

D.T3.4.3

REEF 2W GUIDE FOR PUBLIC ADMINISTRATIONS

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ZAGREBAČKI
HOLDING d.o.o.



adelphi



VEOLIA

Montefeltro
servizi



UNIVERSITY OF
CHEMISTRY AND
TECHNOLOGY
PRAGUE



REGIONALNA
ENERGETSKA
AGENCIJA
SJEVEROZAPADNE
HRVATSKE



Reinholdungsverband Trattnachtal
Biogas Trattnachtal GmbH

KOMPETENZ ZENTRUM
Wasser Berlin



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1. INTRODUCTION

The purpose of this deliverable is to provide a reference guide for public administrations, which will highlight the benefits of integrated solutions REEF 2W, indicating how to proceed in sustainability analysis of different available technological innovations.

The contents of the document is: the introduction of deliverables goal, explanation of background background from which the guide is based and basic principles of guiding.

This brief general guide was elaborated based on the results of experience gained during the project solution and based on all received feedback expressed during meetings with public administrators in all participating countries.

2. BACKGROUND

According to European Green Deal set by European Commission it is necessary to expect growing effort to make EU's economy sustainable. European Green Deal provides an action plan for making Europe climate neutral by 2050, boosting the economy through green technology, creating sustainable industry and transport, cutting pollution. It is going to be funded through public and private finance. Therefore the pressure on public administrators will exists to propose and evaluate the innovative measures leading to fulfilling above mentioned goals.

Solutions proposed and verified by the REEF 2W project can contribute to this effort very significantly.

Basically, wastewater contains two types of energy, chemical one the form of bound carbon and thermal one in the form of hot/warm effluent from domestic, commercial and industrial sites. The former can be accessed by means of anaerobic digestion of the sewage sludge in the form of digester gas (biogas). The latter can be recovered heat exchanges, which are directly installed in the wastewater flow, and a subsequent application of a heat pump. In addition, wastewater treatment plants have large areas of open space (e.g. roofs) which can be used to access solar energy. For the sake of completeness, it shall also be mentioned that the available open space might also be used for wind power installations and the effluent of a wastewater treatment plant might be suitable for hydropower generation. However, in the context of the REEF 2W project the following options for wastewater-based generation of (renewable) energy are in the centre of interest:

- Electric and thermal energy from digester gas (biogas) combustion (only at wastewater treatment plants with anaerobic sludge treatment)
- Thermal energy from wastewater heat recovery in the effluent of wastewater treatment plants
- Electric energy from solar installations on the premises of wastewater treatment plants



Figure 1: Prague wastewater treatment plant whose operators contributed to guide principles verification

The main challenges public and private operators of wastewater treatment plants are likely to face when implementing (some of the) suggested strategic actions can be summarised as follows:

- Inadequate support from municipal/regional/national level of the government;
- Insufficient support from local community;
- Inadequate legislative, policy and operational framework;
- Poor system of incentives and finance models in general.

The suggested CEU program area strategy is structured and written in a way to deal with and to overcome those challenges. It is kept broadly. Not all the recommendations may suit the local context in the EU Member States.

Additional proactive efforts and actions are needed from all involved institutions, sectors and stakeholders to better harness this great potential of renewable energy sources related to wastewater treatment plants. In this context, it is crucial to link energy, wastewater and (solid) waste sectors in their specific spatial context. This will maximise synergies from the implementation of joint renewable energy solutions to obtain a cleaner, healthier and more sustainable environment and society.

Nowadays the public administrators needs to have a tool for evaluation and decision about potential improvement in wastewater and solid waste management in the municipality,

Today, there is a strong need for public administrators to have a tool for evaluating and deciding on potential innovative measures leading to improvements in the field of wastewater and solid waste management in the municipality, district or region for which they are responsible.

The presented guide can serve as such a tool.

3. GUIDE STRATEGY

The guide strategy can be described by following list of consecutive steps describing the activities of public administrators.

- 1) Definition of a need to improve the local wastewater and solid waste management especially in context of improved renewable energy sources utilization
- 2) Public administrators contact REEF 2W platform or REEF expert
- 3) Jointly evaluate opportunities for improvement
- 4) Proposing of alternative solutions
- 5) Evaluation of alternatives using tools developed within REEF 2W
- 6) Evaluation of the most promising alternatives using ISA developed within REEF 2W
- 7) Evaluation of financing options based on deliverable DT_3.2.1_Financial Options Analysis
- 8) Decision making about improvement of wastewater and solid waste management
- 9) Prepare a strategy for presenting the decision to the public based on steps (5,6,7)

Alternatively situation can arise by submission of proposal to improvement of wastewater and solid waste management by external body, than the activities of public administrators in direction to evaluation of such a proposal are similar starting from the point 5.

3.1. Definition of a need to improve the local wastewater and solid waste management

The public administrators alone or based on cooperation with experts has to define what are the main requirements and challenges in the local wastewater and solid waste management. Special attention needs to be focussed on the electric and thermal energy from biogas combustion, thermal energy from wastewater heat recovery in the effluent of wastewater treatment plants and electric energy from solar installations on the premises of wastewater treatment plants. The potential technologies available in this field are described in deliverables of REEF 2W workpackage T1 especially D.T1.1.1 List of best practices to be investigated.

3.2. Public administrators contact REEF 2W platform or REEF expert

The public administrators alone or based on cooperation with their experts are recommended to contact REEF 2W platform or REEF 2W experts which are ready to share the know-how necessary to responsible and sustainable decision making about innovations in wastewater and solid waste management. The needed information are available in D.T3.4.2 REEF2W platform with an action plan for a stable open collaboration among the organizations involved.

3.3. Jointly evaluate opportunities for improvement

The public administrators in cooperation with the REEF 2W platform or REEF 2W experts will analyse the local situation and select the potential innovations leading to an improvement in wastewater and solid waste management especially in context of improved renewable energy sources utilization. The potential solutions available in this field are described in deliverables of REEF 2W workpackage T1, especially D.T1.2.3 Guiding document to demonstrate the benefits of implementation of REEF 2W plants.

3.4. Proposing of alternative solutions

The public administrators will propose based on the findings gained in previous step 3 the potential innovations leading to an improvement in wastewater and solid waste management. The principles of proposed technological solutions needs to be described sufficiently to allow their evaluation in further steps.

3.5. Evaluation of alternatives using tools developed within REEF 2W

The proposed technological solutions are evaluated using the TOOL No1 developed within the workpackage T1, especially D.T1.3.2. Electronic version of the guide for checking the soundness of the REEF 2W with added calculations in excel sheet. The training courses (deliverable D.T2.2.1) in all project countries introduced the TOOL and methodologies set up in T1, therefore each public administrator interesting in serious and correct evaluation has to find experts willing to help with such a task.

3.6. Evaluation of the most promising alternatives using ISA developed within REEF 2W

The best technological solutions selected using the TOOL No1 in previous step 6 will be evaluated by methodology of Integrated Sustainability Assessment (ISA) developed within the workpackage T1 and optimized and verified within the workpackage T3 especially D.T3.1.1. Document describing general framework conditions for ISA and D.T3.1.2. Validated ISA procedure to be used in REEF 2W feasibility study.

3.7. Evaluation of financing options

Very important for making of a decision is the financing of the proposed innovations. Therefore the involved public administrators has to perform an evaluation of financing options. This task will be accomplished using the deliverable DT_3.2.1_Financial Options Analysis which is available taking into account specific conditions of each project country.

3.8. Decision making about improvement of wastewater and solid waste management

Public administrators will make the decision about measures adopted to the improvement of wastewater and solid waste management and improvement of renewable energy sources utilization. The use ISA a multicriterial multi-criteria decision analysis (MCDA) allow to make objective and sustainable decision based on solid data about specific parts of ISA - social, environmental, economic and technical.

3.9. Prepare a strategy for presenting the decision to the public based on previous steps

For the positive social acceptance of the decisions adopted it is extremely important to prepare a strategy for presenting the decision taken on the basis of clear data obtained within steps (5,6,7). This strategy will public administrators prepare using the results of work-package T4, especially D.T4.4.1 CEU program area strategy about development of REEF 2W solutions based on gained experience and D.T4.4.2 Sharing of the CEU program area strategy among the stakeholders and testimonial opinion leaders.

4. CONCLUSION

REEF 2W Guide for public administrations was prepared based on results and experience gained within the REEF2W project. This document will serve as a guide to the successful application of innovative technologies for the improvement of wastewater and solid waste management and improvement of renewable energy sources utilization. The guide will be a live document supplemented by further experience within the open platform established for further exchange of experiences.