

INNOVATIVE PRACTICES IN RENEWABLE ENERGIES TO IMPROVE RURAL EMPLOYABILITY

## PRESENTATION OF THE IN2RURAL PROJECT

TRAINING COURSES FOR TECHNICAL ENGLISH AND RENEWABLE ENERGY FOR  
LOCAL DEVELOPMENT

OPEN ON-LINE COURSE OF TECHNICAL ENGLISH FOR RENEWABLE ENERGY

OPEN ON-LINE COURSE OF RENEWABLE ENERGY FOR LOCAL DEVELOPMENT

**"IN2RURAL" - ERASMUS + KEY ACTION 2, COOPERATION FOR INNOVATION AND EXCHANGE OF GOOD PRACTICE.**

**ACTION: STRATEGIC PARTNERSHIP IN THE FIELD OF EDUCATION, TRAINING AND INERT.**

**FIELD: UNIVERSITY EDUCATION.**

## ABOUT THE PROJECT

Origin - Erasmus intensive "IT Forest - Innovative Training in Forest Biomass for Sustainable Rural Development" - <http://www.itforest.uji.es>

The general objective of IN2RURAL - promoting innovative practices in the renewable energy sector to improve the employability of students in the rural areas of Bacau (Romania), Castellón (Spain) and Gyöngyös (Hungary)

### Specific objectives

- ❖ increases the applicability of learning processes by strengthening the relationship between universities and SMEs,
- ❖ identifying and improving the key competences for professional insertion in this sector,
- ❖ introducing new educational methods,
- ❖ strengthening the degree of internationalization,
- ❖ project management procedures and sustainability of organizations,
- ❖ promoting the active participation of geographically disadvantaged groups,
- ❖ Improving student training for the professional world.

Project beneficiaries - students involved in renewable energy and rural development projects.

## ACTIVITIES

- ❖ applied research for the creation, promotion, development and / or transfer of good practices in the main areas of knowledge covered by the project,
- ❖ specialized training with an innovative approach based on interdisciplinarity (employment, renewable energies and rural development).
- ❖ dissemination and exploitation of project results to the specialized public.

## INTELECTUAL OUTPUTS

- ❖ study prospects and future training requirements in the field of renewable energies for local development
- ❖ developing a collaborative network to identify local socio-economic needs and renewable energy capacities of SMEs
- ❖ Open Educational Resources for Effective Use of the Virtual Learning Platform and ICT Tools for Online Courses
- ❖ online English language technical courses for renewable energy and local development
- ❖ compilation of studies on renewable energies for local development
- ❖ Active Job Search - Open course for energy
- ❖ renewable in rural areas

## PARTNERS



**UNIVERSITY OF JAUME I, SPAIN,**

<https://ujiapps.uji.es/>

It has a vast experience in managing the educational programs of the European Union (Jean Monet, Grundtvig, Master Programs, etc.). It also has experience in promoting student hiring and training for the use of European recognition tools (eg Europass) and personalized professional orientation. Other relevant areas where it has specific competences are the extension of rural services and the generation of Open Educational Resources (EER).



**HELIOTEC (SPANIA)**

<http://www.heliotec.org/en/index.html>

It has experience and technical knowledge in systems based on the use of renewable energy sources, especially in photovoltaic production systems. It is considered to be a leading company in the photovoltaic sector in the Castellón province. Heliotec acts as a consultant on photovoltaic projects in countries where solar energy is not a mature industry such as El Salvador and Algeria. As part of its social responsibility, Heliotec collaborates with public universities and training centers.



## "Vasile Alecsandri" University of Bacau

<http://www.ub.ro/en/>

With extensive experience in managing European projects, UBc is part of the consultative group set up by the North East Regional Development Agency to establish and implement the sustainable development strategy in rural areas. At the same time, the activities of some of its projects required close cooperation with rural areas. University experience in European projects enables the capitalization of skills in dissemination.

**GENERAL ELECTRIC**

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[www.general-electric.ro](http://www.general-electric.ro)

This private company was established in 1994 and has the main activity of designing and executing electrical installations, automation and data transmission and telecommunication systems. General Electric has major clients such as Electrica SA, Transelectrica SA, Hidroelectrica SA, Orange SA, LukOil SA, Rompetrol SA, Dedeman SRL, Selgros Cash Carry and Siemens Romania. At the moment, the maintenance of the wind farm Vutcani, completed in 2012, with a installed capacity of 24 MW.



## **KÁROLY RÓBERT UNIVERSITY COLLEGE (UNGARIA)**

[http://honlap.karolyrobert.hu/h\\_en/](http://honlap.karolyrobert.hu/h_en/)

This public higher education institution has extensive experience in various types of EU funded projects such as Jean Monnet, Erasmus Intensive Programs, Leonardo da Vinci Partnerships and CEEPUS. It has a wide network of cooperation (over 40 partner institutions) with an increasing number of Erasmus + partnerships. In addition, this university has decades of experience in research and development activities in the field of renewable energies, focusing in particular on the possibilities of biomass production and use in rural areas.

## **GEOLIN GEOLIN (UNGARIA)**

Being a spin-off company, Geolin Bt members are active cadres in the higher education sector, regional and rural development, and have numerous biomass-related publications in recognized international journals. Geolin is familiar with both EU funded projects and education-related activities. Geolin Bt is a member of the European Ecocycles Society, an international NGO dealing with sustainable development and the environmental sciences in terms of the production of special biomass for its use.



## TYPES OF ACTIVITIES

### a) intellectual

- study prospects and future training requirements in the field of renewable energies for local development
- developing a collaborative network to identify local socio-economic needs and renewable energy capacities of SMEs
- ***Open Educational Resources for Effective Use of the Virtual Learning Platform and ICT Tools for Online Courses***
- ***online English language***
- ***technical courses for renewable energy and local development***
- compilation of studies on renewable energies for local development
- Active Job Search - Open course for energy
- renewable in rural areas

### b) Seminars in the first, second and third year with project results

### c) learning activities through the mobility of students in higher education



## In2rural

### Navigation

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### Available courses

#### Technical English

Teacher: Szabó Rozália

#### Renewable energy and local development

Teacher: Vincente Alberto Querol Vicente

Teacher: Hector Beltrán San Segundo

#### Photovoltaic energy

Teacher: Zsuzsanna Kray

Teacher: Jose Segarra Murria

#### Biomass

Teacher: Zoltán Bujdosó

Teacher: Patkós Csaba

#### Wind energy

Teacher: Roxana Grigore

Teacher: Leonor Hernandez

Teacher: Zsuzsanna Kray

Teacher: Gabriel Puiu

#### Case studies

Teacher: Vincente Alberto Querol Vicente

Teacher: Hector Beltrán San Segundo

Teacher: Zoltán Bujdosó

Teacher: Patkós Csaba

Teacher: Leonor Hernandez

Teacher: Kinga Kovács

Teacher: Zsuzsanna Kray

Teacher: Zsolt Radics

Teacher: Jose Segarra Murria

## ON-LINE ENGINEERING COURSE FOR RENEWABLE ENERGY

Learning materials for the on-line technical English language course on renewable energy have been integrated into the virtual learning platform hosted by KÁROLY RÓBERT University, along with the learning methodology, evaluation activities and the various ICT tools available to improve collaboration in the virtual environment.



The screenshot shows a web interface for a course titled "Technical English". The breadcrumb trail is: Home > My courses > Technical English > Technical English > Technical English for Renewable Energy > Start Here. A navigation sidebar on the left lists: Home, My home, Site pages, My profile, Current course, Technical English (with sub-items: Participants, Badges), Technical English for Renewable Energy (with sub-items: Start Here, Forum, Online tutorial sessions, Glossary), Renewable Energy and Rural Development, and Photovoltaic Energy. The main content area is titled "Start Here" and contains the text "Introduction to Technical English in pdf format". Below this is a video player for "In2Rural Technical English online tutorial #1". The video shows a woman standing in front of a whiteboard. The whiteboard has handwritten notes under the heading "CONCEPTS": 1. Technical English for Renewable Energy - 10-12h - 12:00, 01 DEC 2012; 2. Renewable Energy for Rural Development - 10-12h - 12:00, 01 DEC 2012. The whiteboard also lists "Modules": 1. Renewable Energy and Rural Development, 2. Renewable Energy, 3. Biomass - 2012, 4. Wind Energy - 2012, 5. Solar Energy - 2012, 6. 7.5 hrs/week, 5.5 DEC 2012. Logos for Károly Robert University and Erasmus+ are visible in the background of the video.

## ON-LINE RENEWABLE ENERGY COURSE FOR LOCAL DEVELOPMENT

### Available courses

#### **Technical English**

Teacher: Szabó Rozália

#### **Renewable energy and local development**

Teacher: Vincente Alberto Querol Vicente  
Teacher: Hector Beltrán San Segundo

#### **Photovoltaic energy**

Teacher: Zsuzsanna Kray  
Teacher: Jose Segarra Murria

#### **Biomass**

Teacher: Zoltán Bujdosó  
Teacher: Patkós Csaba

#### **Wind energy**

Teacher: Roxana Grigore  
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#### **Case studies**

Teacher: Vincente Alberto Querol Vicente  
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Teacher: Patkós Csaba  
Teacher: Leonor Hernandez  
Teacher: Kinga Kovács  
Teacher: Zsuzsanna Kray  
Teacher: Zsolt Radics  
Teacher: Jose Segarra Murria

Learning activities have been distributed to ensure that learning objectives are attained in a flexible way: learning materials can be consulted in a non-linear way, providing participants with a high degree of flexibility.

The on-line platform offered students the opportunity to interact with other participants to share country-specific experiences and best practices.

An advantage of this on-line course was the personalized supervision and assessment of the students. The generated material is also free access to other interested persons.

## Module 1 - Introduction to renewable energy for local development

### CHAPTER 1: TECHNICAL ASPECTS

- Module 2 - Chapter 1, part 1-1
- Module 2 - Chapter 1, part 1-2
- Module 2 - Chapter 1, part 1-3
- Forum Chapter 1
- Quiz of Chapter 1

### CHAPTER 2: ECONOMICAL ASPECTS

- Module 2 - Chapter 2, part 2-1
- Module 2 - Chapter 2, part 2-2
- Module 2 - Chapter 2, part 2-3
- Forum Chapter 2
- Quiz of Chapter 2

### CHAPTER 3: SOCIAL AND ENVIRONMENTAL ASPECTS FOR RURAL DEVELOPMENT

- Module 2 - Chapter 3, part 3-1
- Module 2 - Chapter 3, part 3-2
- Module 2 - Chapter 3, part 3-3
- Forum Chapter 3
- Quiz of Chapter 3

### CHAPTER 4: FULLY DEVELOPED CASE STUDY OF APPLICATION OF photovoltaic/biomass/wind to RURAL DEVELOPMENT

- Module 2 - Chapter 4, part 4-1
- Module 2 - Chapter 4, part 4-2
- Module 2 - Chapter 4, part 4-3
- Quiz of Chapter 4
- Forum for Chapter 4

### CHAPTER 5: PROPOSED CASE STUDIES (to be developed by students in case that are chosen)

- Module 2 - Chapter 5, part 5-1
- Module 2 - Chapter 5, part 5-2
- Module 2 - Chapter 5, part 5-3

It took place between 1-31 March 2016.

The first three chapters address the availability of renewable energy resources, present a panorama of them, and describe the underlying technologies for harnessing these energies in small plants. Finally, the different regulatory frameworks specific to the different European regions and in particular to rural areas are briefly described.

The last two chapters provide an overview of rural areas. For the purpose of their development, students can also include the current social complexity for making suitable, sustainable and successful projects.

#### CHAPTER 1: TECHNICAL ASPECTS

- Module 2 - Chapter 1, part 1-1
- Module 2 - Chapter 1, part 1-2
- Module 2 - Chapter 1, part 1-3
- Forum Chapter 1
- Quiz of Chapter 1

#### CHAPTER 2: ECONOMICAL ASPECTS

- Module 2 - Chapter 2, part 2-1
- Module 2 - Chapter 2, part 2-2
- Module 2 - Chapter 2, part 2-3
- Forum Chapter 2
- Quiz of Chapter 2

#### CHAPTER 3: SOCIAL AND ENVIRONMENTAL ASPECTS FOR RURAL DEVELOPMENT

- Module 2 - Chapter 3, part 3-1
- Module 2 - Chapter 3, part 3-2
- Module 2 - Chapter 3, part 3-3
- Forum Chapter 3
- Quiz of Chapter 3

#### CHAPTER 4: FULLY DEVELOPED CASE STUDY OF APPLICATION OF photovoltaic/biomass/wind to RURAL DEVELOPMENT

- Module 2 - Chapter 4, part 4-1
- Module 2 - Chapter 4, part 4-2
- Module 2 - Chapter 4, part 4-3
- Quiz of Chapter 4
- Forum for Chapter 4

#### CHAPTER 5: PROPOSED CASE STUDIES (to be developed by students in case that are chosen)

- Module 2 - Chapter 5, part 5-1
- Module 2 - Chapter 5, part 5-2
- Module 2 - Chapter 5, part 5-3
- Module 2 - Chapter 5, part 5-4
- Module 2 - Chapter 5, part 5-5
- Module 2 - Chapter 5, part 5-6
- Module 2 - Chapter 5, part 5-7
- Module 2 - Chapter 5, part 5-8
- Module 2 - Chapter 5, part 5-9
- Module 2 - Chapter 5, part 5-10

#### CHAPTER 6: EXTRA MATERIAL

## Module 2 - Photovoltaic energy

It took place between April 1-22.

This module has provided students with technical knowledge related to photovoltaic solar technology with application in rural development.

The first three chapters study the technical, economic, social and environmental impacts to be considered when applying photovoltaic technology to rural development. The fourth chapter presents a case study (an implemented project), useful for students in developing their own case studies.

The fifth chapter is a collection of ten case studies proposed to be developed by students for regions in Spain or other areas in Europe, from which students can choose and develop their own project.

Finally, the sixth chapter contains a collection of links, studies, audio-visual materials and other materials useful to students.

## Module 3 - Biomass energy

It took place between April 22nd and March 13th.

He provided students with basic information on operating principles, types of installations, energy characteristics of different forms of biomass (wood, herbs, biogas), etc.:

- the principles on the use of biomass energy have been described
- technical alternatives and types of "biomass plant"
- an economic perspective has been included in which the estimated costs of typical investments (materials, installations, land use, operation and maintenance) can be recovered,

The impact of social and rural development is assessed on the basis of the supply chain analysis of biomass. The future of these projects will depend on the investigation of biomass potential and innovative technologies (CHP, NO<sub>x</sub>, etc.).

### CHAPTER 1: TECHNICAL ASPECTS

- Module 3 Chapter 1.1.1
- Module 3 Chapter 1.1.2
- Module 3 Chapter 1.1.3
- Quiz of Chapter 1
- Forum Module 3 Chapter 1.

### CHAPTER 2: ECONOMICAL ASPECTS

- Module 3 Chapter 2.2.1
- Module 3 Chapter 2.2.2
- Module 3 Chapter 2.2.3
- Quiz of Chapter 2
- Forum Module 3 Chapter 2

### CHAPTER 3: SOCIAL AND ENVIRONMENTAL ASPECTS FOR RURAL DEVELOPMENT

- Module 3 Chapter 3.3.1
- Module 3 Chapter 3.3.2
- Module 3 Chapter 3.3.3
- Quiz Module 3 Chapter 3
- Forum Module 3 Chapter 3

### CHAPTER 4: FULLY DEVELOPED CASE STUDY OF APPLICATION OF biomass to RURAL DEVELOPMENT

- MODULE 3 Chapter 4.4.1
- MODULE 3 Chapter 4.4.2
- MODULE 3 Chapter 4.4.3
- Quiz Chapter 4
- Forum Module 3 Chapter 4

### CHAPTER 5: PROPOSED CASE STUDIES (to be developed by students in case that are chosen)

- Case study 5.1
- Case study 5.2
- Case study 5.3
- Case study 5.4
- Case study 5.5
- Case study 5.6
- Case study 5.7
- Case study 5.8
- Case study 5.8
- Case study 5.9
- Case study 5.10

### CHAPTER 6: EXTRA MATERIAL

- List of Acronyms
- Statistics
- Videos
- Extra Material 1

## Module 4 - Wind Energy

The material is divided into four chapters (technical, economic, social and environmental aspects).

Technical aspects:

wind speed and wind speed, historical wind data usage,

the evolution of wind turbines over time, basic building configurations, types of wind turbines applicable to exploitation in rural areas,

cost - critical factor,

environmental aspects (influence of wind energy use on the environment, weather prediction methods and wind intensities, etc.)

Finally, an application was developed that follows the chapters of this module - a case study - powering a Millán farm (Lugo, Spain) based on wind power.



## COLABORATORI

