ECO ENERGY SYSTEM –
THE KEY TO A SUSTAINABLE
DEVELOPMENT OF OUR PLANET

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CONCEPT OF HYDROGEN ECONOMY

HYDROGEN AS A FUEL

• The cleanest fuel
  – the only product of its combustion is $\text{H}_2\text{O}$
  – no emissions of $\text{CO}_2$

• The highest energy density among all fuels
  – 4.5, 2.9 and 2.6 times higher than that of coal, petroleum and natural gas, respectively
CONCEPT OF HYDROGEN ECONOMY

Diagram showing the cycle of hydrogen production and use:
- Solar cell
- Wind turbine
- Micro hydro
- Electrolyzer
- Fuel cell
- H₂ storage
- Oxygen
- Water
CONCEPT OF HYDROGEN ECONOMY

FUEL CELLS

\[ H_2 + \frac{1}{2}O_2 \rightarrow \text{Catalyst} \rightarrow H_2O + \text{Electricity} + \text{Heat} \]
• Is this important?

Yes, it is... because it is our chance to overcome the near worldwide energy crisis and ecological disaster.
• Is this important?

Yes, it is...

because as young people we should be familiar with modern technologies
POPULARIZATION OF HYDROGEN ECONOMY

• Is this important?

Yes, it is...

because it’s our turn to take the responsibility for our own future
OUR PROJECT

• Aim

- Popularization of hydrogen economy concept among Bulgarian youngsters by demonstrating operation principles of some key technologies, which are going to build up the backbone of future eco energy system.
LABORATORY MODULE STAND
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Diagram showing a proton exchange membrane fuel cell with catalysts, hydrogen from tank, oxygen from air, exhaust, and an electrical circuit.
LABORATORY MODULE STAND
• Advantages
  ✓ easy construction
  ✓ available materials for implementation
  ✓ possibilities for substitution of modules
    ✓ wind turbine instead of solar panel
    ✓ gas-generators instead of electrolyzer
    ✓ other types of fuel cells
PROJECT DEVELOPMENT

- Construction of new devices for substitution of particular modules.
- Creating of a lab kit consisting basic components for construction of module stand.
- Organizing presentation for students.
- Making and distributing educational film for perspectives of the hydrogen economy.
- Participation in exhibitions and competitions.
- Realization of contacts with youth organizations, having similar interests.
Thank you for your attention !!!