

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

CZECH REPUBLIC

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## 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 al. 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 prioritisation 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 (WWTPs). 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 CO<sub>2</sub> 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. Wastewater-to-energy solution in Czech Republic

#### 4. The EU-Legal and Policy Framework

#### 5. Overview on legal and policy situation in Czech Republic

The WWTP in Prague includes a sludge line with AD thermophilic process. The biogas is now incinerated at the on-site CHP plant, which has a capacity of 5 MW of electricity (gas piston engines). Limited used is made out of heat. Biogas yields are enhanced by co-fermentation of the sludge with liquid biowaste. In the context of REEF 2W, biogas upgrading unit will be installed, allowing to convert the biogas into biomethane.

##### 5.1. National Level

###### 5.1.1. Water management regulation

Environment Act No. 17/1992 Coll.

The law prescribes that everyone's duty is to prevent pollution or deterioration of water and to minimize the adverse effects of human activities on water quality. According to the act, everyone using water sources is obliged to design and realize structures to prevent water pollution and to restore water sources.

Act No. 274/2001 Coll. on Water Supply and Sewerage for Public Use and on Amendments to certain acts (Act on Water Supply and Sewerage)

The act regulates the relations pertaining to the development, construction and operation of public water supply and sewerage systems.

Decree No. 428/2001 Coll. (Amendment by Decree No. 48/2014 Coll.) implementing the Act No. 74/2001 Coll. on Public Water Supply and Sewerage Systems and on Amendment to certain acts with Amendments No. 146/2004 Coll. and No. 515/2006 Coll.

Act No. 254/2001 Coll. on Water and Amendment to Certain Acts (Water Act)

The act deals with the protection of surface and groundwater, economic use of water resources and improvement of water quality, and safety of water works. The act also protects aquatic ecosystems and regulates legal relations to surface and groundwater. The Decree No. 293/2002 Coll. on Fees for Discharge of Wastewater to

Surface Water (amended by Decree No. 110/2005 Coll.) is an important part of the Water Act. The Decree defines the sources of pollution, levels and thresholds of pollution of wastewater and methods to measure discharged wastewater.

Government Order No. 401/2015 Coll. amending the Government Order No. 61/2003 Coll. on

In accordance with the EU law, this government order determines indicators for assessment of water quality of watercourses, surface waters, for wastewater, indicators and limits of permissible pollution (including for wastewater discharge) and for surface water bodies functioning as sources of drinking water, as well as for several other water systems.

There are a number of other technical standards and industry regulations for the implementation of the wastewater treatment plants and other water supply systems that are not listed.

### 5.1.2. Waste management

The main waste management regulations are:

- Act No.185/2001 Coll. on Waste and Amendments of Certain Other Acts, as amended
- Government Order No. 197/2003 Coll. on the Waste Management Plan
- Decree No. 294/2005 Coll. on Conditions for the Disposal of Waste at Landfills and its Use on the Surface of the Land, Amendment No. 387/2016 Coll.
- Decree No. 341/2008 Coll. on Details of Biodegradable Waste Management

Especially the Decree No. 341/2008 gives the specific requirements on the quality of treated bio-waste, the level of treatment and the requirements for the quality of output materials from processing plants.

### 5.1.3. Renewable energy regulation

Legislation in the field of energy is composed of three main regulations - Act No. 458/2000 Coll. on business conditions and public administration in the energy sectors (Energy Act), which regulates the basic conditions of business and state regulation in the electricity, gas and heat industries; Act No. 406/2000 Coll. on Energy Management, which sets the rules for efficient and sustainable use of energy and energy sources; and finally Act No. 165/2012 Coll. on Supported Energy Sources. These acts introduce into the Czech legal order a number of requirements of European Community law. Partial provisions of the acts are specified by dozens of implementing decrees and government orders.

Act No. 458/2000 Coll. on Conditions of Business Activities and State Administration in the Energy Sectors and on the Amendment of certain acts (Energy Act)

This act defines the conditions for production, transmission and distribution of electricity, gas, and energy, as well as for the trade of these commodities. Licenses for trading energy are granted by the Energy Regulatory Office (ERO). The Act further



defines the conditions of the electricity, gas, and heat market and the rights and obligations of involved actors.. Act No. 458/2000 Coll. also defines renewable energy sources, combined generation of electricity and heat and the mandatory purchase of these energies. The Ministry of Industry and Trade and the ERO are responsible for the state administration, the State Energy Inspectorate is appointed as a control body.

#### Act No. 406/2000 Coll. on Energy Management

This act sets out measures to increase the sustainable management of energy use and the rights and obligations of energy management and energy sources. The State Energy concept, territorial energy concepts and the State Program to Promote Energy Savings and Use of RES are the basic concepts for efficient energy use. The Act further sets minimum energy efficiency requirements for energy production, energy performance indicators for buildings, heating and hot water preparation, and obliges utilities to perform energy audits for larger energy consumers as well as energy performance certificates for all new buildings and reconstructions of larger buildings. Under this Act, it is mandatory to label electrical appliances with energy labels and their construction is subject to eco-design requirements.

Act No. 165/2012 Coll. on Supported Energy Sources and on Amendment of certain Acts regulates the marketisation of electricity, heat and biomethane from renewable energy sources, secondary energy sources, high-efficiency co-generation and decentralised electricity generation, state administration and law enforcement, and the rights and obligations of natural and legal persons involved.

The Act also regulates the Czech Republic's National Action Plan for Renewable Energy, the conditions for the issue, registration and recognition of guarantees of origin of energy from RES, conditions for issuing certificates of origin of electricity produced from high-efficiency cogeneration or secondary sources, financing of support for the costs related to the support of electricity from supported sources, heat from RES, decentralised electricity generation, biomethane, and providing a subsidy to the market operator to cover these costs and the electricity from solar radiation.

The act aims, among others, at supporting the development of RES, high-efficiency co-generation of electricity and heat, bio-methane and decentralized electricity generation, and to contribute to the sustainable use of natural resources. Financial support is provided depending on the type and electricity output capacity, in the case of biomass above that according to fuel quality. The ERO announces annually the minimum redemption prices in accordance with the rules set out in this Act.

ERO price decision - annually determined price of energy from RES.

Decree No. 459/2012 Coll. on Biomethane Requirements, Method of Biomethane Metering and its Quality Injected to the Transmission System, Distribution System or Underground Gas Storage Facilities.

Technical rules GAS TPG 902 02 „Quality and Testing of Gaseous Fuels with High Methane Content“,

Technical recommendation GAS TPG 983 01 - „Injection of the Biogas into Gas Networks, Requirements for the Quality and Metering“,

Decree No. 108/2011 Coll. of 14th April 2011 on Gas Metering and the Method of Determining Compensation for Unauthorized Supply, Unauthorized Supply, Unauthorized Storage, Unauthorized Shipments or Unauthorized Distribution of Gas,

Decree No. 345/2002 Coll. specifying metering devices for mandatory verification and metering devices subject to type approval, as amended.

#### 5.1.4. Veterinary legislation

If a plant processes waste containing animal by-products - except the organic fraction of mixed municipal waste, i.e. food wastes, waste from supermarkets with meat content - it must comply with the veterinary legislation.

Act No. 166/1999 Coll. on Veterinary Care and Amendments to Related Acts

Government Order EP 1069/2009 on animal by-products treatment

Decree No. 94/2010 on Certain Veterinary and Hygiene Requirements for the Transport and Animal By-Products Processing, the packaging, containers or vehicles.

#### 5.1.5. General laws of environmental protection

These legal regulations concern practically every project in CR during the preparation, implementation and operation phase. These are the acts on environmental protection (Clean Air Act, Public Health Act), Building Act, Nature and Landscape Protection Act, Environmental Impact Assessment Act and Integrated Prevention Act.

Act No. 100/2001 Coll. on Environmental Impact Assessment applies practically for all waste treatment plants and projects producing emissions. At least, EIA screening procedure must be done.

Act No. 76/2002 Coll. on Integrated Prevention. The obligation to process the IPPC applies for projects with the capacity higher than 75 t/day of other waste treatment, projects with capacity higher than 10 t/day of animal by-products, for all projects processing hazardous waste.

Act No. 258/2000 Coll. on Protection of Public Health - protection of human health from noise and other factors.

Government Ordre No.148/2006 Coll. Sb., on the Health Protection from the Adverse Effects of Noise and Vibrations - noise limits are defined in detail regardless of origin (transport and stationary sources).

In the sphere of construction, territorial planning is very important. The project location must be in accordance with the territorial plans and its regulations in the area. Any modification of the territorial plan is a long-term process with potential complications.

The basic law is Act No. 183/2006 on Territorial Planning and Building Regulations. According to it, projects of waste treatment or energy production must follow a territorial and construction procedure according to this law. These procedures can be merged on request and for small projects only.



## 6. Main legal and policy Barriers in Czech Republic

The following laws and regulations currently act as barriers to introduce or improve efforts concerning EE and RE production in the WWTP.

### Waste management regulation

The Czech legislation defines WWTPs as a public infrastructure that serves to treat municipal and industrial wastewater. There is no legal requirement for a special “permit” for waste processing and management. Development and operation is governed by the Water Act 254/2001 Coll. only. If there is a special step to treat other waste than public or industrial wastewater (normal/concentrated), the WWTP has to fully respect the requirements of waste legislation (Act. No. 185/2001) and the facility or its part shall be classified and approved in line with the waste legislation requirements. This change can be enacted because in some cases, despite minimum technological changes, the EIA process and territorial planning has to be respected. The process of applying for using bio-waste for co-fermentation in WWTPs is complicated.

Pursuant to Czech legislation, WWTP Sludge has its own waste category with specific limits for further handling and utilisation. For a WWTP treating bio-waste there has to be specified, that output remains as “sludge” or “waste processing by-product” by Government order No. 93/2016

WWTP Sludge (both stabilised and also non-stabilised) is categorized as No. 190805 “Sludges produced by municipal waste water treatment” by the Czech waste catalogue - specified by Government order No. 93/2016. These sludges can be utilised as “stabilised sludge” in agriculture according to Government order 437/2016 or disposed as waste or bio-waste. In CR, the bulk of sludge is currently used in agriculture.

By transforming the WWTP to plant with other bio-waste input, there is possibility to have to change output sludge classification to category 190604 “Anaerobic digestion of municipal wastes products” or 190606 “Anaerobic digestion of vegetable and animal by-products residual material”. These wastes have to be processed with different technologies with very limited use in agriculture. For wastes with animal by-product content, including gastro waste from restaurants, it is necessary to comply with veterinary legislation, and especially the Hazard Analysis and Critical Control Point (HACCP).

For anaerobic digestion, gastro waste and slaughterhouse meat waste is interesting. Veterinary legislative specified some requirements for waste processing plants:

According to Act EP 1069/2009 (chapter 29) all processing plants for animal by-products (including gastro waste) has to achieve HACCP standards.

## Energy regulation

Future development of RE prices is uncertain in the CR. This is mainly because for new RE installations subsidies such as green bonuses have been suspended. Subsidies for existing installations have been reduced or completely withdrawn following achievement of the investment breakpoint time (the complete payback of initial investment - the key indicator is project IRR - for biogas projects it is 10.6%). So there are currently no bonuses for new biomethane projects or other RE projects. The policy situation regarding subsidies for heat utilisation is becoming more complicated. Only for biogas plants operated with manure and biowaste are eligible for subsidies.

Existing WWTP with AD commonly use the biogas in CHP units. Until 2013 fixed prices for electricity produced from biogas were guaranteed for minimum 15 years of operation. After 2013 all subsidies for new projects stopped and no follow-up programme or subsidy policy for RE was introduced. In addition, several additional limitations for existing projects were established. For example, the Energy regulations authority specified efficient heat utilisation (means, that there are specified method what is efficient heat utilisation and what not), also new tool of “recompensation” for existing projects was established - after 10 years of operation project was inspected and if there is too much profit, operator have to reward some part of subsidy).

While the situation is improving, there are many cases where it is uncertain how authorities will determine eligibility criteria for receiving subsidies.

For example: biogas plant started before 2013 has guaranteed electricity price. With main technology change - with some technology improvements Operator should lost the claim for guaranteed price. This is unacceptable for most operators and owners.

## Technology barrier

AD is a common method for sludge processing at most mid-sized to large sized WWTPs in CR (>50000 PE).

In most WWTPs in CR, AD facilities were constructed out of concrete or steel tanks, between 1980 and 1990. Mixing of digesters is realized by biogas blowers, heating is always external with heat exchanger (desk type mostly). This design is unsuitable for solid waste processing while only liquid wastes can be processed.

For waste processing, it is necessary to replace existing treatment elements for sorting, shredding, storage, and feeding and the reactor technology. This renders building a new waste processing site often more economic.

One example is the Marius Pedersen Rybitví project: Company Marius Pedersen (waste operator company) rebuild part of WWTP to bio-waste processing biogas plant. There was one large non-used activation tank rebuilt into a new fermenter. In addition, new facilities for waste sorting and processing weres built. Despite the fact, that project is situated at WWTP, there is no connection to WWTP operation and technologies are completely divided.

## Bio-waste availability

In CR, a large share of the population lives in small cities and villages. Bio-waste production is divided and in past years lots of subsidies went to building small and mid-sized compost plants. Most of bio-waste from rural areas is treated by compost plants and is not available for energy production. A more significant amount of bio-waste is collected in larger cities, and adequate quality of it comprises a significant challenge. This applies particularly to city centers and block housing complexes (built 1970 - 1980). The main problem here is low quality and quantities of yielded bio-waste per inhabitant, making collection a costly enterprise and then high cost of collecting. Exempted from it are residential areas with single-family homes. There, collecting systems attain good results in terms of the quantities and quality of bio-waste (mainly Prague and other big cities).

## 7. Drivers and existing approaches to overcome barriers in Czech Republic

In order to speed up development of new renewable energy projects, amendments pertaining to the waste-to-energy legislation are necessary.

There is a big issue with processing by-products usage - mainly stabilised fractions of MSW, as well as with WWTP sludges and composts. There are unachievable limitations at stability (AT4 value) and calorific value for landfilling these materials. This stopped any technology development other than incineration.

The status “end of waste” shall be introduced in the new Waste Act, which will be submitted by the end of 2018. Veolia is striving to emphasise the need for such simplification at the water and waste industry level with relevant stakeholders. Also a careful exclusion of several waste categories from veterinary legislation would simplify the development of projects such as the Prague project.

In the long run, it is absolutely vital to define the optimal share of RE in the national energy mix and assign appropriate resources to develop appropriate projects. The corresponding legislation to the main types of projects must enable simplified project development and operation. At the moment the reality in CP is different: There is no RE policy with a minimum horizon of five years, which would support the most efficient projects.

## 8. 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.

## Legal and Policy Barriers in Czech Republic

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 Czech Republic

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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