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Description of the Deliverable:

The Steam Training Programme report describes the Steam-Up training programme for steam, energy and industry experts, including its framework, scope, contents and materials. Also, the train the trainers and training organization roles are described.

Summary:

The training programme is based on a 12 hour programme, in classroom or blended - depending on the country – using a common training material prepared by partners.

The main objectives of this training programme are building capacity on the application of the developed steam audit methodology, the use of the Energy Management Centre and learning how to sell saving opportunities to top management.

The training programme concerns:

- Essential knowledge regarding smart technologies in steam generation, distribution and maintenance: modern efficient technologies.
- It will also introduce participants to the use of the Energy Audit Methodology including financial indicators.
- The training provided will enable steam auditors to conduct indepth audits that detect energy efficiency measures: energy audit methodology and tools.

Training Programme description

Work package 4

D4.1

Steam - UP

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STEAM - UP

STEAM AND MANAGEMENT UNDER PRESSURE

Report Prepared by Escan, s.l., with support from the STEAM-UP project partners

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1.0 Background

The industrial sector could reduce its energy use by at least 13%. 75% of the potential savings can be found in steam and electric motor systems. Actions to tap the full potential in steam systems have been taken in the past but without success since findings from energy audits were not, or partly, implemented. The following barriers have been identified:

- It has been hard to sell the business case for steam saving measures for enterprise decision makers.
- There is a lack of technical (steam) expertise of energy auditors and within enterprises generally.
- There is no formal organisational structure for dealing with energy efficiency (energy management).
- There is a poor understanding of the NEB's connected to energy savings in the steam area

The objectives and goals of the STEAM-UP project are:

- Bridging the gap between audit results and implementation by developing an in-depth steam audit covering:
 - State of the art steam expertise
 - Involvement of all stakeholders in the enterprise.
 - Identification of non-energy benefits to strengthen business cases.
 - Energy management to secure continuous focus and improvements in the steam area
- Reducing the effort for measure implementation by developing an integrated solution for business case reporting and energy management implementation.
- Achieve energy savings during this action of 55,6 GWh/a through piloting 75 of the in-depth steam audits.

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- Building capacity amongst 400 energy auditors for the use of the in-depth steam audit methodology in their daily practice.
- Building capacity amongst stakeholders in 75 enterprises on steam and the business benefits to increase steam efficiency.
- Building capacity amongst 40 energy management training providers to enable integration of the in-depth steam audit methodology in regular energy training programmes.
- Promote knowledge transfer on steam and the benefits to increase steam efficiency.

The project focuses mainly on the large, energy-intensive industry but the methodology also applies for SMEs. The developed methodology can be made applicable for a wide range of utilities and processes.

1.1 TRAINING OBJECTIVES

The main objectives of this training programme are building capacity on the application of the developed steam audit methodology, the Energy Management Centre and how to sell saving opportunities to top management. The training programme will concern:

- Essential knowledge regarding smart technologies in steam generation, distribution and maintenance: modern efficient technologies.
- It will also introduce participants to the use of the Energy Audit Methodology including financial indicators.
- The training provided will enable steam auditors to conduct in-depth audits that detect energy efficiency measures: energy audit methodology and tools.

Other considerations on issues that will be included:

- Management aspects and good housekeeping, monitoring and performance indicators, which will enable energy managers to have a clear understanding of the steam systems in order to achieve energy efficiency actions.
- Training on the use of the EnMC (Energy Management Centre)

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- Translation from technical measures into business cases that can be easily implemented.
- Map all the NEB's connected to saving opportunities, promote them to support the business case.
- Prepared the consultant, expert or audit responsible to do presentation to the decision makers that sells the opportunity
- In the first editions, inside the framework of the STEAM-UP Horizon 2020 project, 400 steam audit related professionals from Europe will be trained in total.

1.2 PARTICIPANT PROFILE

In order for participants to realize the most benefits from the STEAM UP training, professionals to be trained should have skills and experience in steam, energy or industrial related projects. They might come from:

- Partner organizations
- Steam or energy experts at industries
- Energy auditors and energy managers Research and Educational institutions with expertise on this issue.
- Heads and engineers from the industries which are audited within the STEAM UP project (will have preference, as target groups).
- Engineers and auditors already cooperating with the partners in national projects related to industries, steam and energy efficiency.
- Engineering companies working actively with industries, which typically install and maintain steam systems.
- Engineers, auditors or related senior professionals from partners' networks and associations.
- European Energy Managers (EUREM network)
<http://eurem.net/display/eurem/Training+Providers>

1.3 TRAIN-THE-TRAINER PARTICIPANT PROFILE

The STEAM-UP Training Programme includes specific additional training for individuals who either identify themselves as having training responsibility within their company or organization, or who are identified as having senior experience in the industry or other characteristics that enable them to act as reliable trainers of the STEAM-UP material.

Trainers will be selected by partners in order to assure they have the right background on both steam systems and previous training expertise. These trainers (the selected ones) will participate as teachers in the training course.

In order for Train-the-Trainer participants to realize the most benefits from the STEAM-UP training experience, the same prior knowledge, skills and abilities related to energy management are assumed as in the standard participant profile, in addition to a combination of any of the following attributes:

- Minimum of 7 years practical experience in steam systems, industrial energy efficiency or equivalent. Knowledge on economic efficiency calculations.
- Senior level position or designated company/firm trainer
- Familiarity with personnel development, leadership development, teambuilding development of financial and/or cost and benefit analyses

Additionally, among the overall training team, experts in management systems, non energy benefits and presentation to decision makers and will be involved.

2.0 TRAINING PROGRAMME ELEMENTS

Following the development of a pedagogical concept for the training programme, e-learning and support materials, the content will impart specialized knowledge about energy savings and economic savings in the industry, focused on steam production and distribution.

The training will use the results from “Development of in-depth scan for steam” and “Web-based communication platform” activities.

2.1 TRAINING PROGRAMME DELIVERY

The training programme will be based on a 12 hour programme, in classroom or blended - depending on the country - using a common training material. In case of blended training, a minimum of 6 hours will be in class.

The training has been designed to be delivered with the aid of preparatory materials, PowerPoint Presentations, EnMC tool demonstrations, hand-out materials, and interactive best practice case study presentations, which invite class discussion and in-depth analysis of energy management problems, including small group tasks and a final test.

The training programme requires a minimum of 12 hours of time in order to be adequately presented and comprehensively worked through, including participant assessment. Segments of the training can be broken down and administered at different lengths or intervals as appropriate for individual groups and/or countries.

The curriculum can be presented as desired or applicable based on national individual preferences or work environment requirements. For example, sessions may be broken down as follows:

- Full in classroom: 2 in classroom sessions of 6 hours each → 12 hours
- Blended: 1 in classroom session of 6 hours plus 6-hours online training → 12 hours

The blended training includes delivery of content and instructions via digital media to be developed by the trainees away from the class, and control over the training time by the teachers. In STEAM-UP blended trainings, this involves that teachers will provide part of the training materials and exercises by means of email, platforms or other media, as well as clear instructions on the targets to be reached with those materials and deliveries. Digital media may also include discussion groups (e.g. LinkedIn Group) or sharing audit experiences and best practices.

In the full in classroom trainings, the second training day could be developed on a facility where also a technical visit could be made.

In addition, the training programme may include a technical visit to local steam industry or steam related service provider-manufacturer establishment to highlight or demonstrate the best practices presented in the Training Programme. That should be additional to the 12 hours.

2.2 TRAINING MATERIALS AND TOOLS

The training materials and tools that are prepared for the training include:

- Preparatory Material: 1 Word document (1-2 pages) in English language for each topic of the training, indicating the background and general information and some references of that topic.
- PowerPoints: 1 or several Power Points (maximum 5 MB each to be easily managed) including approximately 35-50 slides per hour of training, in English language, with the contents for training in that topic. The Power Point will include the comments for the teacher in the "notes" area existing in PowerPoint (at the bottom of the PPT slide).
- Practical part, including:
 - Presentation and use of the EnMC tool introducing an example.
 - Exercise with calculations. Excel sheets could be used, and should be prepared blank (without the result) and completed (with the result).
 - Case studies and real examples from partners.
- Only for Blended trainings: instructions on the materials to be used, the targets to be reached and deliveries.
- For the final test: 2 simple closed questions on each topic (x 12 topics) with Yes/No answer. The tests could be daily and corrected onsite by the students themselves.
- On a voluntary basis, short videos with good practices for steam audits existing in Internet could be used. Each country can select and use the videos, usually in their national language.

2.2.1. PREPARATORY MATERIAL

This is a document of approximately 20 pages where background information on the overall training programme is described. It includes the main topics that will be explained in the training programme as well as other relevant information to understand it properly.

2.2.2. POWERPOINT PRESENTATIONS

The PowerPoint presentations are used by the trainer during the programme explanation for introducing new technologies, explaining functional principles, showing schemes, introducing strategies, explaining calculation techniques, etc. The participants will receive presentations before the start of class.

Approximately 40 slides per training hour will be presented. The presentations can be enlarged/reduced or adapted to a reasonable extent by the trainers in order to accommodate special needs or topics of interest of the group.

2.2.3 ENERGY MANAGEMENT CENTRE (ENMC)

The web-based energy management solution -developed within the STEAM-UP project- will be introduced to the attendees. Training on how EnMC shall lower the barriers Energy Managers are facing after the audits, being its objectives:

- To reduce the effort for Energy Managers to present measures as elaborated action plans to the decision maker (top management) by providing an integrated audit reporting/action planning solution and a clear monitoring approach.
- To reduce the effort for Energy Managers to control the realisation of measures by assisted task delegation, by information on best practice and by exchange of experience.
- To motivate energy managers and the appointees by an active help desk for follow up and by automatic reminder.
- Measure the saving effects of STEAM-UP transparently.

The Energy Management Centre will be accessible by computer, tablet or Smartphone in native languages of all participant countries. (https://energy-management-centre.eu:8443/steam_up). EnMC will be explained as a tool for the energy auditors to report their key findings as a business case within predefined templates. EnMC will guide through the cycle of Energy Management and focuses on those steps where this cycle. It will be applicable for any energy efficiency measure.

2.2.4 EXERCISE WITH CALCULATIONS

Practical exercises on STEAM-UP energy efficiency measures can be prepared based on Excel files. This will be simple but practical tools that can be used to introduce examples of the calculations introduced in the EnMC by the auditors.

2.2.5 CASE STUDIES AND REAL EXAMPLES

Case studies and real examples from partners shall be used to show experiences on energy efficiency in steam systems. These cases should include practical information to clarify aspects of steam systems improvements.

2.2.6 BLENDED TRAININGS INSTRUCTIONS AND DELIVERIES

In those countries where STEAM-UP blended trainings will be developed, teachers will provide part of the training materials and exercises by means of email, platforms or other media, as well as clear instructions on the targets to be reached with those materials and what deliveries should be completed by the attendees. The e-learning part evaluation will consist on a checklist or by developing a practical case.

2.3. TRAINING MANUAL

The Preparatory Materials, the PowerPoints and the Practical part will constitute and be integrated in the "Training Manual", that will be provided to the professionals attending the Steam-Up training.

2.4. TRAINING CERTIFICATION TEST AND TRAINING CERTIFICATE OBTAINING

By the end of the STEAM-UP training, participants will be administered a short test designed to demonstrate their level of relevant knowledge and skill acquisition. The test will primarily assess the participants' understanding of the contents presented during the training.

Participants will receive the "STEAM-UP Training Certificate" when fulfilling these requirements:

- To have a CV according to the STEAM-UP training target
- To have attended at least 75% of the in-class training hours
- To have passed the test with minimum 65% of correct answers
- In case of Blended training, in addition to the previous, participants should have completed the e-learning checklist or developed the practical case.

3.0 TRAIN THE TRAINERS

3.1. TARGET GROUP

People from the partner organizations, national expert auditors, specialists in certain steam equipment and systems and, generally, qualified professionals to teach the training materials in the scope of STEAM-UP training course.

Typically, but not limiting, the minimum requirements for the profile would be:

- 5-7 years practical experience in industrial energy efficiency and project management
- Senior level position or designated company/firm trainer
- Familiarity with personnel development, leadership development, teambuilding development of financial and/or cost and benefit analysis.

3.2. TRAINER-INFORMATION

Each trainer will be provided with the materials prepared by the STEAM-UP project affecting his/her topic, in order to assure a homogeneous training in each country. The trainer, as experienced professional in one or several topics, should adapt the materials to the national specific conditions and target groups' interests.

4.0 TRAINING ORGANIZATION

4.1 TRAINING PROVIDER ORGANISATION

The training provider, which in STEAM-UP project will be the project partners, should satisfy the following prerequisites:

- Have a high-level competence on energy efficiency and project viability topics
- Be familiar with the structure of the steam system in the industry and the basic applications of energy technology to ensure the necessary support of the training participants.
- Provision of infrastructure for training
- Have access to a meeting room or similar venue that can accommodate 25-35 people in addition to teachers for the in-classroom part of the training.
- Also, the seminar room for should include the following features:
 - Trainer-PC with Microsoft-Office (Excel, Word, PowerPoint), Internet, Acrobat Reader
 - Beamer / Projector
 - Whiteboard / Flipchart / Chalkboard
 - Participant-PC's with Microsoft-Office (Excel, Word, PowerPoint), Internet, Acrobat Reader. Participants can provide their own computer if pre-announced in the marketing
 - Great climate and sound

Provision of Responsible Training Manager:

- A responsible manager must be named by the training organization and contact details should be provided.

The following organizations will conduct the first edition of the STEAM-UP training in the respective countries listed.

COUNTRY	RESPONSIBLE
Spain	ESCAN
The Netherlands	RVO
	EI
Czech Republic	ENVIROS
Germany	ADELPHI
Austria	AEA
Greece	CRES
Denmark	AURA
Italy	ISNOVA
	Consul System

4.2 ORGANISATIONAL ACTIVITIES

The following preparatory activities should be developed and scheduled before the training course due date:

- Materials in the national language are ready, both for in-class and e-learning training.
- Materials to be given to the attendees are printed.
- Teachers are agreed and ready, and being on the venue of the course at least half an hour before the training starts.
- Training venue (room) was selected and booked, including equipment (laptop, beamer, flip chart).
- The training responsible has visited the in-class venue the week before the training and checked that everything is ready.

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- Coffee, water, refreshments and/or lunch for the training are arranged
- In case of blended training, for the e-learning part, the instructions on the targets and deliveries, the process to provide them and receive the feedback is ready.
- In case of blended training, for the e-learning part, the checklist or practical case is ready.
- Training evaluation final tests are ready.
- Quality evaluation is ready.
- The list with the confirmation of attendance and attendees contact details is ready
- STEAM-UP Training Certificate format is ready
- Webinar function or software is functioning at all locations and audiovisual material is connected and working (if applies)
- Wi-Fi is working and login/passwords are available (if applies).
- Films (to be shown) are on local drive (if applies).
- Attendees list (for signing for presence) is ready

4.3 TRAINERS

The quality of a training programme has a special influence according to the skills of the trainers, who should have competence on different fields.

Some more specific profiles recommended might be: a senior manager on business or from industrial company, senior engineer with skills in processes, senior advisor with communication skills, energy senior manager, certified consultants, professionals with academic/research background, economics and financing experts, sales training experts, etc.

The number of trainers might vary from one country to others depending on the profiles and education, but as a principle it should be avoided too many trainers that might confuse people (2 to 4 could be an ideal number).

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The teachers should be selected from the own STEAM-UP consortium partner organizations in each country, or selected from other organizations when they offer the expertise required.

5.0 CONTENTS OF THE TRAINING PROGRAMME

The Training Programme Includes the following Topics:

N.	TOPIC (<i>Leading topic in bold</i>)	Training MATERIALS (hours)	PREPARED BY
1	Sell saving opportunities "top management"	1	EEI
2 3	Steam/energy audit method + tools & Guidelines	2	ENVIROS
4 5	Tool: Energy Management Centre + EnPI's	2	ADELPHI
6 7 8	ISO 50001 (Energy Management System) + System Approach + Connect to Corporate Strategy	2	OSTERREICHISCHE ENERGIEAGENTUR
	ISO 50001 (Energy Management System)	1	MINISTERIE VAN ECONOMISCHE ZAKEN
9	Modern efficient technologies + Examples + Audits done by partners	2	ISNOVA
10 11	Modern efficient technologies + Examples	2	KAPE - CRES
12 13	Non-energy benefits (NEB) + Behavioural + Steam/energy audit method +tools & Guidelines	2	AURA
14 15	Economy + business cases	1	Consul System SpA

6.0 MARKETING

A series of specific marketing actions for the training programme will be undertaken to raise awareness and interest for the training programme. Creating this awareness and interest is a key factor to reach the envisaged number of participants and success of the training.

In this chapter we describe the target groups, specific objectives, strategy and activities to reach the potential participants to the STEAM UP training programme.

Target groups:

1. Managers and engineers from the industries audited in the STEAM UP project.
2. Managers and engineers from industries outside the audit group, with large saving potential in their enterprises.
3. Energy consultants and auditors
4. Research and Educational Institutions with curricula on energy management
5. Business support organisations (BSO), energy agencies; auditors and engineering companies working actively with industries that typically install and maintain steam systems.

Objectives per target group			
nr	Target group	Nr of people reached	Nr of participants
1	Managers and engineers from audited industries	75	60
2	Managers and engineers	500+	140

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	from industries outside the audit group,		
3	Energy consultants and auditors	500+	100
4	BSOs; Energy Agencies	500+	100
5	Research and Educational Institutions (train-the-trainers)	100+	40

Communication approach per target group:

1. *Managers and engineers from industries that are audited in the STEAM UP project.*

Objective: 75 enterprises will take part in a STEAM UP audit. 80% of the industries (60 individual companies) involved in the project will identify and enable at least 1 staff member to participate in the training.

Approach: the STEAM UP auditors will ensure through their personal contacts on the work floor, that decision makers and senior staff are aware of the content and added value of the training. An attractive leaflet, describing the content and output is available, as well as ongoing feedback on experiences through website, social media and specific publicity.

2. *Managers and engineers from industries outside the audit group, with large saving potential in their enterprises.*

Objectives: the STEAM UP associated networks can reach out to 500+ individual companies that fits the specifications of the target groups for the training. The objective is to have:

We will identify potential participants among the engineers, auditors and related senior professionals via the business networks of the STEAM UP project and associated partners such as UNEP and EUREM .

Approach: all partners will contact their networks either personal or by email to inform and motivate enterprises in their networks to take part in the training. The training leaflet will support their message. The experiences of the training will be communicated through social networks and network newsletters, to enhance the participation through-out the implementation period of the training programme.

3. *Energy consultants and auditors:* All partners will contact their national networks of energy consultants and auditors with supporting materials and personal contact.
4. *Business support organisations and energy agencies, working actively with industries that typically install and maintain steam systems.*

Approach: identification of contact persons, especially consultants and energy agencies, aimed at large industries per country. Selection of contact persons and tailored communication, aimed for further distribution among their networks.

5. *Research and Educational Institutes*

Approach: All activities are aimed to include the training in existing curricula, to ensure continuation after the project period. As a first step, STEAM Up consortium and associated partners will compile an inventory of educational institutes. The contact persons will be approached personally by the national contact persons of the project team.

Participants from this group will follow the specific 2 hour train-the-trainer programme. A specific 'train-the-trainer' leaflet, describing the content and added value, will support these contacts. Experiences from participants will be shared among this target group.

Supporting actions and materials

1. Leaflets, 1 on the training + 1 Train-the-Trainer
2. Content on LinkedIn (European wide) and Twitter (via national accounts)
3. Specific section of the Website, including storytelling on experiences

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4. E-mail
5. Publicity: Printed Press (networking newsletters; professional magazines; newspapers), Radio (national, regional, local) and STEAM UP representation at national and international events

Critical factors for success

1. *Timing*: Determination of the most suitable timing for training to maximise benefits of training and minimise conflicts with existing training schedules or other responsibilities (i.e. investigate annual training schedule, current stage of political and funding cycles, high/low season or peak/off-peak production, etc.)
2. Tailored distribution of the marketing material to target group, including name of Responsible Training Manager and contact information

Post-training activities

1. Announce via social media (and Steam-Up website) the successful completion of a STEAM-UP Training Programme, including training provider, location, number of participants, brief summary of content, benefits of certificate awarded, and contact information for material.
2. Notify STEAM-UP Project Management or contact person in respective country of the successful completion of a training with details for inclusion on project website.
3. Evaluation of the trainings
4. Identification of further training needs.