

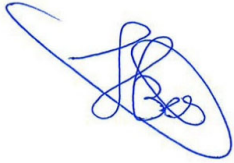
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Legal Framework for Raw Materials from Sewage Water

Interreg 
North-West Europe



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WOW! - Wider Opportunities for raw materials from Wastewater

Sewage contains valuable substances that can be used as raw materials for biobased products. However, in North-West Europe the potential of these resources has so far hardly been exploited. This results in loss of valuable materials, unnecessary CO₂-emissions and less efficient usage of natural resources. The Interreg North-West Europe project Wider business Opportunities for raw materials from Waste water sewage (WOW!), aims to contribute to a more circular approach towards the transition of raw materials from sewage sludge. It does so by matching supply and demand of cellulose, lipids and PHA bioplastics originating from sewage water. The international consortium consists of partners from government, business and academia from the United Kingdom, France, the Belgian region of Flanders, Germany, Luxembourg and the Netherlands.

There are vast market opportunities for raw materials from sewage. To meet this demand, sewage treatment plants and industry need to be aligned. This calls for a transition: sewage treatment plants along with other market players should switch from considering sewage as waste products to considering them as valuable materials. Similarly, the legal framework should envision and facilitate these practices. This may require that the current legal framework needs amendment to further fit these new circular practices. To realize these opportunities the consortium aims to develop value chains for three different streams of raw materials from sewage: cellulose, PHA bioplastics and lipids.

The following activities will be conducted as part of the WOW! project:

- ✓ Identify high potential value chains for raw materials from sewage;
- ✓ Develop a Decision Support Tool that guides sewage treatment plants in their transition towards a circular approach on sewage;
- ✓ Build and run three WOW! pilots to optimize and implement innovative recovery and upcycling techniques;
- ✓ Create bioproducts made out of sewage, such as bioplastics, biofuel and bio-char;
- ✓ Create national policy action plans and an EU policy and legal roadmap.

Summary

Sewage contains valuable resources that can be used as raw materials for innovative biobased products. However, in North-West Europe this potential is hardly exploited. This results in loss of valuable materials and CO₂-emissions. The Interreg North-West Europe project Wider business Opportunities for raw materials from Waste water (sewage) (WOW!) aims to make the transition to a more circular approach by matching supply and demand of cellulose, lipids and PHA bioplastics from sewage. This document aims to provide an overview of the applicable legislation for these resources from waste water sources as currently exists within the Member States that are part of the WOW! Project. These Member States are: the United Kingdom (UK), France, the Belgian region of Flanders, Germany, Luxembourg and the Netherlands. By means of demarcation, the applicable legislation of the other Member States will fall outside the scope of this report.

One of the key issues that currently hampers the recovery and reuse of materials from sewage is the uncertainty and the legal implications of reclassifying raw materials from sewage water as new products and resources that can be brought to market. Despite the overarching European legal framework, Member States are still given considerable leeway regarding the reuse of raw materials from sewage, leading to different interpretations of EU legislation. For instance a product that has received an end-of-waste status based on the Waste Framework Directive in the Netherlands, may still be considered as waste in other Member States. This requires that the transportation of waste is subject to waste legislation. Similarly, the treatment plant also requires the necessary permits to handle the waste. In the case of Germany, it is not clear who should be addressed to start the procedure to receive an end-of-waste status. Without an end-of-waste status, a product may not be transported or used for the production of new products, which means the materials will likely be discarded or incinerated, destroying the potential value of the resources. Likewise, a potential customer is not permitted to test its usability. This leads to a paradoxical situation where marketability at more than pilot scale cannot be proven due to a lack of an end-of-waste status while it is not possible to gain this end-of-waste status because usability may not be tested.

Another example of different regulations based on the same directive, is the transposition of the European Sludge Directive into national legislation. The Sludge Directive aims to encourage the use of sewage sludge in agriculture and to regulate its use while preventing harmful effects on soil, vegetation, animals and humans, encouraging correct use of sewage sludge.¹ Based on this directive, Spain has forbidden to incinerate sewage sludge, whereas the Netherlands has determined that all sludge must be incinerated. In the UK, sewage sludge may only be used in agriculture if it has been stored under anaerobic conditions for at least seventeen days. In contrast, the crops that grow on sewage sludge can freely be traded freely within the internal market.

¹ Art. 1 Directive 86/278/EEC

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1 Introduction

The idea behind circular value chains is not new. Many underlying concepts- such as cradle to cradle, industrial ecology, biomimicry and circularity- have existed for years. The recovery of raw materials from sewage water is also not new. Research and development projects in this field have been ongoing since the late 1990's. Since then, full-scale installations have been developed and marketable products have been produced on a representative scale. The recovery and reuse of materials from sewage water is however not common practice yet. One of the key issues hampering this development, is the uncertainty of the legal implications of turning raw materials from sewage water into new materials and products. The sewage treatment operators nor the industry will invest in the potential of resources conducted from sewage water if these legal hurdles have not been effectively overcome. To be able to solve potential legal issues, first the current (main) legal and policy instruments relating to sewage water on both the EU and Member State level needs to be clear. This report provides an overview of these legal and policy instruments.

1.1 Objective

The objective of this report is to describe the main legal and policy context for bringing raw materials from wastewater to the market, shining light on the main national differences. Due to the project partners of WOW! and by means of demarcation, only the national legislation of the Flanders region in Belgium, France, Germany, the United Kingdom, Luxembourg and the Netherlands will be discussed. This report will be used as a basis and point of reference towards identifying what regulatory hurdles currently stand in the way of extracting the raw materials recovered in the WOW! project on an industrial scale. The raw materials are cellulose, lipids and PHA.

2 European Political landscape

In December 2015, the European Commission adopted an ambitious new Circular Economy Package to stimulate Europe's transition towards a circular economy, boosting global competitiveness, fostering sustainable economic growth and generating new jobs.² The Circular Economy Package intended to help European businesses and consumers to make the transition to a stronger and more circular economy in which resources are used in a more sustainable way. As the European Commission describes, the proposed actions will contribute to 'closing the loop' of product lifecycles through more recycling and reuse, and bring benefits for both the environment and the economy.

The transition was supported financially by the European Structural and Investment Funds (ISEF) with €650 million from Horizon 2020, €5.5 billion from structural funds for waste management, and investments in the circular economy at national level. Next to financial support, the commission stated that they will remove barriers that make it difficult for businesses to optimise their resource use and we will boost the internal market for secondary raw materials.³

In 2019, a press release was issued by the Commission, stating that the Circular Economy Action Plan can be considered fully completed⁴. The press release describes the results of the CEP in relation to the goals set in 2015. The reporting mainly describes technical, technological and economic results. Amendments to legislation and / or harmonisation of legislation are not further described. The attention given to the circular economy, the reuse of raw materials and the available financial resources shows that these are important focus areas. However, the legal framework remains underexposed.

² European Commission, *'Closing the Loop- An EU Action Plan for the Circular Economy'*, COM(2015) 614, Brussels: 2015

³ https://ec.europa.eu/commission/presscorner/detail/en/IP_15_6203

⁴ https://ec.europa.eu/commission/presscorner/detail/en/IP_19_1480

3 European Legal Framework

The EU considers the transition towards a sustainable economic system to be an indispensable part of its industrial strategy. Circular economy principles throughout the EU economy could increase the EU's GDP by 0.5% and create around 700.000 jobs by 2030. Additionally, the circular economy can foster further business creation and entrepreneurship among SMEs.⁵ While legislation already exists in the field of product sustainability on both mandatory and voluntary basis, the Commission will propose a sustainable product policy legislative initiative, including a Ecodesign directive applicable to the broadest range of products possible. At the same time, the Commission will propose sustainability principles and other appropriate ways to regulate aspects including product improvement in the field of durability, reusability, upgradability and reparability while addressing hazardous chemicals in products and increasing energy and resource efficiency, increase recycled content in products, enable remanufacturing and high-quality recycling, reducing carbon and environmental footprints and restricting single-use and countering premature obsolescence, a ban on the destruction of unsold durable goods, incentivising products-as-a-service initiatives, mobilising the potential of digitalisation of product information and rewarding products based on their sustainability performance.⁶

3.1 Water Framework Directive (2000/60/EC)

The Water Framework Directive aims to fulfil a number of goals related to the quality and quantity of water resources. According to Article 1 of the Directive, it aims to protect inland surface waters, transitional waters, coastal water and groundwater in order to (a) prevent further deterioration and protection of the status of aquatic ecosystems, (b) promote sustainable water use based on long-term protection of available water resources, (c) enhance protection and improvement of the aquatic environment by means of progressive emissions reduction, (d) ensure the progressive reduction of pollution, and (e) contribute to mitigating the effects of floods and droughts.⁷ Surface water must adhere to two quality standards: "good ecological status" and "good chemical status". How to reach these standards is determined in Annex V of the Directive. Since no absolute standards for biological quality can be set throughout the EU due to ecological variability, only slight deviation from the biological standards is required in order to minimize the anthropogenic impact.⁸ Groundwater on the other hand, is regulated somewhat differently as Member States may not pollute groundwater at all. Member States are therefore not only required to refrain from polluting groundwater but they must also adhere to strict specific regulations with regard to nitrates, pesticides and biocides.

The Directive requires Member States to identify water bodies and determine a competent authority which is required to register protected areas and monitor surface water status. If a river encapsulates more than one Member State (i.e. the Meuse river⁹), the water body is assigned to an international river basin district. Cooperation with third-countries may be required as well (i.e. with the Rhine river which also flows through Switzerland and Liechtenstein). Member States are required to establish a river basin management plan which must be updated every six years.

The Member State is required to assure within 15 years after the coming into force of the Directive that water quality is sufficient.¹⁰ The deadlines may be extended, provided that no further deterioration occurs.

⁵ European Commission, 'Circular Economy Action Plan for a cleaner and more competitive Europe', Brussels 2020, p. 4

⁶ European Commission, 'Circular Economy Action Plan for a cleaner and more competitive Europe', Brussels 2020, p. 6-7

⁷ Art. 1 Directive 2000/60/EC

⁸ <ec.europa.eu>, search for 'introduction to the EU Water Framework Directive', last checked on 17-06-2019

⁹ The Meuse river flows from France to Belgium and the Netherlands and ends in the North Sea.

¹⁰ Art. 4 Directive 2000/60/EC

If this cannot be achieved, Member States are required to explain the reasons why, based on technical, economic or natural circumstances.¹¹ With regard to the technical adaptations of the Directive, the Commission shall be assisted by a Committee.¹² This Committee will be given an advisory role on all legislative measures that have an impact on water.¹³ Technical aspects and specific standards that must be taken into account are added in the Annexes attached to the Directive.

Water scarcity is likely to become even more intense and widespread worldwide due to climate change. This is one of the reasons why the European Commission wants to regulate water reuse requirements in order to reduce water scarcity.¹⁴ Some Member States already use treated wastewater for agricultural irrigation. Due to the relatively stable wastewater volume over the course of the year, wastewater can represent a reliable water resource for certain uses.

On 28 May 2018, the Commission therefore proposed a regulation on minimum requirements for water reuse, which is to define uniform minimum requirements for the water quality of treated wastewater for agricultural irrigation.¹⁵ The proposal aims to regulate the use of treated municipal wastewater (in accordance with the European municipal wastewater directive 91/271 / EEC) for agricultural irrigation. In addition to the quality requirements, it contains a risk management approach and guidelines to improve data transparency for water reuse.

3.2 Sludge Directive (86/278/EEC)

The Sludge Directive aims to encourage the use of sewage sludge in agriculture and regulates its use while preventing harmful effects on soil, vegetation, animals and humans, and encouraging correct use of sewage sludge.¹⁶ Sludge is defined as: (i) residual sludge from sewage plants treating domestic or urban waste waters and from other sewage plants treating waste waters of a composition similar to domestic and urban waste waters, (ii) residual sludge from septic tanks and other similar installations for the treatment of sewage and (iii) residual sludge from sewage plants other than those referred to in (i) and (ii). The sludge under (i) may only be used for agricultural purposes.¹⁷ Member States are prohibited to use sludge with a high concentration of heavy metals and treat sludge before it is used for agricultural purposes in order to prevent soil deterioration.¹⁸ Additionally, Member States are required to ensure up-to-date records with regard to the quantity of sludge, its composition, the type of treatment carried out, names and addresses of recipients of the sludge and the place where the sludge is used.¹⁹ Sludge producers are required to provide users with information with regard to the composition of the sludge every six months.²⁰ If results of analyses do not significantly vary over a full year, analyses can be brought back to once every twelve months. Similarly to the Water Framework Directive, a Committee is set up consisting of representatives of the Member States and a representative of the Commission who will act as chairman. The goal of this committee is to offer opinions to the Commission.²¹ The Committee votes by means of qualified majority.²²

¹¹ Art. 4(4) Directive 2000/60/EC

¹² Art. 21 Directive 2000/60/EC

¹³ Art. 19(1) Directive 2000/60/EC

¹⁴ Proposal for water reuse COM/2018/337 final - 2018/0169 (COD)

¹⁵ (COM (2018) 337 final)

¹⁶ Art. 1 Directive 86/278/EEC

¹⁷ Art. 3(1) Directive 86/278/EEC

¹⁸ Art. 5 jo. Art. 6 Directive 86/278/EEC

¹⁹ Art. 10 Directive 86/278/EEC

²⁰ Art. 6(b) jo. Annex IIA Directive 86/278/EEC

²¹ Art. 15(3)(a) Directive 86/278/EEC

²² Art. 15 Directive 86/278/EEC

3.3 Proposal for the Soil Framework Directive (COM/2006/0232 6)

Soil is a non-renewable resource and it is deemed vital for the performance of many functions vital to human activities and ecosystem survival (i.e. for water, human health, climate change, food safety and nature and biodiversity protection). However, over recent decades, there has been a significant increase of the soil degradation process and this is expected to rise if no action is taken (i.e. due to inappropriate agriculture and forestry practices, industrial activities, tourism and urban development). Although soil protection provisions already exist within EU legislation, there is no specific EU legislation on soil protection. The proposal thus aims to fill this gap while establishing a common strategy for the protection and sustainable use of soil.²³ The proposed Directive focuses on:

- The establishment of a common framework to protect soil on the basis of the principles of preservation of soil functions, prevention of soil degradation, mitigation of its effects, restoration of degraded soils and integration in other sectoral policies;
- The requirement to identify, describe and assess the impact of some sectoral policies on soil degradation processes with a view to protect soil functions;
- The requirement for land users to take precautionary measures when their use of the soil can be expected to significantly hamper soil functions;
- An approach to soil sealing to ensure a more rational use of land in accordance with Article 174 of the EC Treaty and to maintain as many soil functions as possible;
- Identification of areas at risk of erosion, organic matter decline, salinization, compaction and landslides, and establishment of national programmes of measures. The extent of the areas at risk of these threats need to be identified. To ensure a coherent and comparable approach, the identification of risk must be carried out on the basis of common elements. These elements include parameters which are known to be driving forces for the different threat. Risk reduction targets and programmes of measures to reach those targets will have to be adopted. Programmes can build on standards and measures already identified and implemented in national and Community contexts;
- Measures to limit the introduction of dangerous substances into the soil, to avoid accumulation in soil that would hamper soil functions and create a risk to human health and the environment
- Setting up an inventory of contaminated sites, a mechanism for funding the remediation of orphan sites, a soil status report, and establishing a national strategy for remediation of the contaminated sites identified. The definition of contaminated sites and a list of potentially soil polluting activities are established. These are the basis for locating the sites which can potentially be contaminated, as a preliminary step to the establishment of an inventory of effectively contaminated sites. This would be complemented by the obligation for seller or prospective buyer to provide a soil status report for any transaction of land where a potentially contaminating activity has taken or is taking place. A similar provision, concerning the energy performance of buildings, already exists in Community legislation (see Article 7 in Directive 2002/91/EC).²⁴

3.4 Commission Decision on Hazardous Substances (2000/532/EC)

The Commission Decision on Hazardous Substances offers an EU-wide terminology for waste classification in order to ease waste management. The Decision consists of a list providing a broad variety of activities including waste transport, installation permits and can be used as a basis for waste statistics.²⁵ The list determines if waste can be classified as hazardous. The Decision is divided into 22 different chapters, each

²³ Proposal for a Directive of the European Parliament and the Council establishing a Framework for the protection of soil and amending Directive 2004/35/EC (COM/2006/0232 6), p. 1

²⁴ Ibid, p. 5-6

²⁵ <ec.europa.eu>, search for: 'waste classification and the European List of Waste', last checked on 17-06-2019

further specified with a six digit code. For the WOW! Project, specifically chapter 2 (Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing), chapter 9 (Wastes from organic chemical processes) and chapter 21 (Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use) are of particular relevance.

3.5 Directive Concerning Urban Waste Water Management (91/271/EEC)

The Urban Waste Water Management Directive aims to protect the environment from adverse effects regarding urban waste water discharges and discharges from several industrial sectors listed in Annex III.^{26,27} The Directive concerns the treatment, collection and discharge of three forms of waste water: urban waste water (domestic waste water or mixture of domestic waste water and/or run-off rain water), domestic waste water (waste water from residential settlements and services which originates predominantly from human metabolism and household activities) and industrial waste water (waste water discharged from premises used for carrying on any trade or industry other than domestic waste water and run-off rain water).²⁸ The Directive requires Member States that all these forms of waste water can be collected and treated so that the environmental impact remains at a minimum. This is even more so if waste water is discharged in designated sensitive areas.²⁹ Sensitive areas must be reviewed at minimum once every four years.³⁰

Member States are required to determine competent authorities and these authorities shall monitor discharges from urban waste water treatment plants and especially the amounts and composition of sludge.³¹ Member States are then required to biannually publish situational reports on the disposal of urban waste water and sludge in their areas. These reports must then be transmitted to the Commission.³² Afterwards, the Commission makes a progress report every two years. It is assisted by a committee, consisting of representatives of the Member States.³³ The Committee offers an opinion which is to be voted on. The Commission will then adopt the measure envisaged and if no opinion is given, the Commission will submit a proposal to the Council who will act by qualified majority.³⁴

3.1.6 Waste Framework Directive (2008/98/EG)

The Waste Framework Directive offers basic definitions and concepts of waste management in order to protect the environment and human health and reducing adverse effects of waste while reducing it as much as possible.³⁵ However, not all forms of waste fall under its scope as more specific regulations apply (i.e. for radioactive waste, waste water, etc.). Following Article 3(1) waste is defined as *'any substance or object which the holder discards or intends or is required to discard'*. Article 4 offers the waste hierarchy which applies as a priority order in waste prevention and management: (a) prevention, (b) preparing for re-use, (c) recycling, (d) other recovery (e.g. energy recovery) and (e) disposal. Member States are

²⁶ Art. 1 Directive 91/271/EEC

²⁷ According to Annex III, these industrial sectors are: 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 gelatin and of glue from hides, skin and bones, malt houses, fish-processing industry.

²⁸ Art. 2, par 1-3 Directive 91/271/EEC

²⁹ Art. 5(2) Directive 91/271/EEC

³⁰ Art. 5(6) Directive 91/271/EEC

³¹ Art. 15(1) Directive 91/271/EEC

³² Art. 16 Directive 91/271/EEC

³³ Art. 18 Directive 91/271/EEC

³⁴ Art. 18(3) Directive 91/271/EEC

³⁵ Art. 1 Directive 2008/98/EG

required to deliver the best overall environmental outcome when applying the waste hierarchy and are required to take the necessary measures to ensure that the waste indeed undergoes recovery operations.³⁶ This must be done while protecting human health and the environment, and in particular without a risk to water, soil, plants and animals, without causing nuisance through noise and odours or while adversely affecting the countryside or places of special interest.³⁷

End-of-waste status means that a specified waste product ceases to be waste when it has undergone a recovery and complies with the following conditions:

- a. the substance or object is commonly used for specific purposes;
- b. a market or demand exists for such a substance or object;
- c. the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- d. the use of the substance or object will not lead to overall adverse environmental or human health impacts.

Lastly, the directive requires Member States to establish a permit system when undertakings intend to carry out waste treatment activities. The permit must include the types and quantities of waste that may be treated, technical and other requirements for each type of operation permitted, safety and precautionary measures that must be taken into account, the method to be used for each operation, monitoring and control operations as may be necessary, closure and after-care operations if applicable.³⁸

3.7 Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (REACH Regulation (1907/2006/EC))

The Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (REACH Regulation) was adopted in order to improve the protection of human health and the environment from the risks imposed by chemicals while enhancing the competitiveness of the EU chemicals industry. Additionally, it aims to promote alternative methods of assessment of hazardous substances while maintaining their free circulation on the internal market.³⁹ The regulation applies to all forms of chemicals reaching from chemicals used in industrial processes to daily-used chemicals such as cleaning supplies, paints, etc. The REACH regulation requires that companies register the chemicals they use, either as manufacturer, importer or downstream user, if they use at least one tonne of the chemical per year.⁴⁰

The registration must be sent to the European Chemicals Agency (ECHA). The registration includes a chemical safety report as well as a technical dossier containing the identity of the manufacturers, the relevant use of the chemical, guidance on safe use, labelling requirements and study summaries as follow from the Annexes to the regulation.⁴¹

The ECHA then individually evaluates registrations for compliance⁴² and EU Member States evaluate selected substances if they consider a chemical to be hazardous for the environment or human health. ECHA's Committees for Risk Assessment and Socio-economic Analysis can then assess if these risks can be managed. If the chemical is considered to be an unmanageable risk for either the environment or public

³⁶ Art. 10 Directive 2008/98/EC

³⁷ Art. 10, 12 and 13 Directive 2008/98/EC

³⁸ Art. 23 Directive 2008/98/EC

³⁹ Art. 1(1) Regulation 1907/2006

⁴⁰ Art. 6 and 7 Regulation 1907/2006

⁴¹ Art. 10 Regulation 1907/2006

⁴² Art. 40 Regulation 1907/2006

health, the ECHA is required to make up a report to prove this. Likewise, national agencies from the Member States may also wish to restrict the chemical.⁴³ The Committees are to give their opinion within ten months, starting from the date of the application.⁴⁴ This opinion is then sent to the applicant for their comment. If the applicant does not wish to comment, the Agency sends the opinions to the Commission, the Member States and the applicant.⁴⁵ If the applicant does wish to comment, he must do so within two months. Afterwards, the Commission prepares a draft authorisation decision within three months after receiving the opinion of the ECHA. Summaries of the decisions are published in the Official Journal of the EU and a database will be kept by the ECHA.⁴⁶ If a chemical is deemed safe, Member States are prohibited from restricting or impeding the manufacturing to import and market the chemical.⁴⁷

3.8 Fertilisers Regulation (2003/2003/EC, incl. amendments 219/2009/EC, 463/2013/EC and 157/2016/EC) and the revised Regulation 2019/1009

The Fertilisers Regulation aims to ensure the quality and safety of fertilisers that are brought on the EU market. Only if fertilisers comply with the requirements laid down in the regulation, may they be designated as 'EC fertiliser', offering them with free circulation throughout the internal market.⁴⁸ Additional to the more technical standards that follow from the annexes, the regulation requires that EC fertilisers have identification markings and labels to ensure traceability.⁴⁹ Additionally, a number of specific requirements are discussed in the regulation dependent on the fertiliser type: inorganic primary nutrient fertilisers (chapter 1), inorganic secondary nutrient fertilisers (chapter 2) and inorganic micro-nutrient fertilisers (chapter 3). Despite the framework that the Fertilisers Regulation has created to harmonise the fertilisers industry throughout the EU, important gaps remain. For instance, nearly half of the fertilisers on the EU market did not fall under the legislation as they originated from organic waste streams or a combination of organic and inorganic materials which was not covered by the Regulation. Furthermore, environmental and material safety concerns in inorganic fertilisers (such as cadmium) were not fully taken into account, and may pose a risk for environmental safety and human- and animal health.⁵⁰

To address these concerns, the Council and the Parliament adopted a revised Fertilisers Regulation (Regulation 2019/1009), which will come into force on 16 July 2022.⁵¹ The new Regulation will only cover fertilisers that are marketed as EC fertilisers, and not purely nationally marketed fertilisers.⁵² The new Regulation opens up the Internal Market for bio-based fertilisers, boosting the circular economy, and, under circumstances, also offer it end-of-waste status, as following from Directive 2008/98/EC.⁵³ While Regulation 2003/2003 only allowed Member States to impose penalties⁵⁴, Regulation 2019/1009 requires Member States to impose them, which shall be effective, proportionate, and dissuasive.⁵⁵

⁴³ Art. 69(4) Regulation 1907/2006

⁴⁴ Art. 64(1) Regulation 1907/2006

⁴⁵ Art. 64(5) Regulation 1907/2006

⁴⁶ Art. 64(9) Regulation 1907/2006

⁴⁷ Art. 128(1) Regulation 1907/2006

⁴⁸ Art. 3 and 5 Regulation 2003/2003

⁴⁹ Art. 7-9 Regulation 2003/2003

⁵⁰ Consideration 10, Regulation 2019/1009

⁵¹ Art. 50 Regulation 2019/1009

⁵² Consideration 5

⁵³ Consideration 1 Regulation 2019/1009 & Article 19 Regulation 2019/1009

⁵⁴ Consideration 18 Regulation 2003/2003

⁵⁵ Art. 48 Regulation 2019/1009

4. Dutch Legal Framework

4.1 Environmental Management Act (Wet Milieubeheer)

The Environmental Management Act is the main overarching legal instrument for environmental law in the Netherlands and regulates a large number of different terrains. The act is a framework law and therefore in broad lines states what legal instruments are applicable and which principles apply to them. Further elaboration is offered in underlying council orders (Algemene Maatregelen van Bestuur), ministerial regulations and many other acts that focus on a specific part of environmental protection (e.g. the Nature Protection Act which implements EU species protection and Natura 2000 legislation). The act is broad in its scope and contains the powers of national (advisory) bodies, plans, environmental quality requirements, the environmental impact assessment, coordination, enforcement, measuring, etc. Additionally, more substantive issues are discussed such as sound, air pollution, emission trading and, of particular relevance for this research: waste. The act implements the waste directive⁵⁶ in chapter 10.⁵⁷ It is prohibited for anyone *'who performs or fails to perform actions with regard to waste and who knows or could reasonably have known that adverse consequences for the environment arise or could arise as a result, is obliged to take or refrain from taking all measures that can reasonably be required of him, in order to prevent or limit those consequences as much as possible.'* This broad duty of care assures that the environment must be taken into consideration in all instances.^{58,59} Waste water also falls under the waste definition, as was confirmed by the Council of State, the highest administrative court in the Netherlands.⁶⁰

4.2 Water Act (Water Wet)

The Water Act, together with the underlying Water Decree (Water Besluit) and Water Regulation (Waterregeling), regulate water management systems including water defences, surface water and groundwater bodies. Additionally, the act explains the tasks and organisation of the water authorities. The act is based on three distinct yet complementary goals: preventing or limiting of floods (quantity), water scarcity (quantity) and improving the quality of the water system for fulfilling all societal functions (quality).⁶¹ The Water Act imposes a duty of care on both Water authorities and local municipalities. Water Authorities are required to purify municipal waste water⁶² whereas municipalities are required to collect all forms of water (i.e. waste water and rainfall).⁶³ To fulfil this duty of care, municipalities are required to draft a municipal sewage plan.⁶⁴ Although drafted on the municipal level, a number of parties have to be involved in its drafting such as the Water Authorities, sewage authorities and the province.⁶⁵ The plan contains an overview of the sewage facilities for: the collection of urban waste water, collection and treatment of run-off rainwater, measures aimed at preventing or mitigating adverse effects of groundwater levels, overview of replacements and construction during the planning period, the way facilities are managed and the consequences for the environment by present and planned facilities, an initial overview of the financial consequences of the activities and an evaluation of the former plan.⁶⁶

⁵⁶ Directive 2008/98/EC

⁵⁷ <www.afvalcirculair.nl>, search for *'wet milieubeheer, afvalstoffen'*, last checked on 14-03-2019

⁵⁸ Art. 10.1 Wet Milieubeheer

⁵⁹ See in this regard also the National Waste Management Plan as discussed before.

⁶⁰ ECLI:NL:RVS:2009:BJ6670, 02-09-2009

⁶¹ Art. 2.1 Water Act

⁶² Art. 3.4 Water Act

⁶³ Art. 3.5 Water Act

⁶⁴ Art. 4.22 Wet Milieubeheer

⁶⁵ Art. 4.23 Wet Milieubeheer

⁶⁶ <www.infomil.nl>, search for *'Gemeentelijk Rioleringsplan'*, last checked on 04-03-2019

4.3 Fertilisers Act

Dutch manure policy is based on the Nitrate Directive and the Water Directive. These have been implemented in a several national acts being: the Meststoffenwet (Fertilisers Act), Wet Bodembescherming (Soil Protection Act) and the Wet Herstructurering Varkenshouderij (Restructuring of Pig Farming Act). The aim of the Fertilisers Act was to guarantee fairness in the trade of fertilisers in order to protect the user against inadequate fertilisers. The law is broad in scope and classifies it according to different types of fertilisers such as animal fertilisers, sewage sludge, compost, other organic fertilisers and inorganic fertilisers (artificial fertilisers). The basic principle of Dutch fertiliser policy is that foreign fertilisers may not be transported or sold in the Netherlands unless they are included in the Fertilisers Act (and indirectly the Nitrate Directive).⁶⁷ The regulation mainly concerns the composition and description of the fertilisers, type designation, identification, packaging, traceability and labelling of the fertilisers.⁶⁸ In addition, the methods of treatment, quantity of animal fertilisers and the quantity and composition of end products of treatment must be taken into account. These requirements are set out in more detail in the Uitvoeringsbesluit Meststoffenwet (Fertiliser Act Implementation Decree). However, the Dutch state received derogation from certain aspects of this directive, allowing the agricultural sector to spread more manure than is permitted under the standard rules. This decision was given by the Nitrate Committee to the European Commission.⁶⁹

4.4 National Waste Management Plan (Landelijk Afvalbeheerplan (LAP))

The National Waste Management Plan (LAP), based on the National Environmental Policy Plan and the Waste Directive⁷⁰, offers the policy framework for waste in the Dutch circular economy and is based on several ambitious goals. Firstly, the maximum amount of waste supply may not be higher than 74Mton. Secondly, at least 95% of waste must have a useful application by 2021. For household waste, the ambition is raised to 99%. Additionally, sub goals include better usage of residual heat from waste combustion and the realization of a level playing field for European waste management.⁷¹ All levels of government, (national, provincial and local) are required to take the LAP into account when carrying out or making decisions that revolve around waste, offering a uniform and consistent waste management policy.⁷² Because of this, the LAP can above all be considered as the overreaching policy framework consisting of numerous topics revolving around waste such as collection, recycling, burning, disposal, transport, circular economy and matters to take into account when allocating permits, monitoring and supervision, determining if something must be considered as waste or not.

The LAP is drafted by the Minister of Infrastructure and Water Management (Minister van Infrastructuur en Rijkswaterstaat) and drafted every six years, making that LAP3 is now in force and will remain so until revision in 2021.⁷³ In the LAP, the waste hierarchy must be respected.⁷⁴ Derogation of the LAP is however permissible where necessary if this is justified in relation to the entire life cycle of the waste.⁷⁵ Due to this high standard of reasoning, the LAP aims to assure uniformity while still providing some necessary flexibility.⁷⁶ Next to national approval from the Dutch Parliament (Tweede Kamer) and the Senate (Eerste

⁶⁷ Art. 4 Meststoffenwet

⁶⁸ Stb. 2007, 251 (Uitvoeringsbesluit Meststoffenwet)

⁶⁹ <www.rijksoverheid.nl>, 'Europese Commissie positief over derogatie voor Nederland' last checked on 20-03-2019

⁷⁰ Art. 10.6 Wet Milieubeheer & Directive 2008/98/EC

⁷¹ Landelijk Afvalbeheerplan, p. 9

⁷² Consultatie Landelijk Afvalbeheerplan, p. 4

⁷³ Art. 10.3 Wet Milieubeheer & Landelijk Afvalbeheerplan p. 7

⁷⁴ Prevention, preparation for reuse, recycling, other useful applications such as energy generation, safe disposal.

⁷⁵ Art. 10.5 sub a Wet Milieubeheer

⁷⁶ Consultatie Landelijk Afvalbeheerplan, p. 5

Kamer), citizens are invited to give their opinion before the plan is adopted.⁷⁷ Currently, 85 sectoral plans exist which consist of further policy considerations regarding the higher usage of waste in specific sectors.⁷⁸ If a sectoral plan is present, it will be considered the *lex specialis*, and will therefore have priority over the LAP.⁷⁹

4.5 End-of-waste criteria

The existing waste regulations have a number of conditions (including the EoW criteria) that can have a limiting effect on the recovery and delivery to third parties. In practice, it is not always clear to water managers whether and when these valuable substances lose their waste status. This creates uncertainty for water authorities as to whether or not they can use these materials for the production of raw materials or fertilisers. Pursuant to the Environmental Management Act, urban waste water falls under the concept of waste materials. The Dutch legislator has indicated that although the European framework directive on waste materials does not formally refer to waste water, waste water materials do fall within the definition of waste materials. Urban waste water must therefore be defined as waste. The Waste Framework Directive provides a basis for the European Commission to draw up criteria on the basis of certain conditions to determine when a specific waste that has undergone recovery treatment no longer has the status of a waste (European end-of-waste phase criteria).

No European end-of-waste phase criteria are laid down for urban waste water or substances recovered from it. In this case, Member States may decide on a case-by-case basis whether a certain substance no longer constitutes waste. Under Article 1(1)(6) of the Environmental Management Act, the Minister of Infrastructure and the Environment may decide to do so if the waste has undergone recovery treatment and therefore meets specific criteria laid down by the Minister on the basis of the Waste Framework Directive (national end-of-waste criteria). For substances recovered from urban waste water, no national end-of-waste phase criteria have yet been established. Until these are formally adopted, the Minister will not be able to decide on the final waste phase of a raw material recovered from urban waste water. This means that the water authority must first substantiate its assessment of the end-of-waste phase for each recovered substance on the basis of all the concrete circumstances listed in the questionnaire from the 'Waste or Raw Materials' web test conducted by Rijkswaterstaat Leefomgeving, Ministry of Infrastructure and the Environment.

The Legal Guide recommends that the water authority should have the outcome tested by the Waste Management Helpdesk of Rijkswaterstaat. The Helpdesk sends the request to the Waste Knowledge Platform. In this platform experts from the provinces, its Inspection Authority (Inspectie Leefomgeving en Transport), Rijkswaterstaat and the Ministry of Infrastructure and the Environment test whether the assessment of the status of the material is correct. The assessment and its results are made known to all authorities involved. In the event of a positive legal opinion by the Waste Helpdesk, the water authority may request the Minister of Infrastructure and the Environment to take a decision on the basis of Article 1.1, paragraph 6 of the Environmental Management Act (decree on the end of the waste phase), submitting the supporting study, including advice. For the water authority, such a decision clearly states that the substance concerned can be supplied to third parties without any additional permit, notification

⁷⁷ Art. 10.9 Wet Milieubeheer

⁷⁸ Of these 85 as listed in annex E, only several may be relevant for biobased products from waste water: (16) water treatment sludge, (17) residuals from the preparation of drinking water, (22) residues from sludge combustion, (58) oil/water mixtures, oil/water/sludge mixtures and oily sludges, (73) highly polluted waste water streams and baths, (75) metal-containing waste water with organic contaminants, (76) other acids, other bases and other metal-containing waste water, and (77) aqueous waste with specific contaminants

⁷⁹ Consultatie Landelijk Afvalbeheerplan, p. 9

and registration obligations under the Waste Management Acts. A similar result can be achieved by asking the competent provincial authority to take a decision on the end of waste phase within the framework of the permit in the context of the amendment of the single permit.⁸⁰

4.6 Green Deal Raw Materials - Union of Water Authorities (Green Deal Grondstoffen Unie van Waterschappen, C-174)

Green deals are soft law agreements made between the central government and companies, other governmental agencies and/or NGO's. In these deals, the central government facilitates plans to alleviate hurdles that restrict sustainability goals. Green deals are used for a number of purposes such as renewable energy, climate, water, natural resources, biodiversity, mobility, construction, food production and the Biobased economy. The government helps actively searching where legislation can be amended, as a networker to bring parties together and to aid companies to tap into new domestic and foreign markets.⁸¹

The Green Deal Raw Materials is made between the central government and the overarching Union of Water authorities in which all local water authorities are represented. The deal attempts to strengthen the economy while simultaneously decreasing the dependence on fossil energy and scarce natural resources.⁸² It does so by promoting and increasing the amount of resources from sewage water, particularly phosphate, cellulose, bioplastics, alginate and CO₂⁸³. In the deal, the Union of the Water Authorities encourages local water authorities to draft plans for demonstrative pilots, coordination between the water authorities, signalling of regulatory hurdles, and assisting companies within the water sector.⁸⁴ The central government on the other hand will facilitate by means of addressing these regulatory hurdles where this is desirable, facilitating technical, legal, financial, communicative and organisational advice, and actively helping water authorities to find funding for their projects.^{85,86}

4.7 National Environmental Policy Plan (Nationaal Milieubeleidsplan)

The National Environmental Policy Plan is a temporary policy plan which remains in force until 2030. After that, a new policy plan will be drafted. It focuses primarily on several persistent bottlenecks. The current plan as conducted on 13 June 2001, was created by the Dutch Council of Ministers and has as its focus to put an end to passing environmental burdens on future generations and developing countries. The plan focuses on overreaching topics, all of which in the next thirty years ask for considerable changes. The topics discussed in the plan are: loss of biodiversity, climate change, over-exploitation of natural resources, threats to health, threats to external security, damage to the living environment and potentially uncontrollable risks. The objectives have been formulated in terms of quality of life rather than economic development.

4.8 Energy from Biomass

Art. 1.1 section 1 of the Environmental Decree (Besluit Omgevingsrecht (BOR)) provides a broad definition of the term biomass: *'All products consisting of agricultural or forestry plant material that can be used as fuel to exploit its energy content. These are vegetable waste from agriculture or forestry, vegetable waste from the food industry if the heat generated is recovered, fibrous vegetable waste from virgin pulp*

⁸⁰ RIVM, 'Hergebruik van Grondstoffen uit Afvalwater', Rapport 2015-0206, p. 20-21

⁸¹ <www.rijksoverheid.nl>, search for 'Green Deal aanpak', last checked on 04-03-2019

⁸² Green Deal Grondstoffen Unie van Waterschappen-Rijk, p. 1

⁸³ Green Deal Grondstoffen Unie van Waterschappen-Rijk, art. 1

⁸⁴ Green Deal Grondstoffen Unie van Waterschappen-Rijk, art. 4

⁸⁵ Green Deal Grondstoffen Unie van Waterschappen-Rijk, art. 7

⁸⁶ Projects for which the green deals have been used can be found via:

<https://www.greendeals.nl/sites/default/files/downloads/GD195-Bijlage-1-exemplarische-projecten.pdf>

production and paper production from pulp if it is co-incinerated at the place of production and the heat generated is recovered, cork waste and wood waste with the exception of wood waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coating'. The diversity of biomass makes that biomass can be used for heat, electricity, biodiesel and gas. Currently, biomass is responsible for 68% of the renewable energy generated in the Netherlands.⁸⁷ Converting biomass into energy often requires a technical or chemical process, depending on the type of biomass, the quality of the biomass and the application. The two most relevant forms of energy generation will be discussed: combustion and fermentation. Which permits are required depends highly on the (capacity of the) production installation, the biomass to be used and what happens to the residual product.⁸⁸

4.8.1 Combustion

A permit is required to operate a combustion plant with a capacity exceeding 15 MW.⁸⁹ The Activities Decree stipulates ex art. 3.7 section 6 that if there is a permit obligation based on the BOR, par. 3.2.1. of the Activities Decree Environmental Management no longer applies, which means that the emission requirements do not have to be included in the permit. The burning of fuels other than natural gas, propane, butane, liquid fuel to biodiesel, biogas or biomass consisting of wood pellets in accordance with NEN-EN 14214 leads to a permit requirement. For installations with a capacity exceeding 50 MW, a permit is always required regardless of the fuel.⁹⁰ When granting a permit, the competent authority will consider, inter alia, the best available techniques, target requirements, technical measures and other measures depending on the specific installation and its geographical location.⁹¹ Art. 5.13b specifies the grounds when the single permit must or may be refused. For example, the permit must be refused if an environmental impact report has to be drawn up, if the limit values for noise, odour, particulate matter, sulphur dioxide, nitrogen oxide, lead, benzene, arsenic, cadmium, nickel, benzopyrene, have been exceeded.⁹² In addition, the single permit should be refused if the activity results in an unacceptable risk to the living environment, taking into account at least the location of the risk contour, influence of risky activities in the vicinity of the installation and the likelihood of consequences of incidents at the installation and their possible consequences for the environment.⁹³ Finally, it is possible for the competent authority to refuse the permit in the interest of the efficient management of waste or because of integrity assessments.⁹⁴

4.8.2 Fermentation

During fermentation, biomass is anaerobically fermented so that micro-organisms are broken down, creating a biogas consisting of methane and carbon dioxide. Legally, a distinction can be made between mono-digestion and co-digestion. Mono-fermentation is defined as the fermentation of only one type of product, which often occurs when only one biomass flow is available (e.g. manure or residual flows from the potato processing industry). Co-digestion combines products. In the agricultural sector, for example,

⁸⁷ Central Bureau of Statistics, *'Hernieuwbare Energie in Nederland 2015'*, The Hague 2015, p. 3

⁸⁸ D. Tempelman, *'Groen (als) Gas: Een analyse van de groen-gasketen'*, Nederlands Tijdschrift voor Energierecht 2012, nr. 3, p. 126

⁸⁹ Categorie 1.4 Besluit Omgevingsrecht

⁹⁰ Art. 1.3 Besluit Omgevingsrecht

⁹¹ Art. 5.4- t.13a Besluit Omgevingsrecht

⁹² Art. 5.13b jo. Bijlage 2 Wet Milieubeheer

⁹³ Art. 5.13b lid 11 Besluit Omgevingsrecht

⁹⁴ Art. 5.13b lid 4 Besluit Omgevingsrecht

a combination of animal fertilisers and agricultural residues could be considered.⁹⁵ When biomass is extracted from sewage installations, it is assumed that co-fermentation will play a more important role than mono-fermentation, since several products will come together.

An environmental permit must be applied for a fermentation installation if it concerns the fermentation of exclusively animal manure with a processing capacity of at least 25,000 m³ per year.⁹⁶ The Activities Decree requires that an installation for the fermentation of animal fertilisers be sealed off gas and provided with an overpressure protection system and an electronic monitoring system. If an incident occurs during the storage, transport or processing of the gas, the installation holder must take action within one hour. The competent authority may require the gas to be incinerated if the installation holder has taken too few measures and in order to prevent the emission of the fermentation gas.⁹⁷ In addition, the installation keeper is obliged to analyse samples monthly and store them for a period of at least five years.⁹⁸

⁹⁵ A distinction can be made between psychrophilic fermentation (0-20 °C), mesophilic fermentation (20-45 °C) and thermophilic fermentation (45-75 °C). However, this distinction is not made by the Dutch legislator, which means that it will not be discussed. For the record, mesophilic fermentation is the main method used in the Netherlands. <www.infomil.nl>, search for '*het vergistingsproces*', last checked on 20-03-2019

⁹⁶ Art. 2.1. lid 1 sub a jo. Sub 1 Wabo jo. art. 2.2.a lid 8 Besluit Omgevingsrecht jo. Art. 3.129c lid 1 Activiteitenbesluit Milieubeheer

⁹⁷ Art. 3.129d Activiteitenbesluit Milieubeheer

⁹⁸ Art. 3.129e Activiteitenbesluit Milieubeheer

5 British legal framework

5.1 Waste strategy

In December 2018 the UK government published its Resources and Waste Strategy. This outlines its policy direction on minimising waste, promoting resource efficiency and moving towards a circular economy which reflects the government's 25 Year Environment Plan. This plan, amongst other things, aims to reduce waste by promoting reuse, remanufacturing and recycling.⁹⁹

5.2 Environmental Protection Act 1990 ("EPA 1990")

Section 34 of the EPA 1990 imposes a duty of care on anyone handling controlled waste (i.e. producers, carriers, importers, dealers, brokers and those sorting and treating waste). The duty includes, amongst other things, taking such care to apply the waste hierarchy¹⁰⁰ (i.e. prevention, preparing for re-use, recycling, other recovery, disposal), preventing unauthorised/harmful deposit, treatment and disposal of waste, preventing a breach by any other person to meet the requirement for an environmental permit or breach of a permit condition (see below) and ensuring that persons to whom waste is transferred are authorised and that the waste is accompanied by a written description to allow the transferee to deal with it properly. This ensures there is a clear audit trail from production to disposal (including recovery) of the waste. Therefore, until such point that the material extracted from the waste water attains EoW status, those handling the material would be required to comply with the waste duty of care.

The Waste Framework Directive defines waste as *"any substance or object which the holder discards or intends or is required to discard"*. Discarded has a special meaning under the WFD and includes the disposal and recovery or recycling of an object or substance. "Recovery" is defined in the WFD as *"any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy."* "Recycling" is defined in the WFD as *"any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or backfilling operations."*

A material that is waste retains waste status until EoW requirements are met. EoW status can be achieved by complying with specific EoW criteria established by the European Commission or evidencing that the general requirements to demonstrate EoW have been met. Currently, specific EoW criteria only exist for iron, steel, aluminium scrap, glass cullet and copper scrap. Where no specific criteria has been set, an assessment based on case law on EoW is necessary. The Environment Agency states that the test in the case of *OSS*¹⁰¹ generally represents all case law requirements for the EoW test. This case provides that the below is what is required for a material to have met EoW requirements meaning it is a product and therefore no longer regulated as waste: (1) the waste has been converted into a distinct and marketable product (i.e. the waste is a completely new product, different to the original waste and there is a market for the material so it will definitely be used); (2) the processed substance can be used in exactly the same way as a non-waste, and (3) the processed substance can be stored and used with no worse environmental effects when compared to the material it is intended to replace.

⁹⁹ Department of State for Environment, Food and Rural Affairs (DEFRA), *'Our waste, our resources: A strategy for England'*, London: 2018

¹⁰⁰ Regulation 12 of the Waste Regulations 2011 sets out the waste hierarchy.

¹⁰¹ *R(OSS Group Limited) v Environment Agency and Others and DEFRA* [2007]

In England, the Environment Agency also operates a service where you can ask the EA for an opinion on the waste status of a material. This is accessed using the online IsItWaste¹⁰² tool. Note that there is a charge for this service¹⁰³. The EA has also established several waste quality protocols¹⁰⁴ whereby if the waste meets the requirements of a protocol, the EA will not treat it as waste.

Until any material extracted from the waste water achieves EoW status, the material will be regulated as waste meaning it will be subject to the various legal requirements considered below. Note that additional legislation would also need to be considered if the waste product was used to produce renewable energy, including consideration of permitting requirements and financial incentives etc. If the material does not meet EoW status, a permit may be required to store, recover and/or dispose of the waste material unless a waste exemption applies and is registered or the particular waste operation is excluded from regulation under the EPR 2016. This means that unless the material extracted from the waste water achieves EoW status, a customer for example, receiving the material may require a permit to receive and store it. Exemptions/exclusions vary depending on the type and quantity of material and the way in which it is being used.

If the material does not meet EoW status, a permit may be required to store, recover and/or dispose of the waste material unless a waste exemption applies and is registered or the particular waste operation is excluded from regulation under the Environmental Permitted Regulations 2016 (only applicable for England and Wales). This means that unless the material extracted from the waste water achieves EoW status, a customer for example, receiving the material may require a permit to receive and store it. Exemptions/exclusions vary depending on the type and quantity of material and the way in which it is being used.

5.3 Water Resources Act 1991

The Water Resources Act aimed to consolidate pieces of already existing legislation in the field of UK water law: these being: the Water Industry Act 1991, Land Drainage Act 1991, Statutory Water Act 1991 and the Water Act 1991 into one all-encompassing Act. While part I is comprised of the roles of the different institutions related to water management, part II discusses the institution's powers and the procedure of legal security. Part III discusses pollution offences. Failure to comply or to obtain a permit when one is needed, may result in legal actions, conducted by the Environment Agency. The Environmental Agency could issue a warning, formal caution or prosecute. If prosecuted, a potentially unlimited fine may be imposed. Failure to obtain a permit where required and/or breach of a permit condition could also lead to the Environmental Agency issuing a warning, formal caution or prosecution. Additionally, the EA is also able to accept an Enforcement Undertaking. This is a voluntary offer by an offender in lieu of prosecution to put right the effects of their offending and its impact on third parties. The penalty for operating without the relevant permit or in breach of a permit condition, if heard in the Magistrates' Court, is a potentially unlimited fine and/or up to 12 months imprisonment or, if heard in the Crown Court, a potentially unlimited fine and/or up to 5 years imprisonment. Fines are calculated in accordance with the Sentencing

¹⁰² IsItWaste tool: <https://www.gov.uk/government/publications/isitwaste-tool-for-advice-on-the-by-products-and-end-of-waste-tests/isitwaste-tool-user-guide>

¹⁰³ IsItWaste charges: initial charge of £750 (ex VAT). Once paid, the EA will consider if all the correct information has been supplied to make an assessment. The EA will thereafter provide a cost estimate for a full technical and legal assessment based on a rate of £125 per hour (ex VAT). <https://www.gov.uk/guidance/turn-your-waste-into-a-new-non-waste-product-or-material>

¹⁰⁴ Quality Protocols: converting waste into non-waste products: <https://www.gov.uk/government/collections/quality-protocols-end-of-waste-frameworks-for-waste-derived-products>

Council's Environment Offences¹⁰⁵: Definitive Guideline which takes into account the level of culpability, harm and turnover of the defendant. Part IV of the Act discusses floodings, part V fisheries, part VI financial provisions in relation to the appropriate agency, part VII land and works powers and part VIII discusses informational provisions.

¹⁰⁵ Environmental Offences: Definitive Guideline: <https://www.sentencingcouncil.org.uk/wp-content/uploads/Environmental-offences-definitive-guideline-Web.pdf>

6 German legal framework

6.1 General aspects

A comprehensive legal framework on raw materials from sewage water does not exist within German legislation. However, the recovery of raw materials from sewage water has several intersections with German laws. These laws and their relation to raw materials from waste water are listed in the following sections. First, an outlook on requirements for production processes within German water law is given. Second, an overview on existing legislation for utilisation of sewage sludge as fertilizer is given. Third, the context of the preference of recycling over energetic usage of raw materials from sewage water is described within the federal law on circular economy. Information on policy to regain raw materials from sewage could not be identified during this literature research.

6.2 Water Resources Act (Wasserhaushaltsgesetz (WHG))

The Wasserhaushaltsgesetz (WHG) is the German implementation of the European Water Framework Directive 2000/60/EC and the fundament of the German federal water law.¹⁰⁶ It came into effect in July 2009 and as a federal law it is operative within the whole Republic of Germany. State laws are subordinated. It states that a sustainable management of the waterbodies has to be operated to protect the waterbodies being livelihood of humanity, habitat for animals and plants and usable property. A good ecological, chemical and quantitative state of water bodies has to be achieved or preserved. Incorporated waterbodies are surface water, coastal water and ground water. Although the use of waterbodies is generally not allowed (§8) the permission can be granted (§10 and the following). Several common utilisations are listed (§9), for example introduction or leading-in of substances.

6.3 Waste Water Decree Abwasserverordnung (AbwV) and the Waste Water Levy Act Abwasserabgabengesetz (AbwAG)

Introduction of sewage water into waterbodies is an often granted permission, so there are directives generally regulating it. One of these, is the Abwasserverordnung which is the German implementation of the European Directive Concerning Urban Waste Management 91/271/EEC.¹⁰⁷ Threshold values for emissions of harmful substances and minimum standards of water quality before the water can be reintroduced to the water bodies are regulated. Another directive is the Abwasserabgabengesetz which regulates the coasts of leading-in.¹⁰⁸ Once the utilisation of waterbodies is permitted, protection and utilisation are not ranked. When raw materials are regained from sewage, their production processes need to be consistent with these laws.

¹⁰⁶ Wasserhaushaltsgesetz, WHG, Gesetz zur Ordnung des Wasserhaushalts, 31. Juli 2009, zuletzt geändert 04. Dezember 2018

¹⁰⁷ Abwasserverordnung, AbwV, Verordnung über Anforderungen an das Einleiten von Abwasser in Gewässer, 21. März 1997, Fassung vom 17. Juni 2004, zuletzt geändert 06. März 2020

¹⁰⁸ Abwasserabgabengesetz, AbwAG, Gesetz über Abgaben für das Einleiten von Abwasser in Gewässer, 13. September 1976, Fassung vom 18. Januar 2005, zuletzt geändert 22. August 2018

6.4 Sewage Sludge Ordinance (Klärschlammverordnung (AbfKlärV) and the Fertilizer Ordinance (Düngemittelverordnung (DüMV))

The German Klärschlammverordnung is the German implementation of the European Sludge Directive 86/278/EEC.¹⁰⁹ It regulates the utilisation of sewage sludge, mainly in agriculture but also in landscape architecture. Corresponding to the legal text disperse of sewage sludge must not have harmful impact on soils, vegetation, humans and animals but simultaneously the usage of sludge shall be supported. Currently (2018) about 23 % of the sewage sludge from municipal STP is used as fertilizer in agriculture (16 %) and landscape architecture (7 %) (1). Less than 2 % are unspecified declared as material utilisation. Most of the sewage sludge (74 %) are burned (thermic disposal). The percentage of direct disperses as fertilizer is to be reduced stepwise to meet concerns regarding the containing contaminants. But since phosphorus is a critical raw material legal steps have been taken for a resource recovery of phosphorus from sewage sludge and sewage sludge ashes. Operators of sewage treatment plants need to recover phosphorus from sludge with phosphorus contents of at least 20g phosphorus per kg dry mass until 2029 the latest.¹¹⁰ For STPs with less than 100.000 population equivalents (PE) the deadline is 2032. STPs with less than 50,000 PE are excluded from the decree. Alternative to the recovery of phosphorus from sewage sludge the recovery from ashes is permitted. A product from sewage water, which is already on the market, is magnesium-ammonium-phosphate (MAP) fertilizer, like the fertilizer Berliner Pflanze (Berliner Wasserbetriebe, 2019). This product needs to meet the product requirements which are determined in the Düngemittelverordnung, which is the German implementation of the European Fertilizer Regulation 2003/2003/EC.¹¹¹ Recycling of other substances from sewage water than phosphorus is not yet included in German legislation. If the product is not listed in the Fertiliser Ordinance, an informal application for approval must be submitted to the Federal Ministry of Food and Agriculture.

6.5 Recycling Management Act (Kreislaufwirtschaftsgesetz (KrWG))

Pursuant to the Abfallverzeichnis-Verordnung which is the German implementation of the Commission Decision on Hazardous Waste 2000/532/EC sewage sludge is considered as waste. Therefore the Kreislaufwirtschaftsgesetz is applied.¹¹² It is the German implementation of the European waste Framework Directive 2008/98/EG and it is aimed at the facilitation of the recycling economy to protect natural resources. The top priority is the annihilation of hazardous substances. But as long as this is warranted the dispose of waste has to follow the waste hierarchy, where a recycling is preferred in contrast to an energetic recovery. The production of the carbon based products cellulose, lipids and PHA is a recycling of the inherited carbon within the sewage water.

End of waste status is achieved when a process has passed that grants the following material criteria (§5):

- The application aims at particular purpose
- There is a market or demand
- Technical and legal requirements are complied with and
- The application is innocuous

¹⁰⁹ Klärschlammverordnung, AbfKlärV, Verordnung über die Verwertung von Klärschlamm, Klärschlammgemisch und Klärschlammkompost, 27. September 2017, zuletzt geändert 27. September 2017

¹¹⁰ Statistisches Bundesamt, destatis, Klärschlamm Entsorgung nach Bundesländern

¹¹¹ Düngemittelverordnung, DüMV, Verordnung über das Inverkehrbringen von Düngemitteln, Bodenhilfsstoffen, Kultursubstraten und Pflanzenhilfsmitteln, 05. Dezember 2012, zuletzt geändert 02. Oktober 2019

¹¹² Kreislaufwirtschaftsgesetz, KrWG, Gesetz zur Förderung der Kreislaufwirtschaft und Sicherung der umweltverträglichen Bewirtschaftung von Abfällen, 24. Februar 2012, zuletzt geändert 20. Juli 2017

In summary it can be said that the direct application of sewage sludge as fertilizer is no longer aimed for and sewage sludge shall be thermally treated. The recycling of waste in Germany has clear preference and hence a well-established process of carbon recycling from sewage sludge should be appreciated. However, recycling of carbon and other substances from sewage water, except for phosphorus, currently plays a minor role in Germany.

7 Flemish Legal Framework

In Belgium, environmental legislation is based on the regional level, rather than on a federal level. In practice this leads to differences between Flanders, Wallonia and the Brussels region. Due to these differences, only the region where the WOW! partners are situated is discussed: Flanders.

7.1 Decree on General Environmental Policy (Decreet Algemeen Milieubeleid)

General Flemish environmental policy stems from the Decree on General Environmental Policy. This decree has as its goal the protection and sustainable usage of natural resources and nature, the protection of ecosystems and against pollution and nature conservation as well as maintaining rural diversity and upholding natural habitats and ecosystems.¹¹³ The Decree is of a more general, and procedural nature, while encompassing the environmental principles.¹¹⁴ Specific environmental legislation also exists, based on the relevant sector. Flemish environmental legislation can generally be categorized between environmental hygienic legislation, which aims to protect soil, air, water, to prevent negative consequences for human health, and environmental management legislation which aims to protect the overall environment by assuring that permits are required for certain activities and upholding general environmental standards.¹¹⁵

7.2 Decision establishing the Flemish regulations concerning the sustainable management of material cycles and waste (Vlaams Reglement betreffende het Duurzaam Beheer van Materiaalcringlopen en Afvalstoffen, VLAREMA)

The new Waste Framework Directive was transposed into the Materials Decree of 23 December 2011 and the accompanying implementation decision called VLAREMA (acronym for: Decision of the Flemish Government establishing the Flemish regulations concerning the sustainable management of material cycles and waste). Among other things, the provisions dealing with the end-of-waste phase and by-products were transposed into Flemish legislation. The legislation builds on the experience with the regulations that were previously known in the Flemish Region under the term 'secondary raw materials' and provides a clear framework for defining the waste phase.

The Flemish Region itself has formulated specific criteria to lay the foundation for the end of waste or by-products status. This according to the so-called 'flow-by-flow' approach, whereby Member States draw up specific criteria, of course within the margins of the waste definition and the basic conditions, and notify specific criteria to the European Commission. It may also be that there are no specific criteria available, but that there is nevertheless a question about waste status. In that case, the assessment framework from the Materials Decree applies. Since sewage is a waste material, resources, recovered from sewage, have to follow the criteria for end-of-waste products.

In case of specific EU end-of-waste criteria or by-product criteria, an EU assessment based on environmental safety, environmental hygiene and traceability has already been conducted. In this case VLAREMA foresees that the European criteria and procedures are in force, and not the possible criteria or the requirement for a raw material declaration in the VLAREMA. If additional specific criteria are required at Flemish level, the Minister reserves the right to take additional measures. The establishment or company that meets the European conditions or criteria with regard to raw materials for its material and that wants to put them on the market must make itself known to OVAM, the Flemish governmental agency

¹¹³ Art. 1.2.1 §1 Decreet Algemeen Milieubeleid

¹¹⁴ Art. 1.2.1 §2 Decreet Algemeen Milieubeleid

¹¹⁵ <www.rechtswijzer.be>, search for 'milieurecht', last checked on 24-05-2020.

responsible for waste policy (Openbare Vlaamse AfvalMaatschappij) and be registered in a register. This is a simple one time registration procedure and does not demand a substantive assessment. At the simple request of OVAM or the regulator, the company involved, must be able to demonstrate the compliance with the European requirements.

If no specific European criteria exists, it may also occur that the Flemish government sets up its own criteria. This end-of-waste status will however only apply within Flanders. The Flemish government has set up criteria for (1) Criteria for raw materials intended for the use as fertiliser or soil improver, (2) Criteria for raw materials intended for the use as building material, and (3) Criteria for raw materials intended for the use in artificial sealing layers utilising water glass at category 1 and 2 landfills.

In Appendix 2.2. of VLAREMA, per area of application, the list of waste materials that are eligible for use as raw material is included. It may be demanded that compliance with the criteria be assessed on the basis of a raw material declaration or another control arrangement, such as the inspection certificate for compost or the harmonised regulation for granulates from inert C&D waste. This is not always mandatory, it is indicated in the respective appendixes. Specific for end-of-waste products used as a fertiliser or soil improver, the raw material declaration is a condition to obtain a derogation in order to place the raw material on the market in Belgium. The legal framework is contained in the Royal Decree on Fertilisers. This derogation assesses the agricultural quality of the raw material. More information can be found on the website of the federal government.¹¹⁶

In addition to these three areas of application, we also distinguish two material flows: material from non-ferrous metallurgy, which is used in non-ferrous metallurgy, and materials from ferrous metallurgy. These materials are included in a specific ministerial decree and a raw material declaration is in principle not required for these flows. For the other materials, where no specific criteria are included, a trade-off is made on the basis of the waste definition and the testing framework in the materials decree (article 36 for waste materials, article 37 for by-products). A processor can voluntarily submit a request for a raw material declaration to the OVAM, for example to avoid doubt or discussion in possible future inspections.

7.3 Flemish Regulation regarding the Environmental Permit (Vlaams Reglement betreffende de Milieuvergunning, VLAREM)

VLAREM determines when, where, and for what an environmental permit is required. VLAREM is divided in two regulations. VLAREM I classifies various activities according to their harmfulness and determines which activities require governmental permission and/or a permit. VLAREM II focuses on the more procedural aspects with regard to the permit conditions that need to be adhered to and the environmental standards to which the government must attune its environmental policy.¹¹⁷

¹¹⁶ <https://fytoweb.be/nl/meststoffen>

¹¹⁷ <www.ecopedia.be>, last checked on 24-05-2020.

8 Luxembourgish Legal Framework

8.1 Overview of the main principles of waste management in Luxembourg

- Waste policy is guided by the waste hierarchy with a priority to prevention followed by reuse and recycling, recovery, especially energy and, finally disposal;
- The principle of prevention is to prevent a product from becoming waste and to reduce the harmfulness of waste whose production could not be avoided;
- The main purpose of recycling but also for reuse is to keep materials as long as possible in the economic circuit (biological or technological cycle) and thus to achieve a high level of economic return on natural resources;
- If reintroduction into the material cycle is no longer possible thermal or energy recovery in a facility provided for this purpose must be considered;
- Finally, disposal is reserved only for waste which is no longer suitable for reuse, recycling or energy recovery;
- To achieve the objectives of the waste hierarchy and to ensure transparency of flows, appropriate information on waste management must be provided at all levels;
- When it comes to waste treatment, the notion of quality is essential and quality must be inherently involved in all stages of waste management. Thus, separate collection of waste must aim to ensure high quality recycling;
- Another important principle in the field of the environment in general and in that of waste in particular is the polluter pays principle. This principle aims to make the initial producer or holder of waste bear the costs of waste management;
- With the ecological awareness of our society, waste management must be integrated into a philosophy oriented towards a circular economy focused on limiting the waste of resources and environmental impacts.

8.2 The Law of March 21, 2012 on waste management - Loi modifiée du 21 mars 2012 relative à la gestion des déchets

The Law of March 21, 2012 on waste Management is the main legal instrument for waste management in Luxembourg and regulates its different aspects. This act implements the Waste Framework Directive¹¹⁸ in national legislation and it prescribes the generation of a National Plan for waste and resource Management (Plan national de gestion des déchets et des ressources – PNGDR) every six years.

8.3 The National Plan for waste and resource management 2018

The national plan for waste and resource management 2018 (Plan national de gestion des déchets et des ressources - PNGDR) includes measures and guidelines for the implementation of the amended Law of March 21, 2012 on waste management. Also, the national waste management plan defines quantified targets for future years and aims to promote the circular economy in Luxembourg. It analyses the situation in terms of waste management as well as the measures to be taken to ensure the reuse, recycling, recovery and disposal of waste in the most environmentally friendly conditions while remaining in accordance with the national and international legislative context.

¹¹⁸ Directive 2008/98/EC

The prevention program, also provided for by law, is integrated into the text of the national plan and explicitly targets everything related to the waste prevention aspect. In the waste and resource management plan, nineteen waste streams are analysed in more detail and specific objectives and measures are defined for the different waste streams. Waste from WWTP is one of the waste streams explored in more detail. The following objectives, to be implemented by 2022 were set as follows:

- Orientation of the valorisation of sewage sludge towards sectors other than spreading in agriculture
- Prevention of contamination of sewage sludge
- Recovery of phosphorus

In order to assure these objectives are reached, the following measures added to the national waste plan:

- Prevention at source. In the interest of preventing contamination of sewage sludge with polluting substances, information and awareness-raising for the population, in particular regarding abuse of consumption and elimination through the sewer of medicines and other harmful substances are important actions to pursue. Similarly, institutions are required to control their discharges into the wastewater network.
- Energy recovery from sludge in the clinker production facility in Rumelange.
- Monitor developments in new recovery techniques including phosphorus recovery
- New phosphorus recovery and recovery techniques will be followed in order to study their implementation on a national scale.
- Recovery of sand from WWTP. This sand should be recovered, particularly in the construction sector.

Other resources from wastewater or sewage sludge are not specified in the plan.

8.4 [Regulation on sewage sludge - Règlement grand-ducal du 23 décembre 2014 relatif aux boues d'épuration](#)

The Règlement grand-ducal du 23 décembre 2014 relatif aux boues d'épuration is the implementation of the European Sludge Directive 86/278/EEC. It regulates the utilisation of sewage sludge, mainly in agriculture but also in landscape architecture, for all other recycling operations it refers to the waste legislation. Corresponding to the legal text, disposal of sewage sludge must not have harmful impacts on soils, vegetation, humans and animals but simultaneously the usage of sludge shall be supported. Currently (2017) about 81% of the sewage sludge from municipal WWTP is used as fertilizer in agriculture (21%) and landscape architecture (60%). The remaining quantity of sewage sludge (19%) is incinerated (mostly in the national cement industry). The percentage of direct spreading as fertilizer shall be reduced stepwise to meet concerns regarding the containing contaminants. A nationwide study commissioned by the Ministry of Environment, Climate and sustainable Development is ongoing in order to analyse the future possibilities of sludge recovery for the total amount of sludge has been produced by the Luxemburgish WWTPs.

8.5 [Regulation on the use of nitrogen fertilizers in agriculture \(Règlement grand-ducal modifié du 24 novembre 2000 concernant l'utilisation de fertilisants azotés dans l'agriculture\)](#)

The Luxemburgish Regulation on the use of nitrogen fertilizers in agriculture is part of the transposition of the European Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources. This regulation determines, besides the before mentioned, regulation on sewage sludge, also the use of sewage sludge as a fertilizer for agricultural purposes.

8.6 Water Act (Loi modifiée du 19 décembre 2008 relative à l'eau)

The Luxemburgish Water Act is the Luxemburgish implementation of several European Directives regarding Water management: the European Water Framework Directive 2000/60/EC and the Directive on the assessment and management of flood risks 2007/60/CE. It came into effect in December 2008 and was last modified in May 2018. This Act applies to surface water, groundwater and urban cycle water. The purpose of this Act is to create a framework for the protection and management of the waters referred to in the subsection before in order to: (a) prevent further degradation, preserve and improve the state of water and aquatic ecosystems as well as, with regard to their water needs, terrestrial ecosystems and wetlands which depend on them directly; (b) promote sustainable use of water, based on the long-term protection of available water resources; (c) strengthen protection of the aquatic environment and improve it, in particular by specific measures designed for the progressive reduction of releases, emissions and losses of priority substances, and for the cessation or progressive elimination of releases, emissions and losses of priority hazardous substances; (d) ensure the progressive reduction of pollution of groundwater and prevent the worsening of its pollution; (e) regenerate the surface water regime; (f) manage the risks of flooding and mitigate the effects of floods, low water levels and droughts; (g) adopt the guiding principles governing the supply of water intended for human consumption and industrial use, craft and agricultural, as well as the evacuation and sanitation of built-up areas; (h) develop and implement monitoring and operational programs for the purpose of quantitative and qualitative aspects of surface water and groundwater; (i) contribute to the maintenance of watercourses taking into account the provisions of points a) and e) and achieve the objectives of the applicable international agreements on water management and protection to which the Luxembourg is one of them, including those aimed at preventing and eliminating pollution of the marine environment.

8.7 Regulation on the treatment of urban waste water - Règlement grand-ducal modifié du 13 mai 1994 relatif au traitement des eaux urbaines résiduaires

The Luxemburgish Regulation on the treatment of urban waste water is the implementation of the European Urban Waste Water Treatment Directive 91/271/EEC. The Act states requires that a permit may be given if the treated wastewater can be reused when appropriate. Evacuation paths must minimize negative effects on the environment.

The regulation states in his article 9 regarding the evacuation of sewage sludge, that: (1) Sewage sludge is reused when appropriate. Evacuation paths must minimize negative effects on the environment.¹¹⁹ and (2) The discharge of sewage sludge into surface water by dumping from boats, pipes or any other means is prohibited.¹²⁰ A definition of appropriate reuse of wastewater and reuse of sludge is not given in this regulation.

8.8 End-of-waste status

The before mentioned Law of March 21, 2012 on waste management states that certain specified waste ceases to be waste when it has undergone a recovery or recycling operation and complies with specific criteria to be developed in accordance with the following conditions: (1) the substance or object is commonly used for specific purposes; (2) there is a market or demand for such a substance or object; (3) the substance or object fulfils the technical requirements for the specific purposes and complies with the legislation and standards applicable to products; and (4) the use of the substance or object will not have any overall adverse environmental or human health impacts.¹²¹ The criteria shall include limit values for

¹¹⁹ Art. 9. Boues d'épuration

¹²⁰ Art. 8. Autorisations

¹²¹ Art. 7. Fin du statut de déchet

pollutants where necessary and shall take into account any possible adverse environmental effects of the substance or object.

Even if wastewater is specifically excluded from the scope of the Law of March 21, 2012 on waste management, insofar as they are already covered by other legal or regulatory provisions, all by-products issued from wastewater treatment fall under the concept of waste within the meaning of Article 4, paragraph (1) of the same law. Until any product or material extracted from wastewater treatment achieves EoW status, the product will be regulated as waste and will be subject to the various legal requirements considered above.

9 French Legal Framework

The French national waste management plan aims to provide an overall vision, at national level, of the waste management system and of the national policy carried out in this area. In particular this plan aims to improve the recovery of waste. The waste prevention and management policy is fully in line with the wishes of the French authorities to implement this transition to a circular economy model. In 2014, the French government has adopted the waste prevention 2014-2020 national program, currently under revision. It should focus on solutions producing the best global environmental result, meaning, in order:

- Preparation for reuse
- Recycling
- Other forms of recovery, in particular energy recovery
- Elimination¹²²

9.1 Environmental Code (Code de l'environnement)

The Environmental Code is the main French legislation in the field of the environment and encompasses a wide variety of topics. It consists of 7 books: common provisions, physical environments, natural spaces, fauna and flora, prevention of pollution, risks and nuisances, provisions applicable in France's overseas territories and environmental protection in Antarctica. Further relevant environmental considerations are brought under in the Mining Code, Energy Code and Public Health Code. Particularly relevant for this paper is book 5, title 4 which focuses on waste management and prevention.¹²³ Article L. 514-1-1 states that waste is considered to be *'any residue from a production, transformation or use process, any substance, material, product, or more generally any movable property abandoned or which the holder intends to abandon'*.¹²⁴ The end-of-waste criteria follow state that four cumulative criteria must be met:

- The substance or object must be used for specific purposes
- There is a market or demand for such a substance or object
- The substance or object fulfils the technical requirements for the specific purposes and complies with the legislation and standards applicable to the products
- The use of the substance or object will not have any global harmful effects for the environment or human health¹²⁵

In France, several ministerial orders establishing criteria for end of waste status have been published for:

- Crushed wood for use as fuel in biomass combustion plants¹²⁶
- Greasy waste and used cooking oils for use as a fuel in a combustion plant¹²⁷
- Waste oil distillation residues for use as a bitumen plasticizer in the manufacture of waterproofing membranes for roofs¹²⁸

¹²² https://www.ecologique-solidaire.gouv.fr/sites/default/files/Plan%20national%20des%20dechets_octobre%202019.pdf

¹²³ Art. L541 and further Environmental Code

¹²⁴ Article L.541-1-1 Environmental Code

¹²⁵ Art. L541-4-3 Environmental Code

¹²⁶ Arrêté du 29 juillet 2014 fixant les critères de sortie du statut de déchet pour les broyats d'emballages en bois pour un usage comme combustibles de type biomasse dans une installation de combustion

¹²⁷ Arrêté du 24 août 2016 fixant les critères de sortie du statut de déchet pour les déchets graisseux et les huiles alimentaires usagées pour un usage en tant que combustible dans une installation de combustion classée sous la rubrique 2910-B au titre de la nomenclature des installations classées pour la protection de l'environnement et d'une puissance supérieure à 0,1 MW et les esters méthyliques d'acides gras fabriqués à partir de ces déchets destinés à être incorporés dans un produit pétrolier

¹²⁸ Arrêté du 10 juillet 2017 fixant les critères de sortie du statut de déchet pour les résidus de distillation des huiles usagées pour un usage comme plastifiant de bitumes dans la fabrication de membranes d'étanchéité pour toiture

- Objects and chemicals that have been prepared to be reused¹²⁹
- Chemicals or objects that have been regenerated¹³⁰
- Cut wiping rags made from used textiles for use as rags.¹³¹

9.2 Water Act (le Code de l'eau)

Water in France is not managed according based on its ownership, but by its uses.¹³² Unlike environmental law, the French legislator has not drafted a Water Code. Currently, the legal rules applicable to water resources are scattered among several codes. For example, water management planning is governed by the Environmental Code, public drinking water service by the Local Authorities Code, river public domain by the General Code of Public Property, water pollution offences by the Criminal Code, etc.

It is possible to distinguish “three major water acts” that have been adopted in France and have made it possible to lay the foundations of the current water law:

- The law of 16 December 1964 on the regime and distribution of water and the fight against pollution. It establishes the legal framework for regulating the pollution of water resources;
- The law of 3 January 1992 on water. It provides for a single system of authorisation and declaration for all works, installations, works and activities carried out for non-domestic purposes, depending on the importance of the work, the risks involved, the dangers and the impact on health, safety and the free flow of water;
- The law of 30 December 2006 on water and aquatic environments. It brings the recognition of the priority use of water for human consumption and the recognition of the right of access to drinking water under conditions that are economically acceptable to all.

The decree of 16 May 2005 created a basin committee in each of the 12 rivers basins. This committee, also known as the “water parliament”, has an advisory and leadership role within the river basins. It is composed of 3 colleges. 40% of its representatives are from local authorities, 40% are water users and 20% are government representatives. The water agencies have a specific role in implementing the principle of balanced and sustainable management of water resources. They have the status of public administrative State institutions. They are established in each basin or grouping of river basins and placed under the supervision of the Minister for the Environment.¹³³

¹²⁹ Arrêté du 11 décembre 2018 fixant les critères de sortie du statut de déchet pour les objets et produits chimiques ayant fait l'objet d'une préparation en vue de la réutilisation

¹³⁰ Arrêté du 22 février 2019 fixant les critères de sortie du statut de déchet pour les produits chimiques ou objets ayant fait l'objet d'une régénération

¹³¹ Arrêté du 25 février 2019 fixant les critères de sortie du statut de déchet pour les chiffons d'essuyage coupés élaborés à partir de textiles usagés pour un usage comme chiffons

¹³² <https://hal.archives-ouvertes.fr/hal-00857368/document>

¹³³ <https://www.encyclopedie-environnement.org/en/society/water-law-in-france/>

9.3 Rural and Maritime Fishing Code (Code rural et de la pêche maritime)

The Rural and Maritime Fishing Code encompasses a wide terrain of topics in the field of sustainable development in rural areas. While the code has a strong environmental focus with provisions related to agriculture, forestry, prevention of natural disasters and preservation of water resources, it also focuses on rural communities in general such as employment in rural areas, spatial planning, rural heritage and landscape protection and the maintenance and adaptation of collective services in low population densities.¹³⁴ of Book II, Title V, chapter V (Art. L255-1 and further) is the implementation of the EU Fertilizers Regulation. Before fertilizers can be brought on the market, they must be evaluated under the prescribed conditions of use, and the absence of harmful effects on human health, animal health, the environment, and the general effectiveness of the fertilizer.¹³⁵ This evaluation does not have to be made if it is explicitly authorized by EU regulation or it corresponds to conditions set by order of the Minister responsible for agriculture.¹³⁶

¹³⁴ Art. L111-2 Rural and Maritime Fishing Code

¹³⁵ Art. L255-7 Rural and Maritime Fishing Code

¹³⁶ Art. L255-6 Rural and Maritime Fishing Code

10 Conclusion

This document has provided an overview of the policy frameworks that have implications for product recovery from sewage water (particularly from sludge). Both the EU policy framework and the policy frameworks of the Member States that are part of the WOW! Project are discussed. These Member States are: the United Kingdom (UK), France, the Belgian region of Flanders, Germany, Luxembourg and The Netherlands.

It is acknowledged that other policy frameworks – notably those emerging around water reuse and renewable energy – also have significant implications for the broader implementation of circular approaches around wastewater, and it is difficult to view the requirements around product recovery in isolation. It is also acknowledged that there is significant variation between Member States in how they interpret and implement the EU policy frameworks that have implications for product recovery from sewage water. The national regulatory requirements create an even more complex governance picture.

For instance a product that has received an end-of-waste status based on the Waste Framework Directive in the Netherlands, will still be considered waste in other Member States. This means that the transportation is subject to waste legislation and the plant where material goes to has to have a waste authorisation. In the case of Germany, it is not clear who should be addressed to start the procedure to receive an end-of-waste status. Without an end-of-waste status, a product may not be transported or used for the production of new products. A potential customer is not permitted to test its usability. This leads to a situation where marketability at more than pilot scale cannot be proved due to a lack of an end-of-waste status while it is not possible to gain this end-of-waste status because usability may not be tested.

Another example of different regulations based on the same directive, is the translation of the European Sludge Directive in national legislation. The Sludge Directive aims to encourage the use of sewage sludge in agriculture and regulate its use while preventing harmful effects on soil, vegetation, animals and humans, encouraging correct use of sewage sludge. Based on this directive the Netherlands has determined that all sludge must be incinerated. In the United Kingdom, sewage sludge can be used in agriculture but only if it has been stored under anaerobic conditions for at least seventeen days.