# D2.4.1: 5 REPORTS ON THE LEGISLATIVE/ADMINISTRATIVE FRAMEWORKS IN THE INVOLVED REGION – STRUCTURE AND QUESTIONNAIRE

## AUSTRIA

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## Table of content


1. Introduction ..... 2

2. Scope of the Study ..... 3

3. The EU-Legal and Policy Framework (done by adelphi) ..... 4

4. Overview on legal and policy situation in Country X ..... 11

4.1. National Level: ..... 11

4.2. Federal Level: ..... Errore. Il segnalibro non è definito.

4.3. Municipal Level: ..... Errore. Il segnalibro non è definito.

5. Main legal and policy Barriers in Country X ..... 11

6. Drivers and existing approaches to overcome barriers in Country X ..... 16

7. Appendix I: Questionnaire for Legal and Policy Barrier Analysis ..... 17

Literature ..... 18

# 1. Introduction

Innovation in the water sector is stifled by multiple barriers, keeping innovation outcomes lower than in other sectors. Factors commonly include risk aversion of water and wastewater utilities, lack of public or commercial funding and too stringent and conflicting regulations (Kiparksy et al., 2013, Ajami et a. 2014, Speight, 2015). A growing body of studies is investigating the barriers that particularly apply to nascent wastewater-to-energy systems. Dierich et al. (2017) for example mentions an unsuitable legal framework, low political priorisation of inter-sectoral action, and insufficient experience in utilities as main barriers. In another study (WERF, 2012), the authors find that "inadequate payback/economies" feature as the most dominant among 10 barriers impeding the implementation of biogas usage in the US wastewater treatment plants (WTPs). Financial hurdles also rank high up in a global study focusing on energy efficiency in US water and wastewater utilities, alongside governance issues and knowledge gaps (ESAMAP, 2012).

These studies indicate that the dissemination of wastewater-to-energy systems is generally confined by a wide range of different barriers, rather than a few single ones. Some of the barriers are applicable to all water-related innovations. Others are unique to wastewater-to-energy systems, their specific type of technological or managerial solution, and the local or regional context the utility is situated in. This becomes obvious in studies that examine specific aspects of wastewater-to-energy systems, for example the "flexibilisation" of energy production and consumption in waste water treatments plants (WWTPs) for optimized energy supply (Dierich et al., 2017). Barriers concern cultural or behavioural aspects within the utility itself (e.g. low commitment of top management) as much as external conditions, for example low regulatory pressure to reduce energy consumption (ESAMAP, 2012). Identifying these barriers is a critical step in order to form measures for setting up framework conditions conducive to the uptake of innovative wastewater-to-energy systems.

As with any other environmental reform, improving the energy performance of wastewater utilities (WWUs) requires strong backing through legislation and policy at various political levels. In this report, we understand legislation and policy and the framework they form to include all laws, policies, regulations, strategies, rules and other instruments used to improve energy outcomes of WWUs. These affect a large host of disciplinary fields, like economics, spatial planning, finance, or utility governance and management relevant to wastewater-to-energy systems. implementing the framework, national and sub-national governments play a key role. They need to grant high-level political support for establishing national legislation and policies, take up the role of the regulator and financier, and initiate other important steps, such as creating a well-engaged and connected agency that provides leadership and coordinates efforts nation-wide (e.g. to produce necessary information like energy maps) (Vogt et al., 2010).

In overcoming key barriers, there are different types of legal and policy measures. With respect to heat generation in WWTPs, Kretschmer (2017) distinguishes between regulatory, incentive-oriented and actor-supportive measures. Necessary regulations, for example, require utilities to reduce CO2 emissions, to track and improve energy performance through energy audits, or to prescribe phasing out energy-inefficient

technologies. Incentives, in contrast, may link government funding or tariff reforms to the utility's energy performance. Or they remove subsidies for electricity that discourage utilities from taking steps towards more energy-efficient operations. Typical actor-supportive measures help utilities to gain access to information about new innovations, their costs, benefits, and available funding opportunities, or offer educational programs for and advice to utility staff. Governments can further establish policies to shore up financing, such as specific financial vehicles for investments in energy efficiency and renewable production in WWTPs or by facilitating access to cross-sector financing programs (e.g. climate funds).

# 2. Scope of the Study

The objective of deliverable 2.4.1 is to

I) examine the **legal and policy situation** with respect to energy efficiency (EE) and renewable energy (RE) production outcomes of WTPs in the five countries participating in the project REEF2Water;
II) identify the main **legal and policy barriers;**
III) and discern **drivers and existing approaches** to overcome them.

The analysis is based on **desktop research**, information compiled in D1.1.1 on the legal situation and experience of the authors themselves.

The aim of deliverable D2.4.1 is to contribute **to improving the legal and policy framework conditions** that are central for the uptake of wastewater-to-energy systems in each of the five countries. The resultant outcomes form the basis for D2.4.2, in which concrete recommendations for improving laws and regulations are provided. These will subsequently be shared and discussed with policy makers from the participating countries. Furthermore, D2.4.1 will form the basis of a position paper (D5.2.3), which identifies local legislation and regulatory barriers hindering REEF2Water regional implementation strategies, as well as measures to dismantle them.

The nature of the Reef2Water solutions implies that their implementation is affected by a **complex legal and policy framework**. Given that the solutions are part of the wastewater, energy, and solid waste system, a **cross-sectorial perspective** that relates to legal and policy aspects of each of these three systems was taken. This ensures that necessary **sector linking** is achieved in practice.

The analysis considers the **different ways to exploit energy** from wastewater, including energy from biogas production, on-site renewable generation and operational energy efficiency. Here, it is being distinguished between **thermal and electrical energy.** Given the project's particular ambition to enrich sludge through **organic substrates** in the treatment process, the analysis considers applicable legislation and policies of the solid waste system. Furthermore, as the project aims at exploring the potential for WWTPs to become local providers of energy, legislation and policies regulating **temporary energy storage** (such as power-to-gas solutions) and **feed-in into the grid** (including relevant

market-based mechanisms) are considered. All of these aspects are examined for **different political-administrative levels**, at which policy and legislation are given effect at (international/EU, national, federal, and municipal). This helps to locate barriers more precisely, as well as to find scale-sensitive measures to overcome them.

# 3. The EU-Legal and Policy Framework

## 3.1. Environmental policy and law making in the EU

This chapter summarizes the most relevant EU Directives affecting the implementation of measures to increase EE and RE production in WWTPs. It then analyses a range of legal and policy barriers that are central in doing so.

Directives form the most common regulation in the EU legislative framework. They set the standard conditions and rules. According to the Subsidiarity Principle, member states have to transpose these into national legislative systems, following a clearly defined timetable and a way that best suits national circumstances (LeBlanc et al. 2008).

While member states are aiming at the same goals, the means they use to achieve them can be quite distinct, the heterogeneous development of EU energy markets serving as a very good example.

## 3.2. Key drivers of wastewater-to-energy solutions and resulting trends across EU member states

The share of renewables in the EU energy mix reached 17 % in 2016. It increased twofold since 2004, being mainly driven by legally binding energy saving and decarbonisation targets (Edwards et al., 2016).

- Renewable energy markets have distinctly developed across member states in what regards their scale and composition of different renewable energy forms. For example, biogas is predominantly used to produce electricity while much of the heat potential remains unexploited (Kampman et al., 2016). Also, only some frontrunners such as Sweden actively pursue producing biomethane for the transport sector.

- Only a few countries, such as Spain, use sewage sludge as a main feedstock for biogas production, making it the feedstock being used the least overall (Scarlat et al., 2018). In most member states, such as Germany and Italy, crops dominate as a feedstock while the potential to use sewage remains largely untapped (Figure 1.).

- The EU has began to embrace a circular economy approach. Its stringent regulatory regime is changing waste streams and disposal options. Importantly, while bio-waste and sludge production increase (Zsirai, 2011), limits are put on landfilling, and particularly of biodegradable material. Applying sludge as a fertiliser and soil conditioner is still the preferred options in most member states, more stringent rules

confine this end-use form (Spinosa 2010). Together these developments have driven wastewater-to-energy solutions.

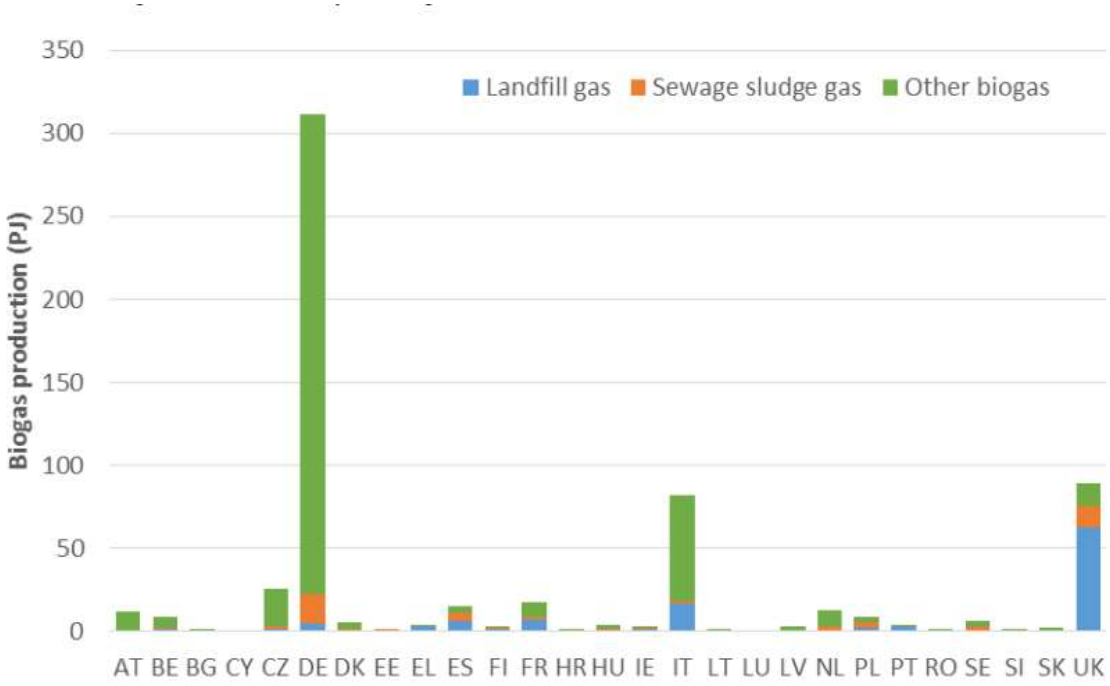


**Figure 1: Biogas production per Member State in 2014, differentiated by source (Kampman et al., 2016)**

## 3.3. Overview of key EU legislation and policies

### 3.3.1. Water & Wastewater

**The Water Framework Directive (2000/60/EC)**

This directive (here referred to as the WFD) requires that rivers, lakes, transitional waters, coastal waters, and groundwater obtain "good status" by 2027. To achieve this goal, the EU has determined a clear timeline and three six-year management cycles for the member states. One of its main elements is the introduction of River Basin Districts, which form the management units for managing water resources. Importantly, the WFD pertains to services of both water and waste water.

**The Urban Waste Water Treatment Directive (91/271/EEC)**

The main objective of the Urban Waste Water Treatment Directive (UWWTD) is to protect the environment from negative effects of urban wastewater discharges. It comprises the collection, treatment, and discharge of domestic wastewater, mixture of wastewater, and wastewater from certain industrial sectors. It stipulates the level of treatment and the removal of nutrients and basic sanitary parameters, as well as conditions for sludge disposal and reuse.

**The Sewage Sludge Directive (86/278/ EEC)**

The Sewage Sludge Directive (SSD) is concerned with the management of sewage sludge. It particularly seeks to encourage the use of sewage sludge as a soil conditioner and fertiliser in agriculture. It bans applying untreated sludge on agricultural land. Also, it sets all the requirements and provisions to prevent potential harmful effects on humans, animals, soil and vegetation as well as surface and groundwater. The Directive lays down the basic limits for potentially toxic elements (PTEs, which are HMs) in SS and soil.

### 3.3.2. Climate change mitigation

**2020 Climate and energy package ("20-20-20 targets")**

This package was established in 2007. Its goal is to ensure that the EU meets its climate and energy targets. In consequence, the legislation encompassed three main targets for the year 2020:

- 20% increase in energy produced from renewables
- 20% enhancement in energy efficiency
- 20% cut in greenhouse gas emissions (compared to 1990 level)

**Emissions Trading System (ETS)**

The ETS is a central element in the EU's policy to tackle climate change and a key tool for reducing greenhouse gas emissions in a cost-effective manner. It is based on a "cap and trade" system. The cab limits the amount of greenhouse gas emissions a certain user or industry is allowed to emit. As the cap is gradually lowered over time, emissions are expected to fall. Within the cap, companies receive or buy emission allowances that cover their emissions. These can be traded.

**Effort sharing agreement for the non-ETS sectors**

The Effort Sharing Decision establishes binding annual greenhouse gas emission targets for Member States for the period 2013–2020. These targets concern emissions from most sectors not included in the EU Emissions Trading System (EU ETS), such as transport, buildings, agriculture and also waste. The regulation aims to ensure that the non-ETS sectors emissions reduction target of 30% by 2030 compared to 2005 levels.

### 3.3.3. Renewable energy production and energy efficiency

**Renewable Energy Directive (2009/28/EC)**

The Renewable Energy Directive (RED),which is currently being revised, establishes a policy framework for producing and encouraging renewable energy in the EU, including biogas. The directive requires that 20 % of the EU's energy mix in 2020 must be renewable. It translates this general goal into individual targets for each of the member states. In a recent proposal to revise the directive the Commission elevated that goal to 27 % by 2030. The RED also defines sustainability criteria for biofuels and bioliquids in the transport sector.

**Directive to reduce indirect land use change for biofuels and bioliquids ((EU/2015/1513)**

The ILUC was established as response to sustainability challenges concerning bio-energy made out of food-based crops, most importantly indirect land-use change. It amends current legislation on biofuels, including the Renewable Energy Directive (2009/28/EC) and Fuel Quality Directive (2009/30/EC). For example, it limits the share of biofuels produced from crops in the transport sector (7% in overall fuel mix). It also requires that biofuels produced in new installations emit at least 60% fewer greenhouse gases than fossil fuels.

**Energy Efficiency Directive (2012/27/EC)**

The Energy Efficiency Directive (EED) mandates energy efficiency improvements. It establishes a common framework for the promotion of EE within the EU to meet its EE headline target of 20% by 2020, in all stages and sectors of the supply chain. EU member states have to prepare a National Energy Efficiency Action Plan every three years and report on their progress in the different sectors (i.e. industry, residential, services, public, transportation, electricity and heat generation).

**Directive for combined heat and power generation (2004/8/EC)**

This directive promotes the use of combined heat and power (CHP) units to improve the efficiency of electricity and heat production. It sets rules on guarantees of origin, efficiency criteria, administrative procedures, and other issues. Member states are encouraged to provide support schemes for CHP units to enable their widespread implementation (including specific support for WTTPs).

### 3.3.4. Natural Gas

**Directive on services in the internal gas market (2009/73/EC)**

This 'Gas Directive' establishes common rules for the transmission, distribution, supply and storage of natural gas. It stipulates rules relating to the organisation and functioning of the natural gas sector, access to the market, the criteria and procedures applicable to the granting of authorisations for transmission, distribution, supply and storage of natural gas and the operation of systems. The rules also apply in a non-discriminatory way to biogas and gas from biomass, i.e. sewage gas from WWTPs.

**Directive for internal electricity market (2009/72/EC)**

This directive establishes common rules for the generation, transmission, distribution and supply of electricity, together with consumer protection provisions, with a view to improving and integrating competitive electricity markets in the EC. It lays down the rules relating to the organisation and functioning of the electricity sector, open access to the market, the criteria and procedures applicable to calls for tenders and the granting of authorisations and the operation of systems such as transmission or distribution systems, including the request for unbundling of electricity production and

**Directive for taxation of electricity and other energy products 2003/96/EC** (EU 2003a) sets a framework for taxation of electricity and other energy products, e.g. gas or other fuels. It defines the energy products to be taxed and the minimum amount. The project "Full scale demonstration of energy positive sewage treatment plant concepts towards market penetration" (POWERSTEP) has received funding under the European Union HORIZON 2020 –

### 3.4. Solid waste management

**The Waste ´Framework Directive (2008/98/EC)**

This directive defines basic concepts such as the "waste hierarchy" (a priority order set among waste prevention and management options), and stipulates requirements for waste management, such as to up a separate collection of waste, waste management plans, and waste prevention programmes. It also establishes legally binding targets such as for household waste streams including biodegradable materials).

**The Landfill Directive (1999/31/EC)**

This directive aims at preventing or reducing adverse environmental impacts from landfilling of waste through stringent technical requirements for waste and landfills. It obliges Member States to reduce the amount of biodegradable municipal waste that they landfill to 35% of 1995 levels by 2016 (for some countries by 2020) while current legislative of the proposal of it consider a complete ban of landfilling.

## 3.5. Legal drivers and barriers

**Paucity of energy aspects and targets in water legislation**

Energy-related issues remain vastly absent from the EU's legal and policy framework of the water sector. The key water-related directives, the WFD and the UWWTD, make no provisions that specifically focus on targets, measures or incentives to improve EE or renewable production measures in WWTPs, whether motivated by ambitions of cost-efficiency or decarbonisation. Also, more recent water policy documents such as the "Blueprint to Safeguard Europe's Water Resources" (2012) poorly make that linkage. A legislative proposal of the Drinking Water Directive adopted this year comprises one of the first attempts to embrace the water energy-water nexus by encouraging member states to increase energy efficiency.

**Lack of overall cross-sectoral and coherent legal framework**

The absence of a cross-sectoral approach spanning across various relevant EU energy, waste, water, agricultural and other concerned directives stifles legal backing needed to more systematically support wastewater-to-energy solutions. Energy-related issues are missing in EU water sector policy and law, which predominantly focus on water quality and quantity goals. The RED, on the other side, fails to articulate specific provisions on how, for example, the waste water sector can contribute to achieving targets concerning carbon reduction and renewable

production. Incoherence of the overall legal and policy framework has been ranked as the top barrier for biogas production (Kampmann et al., 2016).

**Inadequate priorisation of second generation bio-energy**

Member states have been free to opt through which form of renewable energy they accomplish these targets. This flexibility has given rise to divergent developments of the biogas market across the member states (Torrijos, 2016), with in part undesirable outcomes. A prominent example applies to the rise of crop-based biogas, which ranks as the EU's main type of bio-energy and dominant renewable energy form (Kampman et al., 2016). As a feedstock, however, crops have proven adverse environmental impacts (e.g. land use change). The environmental footprint of biogas produced from waste streams, in contrast, is significantly better, but their share in the biogas market lag behind that of crop-based biomass (see. Figure 1). This is because the EU legal and policy does not systematically support renewable energies according to their sustainability performance. Sustainability criteria, which form one central pre-condition towards doing so, exist only for the transport sector while they lack cross-national harmonisation (Kampman et al., 2016).

**An improving yet unreliable base of bio-waste feedstock**

The EU's stringent regulatory regime for waste functions as a strong driver for wastewater-to-energy systems. The Landfill Directive is viewed as the most important factor propelling the growth of anaerobic digestion (AD) (including on-farm applications) in treating biowaste and industrial feedstock (Edwards et al., 2015). This is because the ban on landfilling and tightening quota for reducing landfilled biodegradable organics increase the need to find solutions for disposing growing amounts of bio-waste (Torrijos, 2016). However, many member states do not have a reliable bio-waste feedstock base (Edwards et al., 2016). Only 25 % of the total bio-waste in the EU is recycled while recycling rates are considerably lower in many member states (Mateescu et al., 2008). In some countries like the UK, access to adequate organic feedstock is already a barrier (Kampman et al., 2016). Additionally, current regulations do not promote AD as a preferable disposal option for biowaste. Legal loopholes still allow member states incinerate or landfill biowaste (Iacovidou et al., 2012). The European Biogas Association (2016) remarks that incineration may become the main disposal option for biowaste as the as the landfilling ban takes effect.

**Under-development of heat usage due to weak incentives**

Whether WWTPs achieve high potential of energy and carbon emissions savings depends on exploiting both heat and electricity generated during the combustion of biogas. Biogas markets have expanded in several EU member states. However, despite some positive development, often only the electricity generated from biogas is used while the heat potential remains untapped. Currently, only 25 % of the heat is used in Europe's WWTPs (Scarlat et al., 2018). While plant operators face pressure to improve the economics of biogas plants (ibid), weak incentives at the EU-level comprise one key factor responsible for the slow development of heat usage from biogas (Kampman et al., 2016).

### Lacking revenue streams for sewage-based co-digestate

Using co-digestate of sewage sludge and bio-waste as soil conditioner or fertiliser (for example in agriculture) can spur the uptake of wastewater-to-energy solutions (Edwards et al., 2015). Such "end-use" applications guarantee that sewage sludge, whose production in Europe will rise over the next years (Werle, 2015), will be harnessed in the spirit of a circular economy. Currently, however, sludge-based co-digestates are subject to an incoherent and partially conflicting legal and regulatory regime (Iacavidou et al., 2012), which compounds the dissemination of AD technologies. One main barrier is that co-digestate containing sewage sludge is currently classified as waste and not a valuable product. This legal definition only allows WWTP operators to market the biogas, but not its by-products, undermining additional revenue streams (Kampmann et al., 2016).

### Ambiguous financial mechanisms for wastewater-to-energy solutions

Access to inexpensive renewable energy will become increasingly important because the cost of sewage sludge treatment is bound to rise due to higher treatment standards and rising energy costs, among others (Zsirai, 2011). Cost pressures, which the imposed by the cost-recovery principle in the WFD, theoretically attractive for WWUs to deploy RE production. However, new technologies such as AD are capital-intensive, generally requiring subsidisation (Edwards et al., 2015). National support schemes (e.g. feed-in tariffs) form the key financial mechanism to drive renewable energy developments in the EU. However, these are still ineffective in many member states, for example due to low or reduced subsidies (Kampman et al., 2016). At the same time, the EU legislation and policies upon which the support schems are based are yet not sufficiently linked to sustainability criteria, as argued above. Furthermore, Green Public Procurement (GPP) for WWTPs currently apply only to EE, but not to producing RE (Loderer and Hananel, 2018).

### Grid injection of bio-energy

If not used for self-supply in on-site CHP plants, WWUs have several options to bring bioenergy to the market: As biogas or biomethane via the gas network; as heat via the district heating network; or as electric power via the electric grid. Arguably, a range of barriers apply to each of these options. Generally, decentralized energy forms – such as wastewater-to-energy solutions – lack a common EU framework that explicitly supports them. Across member states + small market entrants providing distributed energy (DE) still face various challenges, including a lack of explicit incentives in planning and operations of networks, high connection charges, or high trading fees (Ropenus and Skytte, 2005). Another specific example concerns cross-border trade of biomethane, which is hindered substantially by national quality standards, which lack harmonisation (Kampan et al., 2016).

# 4. Overview on legal and policy situation in Austria concerning a waste treatment plant

In Austria parts of the legislation are set on country level, others at regional level. Austria consists of nine provinces, so federal law exists in nine variants. As the pilot plant in Austria is situated in Upper Austria, the section about federal laws focuses on this province.

## 4.1. National Level

At national level, the following laws are of relevance:
Austrian waste management law (Abfallwirtschaftsgesetz 2002)
Water act (Wasserrechtsgesetz 1959)
Gas economy law (Gaswirtschaftsgesetz)/ÖVGW-Richtlinien G31 + G33
CHP act (KWK-Gesetz 2009)
Green electricity law (Ökostromgesetz)
Climate protection law (Klimaschutzgesetz)
Law about the organisation of the electricity economy
(Elektrizitätswirtschaftsorganisationsgesetz – ElWOG)
Trade Law (Gewerbeordnung)

The most important ones are described in the following, including a brief analysis about the main drivers and barriers for waste and wastewater energy use.

### 4.1.1. Austrian waste management law (AWG 2002)

The basic law concerning waste management in Austria is the Waste Management Law (Abfallwirtschaftsgesetz, AWG 2002). Additionally all nine provinces have federal state laws, which regulate all those waste management aspects which are part of their responsibility. These are mainly the costs the legal framework of the waste collection.

The main issues of the AWG 2002 are the prevention, the preparation of recycling; the recycling and any other use and disposal of waste; duties of persons working with waste; and specifications for waste processing sites. It also stipulates to end landfilling of untreated waste by setting a maximum organic carbon threshold of 5%, which can only be reached via incinerating or mechanical-biological treatment.

Organic waste like bio-waste and used cooking fat are collected and treated separately from non-biological fractions via composting or biogas.

Every sampling, depositing or treatment of waste has to be permitted according to the AWG 2002. The federal government, and not the local major, holds the authority to do so. The rules for obtaining a waste processing permit are in many cases stricter

than receiving permits for wastewater. This is mainly because wastewater processing is seen as a public task while waste processing is mainly done by private companies.

The RHV-Trattnachtal could do the waste processing without an additional legal unit like a company, but it seems that the contrast of public wastewater processing and commercial waste processing led to the formation of two legal bodies, the public RHV-Trattnachtal and the commercial Biogas Trattnachtal GmbH.

The following aspects have to be clarified to acquire a permit:

- Amount of processed waste per year in tons
- Processed waste defined by key number
- Animal waste needs an additional permit (in Austria called “Tiermaterialien Gesetz”)
- Certain animal waste like slaughterhouse waste needs a sanitation unit that can provide 70°C for 60 minutes with particle size <12mm
- The waste emits odor, so the storing and processing likely needs to be a closed process with combined biological filter
- The produced end product after fermentation and its minimum quality for proper use has to be defined. Because of the co-fermentation at the RHV-site the produced end product is still sewage sludge. In Austria this is because of the 50% rule that means: if the end product contains more than 50% sludge, it stays legally sludge. If there was a surplus of waste it would be then biogas waste manure.

Possible barrier: The sewage sludge from the RHV-Trattnachtal can still be used in agriculture, which is also the cheapest way for disposing sludge. In other Austrian regions sewage sludge used in agriculture is not allowed anymore. In the future this will lead to an increase of costs for sludge disposal.

### 4.1.2. Water act (WRG 1959)

Every use of water that has an effect on lakes, rivers or the ground water has to get approval from the federal government according to the water act. The responsible authority is the federal government.

Barrier: The wastewater permit for a sewage plant deals mainly with incoming wastewater und defines the reduction values for nitrogen, ammonia, phosphorus, COD and BOD without any connection to the treated waste from the co-fermentation, because it does not enter the plant via the sewer, but it comes in per lorry.

That means that reduction values in % are much harder to fulfil than in fixed numbers.

This can be shown with the following example:

- Goal: 70% reduction of nitrogen = 500kg N incoming and <150 kg N outgoing
- But the treated waste can add 100 kg N without being counted
- so the 70% rule is affected to its disadvantage.
- = 600kg N incoming and 150 kg N outgoing means a 75% reduction

So the waste treatment can result in a conflict between the sewage plant and its reduction values!

The RHV-Trattnachtal finally achieved an agreement with the local authorities, that the N-value of the waste can be measured regularly in a laboratory and then be added do the nitrogen, coming in from the sewer. A general methodology for all Austrians wastewater treatment plants should be achieved.

All other waste ingredients have normally no real negative impact and are therefore not additionally measured.

#### 4.1.3. Gas economy law – Gaswirtschaftsgesetz

The Austrian gas economy law is the basis for feeding in biogas into the Austrian gas grid. According to this law, producers of biogas have the right to feed in biogas into the grid, even on behalf of their customers. Gas quality and feeding points are regulated.

The ÖVGW-Richtlinie G31 contains the main quality criteria and G33 deals with the marketing rules.

Possible barrier: A legal threat to the further operation of biogas/sewage gas feeding into the grid is that the mean $H_i$ (higher heating value) of gas in the grid shall be increased up to 11.2 kWh/Nm$^3$ and the tolerance shall be decreased from 3 to 2% in the next years. This would mean that large amounts of propane would have to be added in order to increase $H_i$.

#### 4.1.4. Trade Law (Gewerbeordnung) – heat supplier

In order to be allowed to act as a heat supplier.

### 4.2. Federal level (Upper Austria)

#### 4.2.1. Sewage sludge act (2006)

The agricultural use of sewage sludge has to be approved according to the Upper Austrian sewage sludge act from 2006. Sludge application is regimented in Austria by 9 federal state decrees. The use as a fertilizer in agriculture is limited to five federal states, four have banned sewage sludge to be used this way. In Upper Austria the sludge can be used if it fulfils the following requirements:

| heavy metal | sludge<br>threshold value | soil*<br>threshold value |
|---|---|---|
| Pb | < 400 mg/kg TS | < 100 mg/kg TS |
| Cd | < 5 mg/kg TS | < 0,5 mg/kg TS |

| | | |
|---|---|---|
| Cr | < 400 mg/kg TS | < 100 mg/kg TS |
| Cu | < 400 mg/kg TS | < 60 mg/kg TS |
| Ni | < 80 mg/kg TS | < 60 mg/kg TS |
| Hg | < 7 mg/kg TS | < 0,5 mg/kg TS |
| Sn | 1600 mg/kg TS | 150 mg/kg TS |
| Adsorbed organic halogens | threshold value | threshold value |
| AOX | <500mg/kg TS | <500mg/kg TS |

Additional parameters without threshold values:

- Dry matter
- Organic substance
- pH-level
- Ammonia
- P/K/Ca/Mg

Barrier: If the sludge is used on fields, the farmers have to register their fields at the local government, because the fields have to be frequently analysed externally on their heavy metal contents to prove that they are below the federal threshold values for soil*. Additionally soils with a pH-level below 5 are banned from sludge use. On soils with a pH-level from 5 to 5,5 sludge may be used if their chalk value (as CaO) is at least 25% of the dry matter. This is only possible, if chalk is used as a pressing aid, or if the sludge is mixed with chalk after the pressing procedure.

If prohibition of sewage sludge use in agriculture is extended nationwide, its disposal will become more expensive, thus making it necessary to increase waste water prices for customers.

### 4.2.2. Law on animal substances (2003)

It regulates the collection, storage, transport, treatment, processing, disposal and use of animal by-products and their placement on the market. The authority is represented by the district government. It defines the rules for the Biogas Trattnachtal, which animal by--products have to be sanitized and what control mechanisms have to be fulfilled to secure proper sanitation and prevent spreading of diseases.

### 4.2.3. License for collection and treatment of waste according §24a AWG 2002

This license is like a “driving license”, because it names a person, which is personally fully responsible for the proper collection and treatment of waste. Therefore the named person has to verify his knowledge in waste and waste management before applying for the license. The permission is granted by the federal government.

### 4.2.4. Upper Austrian fire- and hazard police act (FPG-1994)

§ 2 of the Upper Austrian fire- and hazard police act (FPG) states that everybody is in charge of preventing and minimizing fires and fire hazards.

§ 10 des OÖ FPG obliges local communities with the duties to execute fire controls in fixed intervals. These intervals are:

- By imminent danger – anytime
- Objects belonging to a risk group – every 5 years
- Objects not belonging to a risk group – every 10 years
- Small buildings - every 20 years

# 5. Main legal and policy barriers in Austria

The main barriers in Austria are

- Too many different regulations concerning the same topic
- Too many different competences lead to contradictory platings
- The technical state of the art is quite complex and therefore expensive to build and operate
- The protection of neighbors and the environment makes it hard to find a suitable location for a waste treatment plant
- The bureaucracy requires extensive documentation for waste management
- The renewable energy tariffs for biogas from waste are quite low, providing calculate making investments unattractive financially
- There is no renewable heat or renewable gas regulation in Austria stipulating the use of biogas

The waste collection has a good standard in Austria, but especially household waste still contains a considerable organic share. Other waste should be collected separately like glass and paper.

The main task is to run and maintain all the existing waste facilities, because the requirements concerning employees and machinery are constantly rising. The volumes of produced waste are also rising due to increasing population and good economic growth.

There is already a lack of incineration capacity in Austria, which enlarges as all sewage sludge will need to be incinerated in ten years time.

In Austria it depends on the staff and especially the lead operator of a wastewater treatment plant if RES are used or not. There are no promotion programs nor special funding nor feed-in tariffs for electricity. Sewage sludge and sewage gas are explicitly denominated as renewable energy carrier in the Green electricity law, but there is no obligation to contract electricity from sewage sludge for the Green electricity management body (contrary to most other renewables - § 13) and is explicitly excluded in the technology funding program § 43.

Future legislations should aim on building a level playing field for all renewable energy carriers, including all the RES on wastewater treatment plants.

Moreover regulations on the gas quality in the grid should not be increased if it is a threat for renewable gas injection, such as from sewage gas, which is currently under discussion in Austria.

# 6. Drivers and existing approaches to overcome barriers in Austria

Energy from waste water compared to wastewater treatment plants is no priority in the legislation, neither on national nor on regional level. Wastewater treatment plants are designed for cleaning waste water. Certain barriers were addressed before that might add additional problems for wastewater treatment plants in applying energy supply systems.

There is no encouragement from policy makers for the management of wastewater treatment plants to act as an energy supplier. Also spatial planning regulations until now do not consider the existence /absence of local surplus energy as a reason for dedicating land as building area or not.

Successful examples are needed and have to be promoted in order to raise awareness of this important energy potential to gain more relevance in legislation.

# 7. Appendix I: Questionnaire for Legal and Policy Barrier Analysis

This questionnaire is intended for gathering primary and secondary data needed to accomplish D2.4.1. There is no obligation to use it, but you may find it useful drawing on all or several of the proposed guiding questions.

- Conduct 5-10 interviews with experts such as utility staff or policy makers and other experts, separately or in focus groups;
- Adjust questions according to the type of interviewed respondent, characteristics of the treatment facility and utility and country context.

Comment: No interviews were made so far on specifically this topic, so this section remains empty until the stakeholder dialogue has been performed.

## Legal and Policy Barriers in Country X

1. How conducive is the legal and policy framework in supporting the implementation of EE and RE measures in the WWTP(s) of your country?

2. Can you outline and describe in detail the most significant legal and policy barriers, differentiating between the main ways for exploiting energy from wastewater where relevant (such as improving operational energy efficiency or generating electricity and heat from biogas)?

3. Can you identify the political level(s) at which legal and policy barriers may be most severe (EU/International, national, federal and local)?

4. Does the legal and policy situation support or impair interventions for exploiting waste heat more than electricity or vice versa? If so, what barriers apply?
5. Which legal and policy barriers constrain WWUs from using surplus heat and electricity for self-supply?

6. What legal and policy barriers impede supplying waste heat or electricity to the market in your country? For example, regulations may prohibit WWUs from entering business other than managing wastewater while low subsidies for RE might constrain them to gain financial sustainability.

7. What legal and policy barriers particularly apply for integrating systems of solid waste and wastewater to use organic substrates for enrichment of sludge in the co-fermentation process?

### Policy and legal drivers and approaches to overcome barriers in Country X

8. Can you outline and describe the most significant legal and policy drivers, differentiating between the main ways for exploiting energy from wastewater where relevant?

9. What governmental or private sector actors do you consider most critical for improving the legal and policy framework for wastewater-to-energy systems?

10. What actor-based instruments (such as a central agency to coordinate interventions with respect to energy-related matters or specific funding or educational programmes) have been established to promote wastewater-to-energy systems?

11. Are you aware of legal and policy interventions that are currently being planned or already under way to overcome the main barriers you mentioned above (e.g a revision of the sludge ordinance or law with respect to CHP?)

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