



*Erasmus+ KA2 Knowledge Alliances project
“Greening Energy Market and Finance – GrEnFln”*

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WP5 – D5.2 – Report on the Final curriculum development

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Executive Summary

This report presents the Final Draft of the Consortium Agreement regarding the Master programme implemented by the GrEnFln consortium.

1. Introduction and motivation

The new Master created by the GrEnFln Consortium is a multidisciplinary project whose main goal is to provide students with a culturally broad and academically rigorous preparation to analyse and manage the issues arising from the transition to a low-carbon economy, using financial innovation to guide companies through this delicate phase by favouring a risk control policy.

The proposed educational path is designed around the profile of the 'Sustainable Energy Expert'. Given the pivotal role that this new professional figure is expected to play in facilitating the transition to a sustainable economy, it must bring together multiple competences that usually characterise various professional profiles. In particular, fundamental aspects will be engineering knowledge on renewable energy sources and in sustainable economics, as well as quantitative skills relating to aspects of risk management and financial engineering. The strong belief of the consortium is that only such an interdisciplinary approach can ensure the preservation of a viable economy with awareness of environmental impact and protection of the common natural heritage.

In particular, the role of finance in this training project takes on a completely new and fundamental connotation, since it is precisely the creation of new financial products that support the shift towards energy diversification alongside policies to control/cover the natural risk implicit in the supply itself with renewable sources.

These are the main motivations that pushed the GrEnFln Consortium to work for the creation of an innovative Master degree in Green Energy and Finance. The implementation of such a program was one of the main goals of the GrEnFln project, and has been supported by the consultation of Stakeholders and by several testing activities, as it is described in Section 2.



The master will officially start in the Academic year 2023/24 and will be given by three HEIs partners of the GrEnFIN project, namely the University of Bologna (UNIBO), the Ludwig Maximilians University of Munich (LMU) and the Paris-Dauphine University.

2. Stakeholder consultation and testing phase

The new master degree proposal stems from a careful analysis of the current international educational offerings and the collection of market needs, which was carried out through an articulated consultation plan, conducted as part of the GrEnFin Project. Industrial stakeholders of the project actively participated first in the mapping of the market and identification of the target groups, then in the elaboration of the design of the educational project and in the testing and subsequent validation phases.

Consultation results show that the course has found great interest and appreciation from the social partners consulted. In fact, the course is perceived as innovative in the international framework given the gap that currently exists between educational offers and industrial needs. Based on the consultations, the course appears to offer an organic set of knowledge and skills based on a constant dialogue between the various disciplinary areas. The training objectives are perceived to be consistent with the curricular needs of the market: they are rated from *considerable* to *very relevant* both in terms of importance and expected outcomes in all the skills' areas involved.

Through the consultation there was also a discussion on the course name, employment outlets, expected training needs and objectives, as well as the characteristics of the final test for the degree. The main points of attention noted were discussed within the GrEnFin consortium, and led to the identification of the following lines of action:

- Cover more issues related to the legal aspect and public policies as facilitators of the strategic trend in relation to the green transition as well as methodologies for financing the transition. Taking this prominence into consideration, the Consortium decided to stress more on these topics within the teaching of the business field. In addition, the Consortium is committed to increasing the supply of related/optional teachings (especially within the Climate&Business science curriculum), so as to further specialize the course in the suggested area;
- Provide a clear differentiation of competencies of professional profiles referring to



different curricula (especially from the perspective of proper career guidance). On the basis of this remark, the Consortium discussed the possibility of providing, among the faculty members, a figure to facilitate the choice of the most appropriate curriculum as well as the exit orientation of graduates. Therefore, the figure of the "career and placement officer," selected from among the course council members, was introduced.

- Include specific elements within the educational objectives of the individual finance-related teachings, such as a more pronounced presence of knowledge related to the commodities market and financial derivatives related to that market;
- Provide connecting workshops between the various teachings to give organicity to the strongly interdisciplinary project;
- Provide for in-progress alignment/support tutorships in the disciplines of greatest interest in the course given the possible level of heterogeneity in students' backgrounds

All these suggestions have been taken into consideration when designing the final Curriculum. Moreover, a consistent testing phase has been carried out during the last two years of the program. Specifically, two GrEnFin Summer Schools have been offered in June 2020 and June 2021 (online, due to the Covid pandemic), the GrEnFin Full Immersion Experience has taken place in Bertinoro (Italy) in June 2022 and the GrEnFin Pilot Class has been implemented in the Academic year 2021/22 at the universities of Bologna, Katowice and Munich. The criticalities emerged from this testing activities and how they have been taken into account in the Curriculum designed are the main subject of the deliverable D5.1.

3. Programme overview and legal framework of the partners involved

First objective was to organize a joint structure, but the required administrative checks carried out uncovered several incompatibilities between local legislation and joint agreement points. In order to overcome the incompatibilities, UNIBO, LMU and Paris-Dauphine have worked together for the creation of a multiple degree structure. The official agreement is expected to be signed within the end of 2022. Due to the Multiple degree structure, the students attending the course of any of the 3 universities will be awarded by the university offering the course, a degree certificate with one of the following names



- Master programme in Greening Energy Market and Finance (UNIBO)
- International Master in Business Mathematics and Green Finance (LMU)
- Master in Economics and Finance (Paris-Dauphine)

In the case of UNIBO and LMU, the titles have been approved by the specific state's ministry. Paris-Dauphine already had the Master in its programme, so it does not need the approval. The fields of the degree programme are:

- LM16-Finance (Unibo)
- Mathematics (LMU)
- Economics and Finance (Paris-Dauphine).

The degree programme is based on the ECTS credits system and has a duration of two years: the first year, students are supposed to stay at the home university, whereas the second year they will travel to a partner university. In particular, a minimum of 60 ECTS have to be achieved “abroad” (that is, at the chosen university). The thesis will be written at the host university, and the mandatory internship will be also implemented “abroad”.

Even if the program officially starts in the Academic year 2023/24, the first cohorts of students from UNIBO and LMU who will travel to the respective partner universities are the 2022/23 ones, thanks to a derogation granted to the two universities. On the other hand, the first cohort of Paris students that will take part to the Master is the 2023/24 one.

4. Didactical plan

The didactical plan of the Programme has been designed taking into consideration the needs highlighted in the Stakeholders consultation and the criticalities emerged from the testing activities (see Chapter 2).

In particular, a fundamental question when implementating a didactical plan for a new Master programme is related to the expected skills and knowledge that the students graduating have to achieve. In the case under analysis, it has been agreed that the student who graduates from the GrEnFin Master programme has to be able to:



- manage future changing processes either in the external scenarios (due to climate change impact) and internal ones (due to technological progresses and innovations);
- manage future societal and economical challenges arising from global warming;
- manage the transition process, either at the enterprise level or institutional/regulatory one
- quantitatively evaluate and manage the risk coming from Climate change (Climate risk)

These abilities, related to the goal of learning with understanding, must be assured by a global educational methodology that merges theoretical and practical learning through innovative methodologies, implying an active participation of students (flipped classes methodologies, direct involvement of students as tutors or supporter of their pairs, involvement in the governance of the master with a role of consultants to solve possible criticalities arousing or simply to give suggestion for improvements) and a reinforcement of transversal skills through team work activities based on assigned projects (related to different scientific fields).

However, given the complexity of the transition process and the multiple role that the Sustainable Energy Expert will play in it, it became necessary to differentiate the professional figure by favoring the focus of training on one of the following specific contributions:

- supporting the production system in identifying the best energy supply strategy based on the impact in terms of risk and in compliance with the regulator's directives
- designing ad hoc financial products that allow companies to hedge/manage the natural risk arising from renewable choices
- supporting the company's financial management that is aware of the impact that climate change will have at the micro and macro economic level, in identifying the best asset allocation policy in compliance with ESG objectives of minimizing environmental impact

The triple role identified has led to the structuring of 3 curricula that aim to train the Sustainable Energy Expert in "Renewable Technologies," "Environmental Finance," and "Climate&Business Science," respectively.

Although the project stems from the merging of several areas of expertise, students will have the flexibility in developing their own educational plan that fosters in-depth studies in one of these subject areas. The specializations define three curricula aimed at educating the figure of "Sustainable Energy Expert" with specific focuses on certain skills expected by the stakeholders consulted.



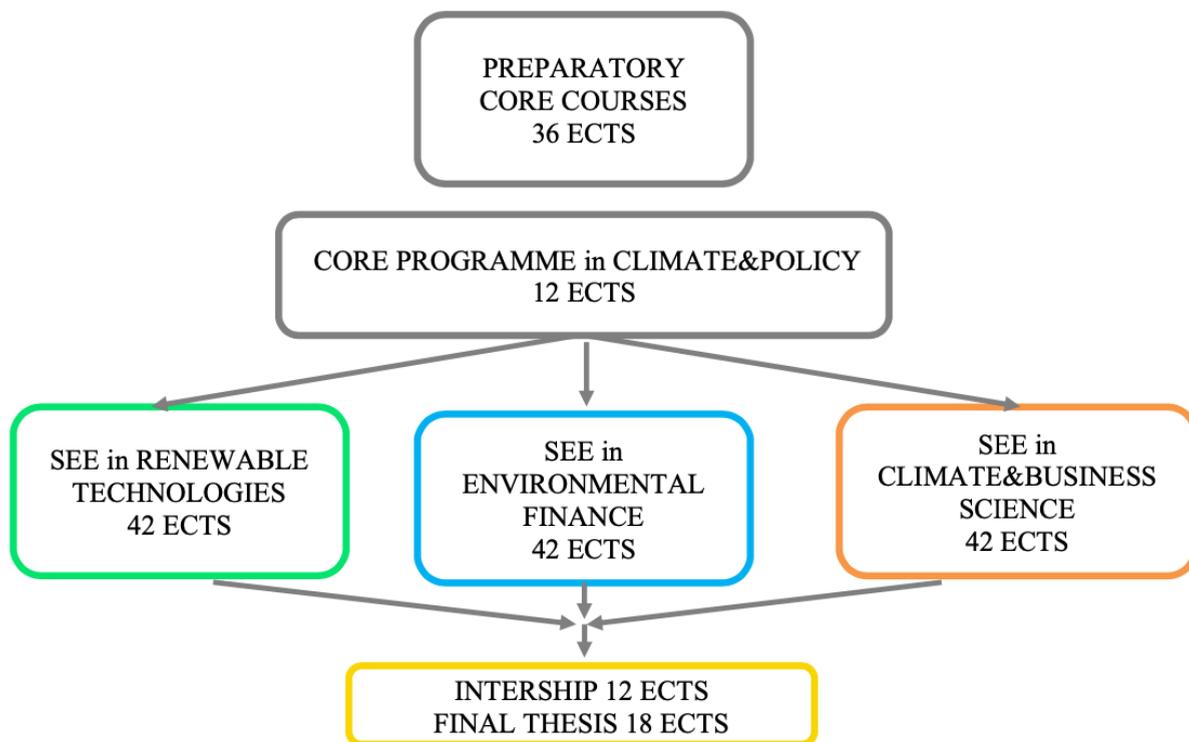
The curriculum in "Renewable Technologies" aims to educate an expert with engineering knowledge of specific interest in renewable sources and implementable technologies to energy production and storage. This specific knowledge is enriched by teachings aimed at providing the economic-financial skills to be able to approach the energy transition with full awareness of its implications on the production system, the viability of the business cycle, and the impact on systemic risk.

The curriculum in "Environmental Finance" aims to educate an expert with quantitative profile and environmental knowledge, in order to be able to guide companies in the energy transition, suggesting hedging and risk control solutions based on the definition of new derivative products written on the natural variables of interest for the transition. Here quantitative finance knowledge is put at the service of sustainability goals.

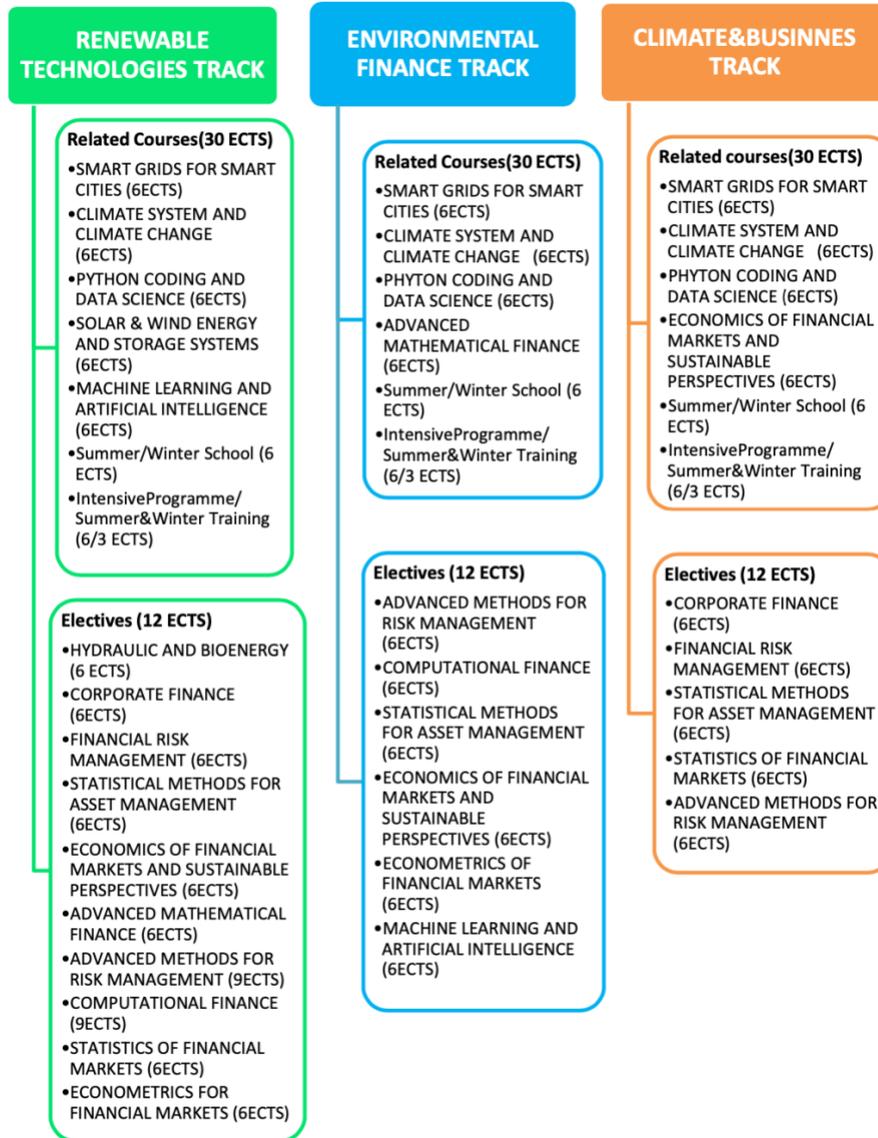
The curriculum in "Business and Climate Science" emphasizes skills related to forecasting climate variables, mitigation and adaptation policies related to the impact of climate change in managing sustainable market transition. The identification of management methodologies appropriate to corporate business is within the specific expertise of this figure.

Whatever curriculum is chosen, the student will then undertake the thesis at a host university on an applied topic related to the GrEnFIn world, besides a mandatory internship possibly at one (main or associated) partner of the Consortium.

Here is a schematic overview of the programme.



Here below we present a detailed description of the three curricula. The courses are listed along with their classification as related and elective modules. Related courses are compulsory for the chosen track while electives are expected to be chosen by students in order to tailor their educational path.



5. Academy – business synergy



As explained above, the Master stems from a joint confrontation between academia and business that makes the proposal innovative, both in terms of content and teaching methodologies, inspired by a business approach in which the problem starts from a concrete case (clearly localizable in a specific industrial reality) and in the search for its solution, during which the theoretical outline aspect is deepened. Therefore, a methodological approach is proposed that supports a complete integration between academia and business and is able to fully exploit all the resulting synergies.

In general, joint activities are planned between academia and business as well as the participation of students and professionals in the same project teamwork (Summer/Winter Training, Summer/Winter school and Intensive Program). Teamwork activities carried out with the participation of students and professionals are also supposed to enhance soft skills.

A very important emphasis is posed on the experience of internship and the elaboration of the final thesis, where a joint work with an academic and a professional supervisor requires a deep understanding of the topic, from a theoretical, empirical and feasibility point of view, together with the ability to imagine a solution which is totally comprehensive with these shapes of the problem. The internship represents therefore a fundamental experience for students in which the theoretical knowledge learned is transposed to the business dimension, giving the student an awareness of its value and practical usefulness.

Moreover, students will have the opportunity to access a dedicated “Internships” webpage created on the GrEnFln Platform, which in turn will link back to the university site where they can apply for the required internship, of course on some topics related to the GrEnFln project. This innovative possibility reinforces even more the idea that this master can be truly close to industry, in such delicate issues as those concerning climate change.

6. Mobility plan

The Programme mobility has been agreed between the three universities involved in the Master, and corresponds to the one of an Erasmus + programme.

Specifically, the mobility of each student lasts one year, in the third and fourth semester. It has been decided to have one year mobility in order to:

- Guarantee that the period spent at the host university is long enough in order for the student to have a significant experience
- Let the student work both at the final thesis and at the internship “abroad”.



During the internship, the student will have two supervisors: an academic one, member of the teaching staff of the host university, and one from the company which offers the internship.

7. Budget management

The Master structure can be seen as a set of possible double degrees, involving the three universities. This means that students enroll at the home universities, and pay tuition fees there. On the other hand, during the mobility period students participating in the programme remain enrolled at the home university and they are registered at the host university; they continue to pay tuition fees at their own university and they are exempted from paying tuition fees at the host University.

Since the internship takes place abroad, in mobility terms, it is managed under the rules of the host university.

8. Admission and evaluation procedure

The selection of students for the Master programme is managed independently by each university. This means that each student is selected by the university where he/she starts the Master that is offered by the specific university, and then, spends the second year at one of the other host universities

The adequacy of personal preparation is checked by an Admission Committee on the basis of:

- university-level knowledge of mathematics, economics, finance and statistics
- evaluation of the candidate's curriculum and of the documentation required for admission (international certifications relevant to the interests of the course, document containing the grade of the Bachelor's degree as well as grades, credits and disciplinary sector inherent to all the examinations taken in the bachelor course, extracurricular and professional training experiences relevant to the interests of the course).

Learning outcomes are mainly checked by oral and written exams, project evaluation both on individual and team basis. On-track evaluation through tutorship's practical tests and problem-solving assignments allow to check the capability of students in managing instruments and methodologies with a critical approach.



Greening Energy Market and Finance



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UNIVERSITÀ DI BOLOGNA



University
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