DELIVERABLE 5.1
Elaboration of the Sustainability Plan

Written by	Responsibility
Jonathan Rodriguez (IT)	WP5 Leader
Cláudia Barbosa (IT)	WP5 IT Team
Georgios Mantas (IT)	WP5 IT Team
Maria Papaioannou (IT)	WP5 IT Team
Edited by	
Mohammad Siam (IU)	Member
Fabrizio Granelli (UNITN)	Member
René Lastra Cid (UVIGO)	Member
Felipe Gil-Castiñeira (UVIGO)	Member
Josephina Antoniou (UCLAN)	Member
Marios Raspopoulos (UCLAN)	Member
Stelios Ioannou (UCLAN)	Member
Eliana Stavrou (UCLAN)	Member
Nearchos Paspallis (UCLAN)	Member
Saud Althunibat (AHU)	Member
Moath Alsafasfeh (AHU)	Member
Ziyad Tarawneh (MU)	Member
Ahmad Aljaafreh (TTU)	Member
Andreas Kazantzidis (UPAT)	Member
Omar Daoud (PU)	Member
Mohammed Baniyounis (PU)	Member
Approved by	
Saud Althunibat (AHU)	Project Coordinator

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of the partners of IREEDER project and do not necessarily reflect the views of the European Union'

LIST OF CHANGES

Version	Date	Change Records	Author
1.0	Jan. 10, 2022	Whole document	Cláudia Barbosa, Jonathan Rodriguez, Georgios Mantas, Maria Papaioannou (IT)
1.1	Jan. 18, 2022	Individual Exploitation Plans	Mohammad Siam (IU), Fabrizio Granelli (UNITN), René Lastra Cid, Felipe Gil-Castiñeira (UVIGO), Josephina Antoniou, Marios Raspopoulos, Stelios Ioannou, Eliana Stavrou, Nearchos Paspallis (UCLAN), Saud Althunibat (AHU), Ziyad Tarawneh (MU), Ahmad Aljaafreh (TTU), Andreas Kazantzidis (UPAT), Omar Daoud, Mohammed Baniyounis (PU)

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

This document presents the Sustainability Plan for Erasmus+ Capacity Building Project 609971-EPP-1-2019-1-JO-EPPKA2-CBHE-JP "Introducing Recent Electrical Engineering Developments into Undergraduate Curriculum" (IREEDER).

In detail, the purpose of this document is to describe the strategy that will support the sustainability of the outcomes of the IREEDER project after its lifetime. It includes information on the project outcomes and conditions, recommendations and guidelines for using the developed project products, thus providing all interested individuals and institutions (including further actors not directly involved in the project) with a solid overview on the products available for them for further usage and the ways they could be used. Therefore, a description of the IREEDER outcomes and possible modes of their application and detailed information on the sustainability of the project results are included in this document. In terms of the potential ways of exploitation, the context of each partner and partner country was taken into consideration and the guidelines of reaching target groups and ideas of usage were prepared accordingly.

This document is developed in the scope of the WP 5 - Exploitation of results and sustainability plan (Dissemination & Exploitation) of the Project in compliance with the Project description and all applicable rules & guidelines.

1.1 Definitions

The definition of a sustainability plan requires a brief definition of two complementary concepts: *sustainability* and *exploitation*.

The general definition of **Sustainability** is the capacity of the project to continue its existence and functioning beyond its planned lifetime. The project results can be used and exploited continuously, as such sustainability of results implies use and exploitation of results in the long term.

The sustainability of project outcomes may be difficult to anticipate and to describe in early stages of the project and may as well not concern all the aspects of a project. In each project some results may be maintained, while others may not be required to be sustained. A project can, therefore, be considered as sustainable if relevant results are pursued and products are maintained or developed after the end of the funded project duration. Typically, sustainability actions include the maintenance and update of produced data and software or the provisioning of services and their persistent and self-sustainable maintenance.

As per the definition above, sustainability relates to the exploitation of the project's results**.** But what is understood by *Exploitation*?

The concept of *Exploitation* is often confused with two other concepts that are used to measure the impact of a given project: *Dissemination* and *Communication*, but these are three different notions, which contain different actions and are dealt with in two different project Workpackages.

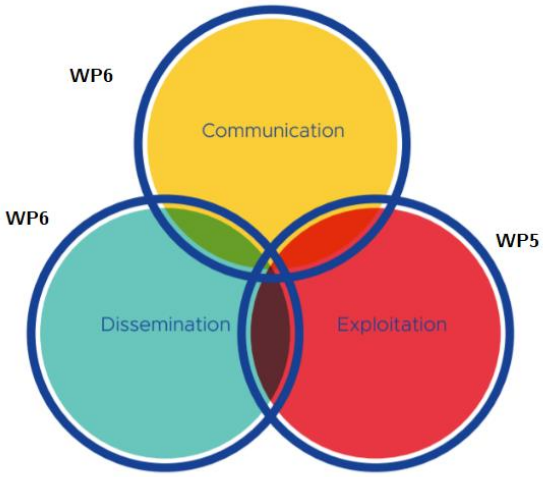

Figure 1 - Measures of the impact of a project

Dissemination refers to the public disclosure of project's results to a specific/specialized target audience, contributing towards the concept of Open Science, by making knowledge and results available to the wider research community.

Communication relates to the communication efforts to the general public of information about project activities, results and its impact.

Both of these concepts are addressed in WP6 of the IREEDER project.

But **exploitation** – which is addressed in the scope of WP5 - refers either to the utilization of results for further research upon the project's completion, or the developing, creating and marketing of a product or process. Its objectives include the effective use of the project results, by the project partners, other relevant stakeholders, or the general public. The target audiences are the project partners, other organization, and the public, depending on our project's results and the target of potential end users.

In fact, exploitation is associated with the use of the project's results at different levels, during and after the implementation of the project. It concerns the necessary action that will bring visibility to the project in order to involve the target groups, end-users, stakeholders and transfer the results/products into their professionals' scope. It is mostly related to the idea of the key actors of a project using its main products and services, and closely associated with the sustainability of the project after its conclusion, since exploitation activities should ensure that the results of the project are used by its target groups and are possibly transferred to other contexts (e.g. other countries; other pedagogical areas; other sectors; other application settings, etc.).

Exploitation of results, with the global aim of achieving sustainability of the project outcomes, is - as

aforementioned - addressed in WP5 of the IREEDER project, which has as main goals:

- to elaborate a sustainability plan;
- to facilitate the adoption of the teaching materials among the Jordanian partners;
- to motivate the update of teaching materials following the project implementation depending on the institutional, social, economic and technological viabilities;
- to set up the e-learning module;
- the supervision of final-year graduation projects on IREEDER topics.

1.2 Purpose of the Sustainability Plan

The purpose of this document is to describe the tangible outputs and outcomes developed in the scope of the IREEDER project which can be considered as sustainable, fulfilling long-term objectives, and causing lasting impact. The document also details the planned activities to reach such objectives, as well as the strategy to ensure long lasting use of the results after project's lifetime including measures towards mainstreaming and multiplying results at national and international levels, establishing sustainable partnerships, among others. It furthers contextualizes how these activities lead to the attainability of the objectives.

This Sustainability Plan is not an answer to all possible sustainability challenges, but rather a roadmap to guide the project team and the project partners as they work on sustainability efforts, providing all the researchers and organizations involved in the project – as well as all interested parties (further involved stakeholders, peer researchers and institutions) - with a solid overview on the project outcomes available for them for further usage and the ways they could be used.

This document can also strengthen partners' understanding of the efforts needed to keep operating and improving within the scope of the IREEDER project, as IREEDER partners can use the plan to market project deliverables to potential funders and other possible partners, and as a guide to support the ongoing management of the project.

A sustainability plan can help identify what resources are necessary to sustain the project, encourage the development of partnerships and support collaboration, and help define progress and the necessary action steps needed to ensure long-term success after the Erasmus+ IREEDER project ends.

As defined in the project description, the methodology of the sustainability plan will depend on the following criteria:

- Institutional viability (crediting, commitment of universities).
- Social viability (interest of companies and training demand of students).
- Economic viability (support from sponsors).
- Technological viability (ensured by the web platform and by laboratories).

1.3 Information on the IREEDER project

The main objective of the IREEDER project is to improve the capacity of Higher Education in Jordan, using state of the art technology and training staff on improving the quality of the materials by making best use of these technologies. The subjects developed in the scope of the IREEDER project will be oriented towards the recent technologies in electrical engineering including Renewable Energies (RE), Internet of Things (IoT) and Cybersecurity (CS), in addition to their different applications.

In detail, IREEDER aim is to develop, integrate, accredit and evaluate a quality bachelor degree subjects in RE an IoT and CS in Jordan with an appropriate laboratory component jointly taught by universities in Jordan, in accordance with the Bologna process. This will ensure that universities in Jordan are placed in a position to offer quality education compatible with European standards and meets socio-economic needs of the emerging knowledge-based society by strengthening teaching in those fields in order to graduate professional leaders who can meet market needs of the country. The project's direct aim is to enhance the capacity and enable Jordanian partner universities to develop sustainable bachelor programmes with state-of-of-the-art educational technologies.

Specific objectives of the IREEDER project are, as such, to:

- **develop, integrate, accredit and evaluate subjects** with **appropriate laboratories' components** in the fields of **RE**, **IoT** and **CS** taught by universities in Jordan and brought into line with the EU requirements. These subjects will be developed and taught in the English language.

- **engage faculty members in the development of interactive instruction techniques** for lectures, laboratory training, and sharing experiences with EU partner universities;

- develop and implement subject content using Virtual Learning Environment (VLE) delivery and remote labs;

- extend services and training in collaboration with the industry firms and local communities.

- **improve the human capacity of Jordanian universities** by providing training and upgrading opportunities in the EU for aspiring young and women academic staff;

A long term objective foresees the developed subjects becoming autonomous after the community funding phase and bringing on further multiplier effects on education, economic and social development environment.

1.4 Information on IREEDER partners' roles

In order to achieve these objectives – and while IT is the lead partner of *WP 5 - Exploitation of results and sustainability plan* – all the consortium partners are expected to contribute to the joint activities of the project as well as to a dedicated exploitation strategy implementation with its own institutional activities. In fact, responsibility to adhere to the developed strategy and plan as well as to implement all planned activities is undertaken by all partners following the roles assigned to them for the project lifetime.

Individual exploitation activities aim at ensuring the use of the project's results at different levels, during and after the implementation of the project. They are related with the necessary action that will bring visibility to the project in order to involve the target groups, end-users, stakeholders and to transfer the results into their professionals' scope and therefore to provide long-term implementation of the project's general aim.

2. DESCRIPTION OF THE SUSTAINABLE OUTCOMES OF THE IREEDER PROJECT

The successful achievement of the IREEDER objectives will imply the genesis of several outcomes which are considered by the consortium to be of sustainable nature, and which can ensure an optimal use of the project's results within the project's lifetime and after its implementation. The identified sustainable outcomes are presented in Figure 2 and further detailed in Table 1.

Figure 2 - Sustainable Outcomes of the IREEDER project

Also detailed in Table 1 are the strategies planned to be conducted after the project's lifetime to ensure their long lasting impact and sustainability.

Table 1: Sustainable Outcomes of the IREEDER project

	Sustainable Outcomes	Strategy to ensure their sustainability	Resources necessary to achieve this	Where will these resources be obtained?	Responsible
1	**Developed subjects in RE, IoT and CS.**	An official accreditation process will be accomplished by the end of the project at all Jordanian partners. This will ensure the sustainability of the main outcome of the project.	No financial support is required to accomplish the accreditation process	n/a	Each of the Jordanian HE institutions
2	**Established laboratories in Jordanian partners**	The established laboratories will be taught inherently with the accredited subjects.	No financial support is required.	n/a	Each of the Jordanian HE institutions
3	**Final year graduation projects**	As part of this strategy – and in a first step towards contributing to the sustainability of this action - high calibre students from each Jordanian partner will undertake a final year graduation project in one of the IREEDER topics with the researchers and teaching staff involved in the project tasked with supervising these students' final-year graduation projects in IREEDER topics.	No financial support is required.	n/a	Each of the Jordanian HE institutions
4	**Fee-based training workshops in RE, IoT and SC**	Jordanian partners will hold yearly training workshops after the end of the project. All stakeholders from academia and industrial sectors will be invited to participate. To motivate the participation, the workshop holder should issue certificates and initiate an award for distinguished participants.	Financial support is required to cover the logistics of the training workshops. Also, a financial support for the award is needed.	The workshop holder (a Jordanian partner) will cover all the expenses related to the logistics of the workshop. For the award, the workshop holder will look for a support from government or industrial sectors. If not available, the holder will grant it. In addition, the revenue collected from the fees paid by participants will be dedicated to cover expenses to sustain this activity, granted awards and tools maintenance.	Each of the Jordanian HE institutions (yearly rotation)
5	**E-learning platform**	The elaborated e-learning platform will be accessible at the project website, and the websites of the Jordanian partners as well.	No financial support is required as the platform will be hosted by the coordinating institution, and accessible via the partner institutions.	n/a	Each of the Jordanian HE institutions
6	**Online training courses**	All online courses will be paid by the participants. The collected fees will be used for maintaining the e learning platform and support other project outcomes after the end of the project.	Financial support is required and will be achieved via participation fees.	The collected fees from participants	Project Coordinator (organization) and all project participants (participation)
7	**Social media presence for outreaching purposes**	A group in the social-media (such as Facebook) will be created to share the gained knowledge in IREEDER outcomes. All workshops' participants will be invited to join the group to share their experience with the others.	No financial support is required.	n/a	Project Coordinator (organization) and all project participants (participation)

2.1 Accreditation of developed subjects

A long term objective foresees the developed subjects becoming autonomous after the community funding phase and bringing on further multiplier effects on education, economic and social development environment. A particular step towards achieving this goal is the accreditation of the developed courses within each of the Jordanian academic partners.

All Jordanian partners have initiated the accreditation stage and the current status is depicted in the corresponding tables below:

- Al-Hussein Bin Talal University [Table 2]
- Mutah University [Table 3]
- Philadelphia University [Table 4]
- Tafila Technical University [Table 5]

Al-Hussein Bin Talal University

Course	Department	Program	Action taken
Renewable energy	Electrical Engineering	Electrical Engineering	Updating existing course
Renewable energy	Mechanical Engineering	Mechanical Engineering	Updating existing course
Introduction to Internet of Things	Computer Engineering	Computer Engineering	Added as a new course in the study plan
Introduction to Internet of Things	Communications Engineering	Communications Engineering	Added as a new course in the study plan
Introduction to Internet of Things	Computer Engineering	Network Security Engineering	Added as a new course in the study plan
Introduction to Internet of Things	Electrical Engineering	Electrical Engineering	Added as a new course in the study plan
Introduction to Cyber Security	Communications Engineering	Communications Engineering	Added as a new course in the study plan
Introduction to Cyber Security	Computer Engineering	Computer Engineering	Added as a new course in the study plan

Table 2: Status of subject accreditation at Al-Hussein Bin Talal University

Isra University

The accreditation process at Isra University is ongoing.

Mutah University

Course	Department	Program	Action taken
Renewable Energy systems	Electrical Engineering	Power and Control Engineering	Updating existing course
Introduction to Internet of Things	Electrical Engineering	Power and Control Engineering	Added as a new course in the study plan
Introduction to Internet of Things	Electrical Engineering	Communications Engineering	Added as a new course in the study plan
Introduction to Internet of Things	Computer Engineering	Computer Engineering	Added as a new course in the study plan
Introduction to Cyber Security	Computer Engineering	Computer Engineering	Added as a new course in the study plan

Table 3: Status of subject accreditation at Mutah University

Philadelphia University

Course	Department	Program	Action taken
Introduction to Renewable Energy	Electrical Engineering	Electrical Engineering	Updating existing course
Internet of Things	Electrical Engineering	Communications and Electronic Engineering	Added as a new course in the study plan
Cyber Security	Electrical Engineering	Communications and Electronic Engineering	Added as a new course in the study plan
Internet of Things	Mechatronics Engineering	Mechatronics Engineering	Added as a new course in the study plan

Table 4: Status of subject accreditation at Philadelphia University

Tafila Technical University

Course	Department	Program	Action taken
Introduction to Internet of Things	Department of Communications and Electronics and Computer Engineering	Computer Engineering	Added as elective specialization course
Introduction to Internet of Things	Department of Communications and Electronics and Computer Engineering	Smart Systems Engineering	Added as elective specialization course
Introduction to Cyber Security	Department of Communications and Electronics and Computer Engineering	Computer Engineering	Added as elective specialization course
Computer and Network Security	Department of Communications and Electronics and Computer Engineering	Computer Engineering	Course updated based on project outcomes
Renewable Energy and Energy storage	Department of Electrical Engineering	Integrated Renewable Energy Engineering	Added as compulsory specialization course
Photovoltaic Energy Systems	Department of Electrical Engineering	Mechatronics Engineering	Added as elective specialization course
Renewable Energy and Energy storage	Department of Electrical Engineering	Electrical Power Engineering	Added as compulsory specialization course
Introduction to Renewable Energy	Department of Mechanical Engineering	Mechanical Engineering	Added as compulsory specialization course

Table 5: Status of subject accreditation at Tafila Technical University

2.2 Established Laboratories in Jordanian partners

The IREEDER project will create teaching and training materials for undergraduate students in electrical engineering and other relevant fields on renewable energy (RE), the Internet of Things (IoT), and cyber security (CS). The practical component will be handled by the establishment of advanced laboratories at Mutah University (MU), Tafila Technical University (TTU), and Al Hussein Bin Talal University (AHU), while other Jordanian partners will be able to access them via remote labs technology. Indeed, the remote laboratories established by the IREEDER project will allow for remote control and monitoring of laboratory equipment, allowing engineering students to conduct experiments in real time, at their own schedule, from anywhere, and whenever it is convenient for them. Aside from the experimental training provided by the internet laboratories, the system is also a great teaching tool since real-time demonstrations of the experiments may be done and concurrently watched by a group of students. This strategy is extremely useful for engineering schools, particularly in Jordan, because resources can be shared through the Internet even during the present challenging COVID 19 time.

The current status of the IREEDER lab establishment is depicted in Table 6.

Laboratory	Location/ Partner	Status
Cyber Security	**Tafila Technical University**	Operating since Nov 2021 Inaugurated on 4th Jan 2022
Internet of Things	**Al-Hussein Bin Talal University**	Operating since Sept 2021 Inaugurated on 3rd Jan 2022
Renewable Energy	**Mutah University**	Operating since July 2021 Inaugurated on 6th July 2021
Remote Access equipment	**Isra University**	Operating since Dec 2021 Inaugurated on 13th Jan 2022
Remote Access equipment	**Philadelphia University**	Operating since Dec 2021
Remote Access equipment	**Al-Hussein Bin Talal University**	Operating since Nov 2021
Remote Access equipment	**Mutah University**	Operating since Nov 2021

Table 6: Status of laboratory establishment

Each of the academic institutions where the laboratories are located will be responsible for their maintenance and up-to-dateness, which includes both hardware and software, as well as required knowledge to maintain it by the laboratory staff.

2.3 Final year graduation projects

The main objective of the IREEDER project is, as aforementioned, to improve the capacities of high quality education in Jordan, using state of art technology and training staff on improving the quality of the courses taught by making the best use of these technologies. The ultimate goal is to contribute to the enhancement of the quality of the Jordanian graduated engineers by providing the basic knowledge and the necessary skills to enter the local (and the international) labor market. As part of this strategy – and in a first step towards contributing to the sustainability of this action - high caliber students from each Jordanian partner will undertake a final year graduation project in one of the IREEDER topics with the researchers and teaching staff involved in the project tasked with supervising these students' final-year graduation projects in IREEDER topics.

2.4 Training workshops

Jordanian partners will hold yearly training workshops after the end of the project, to which all stakeholders from academia and industrial sectors involved in the IREEDER project will be invited to participate. Industrial stakeholders will be asked to contribute to the definition of the syllabus, by sharing their current needs and requirements, to ensure that the course content is aligned with the needs of the industrial players.

These workshops will also be a basis for continuous training and professional development for the academic staff and tutors, as well as for the laboratory technicians in charge of the three developed labs.

To motivate the participation, the workshop holder will issue certificates and attribute an award for distinguished participants.

2.5 E-Learning platform

The developed courses will be made available through a project initiated e-learning platform, which will be accessible via both the project website, and the websites of the Jordanian partners.

2.6 Online Training Courses

The E-Learning platform described above will serve as basis for online training courses, which can be relevant for not only current and future students of each of the institutions, but also further international students currently enrolled in related subjects, as well as researchers and industrial players with a keen interest on the topics.

All online courses will be paid by the participants, with the collected fees be used for maintaining the e-learning platform and support other project outcomes after the end of the project.

2.7 Sustainable social media presence and website

Social media groups (in more social oriented networks such as Facebook, and more professional related sites, such as LinkedIn and YouTube) will be created to share the gained knowledge in IREEDER outcomes. These groups will serve as dissemination banners to the IREEDER project, and to each of the initiatives listed above, to keep subscribers informed about the developments of the project during and after its lifetime, and to motivate participation in ongoing actions. All workshops' participants will be invited to join the group to share their experience with the others.

The project website will also be maintained to ensure all project information and post-project activities can be easily accessible in a centralized space.

3. DESCRIPTION OF THE INDIVIDUAL EXPLOITATION PLANS OF THE IREEDER CONSORTIUM PARTNERS

As aforementioned, individual exploitation activities aim at ensuring the use of the project's results at different levels, during and after the implementation of the project. The individual exploitation plans of the IREEDER consortium members are detailed in Table 7.

Al-Hussein Bin Talal University (AHU)	AHU will direct efforts in the third year of the project towards paving a way to sustain the project outputs and outcomes through the following: - As the three courses have been officially accredited at AHU, the three courses will be available for students at each semester to be enrolled in. - Regular training workshops will be held for students, fresh engineers and interested people form industry at AHU on IREEDER courses (CS, RE and IoT). - AHU will organize a compitetion among students in the Jordanian partners where their IREEDER-related graduation projects will be evalauted. - AHU, as the coordinating institution of IREEDER, will elaborate MoUs within the project partners to boost the mutual cooperation for further levels. - AHU will elaborate an MoU among the five Jordanian partners to orgaize the different the equpment installed in the three laboratories in the Jordanian partners. This will facilitate the utilization of the lab equipemnt during and after the project lifetime. - AHU is committed to look for other funding sources to secure expenses related to IoT lab maintainance after the project lifetime.
Mutah University (MU)	MU will support key outcomes of the IREEDER project and provide the necessary human resources to ensure their long-term suitability by cultivating strong relationships with the project's stakeholders and industrial partners, as well as embracing the need for increased collaboration, resource sharing, and experience exchange via the project website and its social media channels. MU will also investigate the synergies and multiplier effects of the IREEDER project with partners, specifically through the IREEDER platform, by sharing established laboratories, teaching materials, online training courses, and training workshops. Furthermore, the IREEDER project will be the seed of future international collaborations between project partners and MU.

Isra University (IU)	IU has solid relationships with industry and high-qualified research centers in Jordan and worldwide. These relationships will highly help in exploiting IREEDER outcomes. IU will also use the teaching material in the three fields (Renewable Energy, Internet of Things, and Cybersecurity) to boost the level of training and research.
Tafila Technical University	TTU has already inaugurated the cybersecurity lab. TTU utilizes the Lab to offer two different labs courses: cybersecurity lab and computer network lab. TTU already has had the accreditations for all IREDEER courses for three different departments: Dep. of Communications, Electronics and Computer Engineering; Dep. of Electrical Engineering; and Dep. of Mechanical Engineering. TTU has already exploited the Lab for a training course for 10 faculty members and plans to organize further such training events in the future, both for internal staff as well as for possible external participants.
Philadelphia University (PU)	PU is a private University that is committed to prepare graduates who are well-equipped with knowledge, skills and values and who are highly motivated to lifelong learning and capable of fulfilling the requirements of the present time. PU is committed to foster academic research and graduate studies and support innovation plans, and to establish a productive partnership with the local community. Exploiting the outcomes of the IREEDER Project through amending the curricula of Electrical Engineering and associated programs to fit with the new requirements of the local market. PU will use the course materials of the Internet of Things, Cybersecurity and Renewable Energy to provide students with the needed theoretical and practical background. The engineering program in the faculty is planning to work with the industry to solve technical problems through graduation projects using the IREDEER gained knowledge.
Universita degli Studi di Trento (UNITN)	UNITN is a modern university, which focused on internationalization to attract the best students and researchers. This strategy is implemented by teaching most academic courses in English. In particular, this is done especially in the M.Sc. and Ph.D. courses and in most third-year courses at the B.Sc. level. Through its participation to IREEDER, two exploitation strategies are implemented: (1) refreshing available content on Internet of Things and Cybersecurity and developing more up-to-date material, and (2) increasing collaboration with Jordanian Universities. In details, the developed content during IREEDER was and will be integrated in existing courses or used to build new courses and cover new areas. As an example, in the first semester of A.Y. 2021/22 a part of the IoT slides were used to build a new B.Sc. course on “Next Generation Networks”. Regarding collaboration, IREEDER will enable to extend the existing collaboration in research with AHU to education as well as to the other partners of the Consortium.

Instituto de Telecomunicações (IT)	IT is a research centre, committed to provide a tight link between advanced research and industrial interests and market driven requirements. IT is associated with multiple universities, with extended experience in research and academic exploitation, mainly with publishing high standard research results, integrating newly developed and novel research content in their curricula and research supervisions and providing further training opportunities for academic and industry staff, highlighting state-of-the art developments in relevant fields. In particular, and in what concerns its participation in the IREEDER project, IT will use acquired knowledge and developed teaching material in the fields of Cybersecurity and Internet of Things to support and expand its training portfolio. IT participation in IREEDER will also act as a springboard for future collaborations with the project partners and involve stakeholders.
University of Central Lancashire Cyprus (UCLAN Cyprus)	UCLan Cyprus is a university, committed to provide a state-of-the-art teaching and learning environment informed by both research and industry. UCLan Cyprus has a great opportunity through the participation in IREEDER to inform the teaching material of relevant courses, e.g. Electrical engineering, Computing and Cybersecurity with up-to-date, IoT-specific educational content. With regards to teaching material and academic publication, UCLan Cyprus plans to organise IREEDER relevant outputs in books and other academic literature that reflect the IoT-specific updated content for teaching material in Electrical Engineering, Computing and Cybersecurity. In particular, innovative elements, such as the inter-disciplinary and EU-aligned perspectives (e.g. IoT Ethics) that is included, can inform university-specific academic/educational strategies. Finally, the project has been used to inform marketing material to create awareness about the university being established as a go-to destination for research-informed and industry-informed well-rounded IoT-relevant curricula.
Universidade De Vigo (UVIGO)	UVIGO is a public academic institution that has three main objectives: to provide higher education services with high quality rates and oriented to promote work placements among its students, giving priority to internationalization; to promote a basic and applied research through competitive research groups at an international level; and to transfer its knowledge and scientific advances to the society in order to foster an intelligent, sustainable and integrating growth of all its surrounding territory. The UVIGO leads a Campus of International Excellence, awarded by the Spanish Ministry of Education in 2010, a Campus of the Sea that gathers the teaching and researching efforts of seven public universities in Galicia and North of Portugal, as well as those of two national research organisms. In its three campuses at Ourense, Pontevedra and Vigo, our institution offers degree programs in the fields of engineering, science, humanities, technology and legal-social studies. These are distributed among nearly thirty centers where research groups also carry

	out R&D activities. A network of own research centers completes the research infrastructure map. The staff of the GTI group teach in the Telecommunication Engineering undergraduate and master's courses (subjects such as cyberphysical systems, wireless communications, networking, programming) and is also part of the Master in Cybersecurity that started in the course 2018/2019. Also, the staff of the GTI group is part of the atlanTTic research centre. atlanTTic is the Centre for Research in Telecommunication Technologies promoted by the University of Vigo. atlanTTic develops its scientific activity in the fields of privacy and security, multimedia technologies, data networks, e-services, bioengineering, radar, satellite communications and, in general, radio and optical communications. In particular, and in what concerns its participation in the IREEDER project, UVigo will use acquired knowledge and developed teaching material in the fields of Cybersecurity and Internet of Things to support and expand its training portfolio.
University of Patras (UPAT)	UPAT is one of the most dynamic Universities in Greece with continuous improvement in education and research quality with notable distinctions and significant research activity. Great importance is attached to the production of knowledge and the transformation of research results into measurable impact on economy and innovation as well as synergies with the private sector via a variety of financing instruments. UPAT participates in programs, consortia and agreements with other higher education Institutions, research institutes and organizations abroad. Through this way, UPAT provides the opportunity to students and staff to further develop learning outcomes, develop intercultural skills and acquire experience/new teaching skills. In this frame of IREEDER project, UPAT will be benefited in the field of Renewable Energies by acquring experience in new teaching environments, update educational and digital skils, cooperate with IREEDER colleagues to plan joint activities and exchange good practices.

Table 7: Individual exploitation plans

4. DESCRIPTION OF THE CONSORTIUM WIDE EXPLOITATION PLANS

4.1 Local collaboration

The local cooperation between Jordanian partners will be continued through the IREEDER platform, by sharing the virtual laboratories, teaching materials, e-learning courses and other training events.

Given the cooperation links with local Jordanian industrial stakeholders established at the beginning of the IREEDER project, efforts will be made to maintain the academia-industry cooperation network after the project ending with several aspects related to the project sustainability at the local level being ensured through the network, guaranteeing that industry representatives will be involved in the course creation and delivering after the project ending

4.2 International collaboration

The international network created by the IREEDER project and comprised of the 5 Jordanian partners and the 5 European participants will also be maintained, with the potential to create new international cooperation project proposals and further research and training events.