

STE(A)M IDEAS FOR HIGH SCHOOL

Erasmus+ project FROM SCHOOL TO LIFE – MY KNOWLEDGE HELPS ME IN MY DAILY LIFE

Partners

Tamsalu Gymnasium, Estonia

1ο EPAL KARDITSAS, Greece

Liceum Ogólnokształcące im. Tadeusza Kotarbińskiego w Sepólnie Krajeńskim, Poland

Colegiul Tehnic Mihail Sturdza, Romania

BAGYURDU ANADOLU LİSESİ, Turkey



This brochure is an overview of the activities done during the project.

The list of activities is just to give you an idea and suggestions how to deal with STE(A)M in the classroom and outside of it to engage students and make studying enjoyable.



Traditional and alternative sources of energy-consumption and impact on the environment

- **In science/physics/geography**, students do research about

Wind energy

Solar energy

Hydroelectric energy


Wave and tidal energy

Biomass energy

Geothermal and hydrogen energy

and do presentations which are followed by group discussions.

- **Local experts/ university lecturers** could be asked to give workshops



The image is a screenshot of a Zoom meeting. The main content is a presentation slide titled "Geothermal Energy" from Yasar University. The slide features three photographs of geothermal features: a geyser, a colorful hot spring, and a geothermal field. Below the images, the presenter is identified as Assoc. Prof. Dr. Nurdan YILDIRIM, Department of Mechanical Engineering, Yasar University. On the right side of the Zoom window, a list of participants is visible, including Levent Bilir, Anne Kraubner, Emrah Biyik, and Sezgin ARSLAN. A small video thumbnail of the presenter is also shown. The Zoom interface at the bottom includes controls for mute, video, chat, and screen sharing, along with a system tray showing the time as 2:34 PM on 3/28/2021.

An online workshop

- **Project activity with carbon footprint calculator**

Students use an online carbon footprint calculator to see how individual/ family usage affects the environment.

Your Carbon Footprint:

| | |
|--|---------------------------------------|
| <input checked="" type="checkbox"/> House | 1.25 metric tons of CO ₂ e |
| <input checked="" type="checkbox"/> Flights | 0.00 metric tons of CO ₂ e |
| <input checked="" type="checkbox"/> Car | 0.36 metric tons of CO ₂ e |
| <input checked="" type="checkbox"/> Motorbike | 0.08 metric tons of CO ₂ e |
| <input checked="" type="checkbox"/> Bus & Rail | 0.00 metric tons of CO ₂ e |
| <input checked="" type="checkbox"/> Secondary | 4.91 metric tons of CO ₂ e |

Total = 6.60 metric tons of CO₂e

To offset some or all of your carbon footprint, click the sections you would like to offset in the list above, and click the Offset Now button.

Total To Offset = 6.60 metric tons of CO₂e [Offset Now](#)

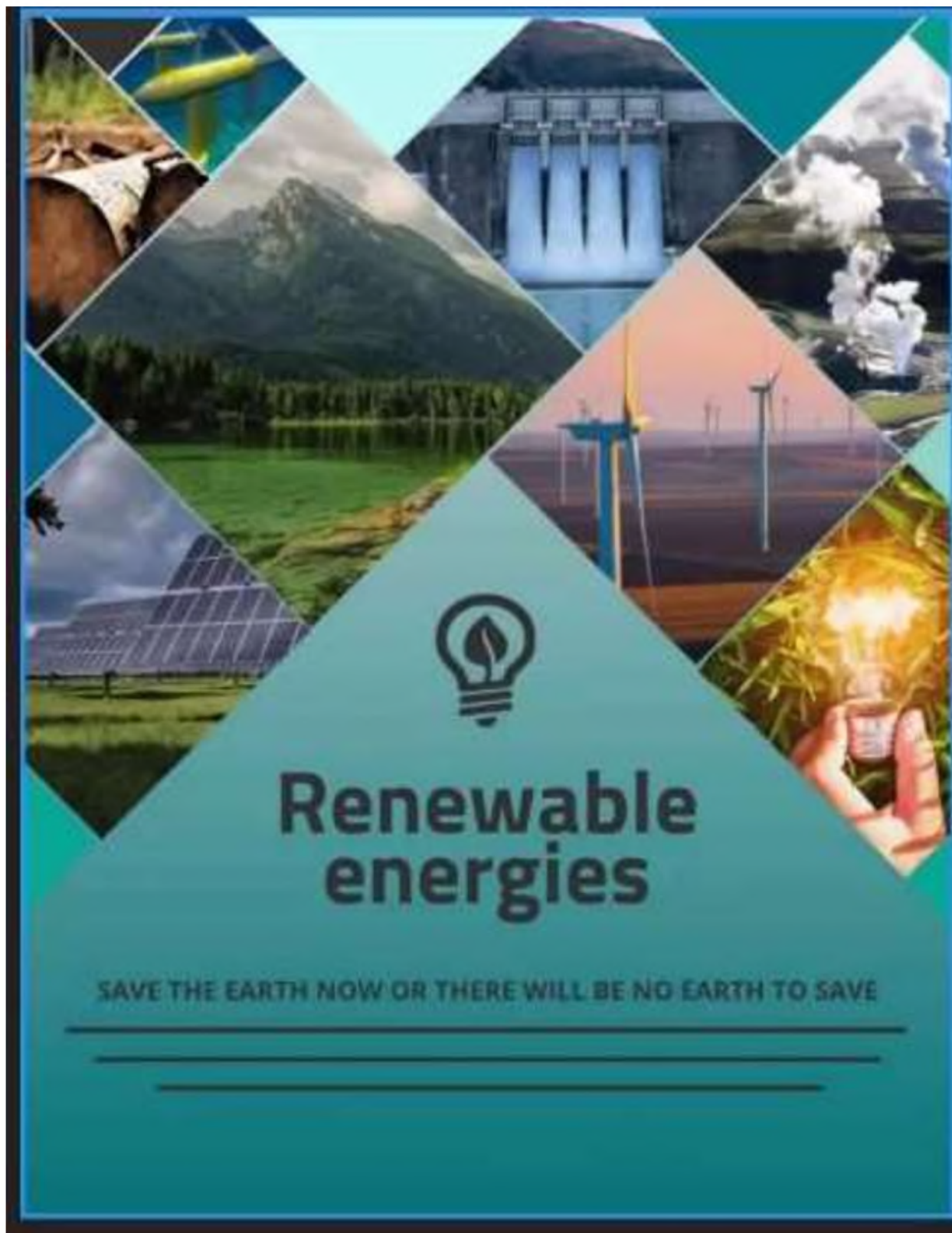
| | | |
|---|--|--|
|  |  |  |
| Your Footprint | Country Average | World Target |

- Your footprint is 6.60 metric tons per year
- The average footprint for people in Estonia is 14.85 metric tons
- The average for the European Union is about 6.4 metric tons
- The average worldwide carbon footprint is about 5 metric tons
- The worldwide target to combat climate change is 2 metric tons

Carbon footprint calculator – example

- **Students think of ways to raise people's interest in responsible energy consumption and use of alternative energy sources.**

They create models, posters or animations etc.



A poster by the Romanian team

OUR GREEN RULES

#1

6 R'S OF SUSTAINABILITY:
REDUCE-REUSE-RECYCLE
REPAIR-RETHINK-REFUSE

CHOOSE
TO
REUSE

#2

THE GOODS OF TODAY BECOME
THE RESOURCES OF TOMORROW



#3

USE SAFE AND
COMPOSTABLE MATERIALS

NO
PLASTIC

#4

WE ADOPT CIRCULAR
ECONOMY



#5

NO TO THE LINEAR
APPROACH ANY MORE:
TAKE-MAKE-DISPOSE



A poster by the Greek team

Water energy and STE(A)M

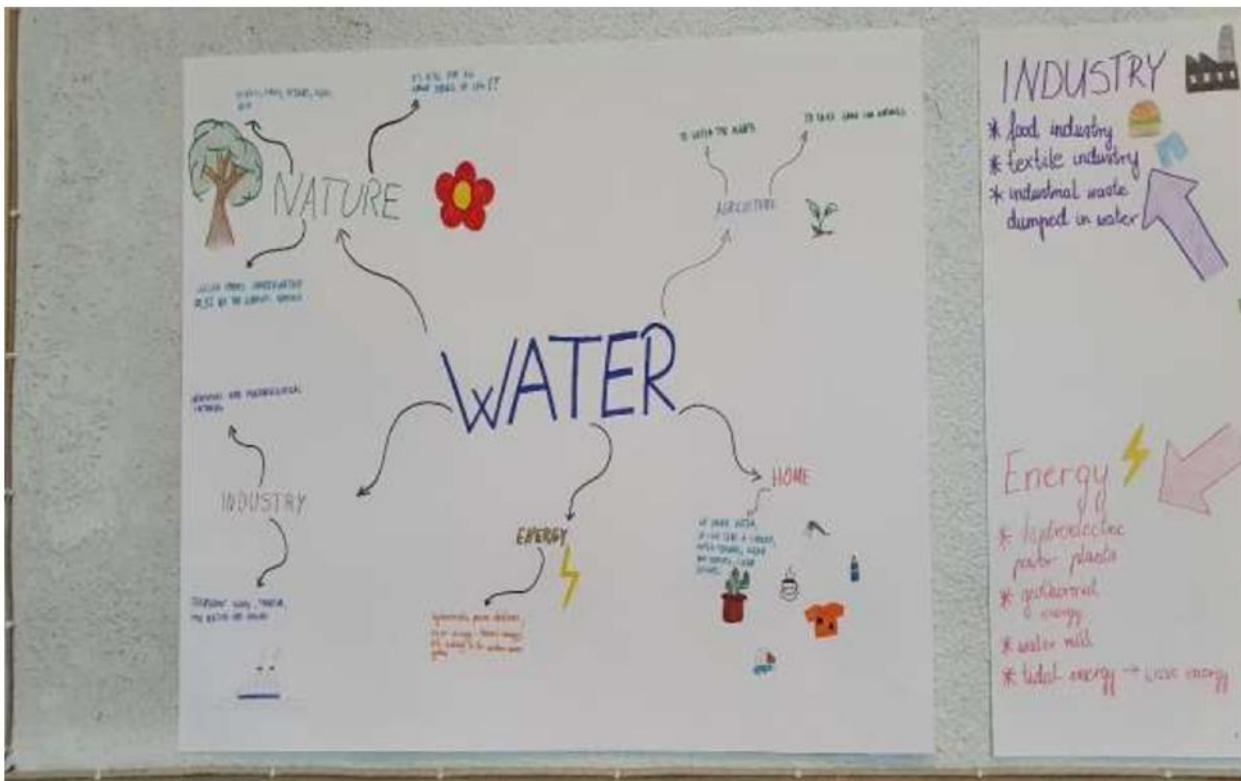
- Water related tasks in different subjects – Maths, Physics, Art



Paper Marbling



Maths tasks



Mindmaps

- **Using the Internet – virtual tours of power plants**

Iru Power plant

<https://www.energia.ee/irutuur/?language=en>

- **Water and symbolism in art, fiction, science fiction, science, religion**

Students do project work and make presentations on water and symbolism in art, literature, film, religion etc.

"Järvesuu poiste brigaad" *in English "Järvesuu guys' working team"*

- Juhan Smuul
- A poem about the construction of the Leevaku hydroelectric power station
- The production of electricity seized due to significant flooding
- The production of electricity continued in 1993.



A presentation by the Estonian team



Jan Matejko – Chrzest Mieszka I
(Christening of Mieszko I) (1889)

This painting shows one of the most important moments in Polish history -
Christening of Poland.

It had place in year 966.

In the background we can clearly see
Lednica Lake.

A presentation by the Polish team

PHRASES WITH WATER

The word 'water' appears in many phrases, as a metaphor. Here are some of them:

- '*make a hole in the water*': fail
- '*put the water in the gutter*': lead an affair to the right way
- '*lose my waters*': feel awkward due to a change
- '*be out of my waters*': I do not know something I am dealing with
- '*like cold waters*': of excellent beauty



A presentation of the Greek team

- In Turkish folk literature and folklore, water is the essence of the universe, as the beginning of the micro and macro cosmos; finds a place for itself in numerous genres, ranging from stories of Dede Korkut , folk tales, legends and fairy tales.



A presentation of the Turkish team



A presentation of the Romanian team

- **Design and build a hydro-mill**

After working on the topic of hydro energy in class and some field trips students build a hydro mill (robotics).



- **Field trips to power plants and individual off-grid energy producers**



Enefit Green (Estonia)



Iru Power Plant (waste-to-energy)



Linnamäe Hydro-electric Power Station



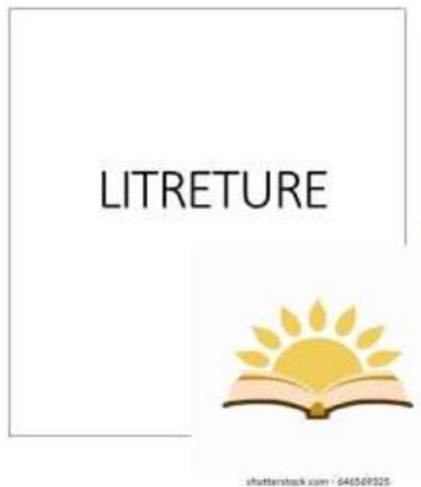
Off-grid energy production and storage in Clean Water Theme park in Estonia



Solar panels in Clean Water theme park in Estonia (production of energy for personal use)

Solar energy and STE(A)M

- **The sun and symbolism in art, fiction, science fiction, science, religion**
Students do project work and make presentations on water and symbolism in art, literature, film, religion etc.



- Sun plays a massive role in our lives. It gives us joy and the power to live. A lot of Polish writers used the sun as a symbol of many things. The sun in Polish literature is a symbol of infinity, sky, fire, world, wanderer, paradise, truth, word, father, intelligence, pregnancy, justice and Resurrection.
- Jan Kochanowski in his poem „Nie porzucaj nadzieje” shows the Sun as a hope. He encourages us not to lose hope when something goes wrong. After the defeat, we cannot give up and "the Sun will rise".

A presentation by the Polish team

- "Home of the sun" by Kaljo Põllu
- 1984
- Metsotinto technique



<http://www.haus.ee/?c=teosed&j=et&id=16711&window=1&form=0>

A presentation by the Estonian team

SUN IN ESTONIAN LITERATURE

The sun was often used as a symbol of fire in old Estonian culture. It was believed to have magical powers.

A presentation by the Estonian team

Erasmus+

FROM SCHOOL TO LIFE
The European Union is helping to support this project

LEPAA
OF KARDIKSA
2020

SUN IN ART

The sun symbol is one of the most ancient symbols in human evolution. Thousands of years ago, cultures across the globe depicted the sun as it appeared to the human eye, and according to its importance in their culture. They depicted suns using a variety of symbols and left behind many artefacts with these symbols. Crosses, circles, discs and rays are some of the most common themes.



Bronze Age Sun cross



The Sun of Macedonia



Aztec Sun Stone



Egyptian winged Sun

A presentation by the Greek team



ZEKİ MUREN (1931-1996)

Turkish singer, composer, songwriter, actor and poet. Known as the "Sun of Art" Muren is considered one of the greatest names in Classical Turkish music.

A presentation by the Turkish team

- **Field trips**

Students see what they have learned in physics/science classes and have a hands-on experience.



A visit to the solar farm in Miroslava



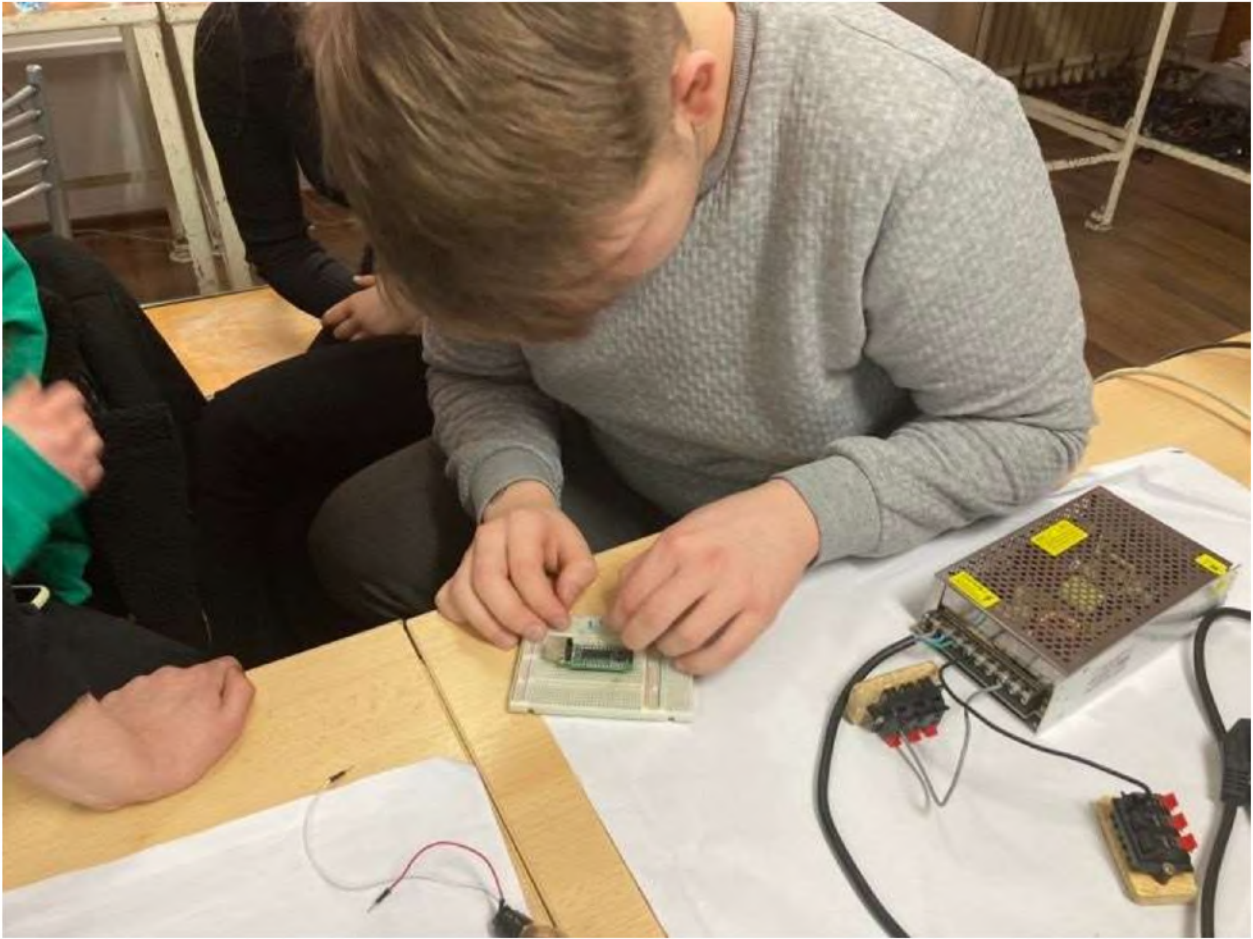
A visit to the solar farm in Miroslava

- **Practical work with solar panels**

In physics building a solar panel and testing how it works



Activities with solar panels



Activities with solar panels

- **Brainstorming – group work**

Students work in groups and think of the advantages and disadvantages of solar energy and its use.



A poster designed in Iasi, Romania (group work)

Sustainable energy in the future – designing smart, green city models

Project-based learning

Students do research and make presentations/videos based on their research, which is followed, by group discussion and Q/A session.



A video by 1st EPAL

Posters

Students design poster of sustainable cities in their art classes



A poster designed in Iasi, Romania (group work)

- **Field trips and practical workshops on site**



Building a sustainable house at the Centre of Environmental Education of Mouzaki



A solar cooker at the Centre of Environmental Education of Mouzaki



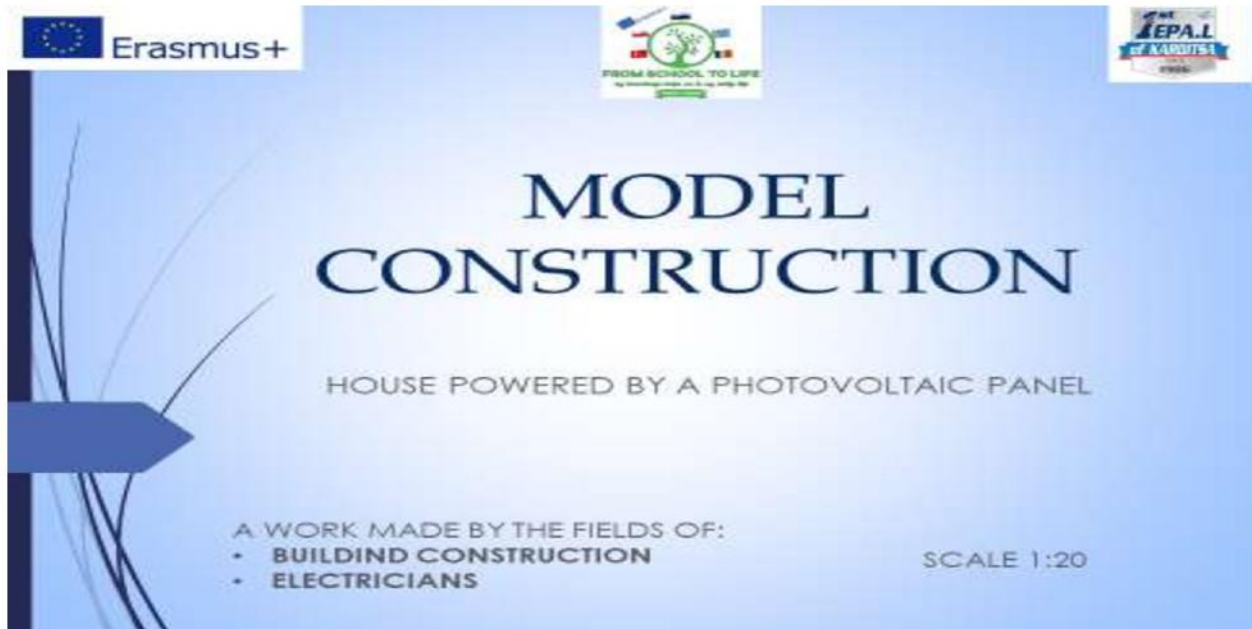
Testing the use of energy of household appliances at the Centre of Environmental Education of Mouzaki



A visit to the Biomass Factory

- **Building a model of a green sustainable city**

Students use the knowledge gained from research, presentations and group work and build a model of a green sustainable city.



A presentation of the activity in Greece



A model of a green sustainable city

Acknowledgement:

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