Erasmus+ KA2 Knowledge Alliances project

"Greening Energy Market and Finance – GrEnFIn"

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WP7 - D7.3 - Report on the Final draft of the basic structure of the learning outcomes

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1. Introduction

One of the aims of the GrEnFIn project was to create a Professional Module addressing the skills' gaps of experts currently working in the energy sector called "Sustainable Energy Expert". The Module covers the knowledge of the financial green products pivotal to sustain a reconversion of the economy to the green energies. Starting from data collected from the questionnaires (external consultations), the partners prepared and discussed the draft curriculum of the professional module.

At the end of 2021 and early 2022 some brainstorming activities and events also had been implemented in order to validate the most suitable and effective methodology for the professional module. The entire design of the professional module had, therefore, to take into account all the suggestions collected by the Consortium and the interested stakeholders. Among these suggestions there was a need to develop a training course that could be able to meet the needs of the labour market, considering the requested skills for the professional figure of "Sustainable Energy Expert", which certainly include the technical ones, but at the same time the transversal and entrepreneurial, always more relevant in the actual work context.

To test the professional module (a short version of it) and to test new educational methodologies a summer training was organized in Katowice as the first assessment experience. It was planned as 3 days-activities to involve 10 professionals, 6 coming from inside the consortium and 4 coming from outside the consortium (selected by an internal commission).

This document shows the final testing phase to create a Professional Module and a description of learning outcomes: the testing phase (part 2), and reports about a possible structure of planned Professional Module (part 3).

2. Professional Module – last testing phase

2.1. Full Immersion Experience as a last test of Professional Module Structure

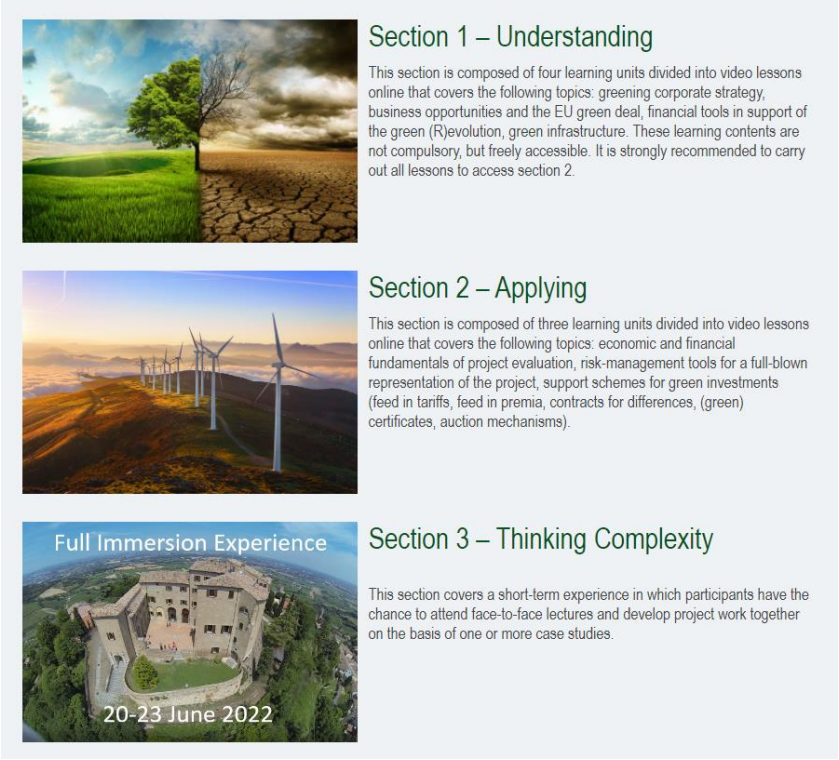
To test the professional module (a short version of it) and to test new educational methodologies firstly a summer training was organized in Katowice in June as the first assessment experience. The final check was organised in a form of the Full Immersion Experience in Bertinoro in June 2022.

- **Structure** – Following an idea developed before the Summer Training a structure that consists of 3 sections was maintained. The first two sections were not compulsory, but freely accessible by professionals after the subscription. Each section was divided into learning units. At the end of each learning unit, the user would have to perform a learning verification test and a satisfaction questionnaire; there is no threshold to pass the test but our suggestion is to move to the next learning unit only if at least 60% of the questions has been answered correctly. The final phase was the 3-days event in Bertinoro.

- **Schema** – To clarify the didactic process the content of the Summer training was created and accepted by partners. It covered the main structure of the summer training – its division into three phases:

  - **Section 1** – called "*Understanding*" - This section is composed of four learning units divided into video lessons online that covers the following topics: greening corporate strategy, business opportunities and the EU green deal, financial tools in support of the green (R)evolution, green infrastructure. These learning contents are not compulsory, but freely accessible. It is strongly recommended to carry out all lessons to access section 2
  - **Section 2** – called "*Applying*" - This section is composed of three learning units divided into video lessons online that covers the following topics: economic and financial fundamentals of project evaluation, risk-management tools for a full-blown representation of the project, support schemes for green investments (feed in tariffs, feed in premia, contracts for differences, (green) certificates, auction mechanisms).
  - **Section 3** – called "*Thinking Complexity*" - This section covers a short-term experience in which participants have the chance to attend face-to-face lectures and develop project work together on the basis of one or more case studies. The Full Immersion Experience involve the professionals into the resolution of a Case Study provided by the main industrial partners of the GrEnFIn project. The professionals will be divided in teams and will start dealing with the Case Study for the first two days, assisted by the GrEnFIn's team that created them. The Case Study will be focused on the topics of

energy, green finance and quantitative methods. In the last two days of the experience the Professionals will join with the students coming from GrEnFIn's University partners, they will support the Case Study resolution process by collaborating with the Professionals recreating a senior – junior environment.



2.2. Assessment of the Professional Module final test and future improvement

Assessment (feedback) and future improvement – Following criticalities that were set after the First summer training the consortium improved the point assessed as the weaker one. Moreover, after the second training phase (the Full Immersion Experience) there are some areas to be improved:

- ✓ Duration: Following the feedback of the participants the time allocated to it seems to be appropriate, as well as the duration of the training, and the duration of learning units; we believe that assumed periods is then optimal for future events.
- ✓ On-line material (Content of the Section 1 and Section 2): Following the feedback of the participants a majority found the workload to be appropriate, as well as the duration of the training, and the duration of learning units.

- ✓ Content of the Section 3 (case study): Following the feedback of participants that appear to have been overall appreciative of the content provided, we think the chosen topics were very interesting and relevant for professionals of energy sector. About materials, we consider useful to provide to participants the materials of case study with more advance in order to have time to study it and to arrive prepared for the 3 days of classroom.
- ✓ Case study management (group work, supervising etc) - Following the feedback of participants there is a need to clarify in advance a format of the collaboration between the students and professionals. Taking into account the short length of the programme there is a need to clarify the learning path for each track.

2.3. Professional Module methodology - Knowledge, Skills, and Competences (KSC)

Based on the local workshops organized on remote basis at the end of 2021 by the SMEs of the Consortium (in particular we refer to Speed Development Consultants SA, JF Digital Energy and MIWenergia) the main results obtained demonstrate an overwhelming acceptance on the proposed learning path in term of methodology used. The entire design of the professional module had, therefore, to take into account all the suggestions collected by the Consortium and the interested stakeholders; among these suggestions there is certainly the need to develop a training course able to meet the needs of the labour market, taking into account the requested skills for the professional figure of "Sustainable Energy Expert", which certainly include the technical ones, but at the same time the transversal and entrepreneurial, always more relevant in the actual work context.

- **Knowledge** – In terms of professional module development, based on the consultation's findings that emphasized the complex, integrated and systemic nature of the core knowledge required, the planned Professional Module keeps a balance between hard (quantitative) and soft (more qualitative) scientific knowledge, paired with a lesser academic, more operational orientation.
- **Skills** – The uncertain, transformative and complex environment where we live today, demands a specific attention to a wider and more integrated trans disciplinary approach, focused on problem setting, problem solving and decision making. To fill in these expectations the Professional Module covers soft, transversal and managerial skills from the most demanding areas of Economics, Sustainability and Environmental Science.
- **Competences** – to complete the professional profile of the Sustainable Energy Expert, the survey's results highlighted also a strong importance of soft skills. This is why the Professional module strongly focuses on the most important ones as: problem-solving, responsibility and team working.

3. Professional Module: a possible structure and learning outcomes

Taking into account potential diversity of professionals' background – the professionals could be interested in the module depending on several aspects like type of their formal education (i.e. type of degree) or personal experience. An analysis of the electricity sector, its structure, differences, impacts, innovations shows a need of wide range of professional knowledge, skills and competencies.

The Professional Model faces this gap (of such diversified offer) via innovative structure of its programme which could be described as a "jigsaw puzzle structure" – a participant takes from the structure what s/he really needs. The following picture describes the structure of Professional Module that has developed till now. It consists of three steps (top-down approach) and the further part of this report describes in details each of three steps.

3.1. Section 1 - *Understanding*

Section 1 is planned to be prepared by professionals and downloaded into GrEnFIn webpage in a form of video lessons devoted either to specific tracks or assessed as an "universal". It covers online lessons carried, and consisted of ten video Learning Units (LU). Each learning unit is composed of 1-4 video-lessons. This part was created to allow professionals to develop skills, get knowledge and understanding of tools necessary to develop the project work. Although there is suggestion about track that LU is devoted for, a main idea was to create a general introduction for all participants. The learning units covers following areas:

Learning Unit 1.1 - Greening Corporate Strategy (T1)

1. The challenge of Climate Change and the need for a green corporate strategy – Lecturer: Stefano Verde
2. Applying the Sustainable Development Goals framework in a corporate strategy – Lecturer: Gaelle Ridolfi
3. Applying the climate change risk management in a corporate strategy – Lecturer: Stefano Scoccianti

Learning Unit 1.2 - Business opportunities and the EU Green Deal (T1)

1. Next Generation EU as business opportunity: main issues, goals and projects of national Recovery Plan
2. Circular Economy: rethinking business models and value chains
3. Energy transition: the need to pursue both green power and low-carbon gases
4. Energy efficiency: the way forward on the consumers' side

Learning Unit 1.3 - Financial tools in support of the Green (R)evolution (Universal)

1. The evolution of Green Finance: from the EU legislation to practice
2. Gas & Power Markets in EU: from commodity to flexibility

Learning Unit 1.4 - A Green Infrastructure case study: clean gases (T1)

1. Technological evolutions in the domain of clean gases
2. Setting-up a green infrastructure: Hera's biomethane plant
3. Operating and managing a biomethane plant

Learning Unit 1.5 - Fundamentals of Value at Risk (T2)

1. Fundamentals of Value at Risk. The parametric approach. The aim of this Learning Unit is to focus on: the evaluation of a risk measure able to represent the maximum potential loss of a portfolio within a given time horizon and at a given confidence level; the intuition of VaR; the parametric VaR: pros and cons.

Learning Unit 1.6 - Electricity market. Iberian and Greek markets" (T2)

1. Electricity Market: I. Energy Actors
2. Electricity Market: II. Iberian Market
3. Electricity Market: III. Greek Market

Learning Unit 1.7 - Adaptation to climate change (T3)

1. Adaptation to climate change in energy sector
2. Adaptation to climate change in urban area and transport
3. Adaptation to climate change basic.

Learning Unit 1.8 - Energy market in Poland (T3)

1. *Next Generation EU as a business opportunity in Poland*
2. *Energy market in Poland*

Learning Unit 1.9 - Innovation in Renewable energy sources (T3)

1. *Hydrogen*
2. *Innovation in RES: Microgrids*

Learning Unit 1.10 - "Adaptation to climate change" (T3)

1. *Adaptation to climate change in energy sector*
2. *Adaptation to climate change in urban area and transport*
3. *Adaptation to climate change basic.*

3.2. Section 2 - *Applying*

Section 2 was prepared by lecturers from higher education institutions to show up the interchange of knowledge between universities and business. It consisted of 11 video Learning Units (LU) that provided more theoretical lessons. The access to Section 2 was allowed only for those who pass an entry test based on topics of Section 1 (at least 6/10 correct answers). All Partner Institution (but mainly HEI lecturers) were asked to deliver the lectures (to be recorded). Hera prepared a special manual for video lessons recording. Professionals could access this part according to their specific individual needs and their previous experience. The topics of the lectures were involved in following areas:

Learning Unit 2.1 - Project evaluation: assessing economic and financial fundamentals (T1)

1. Net Present Value, Internal Rate of Return, Cost-Benefit Analysis, Business Planning

2. Cash Flow, debt and Breakeven point

Learning Unit 2.2 - Risk-management tools for a full-blown representation of the project (T1)

1. Valuation Hedging Investment Decisions

2. Energy Markets Risk Factors

Learning Unit 2.3 - Support schemes for Green investments: a tool-kit economic review with particular reference to the following incentive tools Renewable sources (T1)

Support schemes: Feed in Tariffs, Feed in Premia, Contracts for Differences, (Green) Certificates, Auction mechanisms.

Learning Unit 2.4 - Case Study: Example of Germany (T2)

Example of how the case study can be solved for the case of Germany.

Learning Unit 2.5 - What's more about Value at Risk? (T2)

The aim of this Learning Unit is to focus on:

- *the simulation methods: a proposal to overcome the drawback of the Parametric approach;*
- *historic versus Monte Carlo simulation: pros and cons;*
- *backtesting.*

Learning Unit 2.6 - Modelling and Forecasting of Time Series (T2)

In this learning Unit: what do we mean by forecasting, autoregressive models, moving average models, ARIMA models

Learning Unit 2.7 - Introduction to Time Series (T2)

In this Learning Unit: first insights on time series, time series decomposition, estimation of a trend, autocorrelation analysis, stationarity of time series

Learning Unit 2.8 - Project management (T3)

Project time management.

Learning Unit 2.9 - Project planning (T3)

Project planning

Learning Unit 2.10 - Risk in the project (T3)

1. *The EU's Journey to Net Zero*
2. *Financial risk*

Learning Unit 2.11 - Sources of project financing (T3)

Sources of project financing

3.3. Section 3 - *Thinking Complexity*

During the 4 days programme the participants had a chance to face a project work and solve a problem based on the devoted case study (one of three described above). The main purpose of the planned Professional Module is to achieve a synergy effect between two cohorts – students and professionals. A possibility to organise this event in presence enables the reformulation of a former idea and increase an overall satisfaction coming from direct meeting.

Among the submitted cases, the consortium has selected three that reflect three specialisations (tracks):

- ✓ **Track 1** – Renewable Technologies - Case Study: ***A Biomethane Plant and Green Hydrogen*** – proposed by Hera Group, Italy
- ✓ **Track 2** – Environmental Finance - Case Study: ***Greek and Iberian Electricity Markets*** - proposed by Ego Energy
- ✓ **Track 3** – Climate & Business - Case Study: ***Construction of an Microgrid Cooperating with a Residential Estate and Installation for Refueling Buses with Hydrogen*** – proposed by Tauron Polska Energia

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