**Development of a new educational path to facilitate the sustainable transition of the economy**

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**Brief Introduction**

The research project is strictly connected to the scientific part of the KA-GrEnFIn originates from the analysis of the role of the energy sector in the EU2030 strategy and its need to align to the low-carbon energy transition and circular economy goals of the European Union (EU). GrEnFIn is motivated by a robust demand from the market for a new professional profile, the **Sustainable Energy Expert**, able to assess the risks of the sector due to the exposure to fossil fuels resources, and to identify effective strategies for decarbonization by looking at the characteristics of the green energy market and new financial instruments to finance the transition. GrEnFIn stands for greening energy by promoting the transition to renewable energy sources, thus decarbonizing the EU economy, and the instruments to finance it, accounting for risk, returns and impacts. In line with the key elements of the Innovation Union, the key objectives of EU2030 strategy and the Modernisation Agenda objectives, the project has the aim of promoting high-level professionality and employability in the green energy sector through investment in knowledge and competences.

The project aims to identify a new educational approach (bringing innovation in both contents and methodologies) meant to address several challenges highlighted by the Final Report of the High-Level Expert Group on Sustainable Finance (HLEG, January 2018) as regards the need to update academic and professional curricula to increase financial literacy on sustainability issues, and to update the curricula of professionals and their participation in educational programs. In particular, the HLEG highlights the tight relation between finance and sustainability. In addition, the HLEG recognizes the key role of finance in meeting the EU sustainability agenda, and the need to develop financial instruments and approaches to fill in the green investment gap, which is estimated in 180bn Euro/year in renewable energy investments only. Decarbonizing the energy sector is fundamental to achieve the EU2030 targets as well as to comply with the Paris Agreement signed by the EU and aimed to limit global temperature increase to below 2 degrees C. Indeed, the energy sector alone contributes directly to 55% of emissions in the EU in 2015[[1]](#footnote-1) but it also indirectly contributes to the generation of CO2 emissions from transport, agriculture and housing.

**Needs Analysis**

The first level of the needs analysis is represented the abovementioned Final Report of the High-Level Expert Group on Sustainable Finance (HLEG, January 2018). Here there is a clear recognition of the need to update academic and professional curricula in order to increase financial literacy on sustainability issues, and to update the curricula of professionals and their participation in educational programs. In particular, the HLEG highlights the key role of finance in meeting the EU sustainability agenda, and the need to develop financial instruments and approaches to fill in the green investment gap.

To go through the denounced need, it is important to clarify the energy market’s actors, i.e.

1. Producers/suppliers L/SME: companies that produce energy and sell it to suppliers or supply it directly to the retailers.
2. Traders/Retailers L/SME: companies that buy and resell energy without necessarily produce it.
3. End users L/SME: enterprises that use energy for their productive activity (in any economic sector).

All these enterprises are expected to request energy experts to employ in their staff or to consult for the energy management activities. In particular, producer/suppliers are expected to be interested in hedging their natural position and in steering in the sustainable energy; traders/retailers are expected to be interested in the optimal management of the energy portfolio and in hedging activities, also using the tools of the financial engineering; end-users usually need to be supported in choosing the optimal provision of energy dedicated to their productive activity in the respect of the regulatory constraints. The expected requested knowledge is extremely specialized and focused on the connection between sustainable energy and finance or better on the support the finance can offer to the transition to a sustainable economy. Moreover the educational programme needs to be regularly updated in order to have professionals able to face any new contingent features. The project aims to design an educational path and a professional module in line with the needs denounced by (HLEG, January 2018) and previously detailed as expected needs of any kind of energy market’s actor.

The second level of the needs analysis has been carried out both about the sector needs through **stakeholders and students consultations** and, on the other hand, on the current **educational offer** available for the Energy Sector. The implementation of the needs analysis was addressed to two different target groups in order to identify the participants training needs in term of current knowledge situation in the field of renewable energy sources and particularly in the role of financial products to foster and smooth the transition to low-carbon energy system in Europe.

We carried out a wide analysis about the **current educational offer** in the energy field. Nowadays, 77 Masters are offered in the field all over the world, 64 of them are located in Europe with a remarkable concentration in Spain, France, Sweden and United Kingdom. The data explain the interest in the Energy market especially in Europe. Nevertheless the 55% of these Masters are proposed by independent educational bodies with courses not always devoted also to the renewable sources. These involve technical experts and teachers coming from Universities but are not provided directly by Academic Institutions. On the other hand the other 45% of the offer comes from Universities and it is represented by “local” Masters, i.e. without any international feature, nor cooperation with other countries (as, for example, Double or Joint Degrees) and the faculty is quite completely composed by the staff of the same institutions (<http://www.masterstudies.com/Masters-Degree/Energy-Management/Europe/>). Moreover, there are no Erasmus Mundus Programmes in the Energy field (<https://eacea.ec.europa.eu/erasmus-plus/library/scholarships-catalogue-en>).

Most of the educational offer on sustainability is located in UK and the USA, and focuses on a rather broad concept of sustainability, in terms of natural resource use, consumer behavior or policy, and mostly from an academic point of view. Among the most relevant for the project, in the UK, the Global Sustainability Institute in Cambridge (GSI) leads on a Sustainability Master, providing classes on systems-based approach to addressing sustainability, epistemology of sustainability, the impact of economic growth on ecosystems and limited natural resources, and sustainable behavioral change[[2]](#footnote-2). Oxford University offers short sustainability courses and summer schools focusing on the analysis of the economic and financial implications of carbon stranded assets[[3]](#footnote-3). In the USA, Boston University (Boston) offers a minor in Sustainable Energy for undergraduate students, that provides basic elements of energy sources from the business, economics, policy and engineering perspectives[[4]](#footnote-4). Harvard University has developed the Future of Energy initiative, which engages faculty and students in research on major energy-related problems e.g. climate change, urban air pollution, energy security, from an academic perspective[[5]](#footnote-5).

In contrast, in the EU, the Institute for Ecological Economics at WU (Wien) is among the few academic institutions to offer a truly interdisciplinary international Master in Socio-Ecological Economics and Policy (SEEP) that provides a theoretical background and factual information about the interconnected dynamics of economic and social systems and the physical environment, environmental science and policies[[6]](#footnote-6). However, an interdisciplinary HE course covering cultivating the skills needed by energy business experts and young professionals by covering topics in renewable energy transition policies in the EU, climate-related financial risks, quantitative energy finance, renewable energy project management from a theoretical, empirical and applied point of view is yet to be developed. At last we point out that none of the existing educational programmes are focused on Green Energy Market and Financing in an integrated way meaning to lead a deep quantitative knowledge of the way to favor the transformation of the energy market in full compliance with the environment.

**Main Objectives**

The main objective of the project is to support the GrEnFIn project in the scientific design of the new educational path. The project also intends to contribute in the dissemination activities aimed to provide the Energy Sector’s stakeholders community with the environment and platform to exchange knowledge, competences, experiences. The project will be related mainly to the activities of WP3-GrEnFIn project, i.e. the draft curriculum development.

This work package concerns the definition of the basic structure of the learning, i.e. the study plan including the academic modules (taught by both people coming from academies and industries), the internships and stages provided to students, the credits’ attributions to each of them, the rules governing the mobility of students.

**Methodology**

The proposed methodology is characterized by the following macro-phases:

1.preparation/consultation phase;

2.activation of the academic study path and the professional module;

3.validation (testing and piloting).

The passage from one phase to the next one is steered by an inspiration principle assuring a consultation, reviewing, validation and dissemination as wide as possible. This inclusive inspiration has been respected also in the numerous events organized during the life of the project where a wide audience is consulted to discuss the project’s contents, methodologies, stakeholders’ engagements and validation/dissemination. All the phases have been conceived in view of the final goal reached through a jointly management, a QA plan and a development process fully compliant to the Erasmus Mundus policy. More precisely, when designing the Master Course the project intend to refer to Erasmus Mundus Joint Master Degrees (EMJMDs) principles and features and to the European Approach for Quality Assurance of Joint Programmes agreed standards as in:

* “EHEA Ministerial Conference, Paris 2018", May 2018 <http://www.ehea2018.paris/>
* "EQAR and the European Approach for Quality Assurance of Joint Programmes: information on national legal frameworks" [https://www.eqar.eu/kb/joint-programmes](https://www.eqar.eu/kb/joint-programmes/national-implementation/)/
* "Manual for the European Approach for Quality Assurance of Joint Programmes" by VLUHR  
  <http://www.vluhr.be/europeanapproach>

The EMJMDs features and the QA of Joint Programmes agreed standards will be inspiring for and referred to particularly when designing the Master Course’:

* Learning Outcomes
* Mobility Structure for Students and Teachers
* Study Programme (structure and content of the course, credits, …)
* Admission requirements and selection Procedures principles, Recognitions and Qualifications frameworks
* Learning, Teaching and Assessment of Students principles
* Internal Quality Assurance monitoring processes

The followed methodology will be represented by a first draft which identifies the innovative modules and methodologies to test (during the first summer school, M9) based on the consortium experience, the actual educational offer and a restricted external consultation.

An analytical survey of the specific national programmes and existing double degrees among partners in Energy Finance will be realized. This activity will be performed through a questionnaire to be submitted to partners. The questionnaire will be prepared in the very initial phase and submitted to partners to receive a description of the structure of their actual master programmes, the contents, the course units and ECTS for each single module, the mandatory and free choice courses, the internship programme - when available - and the stakeholders networks. Then the survey will reach the international dimension in order to identify the existing innovative modules which will be potentially part of the projected study path.

A workshop with an umbrella organization will be organized in Bologna in M6 in order to define the aimed competences and to propose a draft of the curriculum coming from an external consultation. This external consultation will allow us to have an external opinion also if restricted before the closure of the stakeholders’ consultation.

Starting from data collected, the external consultation and the partners’ experience, the partners will prepare and discuss (in a virtual conference) the draft joint curriculum which will be presented in different forms, including PDF text files and interactive internet text on the project web site. The curriculum will be described including the professional profile description, the employability paths, the competences to be acquired by learners and their learning outcomes, the modules and course units presented in ECTS credits and the mobility paths of the joint programme.

A summer schools in Bologna (M9) is implemented in order to test some module and the new educational methodologies. During the summer school brainstorming activities will be organized in order to validate the most suitable and effective methodology. Reports will be produced to assure deliverability of the pedagogical methodologies we are testing and of the joint work of academies-enterprises as best-practicing for a European green reconversion. The tested activities organized after the workshop at closure of the first summer school, will incorporate the advices coming from the stakeholders’ consultation and hence will be representative of a wider external viewpoint.

**Main tasks, Milestones, Performance Indicator and Deliverables**

In temporal order, the main tasks are represented by the activities that will follow the opening kick-off meeting supported by integrated activities

1. Analytical survey of the specific national/international programmes and existing double degrees among partners
2. Preliminary draft of the basic structure of the learning outcomes, mobility paths, ECTS provided (virtual discussion at the closure of the Workshop in Bologna, M6)
3. Selection of 30 students admitted to each summer school. Every academic partner internally selects 5 candidate students among their master students and then a commission composed by one person for every university will declare the final decision. Students cannot ask for admission more than one time.
4. Organization of a summer school placed in Bologna (M9) to test some module and the new educational methodologies. The methodologies tested in the first summer school will be selected by the consortium mainly based on their experience while the following tests will take into account the results of the stakeholders consultation and validation’s activities presented in the Workshop (Bologna, M9).
5. Virtual conferences of the partners to discuss the possible critical points of the tested learning outcomes and report to deliver the comments and our experience on the tested pedagogical methodologies
6. Final draft of the basic structure of the learning outcomes and basic structure of the course

**Milestones:**

MS.1 Test of learning outcomes concerning the academic path (M9-M12)

MS.2 Completion of the design of the academic educational path and community training materials (M12)

**Performance Indicators:**

PI.1 Number of academic courses developed and translated to English (syllabi, learning outcomes, course objectives, assessment and evaluation)

PI.2 Number of community members who downloaded the training materials from the Hub

PI.3: Number of students participating in testing activities developed during the project (summer schools/workshops)

**Deliverables**

D.1-Preliminary draft of the basic structure of the course and learning outcomes: It concerns the preliminary definition of the basic structure of the learning outcomes coming from the consortium experience, the actual educational offer and a restricted external consultation.

D.2- Reports of the virtual conferences of the partners to discuss the possible criticality of the tested learning: a summer school is implemented in order to test some module and the new educational methodologies. Selection of students admitted will be done first internally by every academic partner and then by a commission composed by one person for every university of the consortium. Then virtual conferences of the partners to discuss the possible criticality of the tested learning outcomes are organized after the end of the workshop and the summer schools and finally three reports are produced including a report to assure the deliverability of the tested pedagogical methodologies and of the joint work of academies-enterprises as best-practicing for an European green reconversion.

D.3- Final draft of the basic structure of the learning outcomes: It concerns the final definition of the basic structure of the learning outcomes in line with the preliminary draft and in order to solve the criticality of the tested learning outcomes as discussed in the produced reports.

1. http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Greenhouse\_gas\_emissions,\_analysis\_by\_source\_sector,\_EU-28,\_1990\_and\_2015\_(percentage\_of\_total)\_new.png [↑](#footnote-ref-1)
2. https://www.anglia.ac.uk/study/postgraduate/sustainability [↑](#footnote-ref-2)
3. http://www.smithschool.ox.ac.uk/courses/sffc/ [↑](#footnote-ref-3)
4. http://www.bu.edu/earth/education/undergraduate/minors/minor-in-sustainable-energy/ [↑](#footnote-ref-4)
5. http://energy.harvard.edu/ [↑](#footnote-ref-5)
6. https://www.wu.ac.at/en/programs/masters-programs/socio-ecological-economics-and-policy/overview/ [↑](#footnote-ref-6)