



RENEWABLE ENERGIES ONLINE COURSES

Summary:

- Summarise about modules of the on-line courses
- Interview with students
- New renewable energy exploitation in county
- Next step

NEWS ABOUT MODULES OF THE ONLINE COURSES

UJI - INTRODUCTION FOR RENEWABLE ENERGY FOR LOCAL DEVELOPMENT



The Module 1, titled “Introduction for renewable energy for local development”, has been imparted from 1 to 31 March 2016 by the professors Hector Beltrán and Vicent Albert Querol, both from UJI. This introductory module has provided students a general idea and some basic knowledge regarding renewable energies and rural environment.

To this end, the Module has been structured in five chapters. The first three chapters are devoted to introduce the renewable energy resources availability, to present the current panorama and a basic technological description of these energies focused on small installations, and finally to describe the different regulatory frameworks that can be found on the European regions and States. The last two chapters provide an overview about rural areas, also to break some current stereotypes that are held nowadays. Furthermore, students can include social complexity in order to achieve successful and sustainable projects suitable to develop rural spaces.

Taking advantage of the e-learning opportunities, the course has strengthened the participation of the students through a “Forum” with discussions related to the contents covered in the different chapters. In addition, there has been a personalized supervision thanks to the weekly “Online tutorial sessions”, which has facilitated the one to one interconnection between professors and students.

HELIOTEC - PHOTOVOLTAIC ENERGY



The Module 2, titled “Photovoltaic energy”, was held between 1st and 22nd of April 2016 by professors Zsuzsanna Kray and Jose Segarra Murria, both from Heliotec 2006 SL. Spain. This photovoltaic module aims to provide students with the main technical and specific knowledge of the solar photovoltaic technology for its application in the rural environment development.

In order to do this, the Module 2 was split into five plus one chapters. The first three chapters develop the technical, economic, and social and environmental impact to be considered for the application of the photovoltaic technology in rural areas. The fourth chapter introduces a fully developed study case in order to show an example to students and support them in the elaboration of their own case studies. The chapter five is a collection of ten case studies in Spain and in Europe, the students chose from this list to work out their own case study. Finally, the sixth chapter contains a large collection of links, studies, audiovisual material and other.

Although, a lot of answers arrived for the initiated topic, we would like to enrich the learning experience with bigger interaction among students. It will be a good challenge for the next project, to find the most adequate way to motivate the students to write comments on each other’s posts.”

The professors Zsuzsanna Kray and Jose Segarra Murria initiated four forum topics and the students had the opportunity to react on them. This way we wanted to give place to the informal learning ways in a more modern, youthful, online space. There were no good or bad solutions; the aim was to increase the activity of the students. Our experiences show that some of them became very inspired and expressed their own opinion with a lot of details.

GEOLIN

The Module 3 was compiled and managed by Dr. Zsolt Radics from GEOLIN. It has granted basic information for students concerning characteristics of energetic use different biomass forms (e.g. wood, herbs, biogas etc.).

Firstly the principles concerning the use of biomass energy were filed. Not only conditions for efficient exploitation were specified, but also some European examples could be found in order to help understanding basic calculations concerning biomass energy harvest.

Furthermore technical alternatives and installation types for ‘biomass’ installations applicable for rural development were covered. Calculations and design for residential appliances industrial and district heating systems, power generation and co-generation supplemented this chapter.

An economic perspective was also included into this module where estimated costs (materials, installations, spatial planning, operation and maintenance) of some typical investments can be found.

The assesment of environmental impact of certain biomass energy projects is included in the form of emission estimation and “Life Cycle Analysis”. The social and rural development impact is evaluated too concentrating on biomass supply chain analysis. A short vision for future focusing on the field of biomass potential investigation and innovative technologies (CHP, NOx reduction technologies etc.) might be acquired by students.

As the energetic utilization of biomass technically, socially and environmentally is more complex than that of other Renewable Energies beyond student support usual for other modules (“Forum” “Online tutorial session”) to support fruitful learning a detailed biomass sample case-study was elaborated by Dr. Csaba Patkós (GEOLIN).



Wind energy is among the forms of renewable energy that is suitable for small-scale applications. The small wind turbines are generating systems with an electricity production capacity of up to 50 kW. The isolated communities, which otherwise can only rely on diesel generators may use wind turbines to replace diesel generators.

The Module 3, developed by Gabriel Puiu and Roxana Margareta Grigore from “Vasile Alecsandri” University of Bacau and José Segarra Murria and Juan Jorro Ripoll from Heliotec (who developed the case study) attempts to clarify this issue. The material is divided into four chapters, each of them treating a specific issue related to wind energy for rural development (technical, economic, social and environmental aspects).

The technical aspects of wind energy, such as historical data of wind energy use, the evolution in time of wind turbines, basic constructive configurations of turbines with the principal elements, the types of wind turbines which are applicable for rural areas and the necessary steps for sizing a wind turbine installation for a dwelling from the rural area are absolutely indispensable to implement such a project

In making the decision to install a wind turbine, the cost is a critical factor. It is therefore important to establish from the start the price for each watt produced, keeping in mind the entire period of operation, including the fixed and variable operating and maintenance costs for wind energy .

For project sustainability, issues related to the environment should not be neglected. Therefore last part of this material, presents some aspects regarding the influence of wind energy on the environment, wind energy prediction methods to determine wind duration and intensity and wind energy.

In the end of this module, a specific case study application of wind energy technology for supplying energy to a farm in Millán (Lugo, Spain) is developed to follow the chapters throughout this module.

INTERVIEW WITH STUDENTS / OPINIONS

UJI - INTERVIEW WITH IVAN SEGURA RODRIGUEZ (LAST YEAR IN INDUSTRIAL TECHNOLOGY ENGINEERING)



What was your motivation for choosing the IN2RURAL online courses?

There is no subject in my degree related to this topic, so I found the courses interesting to improve my formation in renewable energies.

What are the positive aspects you would highlight about the online courses?

I found it interesting the internationalization of the course and also the possibility to use English along the course so that I can improve my competences in that language. Another interesting aspect in my case was the social point of view of the renewable energy installations that was covered along the different modules. In addition, being the course online, it is more flexible

so I could adapt the dedication to the course to other academic duties.

What would you improve in the course in further editions?

It would be interesting to have all the materials of the different modules from the beginning, also that the extension of the documentation in the different modules would be similar, that the information is not contradictory among modules (ex. batteries in wind /photovoltaic), that the quizzes correspond to the material in the chapter (biomass, not chapter 6), etc.

Do you think that the course has improved your employability?

Definitely it has improved my training in renewable energy and in rural development, but I don't know about my employability.

Would you like to continue with the topic of renewable energy and rural development?

I personally believe that is an interesting topic, and I would like to follow my training in the subject and be able to orientate my professional career in this field.

KRF- IN2RURAL EXPERIENCES BY VIVIEN BALOG



This course was very useful for me. The course helped me to learn about renewable energy sources. I am interested in the renewable energy topic. So it expanded my knowledge. My English language skills improved during this course. All the renewable energy sources (for example: solar panels, wind powers, biomasses, hydropowers, geothermal energies.) are extremely important in a sustainable world. And the most important that we create more and more energy for world.

I am very satisfied with the instructors. They are really helpful during whole program. The communication during the while course was good too form my point of view. In my opinion the tasks were a little bit complex for an average university student who is not an expert in this field. I think the In2Rural course was interesting everybody. It was an innovative project for me. I am grateful for the opportunity.

UVAB- INTERVIEW WITH ECONOMICAL ENGEENERING UVAB STUDENTS



What determined you to be a part of IN2RURAL?

Many reasons made me join this program. Our future depends on Green Energy, on how we manage our CO2 footprint. Studying about renewable energies with foreign students was a big bonus.

Do you think what you studied in the project is useful for the long run?

As the population grows and our kind takes big steps towards the future, little by little we've come to approach the inevitable oil drought. Finding new sources of eco-friendly renewable energies seems to be our only shot for stretching our horizons and grabbing hold of a clean, stable and healthy future. Acknowledging all of these facts about those energy is not only useful, it's also a

necessity for the long run.

What else do you think would've been useful to study in order to contribute more to the development of rural areas using renewable energies? Since

Based on our previous knowledge and level of understanding, I think the information supplied by this course is enough to start a green energy production in a rural area.

Would you like to participate in another similar project?

We found this project interesting and we had so much to learn and acknowledge out of it, not only theoretical information, but also interaction and team work. We would be really interested in more projects like this one. And since we've approached the end of this project, we would really want to thank our teachers and the creators of this project for this awesome opportunity.

NEW RENEWABLE ENERGY EXPLOITATION IN COUNTRY

UJI - MAR DE FULLES, CONNECTING RENEWABLE ENERGIES AND SUSTAINABLE TOURISM

Mar de Fulles is a new tourism complex located next to Sierra de Espadán Natural Park (Castellón, Spain), an area of great ecological value. Among its services, Mar de Fulles offers a hotel, a lodge, a restaurant and multipurpose rooms. The facilities are based on the principles of bioclimatic architecture, functioning with renewable energy and providing Kilometre Zero products (the maximum distance to their suppliers is 100 km). This rural construction is isolated from the grid and its energetic needs are covered by a solar photovoltaic installation in which Heliotec, partner of IN2RURAL, has participated. The PV modules are placed in a coplanar arrangement on the roof of the hotel bedrooms. The roof has an inclination of 12° with a south-facing location. Things have been done this way to improve the architectural integration and minimize the visual impact of the installa -



tion. Given the distance from the grid network and the prohibitively high cost of connecting to it, it was decided to develop a remote renewable power system with the support of a gas-fired generator.

As Juanma Urban, owner of Mar de Fulles, remarks, the key to achieve the energy self-sufficiency is the responsibility and coherence in the resources management, not only by the managers, but also by the staff and the customers. The philosophy under this project combines social, economic and environmental sustainability, being a sample of good practices in the use of renewable energies for rural development.

KRF - NEWS ON RENEWABLE ENERGY EXPLOITATION IN HUNGARY (2016)

In the next 12 months 150 new electric car charger stations can be established. According to the recommendations of the “Jedlik Ányos Cluster” (an organization created to support electric car penetration in Hungary) nowadays the vast majority of these facilities are concentrated in the capital. Their spread to the rural areas may contribute not only to unfold clear cars but to the more frequent use of solar cells as well.

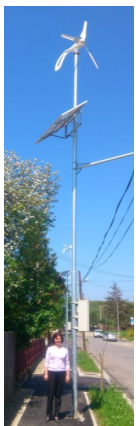
In a giant project co-financed by the EU was implemented in the town of Pécs (Hungary) where a 10 MW solar power station was established by MVM Hungarowind Ltd. as state-owned energetic company. It is one of the biggest such projects in Hungary and the utmost in the backward South Transdanubian Region (Hungary).

The French-owned Veolia Energy Hungary Co. acquired the Hungarian “Dél-nyírségi Bioenergia Művek Energiatermelő (DBM) Co.” operating the biomass power station of Szakoly (North Great Plain Region, Hungary). The aim of the French company is to establish an ecologically and economically sustainable 20 MW power station in this rural region.

According to future strategies until 2020 500 new small biogas power plants can be built. The Hungarian National Biogas Association and the Hungarian Gas-industry Association wants to elaborate together the conditions of biogas input into the national gas pipeline network.

In September 2016 a new building of the Eszterházy Károly University, Eger (Hungary) will be opened. In the construction the best available EE and RES technologies are integrated so it demonstrates the commitment of the institution towards green energies and sustainability and helps to raise awareness of students and the broader population to the relevance of these technologies.

UVAB - NEWS ON RENEWABLE ENERGY EXPLOITATION IN HUNGARY (2016)



Buhuși is a small town located in the northern part of Bacău County at only 28 km from the county capital. The city has about 14,500 inhabitants and a strong sustainable development strategy which was materialized in street lighting for a part of the city by using a hybrid photovoltaic and wind system.

Thus, 99 light poles with a height of 6.5 m were installed on some of the streets, equipped with LED lamp lighting, each of them being provided with a photovoltaic panel and a wind generator.

The solar panels have a power of 200W, 1482 x 676 mm dimensions, and the wind turbine has a diameter of 1700 mm and provides a power of 300W.

The public lighting solution was adopted after the analysis of the town's exposure to sun and airflows. The Solar Map of Romania, provided by the PVGIS European Communities, confirmed that Buhuși and Bacău County are located in an area with high solar energy of about 1,500 KWh/m². With regard to wind energy, Buhuși is situated in zone II, where the average wind speed is of about 6m/s. The lighting system contains energy storage batteries and sensors that control the turning on and off of LED lamps.

NEXT STEP

The next stage, perhaps the most interesting, involves selecting six students, two from each university, to participate into international training. The selection is in progress.

The students selected will be hosted by companies in Spain, Hungary and Romania and will work effectively in projects relating to rural development through renewable energies.

In Spain, students will work with the Heliotec team in Hungary in GAIA Foundation for Ecological and Rural Development and in Romania at General Electric.

As seen through students opinions, we believe this will be an exciting stage in which each student will clarify "live" uncertainties related to the use of renewable energy and also can contribute to generate new ideas for future projects.

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