an End-of-Waste status for struvite and ash-based products from UWWTS and it is a first good step. However, this is only true for fertilising products. Recognising that other materials from UWWTS for other uses may obtain an End-of-Waste status will promote innovation and is a prerequisite for this transition to happen.

Furthermore, waste water treatment as part of water services has, besides the technical side of treating waste water, a socio-legal responsibility to deliver urban waste water and sludge treatment at an affordable price. This means that it is crucial to improve the recycling and recovery of resources from UWWTS to have first a pull from the market to make it economically viable and to support the development of new technologies.

From EurEau's point of view, UWWTS-based materials intended to be reused need not be considered as waste. The circular economy must be based on the principle that the quality of the material defines if it can be reused, not the origin. **Therefore, a legislative route to achieve End-of-Waste status, based on defined criteria for materials that are safe for the environment and human health, is urgently required.** This would avoid different interpretations in different Member States and would enable the market related to sludge products to become established.

5. Towards a clearer future

We would like to propose in this section a reflection to better achieve the circular economy for the waste water sector.

The objective of urban waste water treatment is to collect household and authorised industrial waste water and convey it away from the cities to protect human health and the environment. Waste water is then treated, in order to protect the environment. The result of the physical, chemical or biological, or a combination of these treatment methods is the urban waste water treatment sludge composed of valuable material (water, carbon, oxygen, nitrogen, phosphorus and other micronutrient elements) and a small proportion of contaminants. Whilst it is helpful to differentiate between these treated waste water and UWWTS, it must at the same time be recognised that they are intrinsically related and that the management of UWWTS cannot be separated from effective treatment of waste water. This is why they are both best viewed as part of UWWTD.

A clear organisation of the legislative framework should ensure that the environment is



protected and that the recovery of resources is ensured. Therefore, **the quality of waste water has to be protected in the first place through the enforcement of measures for IED-installations connected to sewers as required in section 3 of this paper.**

Our aim is to recycle and recover substances in a safe way and to maximise the value of the materials produced from waste water treatment. Therefore, the UWWTS needs to have an adequate legislative framework that defines the conditions to deliver good quality materials, protects the environment and human health and ensures that these materials are suitable for reuse. **To optimise the recovery of materials, we ask to include requirements related to the processing of UWWTS, especially digestion in the UWWTD.** The processing of sludge would then be excluded from the IED due to the exclusion of activities related to the UWWTD. Traceability needs to be organised to ensure the quality of the final product. To avoid pollution dilution, we support the idea that the quality UWWTS is monitored and traced. At the same time, this would ensure the quality of the final digestate.

Most of the EU Member States recycle nitrogen and phosphorus from UWWTS by using it in agriculture and this environmentally effective practice has to be maintained and reinforced through the New Circular Economy Action Plan⁴. The SSD, which defines conditions to use urban waste water treatment sludge as fertiliser in agriculture, should be extended to other type of lands like parks, energy crops, sport fields, construction sites, and rehabilitation of landscapes or forests. The requirements might be revised in order to reinforce the protection of the environment and human health in different outlets and the evaluation of the SSD should demonstrate it on scientific basis.

Moreover, the New Circular Economy Action Plan states that the European Commission should determine for which additional waste streams EU-wide End-of-Waste Criteria should be developed. **It is crucial that the entire waste water treatment stream is considered in this assessment** in order to develop the appropriate criteria to remove the waste status at EU level for certain UWWTS materials and foster the market for these secondary raw materials.

This arrangement would bring clarity around the legislative context for UWWTS and material recovery. It gives Member States the freedom to decide on the management options for UWWTS according to their needs and constraints, and allows them to optimise the recovery and reuse of resources.

⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN>.



Annex

Legislative Framework

Table 1: Scope of the four directives

Legislative instrument	Scope
IED	This Directive shall apply to the industrial activities giving rise to pollution referred to in Chapters II to VI.
UWWTD	This Directive concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors (INDUSTRIAL SECTORS: Milk-processing; Manufacture of fruit and vegetable products; Manufacture and bottling of soft drinks; Potato-processing; Meat industry; Breweries; Production of alcohol and alcoholic beverages; Manufacture of animal feed from plant products; Manufacture of gelatine and of glue from hides, skin and bones; Malt-houses; Fish-processing industry)
SSD	The purpose of this Directive is to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging the correct use of such sewage sludge
Waste FD DIRECTIVE 2008/98/EC amended by DIRECTIVE (EU) 2018/851	This Directive lays down measures to protect the environment and human health by preventing or reducing the generation of waste, the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use, which are crucial for the transition to a circular economy and for guaranteeing the Union's long-term competitiveness.'; "Sludge from treatment of urban waste water" is listed under category 19.08.05 in the COMMISSION DECISION of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC



Table 2: Exclusions for certain activities

Legislative instrument	Exclusions
<p>IED</p>	<p>5. Waste management</p> <p>5.3. (a) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment (UWWTD)</p> <ul style="list-style-type: none"> (i) biological treatment; (ii) physico-chemical treatment; (iii) pre-treatment of waste for incineration or co-incineration; (iv) treatment of slags and ashes; (v) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components. <p>(b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, and excluding activities covered by Directive 91/271/EEC:</p> <ul style="list-style-type: none"> (i) biological treatment; (ii) pre-treatment of waste for incineration or co-incineration; (iii) treatment of slags and ashes; (iv) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components. <p>When the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for this activity shall be 100 tonnes per day.</p>



UWWTD	None identified
<p>Waste FD</p> <p>DIRECTIVE 2008/98/EC amended by DIRECTIVE (EU) 2018/851</p>	<p>Article 2 – Exclusions from the scope</p> <p>2. The following shall be excluded from the scope of this Directive to the extent that they are covered by other Community legislation:</p> <p>(a) waste waters;</p> <p>(b) animal by-products including processed products covered by Regulation (EC) No 1774/2002, except those which are destined for incineration, landfilling or use in a biogas or composting plant;</p> <p>(c) carcasses of animals that have died other than by being slaughtered, including animals killed to eradicate epizootic diseases, and that are disposed of in accordance with Regulation (EC) No 1774/2002;</p> <p>(d) waste resulting from prospecting, extraction, treatment and storage of mineral resources and the working of quarries covered by Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries (1).</p> <p>(e) substances that are destined for use as feed materials as defined in point (g) of Article 3(2) of Regulation (EC) No 767/2009 of the European Parliament and of the Council (*) and that do not consist of or contain animal by-products</p> <p>Article 6 - End-of-waste status</p> <p>1. Member States shall take appropriate measures to ensure that waste which has undergone a recycling or other recovery operation is considered to have ceased to be waste if it complies with the following conditions:</p> <p>(a) the substance or object is to be used for specific purposes;</p> <p>(b) a market or demand exists for such a substance or object;</p> <p>(c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products;</p>



	and (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.
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About EurEau

EurEau is the voice of Europe’s water sector. We represent drinking water and waste water operators from 29 countries in Europe, from both the private and the public sectors.

Our members are 34 national associations of water services. At EurEau, we bring national water professionals together to agree European water sector positions regarding the management of water quality, resource efficiency and access to water for Europe’s citizens and businesses. The EurEau secretariat is based in Brussels.



With a direct employment of around 476,000 people, the European water sector makes a significant contribution to the European economy.