Output factsheet: Trainings

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<td>6 BOKU</td>
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Summary description of the implemented training measure(s), explaining the specific goal(s) and target groups

The Austrian training course was held at the pilot plant of RHV Trattnachtal in Upper Austria. The target group was the management of the pilot plant itself. The goal was to inform the management about the usability of the developed REEF2W-Excel-Tool and to fill in the plant-specific values in order to verify the tool and to identify possible shortcomings resp. hints for enhancement of the tool. In the end the tool shall give an overview for RHV Trattnachtal which technology combination delivers the best environmental and economic outcome. The goal of the pilot plant management is to optimize the WWTP efficiency and accordingly to maximize the heat surplus of the plant, also by using unused energy flows. The excess heat shall be fed into a grid serving the two adjacent municipalities Wallern an der Trattnach and Bad Schallerbach. Therefore, it is planned to install a heat pump with about 2 MW using the cleaned wastewater as heat source and to build up a heat grid between the RHV Trattnachtal and the thermal bath “Eurothermen Resort Bad Schallerbach” which is about 5 km away. Between the two sites there are the two named municipalities. From the WWTP the wastewater heat will be the main heat source; furthermore heat from sewage gas production can be used. From the bath geothermal energy can be delivered (source temperature approx. 37 °C); the temperature level could be increased by heat pumps. However, mainly low temperature heat can be delivered, serving domestic floor heating, but also warm water by temporarily increasing the grid temperature (using the sewage gas heat).

NUTS region(s) where training(s) have been conducted (relevant NUTS level)

The training was performed in the NUTS-region “AT 312 Linz-Wels”
Expected impact and benefits of the trainings for the concerned territories and target groups

It is expected that the training course builds the basis for the implementation of the described optimization of the WWTP plant of RHV Trattnachtal and the construction of a local heat grid including the thermal bath in Bad Schallerbach. Environmental benefits by using less fossil energy as well as economic benefits by increasing the local creation of value can be expected. The project and especially the performed trainings are able to deliver information on these issues, either through direct involvement or by delivering the right strategies or tools in order to give the opportunity to develop suitable strategies on their own. The region can moreover benefit from knowledge transfer based on experience with the planned energy system.

Sustainability of the training(s) and developed training material(s) and their transferability to other territories and stakeholders

It is expected that a realization of the planned optimization of the WWTP plant of RHV Trattnachtal will have a sustainable impact on the energy consumption of the region, especially if this example can be multiplied in other plants. This will be the case if the technical and economic performance of implemented measures are in a reasonable range and especially if the expected values can be met in practice. At present, the trainings materials, especially the tool, are not suitable to meet the requirements but the approach in general is appreciated. Regarding transferability a large number of WWTPs in (Upper) Austria exists; however, not always a partner like a thermal bath is available. Also the surrounding areas are different in energy consumption (amount, profiles, temperature). Therefore, a direct adoption of the findings is not possible. Still, the findings and especially a possible realization can serve as a lighthouse project for the suitability of WWTP as energy sources.

Lessons learned from the development and implementation of training measures and added value of transnational cooperation

During the training the following key findings could be identified: The REEF2W approach is highly appreciated as it gives WWTP plants the opportunity to increase the surplus energy and to understand the environmental implications of such measures (important also e.g. for subsidies) and the direct economic benefits. As it allows the inclusion of different technologies, various scenarios can be simulated. However, the current version of the REEF2W-Excel-Tool cannot be used to reach the set goals as there are still a lot of shortcomings explained in detail in DT2.2.2. However, it can be expected that this project will raise the awareness for the importance of this topic.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

DT2.2.1
DT2.2.2
Output factsheet: 0.T2.1 “5 Training Courses in the 5 regions for utility partners and stakeholders on pilot activities”

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**Summary description of the implemented training measure(s), explaining the specific goal(s) and target groups**

The training has the main purpose to present and interactively test the Integrated Sustainability Assessment (ISA) tool that can be used to systematically assess technical innovations for energy optimisation of wastewater treatment plants (WWTPs) on different sustainability criteria. In this way it helps potential users such as utility operators or decision-makers in municipalities to determine whether and how the implementation of measures to increase energy efficiency and renewable energy generation are useful. It does this by making predictions about potentials to improve energy performance, the technical feasibility or the environmental sustainability of the ReefZW solutions. Target groups were professionals working on the management and planning of plants, well acquainted of wastewater treatment issues. The pool of participants comprised three different backgrounds: the representatives from Zagreb City Holding, the representatives of ZOV (Zagreb Wastewater Ltd.) - operators of the Zagreb WWTP and representatives of REGEA who were also the organizers of the training course. Practical experience in engaging with wastewater treatment utilities was provided through WTE Wassertechnik Ltd. which runs and oversees wastewater treatment plant in Zagreb.

**NUTS region(s) where training(s) have been conducted (relevant NUTS level)**

The training course was held on November 14, 2018 in the premises of ZOV (Zagreb Wastewater Ltd.). Čulinečka cesta 287
Expected impact and benefits of the trainings for the concerned territories and target groups

The first training course was the first formal event organized for public utilities. The training aimed to introduce the REEF 2W project, discuss the possible obstacles and to present the tool developed within the project. Therefore, in the first part of the training the participants were given a short overview of the REEF 2W project goals and activities and short discussion on current legislative and financing barriers has followed. The participants from Zagreb wastewater company (ZOV) were informed about the feasibility studies that will be performed within the project and technologies covered by the project. Moreover, the organizers presented the ISA-tool developed by project partners and explained how to use it in order to raise the awareness and motivate them to use it within their utilities.

An expected benefit was certainly to receive the first feedback on the current tool version. The tool was introduced through the excel file which included its key sections followed by detailed explanation. Each tool component was discussed which allowed to receive the participant’s feedback on what could be updated or revised in the next version. Participants were also invited to fill in the questionnaire developed within the project in order to receive more specific feedback for tool improvements. As for the near future, comments of participants on the improvement of the tool within the evaluation questionnaire shall be taken into account during its finalisation.

Sustainability of the training(s) and developed training material(s) and their transferability to other territories and stakeholders

Sustainability and transferability of trainings:
Sustainability of the training will be achieved through the usage of project outputs by project partners and all other key stakeholders involved in the project activities or interested parties. In the case of the first training course in Zagreb, the WTE Wassertechnik (a part of a consortium that owns Zagreb wastewater treatment plant in charge of the management of the CWWTZ) showed interest during the training to stay involved in further project activities, especially ones regarding the development of the pilot case MODEL A, and even to use it within the utility and promote the tool once it is finalised.

Sustainability and transferability of training materials:
The training materials for the Zagreb training included a power point presentation with general information on the REEF 2W-project and the ISA-tool, the ISA-tool in form of an Excel table, the Guideline for the ISA-tool (DT1.5.1) and the Training Curricula (DT.1.5.5) in Croatian. All of the materials were also printed and shared with the participants on the USB-sticks which were gifted to the participants together with other promotional materials developed within the project (leaflets, notes, pencils and cotton bags) but will also be used during the Training of of public administrations, the Training of Trainers (DT4.2.1) and Trainings of Public Administrations (DT.4.5) in WP4.
Lessons learned from the development and implementation of training measures and added value of transnational cooperation

The following conclusions are given:

- The pool of participants comprised three different backgrounds: the representatives from Zagreb City Holding, the representatives of ZOV (Zagreb Wastewater Ltd.) - operators of the Zagreb WWTP and representatives of REGEA who were also the organizers of the training course. These different backgrounds, especially the combination of public utilities and energy agency, enabled to gain interdisciplinary feedback;
- The training proved that the tool is still at an early stage of development, with much work to be done; Therefore, it should be planned for the future trainings to first have the final (or almost final) version of the tool when presenting to the utilities/PaS that are not part of the project consortium in order to avoid looking unprofessional;
- As the agenda in DT.2.2.1 shows, the training for the Zagreb pilot lasted three hours. The duration of the training was shorter than initially planned, but it was certainly enough to discuss everything planned in the agenda.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

The Training Course (DT2.2.1) is an integral part of the project REEF2W. It plays a crucial role in promoting the REEF2W project and ISA tool to different stakeholders. As aforementioned, its purpose was as well to receive feedback for how the tool should be improved during the course of the project. Furthermore the Training Course will also serve as a basis for designing the Training of Trainers (DT4.2.1) and Trainings of Public Administrations (DT.4.5) in WP4.

Figure 1: Velimir Šegon from REGEA presenting the REEF2W-project
Output factsheet: 0.T2.1 “5 Training Courses in the 5 regions for utility partners and stakeholders on pilot activities”

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Summary description of the implemented training measure(s), explaining the specific goal(s) and target groups

The training in Czech Republic was divided in two separate courses. The main objectives were to familiarize the participants with the goals and ideas of REEF2W and interactively introduce the TOOL based on Integrated sustainability assessment (ISA) developed within the project to show the possible usability of this TOOL in practice. TOOL based on the ISA approach can be used for energy optimization of wastewater treatment plant (WWTP) and provide overview on WWTP together with different possible combination of innovative ways and technologies to show the best variation in terms of environmental and economic outcome. Another reason for introducing and testing the tool was to find possible shortcomings and improvements based on feedback from the course participant for further development of the TOOL. The targeted groups were operators of Wastewater Treatment Plants from PVK Company, which among other operates biggest treatment plant in Czech Republic (one training) and another interested parties from fields related to REEF2W project (second training).

NUTS region(s) where training(s) have been conducted (relevant NUTS level)

The trainings were held at two places UCT Prague (Technická 5 166 28 Praha 6 - Dejvice) and PVK Company (Papiřenská 6, 160 00 Praha 6), but both of them are in the territory...
of Capital City of Prague.

Country (NUTS 1) CZ0
Oblasts (NUTS 2) CZ01, Prague
Region (NUTS 3) CZ010, Prague

**Expected impact and benefits of the trainings for the concerned territories and target groups**

It is expected that the information given about the REEF2W to the participants during the training courses will be spread among other public utilities and interest groups from the field of wastewater treatment and energy agencies due to their personal and business contacts. Another impact of the training is that participants are aware about the connection between the REEF2W and Prague pilot case which will be one of the first biomethanization application in Czech Republic and an example for the future implementation of innovative technologies relating to REEF2W at WWTPs in the region. The benefits from testing the real data with experts from the field was also helpful and crucial for improvement of the TOLL and its wider use.

**Sustainability of the training(s) and developed training material(s) and their transferability to other territories and stakeholders**

The targeted groups of the trainings had different professional background (technical operators of WWTP at different position, business managers, environmental inspector, designer of environmental facilities, and the manager of a water utilities association). All participants show interest in promotion of REEF2W principles and application of presented TOOL (when the TOOL will be in final version). During the training the suggestion was made to examine the possibility of linking our TOOL with others and develop the tool behind the scope of the project. The proposal was well accepted by PVK company which show interest in possibility to further develop the tool for their need.

The training materials used during both trainings courses (PowerPoint presentations, Guideline for the ISA-tool (D.T1.5.1), Training Curricula (D.T1.5.5) in Czech) were made available in printed form and distributed among the participants in multiple copies. The training materials will be also available online on the website and later used during the D.T4.2.1 Training of Trainers and D.T4.5 Trainings of Public Administrations.

**Lessons learned from the development and implementation of training measures and added value of transnational cooperation**

From training courses we learnt that targeted groups (operators of WWTP, public utilities and energy agencies) are busy and completely different schedules, which led us to separation and shortening the courses than it was originally planned. Their schedule is often changing so we need to take in count that cancelation few days and even moments before the trainings can occur and thus increase number of invited people from interested parties at maximum.

Furthermore, even though the REEF2W project has been appreciated as beneficial to all participating groups, it is necessary to work on the removal of shortcomings in the tool and to achieve a higher level of the TOOLS both on the user and content parts.
References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

Relevant deliverables to this output are D.T2.2.1 5 training courses in the 5 regions for utilities partners and stakeholders on pilot activities and D.T2.2.2 Feedback from the training courses and evaluation.

Fig. 1: Prof. Jeniček from UCT presenting the REEFZW project
Output factsheet: O.T2.1 “5 Training Courses in the 5 regions for utility partners and stakeholders on pilot activities”

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Summary description of the implemented training measure(s), explaining the specific goal(s) and target groups

The training has the main purpose to present and interactively test the Integrated Sustainability Assessment (ISA) tool that can be used to systematically assess technical innovations for energy optimisation of waste and wastewater treatment plants (WWTPs) on different sustainability criteria. In this way it helps potential users such as utility operators or decision-makers in municipalities to determine whether and how the implementation of measures to increase energy efficiency and renewable energy production are useful. It does this by making predictions about potentials to improve energy performance, the technical feasibility or the environmental sustainability of the Reef2W solutions. Target groups were professionals working on the management and planning of plants, well acquainted of wastewater treatment issues. The pool of participants (excluding the organizers) comprised three different backgrounds: a representative from Berliner Stadtwerke, a public provider of renewable energy and agency to promote them in the city, provided an energy perspective. Practical experience in engaging with wastewater treatment utilities was provided through Berliner Wasserbetriebe, Germany's largest water service provider, which runs and oversees all water and wastewater utilities in the realm of Berlin. Kompetenzzentrum Wasser Berlin is a long-standing partner to both of them, and has led various joint applied research projects on the topic from over recent years. Adelphi has engaged with the water-energy nexus topics in various projects.

NUTS region(s) where training(s) have been conducted (relevant NUTS level)

The training was carried out in the premises of Kompetenzzentrum Wasser Berlin gGmbH (KWB).
Expected impact and benefits of the trainings for the concerned territories and target groups

First, the training had a promotional and educational purpose. While the participants had been aware of the REEF2W-project, the training constituted the first formal event where they learnt about REEF2W, its objectives, and potential outcomes resulting during its course. Therefore, in the first part of the training the participants were given a short overview of the REEF2W project, the different pilot sites and the specific technological upgrades and their differences between them. The participants were informed about the feasibility and advantages of these new technologies. In addition, they learned about the ISA-tool and how to use it. This enables them to apply the tool in their own utility or in other projects.

Another expected benefit for the project consortium was to elicit sufficient feedback about the beta version of the ISA assessment tool. Therefore, the tool was “live-tested” together with the participants. Real data was plugged into the EXCEL tool as the different components of the tool were introduced. This allowed the participants to ask questions, point out aspects that were unclear, and spot errors in the calculations. After the trainings, the participants were issued questionnaires, both to evaluate the facilitation of the training and the tool. This feedback will be used to revise and refine the tool over the course of the next week. It will also be used to prepare the training of the trainings.

Sustainability of the training(s) and developed training material(s) and their transferability to other territories and stakeholders

Sustainability and transferability of trainings:
Sustainability is here defined as the degree to which project outputs are further used during the project period and beyond by partners and other actors. This includes concrete measures (including e.g. institutional structures, financial resources, policy improvements etc.). In the case of Berlin, the Berliner Wasserbetriebe (the municipal water supplier) and the Berliner Stadtwerke (the municipal energy supplier) showed interest during the training to apply and promote the tool once it is finalised. KWB is interested to extent the research on the tool and customize it for other purposes. Furthermore KWB will try to carry out more detailed research on the outcomes of the tool development and ideate about further project development steps. Both of the Berlin project partners (Adelphi and KWB) shared the training events via social media through personal and institutional accounts to further create reach.

Sustainability and transferability of training materials:
The training materials for the Berlin training included a power point with general information on the REEF2W-project and the ISA-tool, the ISA-tool in form of an Excel table, the Guideline for the ISA-tool (DT1.5.1), an abstract of the guideline for the ISA-tool, and the Training Curricula (DT.1.5.5) in German. These materials were made available in printed form. They will also be uploaded to the website and later used during the Training of training of public administrations the Training of Trainers (DT4.2.1) and Trainings of Public Administrations.
Lessons learned from the development and implementation of training measures and added value of transnational cooperation

The following lessons learnt might be most important to the design of the two future trainings:

- Utility operators and representatives of public administrations are usually busy and hard to convince for spending time on matters that bring no immediate payback. The good network of adelphi and KWB proofed crucial in attracting multiple participants. The good quality of the connections was also important for having had them committed to the event. For example, there were few last-minutes cancelations, which is often the case.

- The pool of participants (excluding the organizers) comprised three different backgrounds: A representative from Berliner Stadtwerke, a public provider of renewable energy and agency to promote them in the city; representatives from wastewater and water utility, Berliner Wasserbetriebe (BWB); and policy makers. These different backgrounds were important for gaining interdisciplinary feedback.

- The size of the wastewater utility is important for gaining relevant feedback. The Berliner Wasserbetriebe is the largest water and wastewater service providers in Germany. For the training, this has advantages. A large operator has more capacity to actually allow some staff to take part in the training, but also to communicate regularly and carry out small research tasks. Additionally, staff in a large utility is likely to be more familiar with a broad range of technical aspects and innovations that go beyond only treating wastewater.

- Before hosting trainings, the tool needs to be able to demonstrate a certain level of readiness. KWB and adelphi learnt that the tool was still at a low stage of development and showed quite a range of major deficiencies and errors. While some of these cannot be avoided, “weak” results could easily give participants the impression that they are wasting their time and discourage them from any further engagement (especially if they are not paid for participation).

- As the agenda in DT.2.2.1 shows, the training for the Berlin pilot lasted two hours. The duration of the training was shorter than initially planned. KWB and adelphi decided to do so consciously. Our perception was that a longer training would have resulted in a lower number of participants.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex
The Training Course (DT2.2.1) is an integral part of the project REEF2W. It plays a crucial role in promoting the REEF2W project and ISA tool to different stakeholders. As aforementioned, its purpose was as well to receive feedback for how the tool should be improved during the course of the project. Furthermore the Training Course will also serve as a basis for designing the Training of Trainers (DT4.2.1) and Trainings of Public Administrations (DT.4.5) in WP4.

Figure 1: Christian Loderer from KWB presenting the REEF2W-project
Output factsheet: O.T2.1 “5 Training Courses in the 5 regions for utility partners and stakeholders on pilot activities”

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Summary description of the implemented training measure(s), explaining the specific goal(s) and target groups

The training has the main purpose to present and interactively test the Integrated Sustainability Assessment (ISA) Tool developed inside the project that can be used to systematically assess technical innovations for energy optimisation of waste and wastewater treatment plants (WWTPs) on different sustainability criteria. In this way it helps potential users such as utility operators or municipalities or regional decision-makers to determine whether and how the implementation of measures to increase energy efficiency and renewable energy production from organic wastes are useful. It does this by making predictions about potentials to improve first of all energy efficiency of the existing treatment plant and secondary energy recovery from available waste biomasses. This approach is done on the technical feasibility evaluation and the environmental sustainability analysis of the solutions chosen by the user through the Reef2W ISA Tool. The goal of the training was to inform about the availability of the tool and explain how it works. A second relevant goal was to collect information and criticisms on how to improve it for the final version. Target groups were professionals working on the management and planning of plants, well acquainted of waste treatment issues and energy recovery technologies. The pool of participants (excluding the organizer) comprised four different backgrounds: representatives of Montefeltro Servizi partner of the project and interested in the application of the tool potentials in their working area, professionals from the energy private sector interested to understand how a DSS like REEF 2W ISA Tool could provide them a further argument to clarify how the recovery of energy from wastes could be relevant for a Utility and for a Municipality, local policy makers interested to have a tool that could provide them an objective evaluation of the real energetic potentials of available biomasses and the possible fallout on the municipality, private company producing organic wastes with problems of their management and disposal interested in the possible link with the utilities and the territory.
NUTS region(s) where training(s) have been conducted (relevant NUTS level)

The training was carried out in the city hall of the Municipality of San Leo in Emilia Romagna Region. San Leo is one of the 7 municipalities where Montefeltro Servizi conduct its activity. Emilia Romagna is one of the most advanced region in Italy, where waste treatment has very well conducted. Nevertheless the energetic cost of waste and wastewater treatment is very high and only few cases of recovery of energy from wastes have been realized, and the possible link between waste treatment and urban areas is not yet analyzed.

Expected impact and benefits of the trainings for the concerned territories and target groups

First, the training had a promotional and educational purpose. While the participants had been aware of the REEF2W-project, the training constituted the first formal event where they learnt about REEF2W, its objectives, and potential outcomes resulting during its course. Therefore, in the first part of the training participants were given a short overview of the REEF 2W project, the different pilot sites and the specific technological upgrades and their differences between them. The participants were informed about the availability and advantages of these new technologies. In addition, they learned about the ISA-tool and how to use it. This enables them to apply the tool in their own utility or in other projects.

Expected benefits, as already said, for the project consortium was to elicit sufficient feedback about the beta version of the ISA assessment tool. Therefore, the tool was “live-tested” together with the participants. After the trainings, the participants were issued questionnaires, both to evaluate the facilitation of the training and the tool.

For the territories instead was to have the availability of a DSS that could help decision makers and utility professionals to have a larger view about the potentials of a waste treatment plant not only for the energy point of view but also for the reduction of the environmental impacts that suggested technologies could have.

Sustainability of the training(s) and developed training material(s) and their transferability to other territories and stakeholders

Sustainability and transferability of trainings:
Sustainability is here defined as the degree to which project outputs are further used during the project period and beyond by partners and other stakeholders. This includes concrete measures (including e.g. institutional structures, financial resources, policy improvements etc.). In the case of Montefeltro Servizi very much will depend by the future development of the local legislation and the possibility that they will have to implement scenarios suggested by the Tool. On the side also involving other municipalities and the associated partners the toll will be used also in their structures and with future MoU also other utilities and municipalities will use it. As leader of the Project ENEA will keep available the Tool for all other stakeholders that could be interested in future on it, and will try to keep it updated as much as possible with further technologies or evaluations.

Sustainability and transferability of training materials:
The training materials for the training included a power point with general information on the REEF2W-project and the ISA-tool, the ISA-tool in form of an Excel table, the Guideline for the ISA-tool (DT1.5.1), an abstract of the guideline for the ISA-tool, and the Training Curricula (DT.1.5.5) in German. These materials were made
available in printed form for the Participants but it will be available also from the website. Most importantly, experiences and best practices gathered during the training will provide lessons learnt for the REE2W book in a chapter that will potentially focus on an evaluation of the way trainings for wastewater-to-energy should be designed (D.C.2.5).

Lessons learned from the development and implementation of training measures and added value of transnational cooperation

The following lessons learnt might be most important:

- Utility operators and representatives of public administrations are usually busy and hard to convince for spending time on matters that bring no immediate payback. Often they have opposite interest from the utility side they are mainly interested in the economic development of the utility and interested in those technologies able to reduce costs or increase incomes. From the public administrators they are mainly interested in the development of their administrated area with a more relevance for the interest of the population than at the economic aspect of a single company.
- The pool of participants is relevant because the interaction among different interest can help to identify new aspects that can be adequately solved with the collaboration of different parties.
- **The size of the utility** and the population served is important. Small utilities have very few possibilities to find solutions for the recovery of energy with a payback period acceptable. In the case of waste and wastewater treatment plants the basic investment could be too high for a small utility. This means that for this kind of approach the centralization of the treatment is a solution that should be pursue. On the other side to centralize wastewater treatment and probably much more waste treatments is something that is not well accepted by the population.
- One of the main aspects appears during the training is that implementation of EU legislation on waste and wastewater in the national and regional legislations generate an enormous number of local rules some time very different that contribute in the generation of confusion and difficulties on the application of similar technologies in different countries. An homogenization of the national legislation could help in a more easy identification of possible solutions.

References to relevant deliverables and web-links
If applicable, pictures or images to be provided as annex

The Training Course (DT2.2.1) is an integral part of the project REEF2W. It plays a crucial role in promoting the REEF2W project and ISA tool to different stakeholders. As aforementioned, its purpose was as well to receive feedback for how the tool should be improved during the course of the project. Furthermore the Training Course will also serve as a basis for designing the Training of Trainers (DT4.2.1) and Trainings of Public Administrations (DT.4.5) in WP4.
Figure 1: Discussion during the presentation of the tool