

GREEN JOBS program, materials

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Summary of deliverable

This is an external report which concludes training materials and its components which will be prepared and appropriate adapted to the STUDIO platform.

Training materials transferred from Polish (NAREW), Italian (AISFOR) and Portuguese (ADENE) partners are detailed described according to level and National/European Qualification Frameworks appropriate described in the report entitled **Clustering Training Needs** (*deliverable number 8 of the project*).

List of **knowledge**, **skills** and **competences** which trainee will achieve taking the course is also described in details.

An overview of the STUDIO platform is prepared by NETPOSITIVE¹.

Description of the additional course which will be adapted to STUDIO platform is also prepared. It is a short overview of how the additional material will be offered to STUDIO platform for beneficiaries.

Report is ended by conclusions.

This external document is prepared in English.

¹ Netpositive Számítástechnikai Szolgáltató és Kereskedelmi Kft. - partner nr.2 in the project

Overview of the STUDIO platform

STUDIO is web-based learning infrastructure which supports the whole learning cycle. This learning infrastructure consists of an Ontology Repository and a Content Repository — that are the two major pillars of this solution — a Content Presentation tool, a Test Bank, an Adaptive Testing Engine, and some additional support tools.

Ontologies – that are stored in the Ontology Repository – are the central elements of the content authoring processes. Several domain ontologies are stored in this repository. These ontologies constitute the core of every other component in the system. Curriculum content may come in many forms and formats, from different authors and in different languages.

The electronic learning objects are stored in the Content Repository in this system. Additionally, there is also a Content Developer application, which offers content management functions to the content authors; and a Content Presentation component, which is entitled to present the stored content pieces to the users. Content submitted to the system is not format dependent, all widely used text and multimedia file formats are accepted, recognized and supported.

Students' knowledge is evaluated with the help of multiple choice questions. All questions and possible answers reside in the Test Bank and are connected to one specific concept in the ontology. This way, the learners' knowledge about a certain concept can be evaluated. The Test Item Editor component is responsible for visualizing the ontology structure and letting the user to assign questions to each node in the ontology.

In the course of testing the Adaptive Testing Engine walks through the ontology structure and asks questions about concepts of the ontology. It evaluates the student's answers and decides on the following knowledge elements to be tested. At the end, the user's knowledge is mapped thoroughly and a tailored learning content is offered to be learned. This customized material consists of pieces of learning objects, which are offered by the Content Presentation component.

Non-functional Capabilities

- **Multilingual environment:** The Studio supports translations of the whole system. This means that items of the ontology, repository and test bank can be translated. With Studio content developers have a great tool to create and manage multilingual contents. Studio offers the possibility to translate the interfaces' texts too. Every time the content or interface text is not available on the required language Studio returns with the default language (English).
- **Scalability:** The architecture of the Studio is scalable by using interfaces that runs on the client's browser and databases which were designed with great scalability. The interfaces generate only a reasonable number of requests with small data traffic. For a big number of users it is possible to add additional servers or database server for the architecture.
- **Platform independency:** One major skill of the Studio to easily adapt to different platforms. The web-based design allows us to create interfaces that will work on different platforms, operating systems and browsers until they support web standards. If the current interfaces do not work for some reason, but it is possible to access Studio server on the platform, developers can build a platform specific interface without disturb the existing ones.
- **Privacy:** Studio does not store any additional user information just the user's nick name (or something similar) and the external system's name. This way unauthorized person cannot reach user's identity from Studio, to do that he has to have proper rights in the external system and Studio as well.

Architecture

There are two points of view of the Studio's architecture: the connection with other systems and the Studio's inner design. In the first case we are looking at Studio as a black box and only describe the available communication interfaces. After that Studio's inner design will be described with its inner communication model that allows us a better understanding of Studio's background processes.

Connections to External Systems

Studio built as an independent application and runs on its own but requires an external system to authenticate users. After the authentication process Studio will recognize users and allows them to work in the system (Figure 1). This will only allow access to Studio for a limited time and after the

session timed out, users need to identify themselves. The session only ends if the user ends interactions with the system. As a web application users need to authenticate at every sign in.

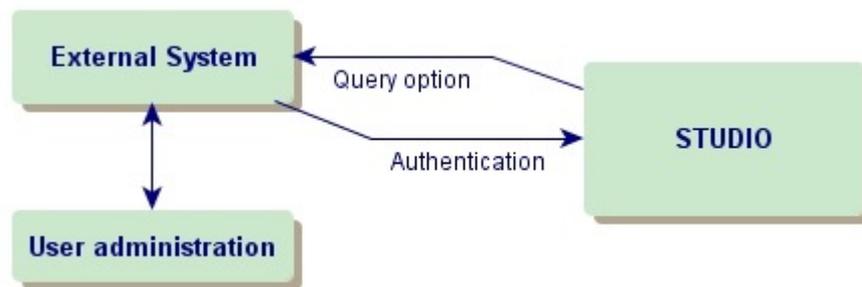


Figure 1 - Connections to External Systems

Studio is able to send back information to the external system as well. This includes some basic statistics, user activity, results. This type of feedback is especially important working with LMS to complete the learning infrastructure but will work with other systems too.

Authentication

For authentication and to enter Studio there are two basic actions which have to be implemented: the background communication of the servers and creating the entry links for Studio.

- Studio needs to recognize the external systems server for this the system has built in function which only needs some information about the new system to connect with. The major work of this process is to create the authentication functions in the external system which usually needs development. Studio offers patterns and support for this process. There are test servers to try out the communication and test interfaces to work with. The external system gives only some basic information about users like the user's name, nick name, rights and selected language. Rights may be overwritten by Studio.
- The entry links need to be built by external systems, these links could be a simple HTML link (or button that points to the same URL, etc.) or a URL for an iframe. In each scenario the links are basically built in the same way, just with iframes it is possible to add Studio's interface to an existing web page. Studio offers a pattern to creating links, like selecting interfaces or selecting concept groups for tests. Link has to contain a token which has to be implemented in the external system, and it is used for authentication. The token is the only variable in the link, but it depends on the external system to make the other parameters variable too.

Query option

Studio can send information back to other systems for further evaluation. These can be posted from the external system via HTTP requests. Requests have to contain a query written on Studio's own query language or a basic statistic type and a format parameter. The external system has to implement some major functions to process the data that will send the Studio. Data types can be JSON, XML or some character-separated format like CSV.

Internal design

Studio has a web-based three-tier architecture which contains graphical user interfaces that can run in user's browsers, a main server and a database layer (Figure 2).

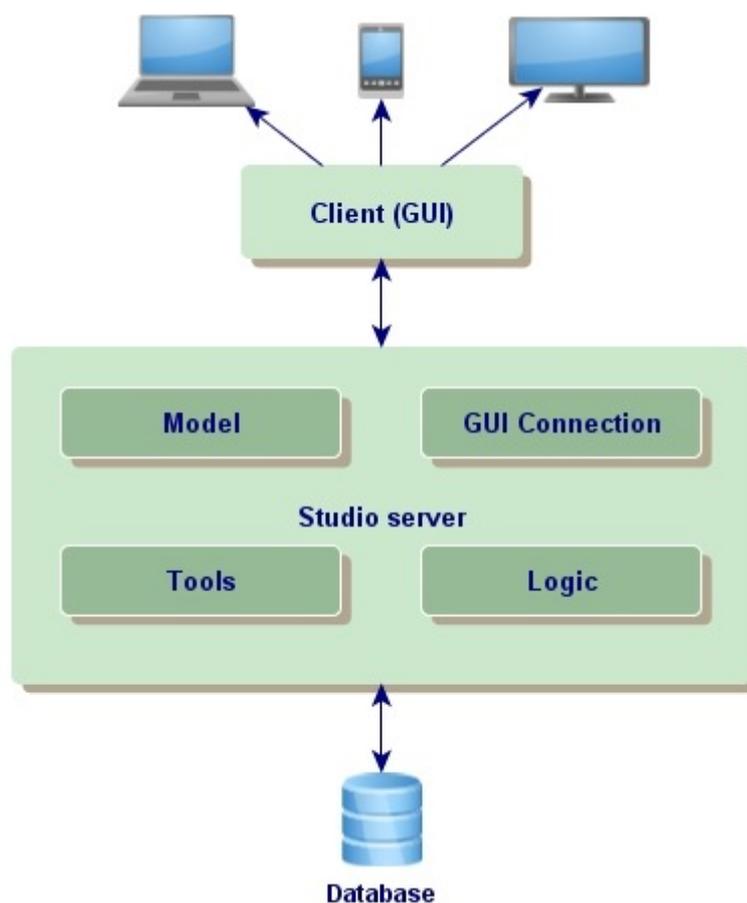


Figure 2 – Internal design

Client

The most important issue that Studio's interfaces are not web pages; they are web applications running in web browsers. The major benefits from this design is that users do not need to install software on computers and they only need to download the GUI once, there are no additional page loadings. The interfaces gain their data from the Studio server by sending AJAX requests, and process them.

This approach allows us to implement interfaces on different platforms or browsers. GUI only needs to follow the communication protocols and patterns by Studio.

Studio Server

The main component of the Studio architecture is the Studio Server which handles everything from user authentication to database writing. The GUI can be downloaded from this server after user is authenticated. The server processes HTTP requests and sends the results back to a GUI or other external system like it has been discussed in the previous section.

Server code can be divided into four major types:

- Connection: this part of the code is responsible for the process of HTTP requests; check user rights and parameters; send the results back.
- Logic: It contains all core functions of the Studio (ontology editing, adaptive test engine, statistics module, etc.)
- Model: model contains all classes that are used in Studio like ontology classes, users etc.
- Tools: tools are used by the server's other three main part, mainly these are functions that are used for content encoding, handle databases.

Database

Database runs in the third tier of the architecture, it cannot be reached directly from interfaces, only system administrators can work with them in that way. The database used by Studio is well scalable and easy to use.

Detailed description of the training materials proposed on STUDIO: Poland

Short introduction / Objectives

The material which will be elaborated and published on STUDIO within the E-GREEN JOBS project on behalf of NAREW² will be based on the material of the training course on "Fitter installer technical equipment in rural construction", organized and delivered by NAREW. The training program was prepared under the Green Technology Center project, implemented with the participation of the European Social Fund under the EQUAL Community Initiative.

General Objectives: Prior preparation of the participants in terms of:

- to identify and characterize the types of sewage treatment plants and materials, equipment and tools for their implementation,
- analysis of the legal and technical mounting options sewage treatment plant in specific soil conditions,
- analysis of the profitability of the construction of sewage treatment plants,
- prepare and conduct the installation wastewater treatment,
- perform maintenance and repair work.

Expected results: The training will help to raise awareness about the types of wastewater treatment plants, the selection of the devices and installation of skills. The scope of the training is focused on the orientation of the participants in a comprehensive approach to the process of building sewage treatment plants. After completing the training, the participant will be able to:

- characterize the types of sewage treatment plants,
- choose the type of treatment and its parameters and additional devices taking into account the legal, technical and economic efficiency of the installation,
- install cables and equipment with equipment installation of household sewage,
- Perform maintenance and repair system.

Confirmation of qualifications trainee after completing all provided for in the modular units will obtain a certificate (certificate) training course, confirming his didactic competencies at the basic level in the field

² Podlaska Stacja Przyrodnicza "NAREW" - partner nr. 3 in the project

of Installation of sewage treatment plants. Also allowed confirmation (separate certificate) completed with positive results modular units, where the candidate with random reasons not finish the whole course. This will allow the replenishment of the full set of requirements of the program in another chosen by the participant during or in the course of other training, without the need for re-examination confirmed the independent modular units certificate.

Technical content

The course is made up of several independent and complementary modules, each addressing a specific area with the aim to transfer knowledge / skills to the participants on that area. The modules relate to either technical-sectorial areas as well as horizontal areas, such as safety at work, the latter having been excluded for the preparation of the material to be published on STUDIO.

The technical – sectorial modules include content related to the regional or to the national normative, with no European dimension and interest and also excluded for STUDIO. A brief description of the modules and their content to be adapted for the preparation of the material to be published on STUDIO is reported below:

The code and name of the module code and the name of the training Indicative delivery time [hrs.]

JM.01 Compliance with health and safety, fire and environmental protection

- JS.01 rights and obligations arising from the employment relationship (3)
- JS.02 principles of health and safety on construction and installation 3
- JS.03 principles of environmental protection in the workplace 3
- JS.04 principles of first aid 9

Total: 18

JM.02 Preparing installation works

- JS.05 General rules for the construction and installation of sanitary 12
- JS.06 types of sewage treatment plant and materials to make them 12
- JS.07 Using technical documentation 9

Total: 33

JM.03 Evaluation of the local sewage treatment plant

- JS.08 analysis of the technical possibilities installation and operation 6
- JS.09 analysis of the legal possibilities assembly 6
- JS.10 analysis of the economic efficiency of the system. 6

Total: 18

JM.04 Installation

- JS.11 demarcation of the foundation elements of the installation 3
- JS.12 preparing job place 3
- JS.13 Implementation trenching 6
- JS.14 Deposition of the key elements of different types of treatment 9
- JS.15 Installation wires and weapons installations 12
- JS.16 Leak testing and commissioning of the installation 3

Total: 36

JM.05 execution of maintenance and repair installations

- JS.17 Policy repair and maintenance of local treatment 6
- JS.18 Repair and maintenance of existing installations 12
- JS.19 control, the operation of the installation 6

Total: 24

Target

The program is aimed at people planning their careers in the installation of sewage treatment plants, in particular the employees and owners of small and medium-sized enterprises engaged in such activities.

List of the competences/learning outcomes/KSC matrix - NAREW

LO/Unit	Knowledge	Skills	Competences
Wastewater treatment systems for farms and small towns	Knowledge of the needs for environmental protection, in particular the protection of the purity of groundwater and surface water	Threat detection and analysis of the needs for environmental protection, especially the protection of the purity of groundwater and surface water	Characterize the impact of various factors and technology on environment

<p>Knowledge of the needs for sewer system and sewage treatment systems for individual households and villages with less than 5 thousand residents</p>	<p>Analysis of the existing and prospective needs for sewer system and sewage treatment systems</p>	<p>Define and plan the technical and legal possibilities for the construction of a wastewater treatment plant in a particular location</p>
		<p>Determine soil conditions and hydrology to indicate the correct location of the wastewater treatment plant.</p>
		<p>Characterize different types of wastewater treatment plants. The basic types of wastewater treatment: Biological and Mechanical Wastewater Treatment Plants- division and characteristics</p>
		<p>Identify and characterize the available materials, equipment and tools for the construction of a wastewater treatment plant</p>
		<p>Evaluate the cost-effectiveness of building a wastewater treatment plant. Prepare economic report; compare the costs of construction and operation of various types of wastewater plants</p>

		<p>Select the type of technology, identify key elements and perform the calculation of the size and performance</p>
		<p>Prepare a project for the construction, start-up and operation of the wastewater treatment plant. Prepare land use; including location of key elements and fitting them to the land on which the project will be implemented</p>
		<p>Preparation of the budget for the project</p>
		<p>Prepare a plan for the impact of the investment on the surrounding environment</p>
		<p>Prepare a plan for periodic maintenance and repairs</p>
		<p>Prepare a plan for sediments and plant biomass</p>
		<p>Prepare the audit program and assess the effectiveness of wastewater treatment plant operation</p>

Duration

The course lasted 129 hours. However not all the modules included in the full duration of the course will be used to prepare the material to be published on STUDIO.

In addition, the material will be supplemented with the latest news from the literature and practical experience regarding the design and construction tasks in Poland and abroad.

Time of the materials which will be used on STUDIO platform is 24 hours.

Name of the course:

"Wastewater treatment systems for farms and small towns"

Level of the course adapted to the basic knowledge, skills and competences - 3rd level in the European Qualification Framework.³

³ more information regarding 3rd level of EQF available in the deliverable 8 - *Clustering Training Needs*

Detailed description of the training materials proposed on STUDIO: Italy

Short introduction / Objectives

The material which will be elaborated and published on STUDIO within the E-GREEN JOBS project on behalf of AISFOR⁴ will be based on the material of the training course on “Development of the agro-energy chain” (Sviluppo delle filiere agro energetiche), organized and delivered by AISFOR.

The course was designed by AISFOR to respond to the training and labour needs of the rural sector of the Lazio Region and was proposed to the Lazio Region within the the specific measure of the Development Rural Plan in the Lazio Region (Piano Sviluppo Rurale – PSR – Lazio): measure 111 which objective was to increase scientific knowledge and technical skills to improve business efficiency and competitiveness.

Technical content

The course is made up of 15 independent and complementary modules, each addressing a specific area with the aim to transfer knowledge / skills to the participants on that area. The modules relate to either technical-sectorial areas as well as horizontal areas, such as safety at work, English language, the latter having been excluded for the preparation of the material to be published on STUDIO.

The technical – sectorial modules include content related to the geographical Lazio region or to the national normative, with no European dimension and interest and also excluded for STUDIO. A brief description of the modules and their content to be adapted for the preparation of the material to be published on STUDIO is reported below:

- Analysis of the energy production and of the opportunities for agriculture on the opportunities and resources of the geographical regional area
- Technical and energy description of possible layouts on how to evaluate the possible sources of renewable energy through the analysis of real cases of agro-energy industrial chains - Chains for biomass / oil combustion dedicate
- Enterprise case study on biogas on Biogas chain
- Microgeneration on the opportunities to increase the competitiveness of the enterprises through the microeolico, hydraulic and fotovoltaic system

⁴ AISFOR Srl - partner nr.6 in the project

- Economical – financial evaluation of investments in the agroenergy sector on how to carry out an economical – financial evaluation
- Energy recovery from biogas entrepreneurial systems on how to implement a proper waste recovery system in the enterprise to increase awareness of the agricultural entrepreneurs on the waste material
- Industrial plant: operation and management on how an agro energy plant operates and is managed - The mechanism of an agro-energy plant

Target

The training course addressed young entrepreneurs and young workers in agricultural. The participants to the course were around 25 and all representatives of the agricultural sector, mainly owners of a farm themselves.

List of the competences/learning outcomes/KSC matrix - AISFOR

LO/Unit	Knowledge	Skills	Competences
Agriculture energy resources, productions and opportunities	Knowledge of the agro-energy sector Knowledge of the main energy production sources in agriculture Knowledge of biomass fundamentals	Detect and analyse the main energy sources opportunities and resources of a specific geographical regional area	

<p>Biomass production: processes, layouts, industrial chains</p>	<p>Knowledge of the main technical elements of the possible biomass energy production</p> <p>Knowledge of the evaluation criteria and models of the alternative sources of renewable energy</p> <p>Knowledge of the main biomass chains / oil combustion dedicate</p>	<p>Carry on a comparative evaluation study on biomass production</p> <p>Analyse, define and evaluate the production layout and process</p> <p>Analyse and evaluate real case study on biogas chains/ enterprises</p> <p>Analyse and evaluate real cases of agriculture biomass production chain</p>	<p>Define and plan the production layout and process</p> <p>Design and plan a biomass chains / oil combustion dedicate</p>
<p>Microeolico, hydraulic and photovoltaic systems impact on enterprises competitiveness</p>	<p>Knowledge of the fundamentals on business models and strategic planning</p> <p>Knowledge of the main evaluation models/ criteria of the energy saving impacts for enterprises applied to the micro-eolico, hydraulic and photovoltaic system</p>	<p>Analyse and evaluate microeolico, hydraulic and photovoltaic systems impact on energy saving and on competitiveness</p>	<p>Define a strategic and operational plan aimed at improve enterprise' competitiveness based on microeolico, hydraulic and photovoltaic system</p>
<p>Economical and financial evaluation of investments in the agro-energy sector</p>	<p>Knowledge of the fundamentals of investments economical and financial evaluation applied to the agro-energy sector</p>		<p>Carry out an economical – financial evaluation of agro-energy investments</p>
<p>Waste recovery systems for the agro-energy enterprises</p>	<p>Knowledge and awareness of waste management and recovery system impacts on the biogas enterprise</p> <p>Knowledge of the main models of the waste materials management and system applied to the biogas energy enterprises</p>	<p>Analyse and evaluate the waste materials management and system applied to the agro-energy enterprises</p>	<p>Design and plan a waste materials system applied to the agro-energy enterprises</p>

Agro-energy industrial plant	Knowledge of the management systems/ models of agro-energy plants		
	Knowledge of the operations and tools of agro-energy plants		

Ontology	Syllabus	
Biomass and sustainability	Knowledge of the agro-energy sector	Definition of the agroenergy sector and its features
	Knowledge of the main energy production sources in agriculture	General knowledge of the main biomass/energy production sources in agriculture
	Knowledge of biomass fundamentals	Fundamentals of biomass and overview of the main production methods
Biomass production: processes, layouts, industrial chains	Knowledge of the main technical elements of the possible biomass energy production	General knowledge of the distributed cogeneration from biomass; Biochemical processes
	Alternative sources of renewable energy	Definition, features and technical processes related to the oil biomass and wood biomass
	Knowledge of the main biomass chains	Definition of the agroenergy chain and its main features

Duration

The course lasted 150 hours. However not all the modules included in the full duration of the course will be used to prepare the material to be published on STUDIO. Only the modules which have a European dimension, are focused on renewable energies and have high interest for the partners will be adapted and transferred on STUDIO.

However the duration of the modules used for the preparation of the STUDIO material is 28 hours, as each of the above mentioned module has a duration of 4 hours.

Level of the course adapted to the basic knowledge, skills and competences - 3rd level in the European Qualification Framework.⁵

⁵ more information regarding 3rd level of EQF available in the deliverable 8 - *Clustering Training Needs*

Detailed description of the training materials proposed on STUDIO: Portugal

Short introduction / Objectives

The implementation of solar thermal systems should contemplate 3 essential phases: project, installation and commissioning. No solar thermal installation should be implemented without a project, mainly if it has a considerable size, over 20 m². The lack of project, which should be elaborated by a competent professional, will likely leave the selection and positioning of components in a circuit to the criteria of the installer, who might not be competent to do so. Moreover, very often a lack of definition will most likely lead to the selection of cheaper components, most likely with poor quality.

It should also be stated that the project is a proper form to involve the owner of the installation who will be presented the various possible options. Project can also be considered a unique form to instruct the installer on details of the installation and also a lasting document for whoever intends to intervene in the installation in the future. Finally, having a project helps clarify the responsibility of various players in various phases of the solar thermal installation.

The proposed training course from ADENE⁶, design of solar thermal installation, intends to capacitate professionals who intend to design solar thermal installations for hot water production. The training is concentrated on the design of a system as a whole and also on some specific components.

Participants in the course will also be able to perform critical analysis of projects, produce a budget and make economic analysis of a proposed system.

Technical content

The training course integrates 8 sequential modules as indicated below.

- Solar radiation and conversion of solar thermal energy
- Solar thermal collectors – typologies, layout (distribution and connection), energetic assessment
- Certification of solar collectors
- Legislation and technical standards
- Components, function, selection criteria and positioning in the circuit

⁶ ADENE - Agência para a Energia - partner nr. 5 in the project

- Systems configuration (systems typologies)
- Sizing of systems
- Support tools for systems sizing
- Case study: analysis, development and resolution

Target

This training, in general, is targeted to engineers, architects, designers and equipment installers. It can also be attended by other professionals who might supervise design and installation of solar thermal systems. People who intend to supervise maintenance operations in solar thermal facilities can also participate in this training.

In the other hand, is open to all professionals who wish to or are working in the field of solar thermal energy, or not having as main activity the design of solar thermal systems, may be involved in the analysis of proposal for the implementation of systems, budgeting, or responsible for facilities operation and maintenance.

List of the competences/learning outcomes/KSC matrix - ADENE

LO/Unit	Knowledge	Skills	Competences
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<p>Solar thermal energy facilities</p>	<p>Design, commissioning, installation and maintenance of solar thermal systems</p>	<p>Global design, critical analysis, budgeting, planning for production, installation, testing, monitoring and maintenance of a solar water heating systems</p>	<ul style="list-style-type: none"> • To define the project to be developed as well associated objectives • To organize the project process, defining a structural documentation accordingly the procedures • Selection and sizing of a solar thermal system, globally and for each its component • Planning, work preparation and workprograme of all phases of project development • Implementation and organization of all technical elements needed for project development • Preparation of the budget for project
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Duration

The original training course has a duration of 8 days that corresponds to 60 hours, including examination. For E-GREEN JOBS it will be adapted accordingly STUDIO platform as a tool to evaluate the knowledge and competences of the trainees. In this context, the main features of the training courses will be as bellow described:

- (1) two (2) learning outcomes (LO) – solar thermal energy facilities designer and solar thermal energy facilities installer
- (2) for each LO, at the platform the trainees will have access to relevant support technical documentation and/or bibliography
- (3) for each learning outcome, it will be created a specific structure, accordingly to the methodology of STUDIO platform
- (4) The skills and competences will be evaluated through a test to check the knowledge of each trainee regarding the LO
 - This test will be based on an excel file with 20 questions covering the sequential modules, being the tests structured as follows:
 - ½ 4 fields - name of the concept, a description or an image of the concept, a question, 4 answers and quotation.
 - The duration for each test will be 2,5 hours.

Level of the course adapted to the basic knowledge, skills and competences - 3rd level in the European Qualification Framework.⁷

⁷ more information regarding 3rd level of EQF available in the deliverable 8 - *Clustering Training Needs*

Additional training material proposed to STUDIO platform - NAREW

Depending on the expectations of the beneficiaries it is possible to present the training material in the form of an instructional film entitled "The design and method of erection of a wooden building in the traditional technology". The film shows the successive stages of the construction of residential buildings using natural materials such as wood and cane. The film is an auxiliary material to the modular training program in the profession of carpenter and roofer - laying traditional roofing materials (chips, shingle, cane).

In addition, an attractive material is a building construction project in which the walls are made of clay and large (not easy available) literature on the benefits of technology and standards of rising residential buildings with clay.

Conclusions

The partnership in this deliverable presented the input into the Project, concerning the detailed overview of the selected training materials and their components which will be prepared and appropriate adapted to the STUDIO platform. Moreover additional training material which will be adapted by NAREW to STUDIO platform is shortly presented in this document. Separated report only regarding additional training course will be prepared respectively.

Presented materials which will be elaborated and published on STUDIO within the E-GREEN JOBS project on behalf of Partnership will be based on the material of the training course on:

- “Development of the agro-energy chain” organized and delivered by **AISFOR**
- “Design of solar thermal installation” organized and delivered by **ADENE**
- “Fitter installer technical equipment in rural construction” organized and delivered by **NAREW**

Training materials will be prepared and appropriate adapted to the STUDIO platform - web-based learning infrastructure which will supports the whole learning cycle in the E-GREEN JOBS.

Partners will adjust the materials to infrastructure of the Studio by preparing the Content and Test to all those three courses.