



**ECO ENERGY 21<sup>ST</sup> CENTURY Contest for University students**



**European Territorial Cooperation Programme**

**“Greece-Bulgaria 2007-2013”**

**Project HYDECON – Contract B1.33.01/31.03.2011**

# ECO ENERGY 21<sup>ST</sup> CENTURY

Contest for University students

Organized by the HYDECON Network:



CENTER FOR RESEARCH &  
TECHNOLOGY HELLAS



SOUTH WEST UNIVERSITY  
“NEOFIT RILSKI”



MUNICIPALITY OF THERMI



ECO ENERGY FOUNDATION

The “ECO ENERGY 21st CENTURY” contest is a part of the international project

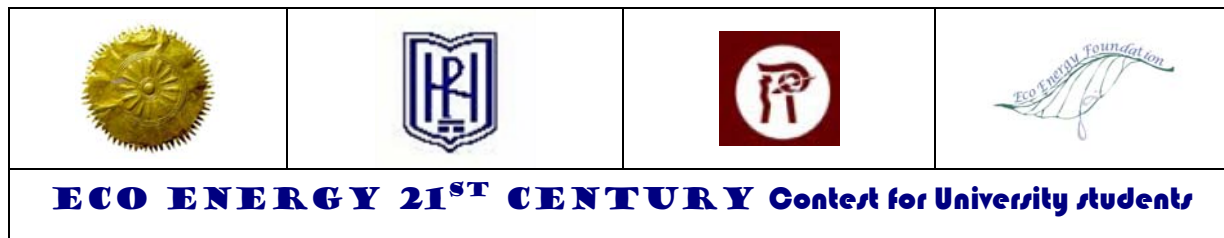
“HYDROGEN ECONOMY COOPERATION NETWORK FOR RESEARCH – PUBLIC AWARENESS – BUSINESS OPPORTUNITIES ACROSS GREEK – BULGARIAN BORDERS”

(Acronym: HYDECON) – Contract B1.33.01/31.03.2011

of the European Territorial Cooperation Programme “Greece-Bulgaria 2007-2013”.

Hydrogen and hydrogen technologies have the potential to increase energy security, stimulate economic growth, and reduce greenhouse gas emissions. Even though there have been many projects worldwide that have proven the feasibility, durability, and reliability of hydrogen technologies, they are still in the demonstration phase.

To promote the transition of hydrogen technologies to real-world commercial operation, Hydrogen powered vehicles and H2 fuelling station technologies are being tested during the last decade, in



demonstration programs, throughout the world. Many of these technologies are now ready for the next step: the transition to commercial operation.

Today's students are the future of the new hydrogen industry and it is critical that they achieve the vision of a hydrogen economy.

The **primary goals** of the contest are:

- to popularize the potential and advantages of technologies related to the hydrogen economy concept among Bulgarian and Greek University students
- To aid in the development of the hydrogen economy and engage students in the progression of hydrogen and fuel cell technologies
- to direct the creativity of young people towards ecological thinking for overcoming the problems connected with depletion of oil-fields and global warming processes
- to encourage the students to present their own point of view and original ideas concerning hydrogen production, storage and use as a fuel.

## **RULES AND TIME-LIMIT OF THE COMPETITION**

### **Rules for application and participation**

- ◆ The competition is open to university students from Greece and Bulgaria.
- ◆ Each team can consist of one or two participants.
- ◆ The competition includes two stages – preliminary selection of participants based on submitted projects; participation at the final stage in Bansko
- ◆ The official language of the contest is English.
- ◆ The applicants must submit the completed Project Application Form and their CV, in English. All documents have to be mailed to [eefound@mail.bg](mailto:eefound@mail.bg) before 10<sup>th</sup> January 2012

### **Project Application Form content**

- ◆ For this Contest, students will refer to the basic elements of an early “hydrogen community” in Greece or Bulgaria. The project should include:



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- potential hydrogen sources comparison of different hydrogen production technologies, selection of technologies appropriate for the hydrogen demand in Greece or Bulgaria
  - design of hydrogen fueling stations evaluation of different hydrogen storage technologies and selection of technologies appropriate for Greece or Bulgaria.
  - identification of potential customers for early market hydrogen applications.
  - ◆ As indicated in the Project Application Form, the projects should include:
    - Title
    - Name and surname of author(s)
    - University, town, project supervisor (if available);
    - Project description
    - Applications: schèmes, illustrations, photos etc.
- The project should not exceed 20 standard pages.
- ◆ Teams may use any source of data or materials: journals, computers, software, references, web sites, books, etc. All sources used **MUST** be cited.

### **Preliminary selection**

- ◆ The preliminary selection of submitted projects will be performed by an Expert jury.
- ◆ The best five (5) projects from Bulgaria and the best five (5) projects from Greece will proceed to the 2<sup>nd</sup> - final stage of the contest, which will held in Bansko – Bulgaria, in April 2012.
- ◆ The selected participants will be announced at least two months before the final stage.
- ◆ The cost expenses of the participants for the travel from Thessaloniki or Blagoevgrad to Bansko and contrariwise as well as the accommodation in Bansko will be covered by the HYDECON project.

### **The competition in Bansko – final stage**

- ◆ The final stage consists of two rounds:

#### 1<sup>st</sup> round - Oral presentation of the projects (10 minutes)

The applicants should present their projects in English using PowerPoint presentation, poster, models, prototypes, etc.

The projects will be **evaluated** by the following criteria:



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- Technical accuracy
- Originality/Creativity
- Clarity of writing
- oral presentation, visualization

### 2<sup>nd</sup> round - Fuel cell competition - Practical Task

The competitors will be supplied with disassembled reversible fuel cells, electrodes, cables and other necessary materials.

They will also have at disposal different chemicals as well as power supplies. Each team will have to decide which will be the most appropriate electrolyte and power supply for production of hydrogen/oxygen by water electrolysis.

The students assemble the cell with the chosen components and implement water electrolysis.

The collected gases are further used in a fuel cell mode in order to produce electricity and supply a small consumer (fan, calculator, watch etc.).

The teams will have 60 minutes to fulfill the whole task.

The teams will be **evaluated** by the following criteria:

- argumentation for the selected components;
- used time for fuel cell assembly and hydrogen generation;
- duration of fuel cell operation with generated hydrogen.

### **Final evaluation**

The final ranking of the participants will be estimated from the scores obtained in both rounds.

### **Awards**

The first, second and third place winner teams will be awarded with special prizes. The rest of participants will receive consolation prizes. Each participant will receive certificate for attendance.

### **Contact Information**

For further information and clarifications please contact:

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