

# Introduction to sustainability and space in VET education



# Planet Change

- Target group: VET students and teachers
- Aim: Raising awareness about sustainability and training 21st century skills in the context of space technology
- Developed: 18 activities to be used in class about sustainability and space



# Planet Change - partners

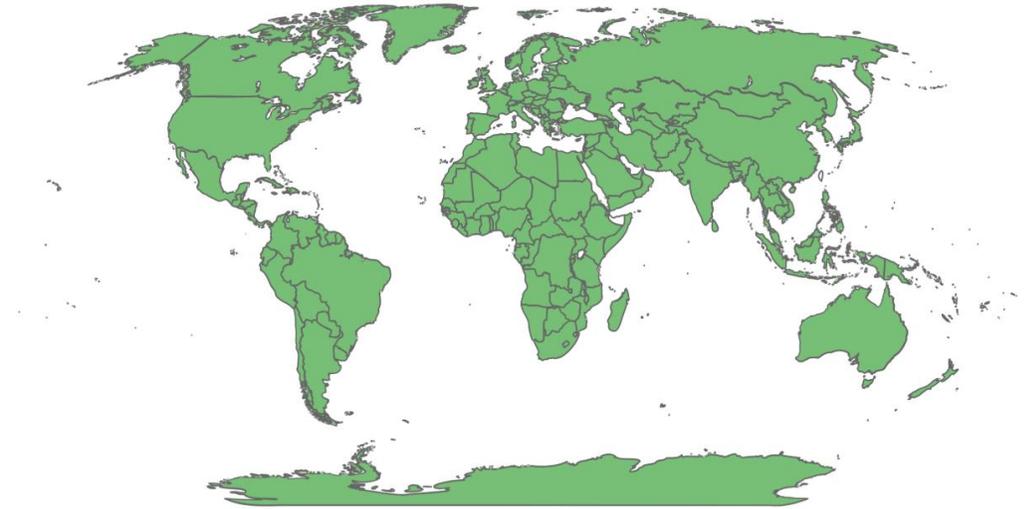
- Netherlands:
  - Leidse instrumentmakers school
  - NEMO Science Museum
- Norway: Andøya Space
- Spain: Instituto Astrofísica de Canarias
- Portugal: Virtual Campus
- Italy: CRES



# Introduce yourself!

- On the Canva, let us know:
  - Where you're from
  - If you work in education, sustainability, space or ....

Let us know where you're from and if you work in education, sustainability or space



# Activities

- 18 activities in the context of sustainability and space technology
- The activities use earth observation data
- The students learn how a concept works in space with applications on Earth

## Themes:

- Pollution
- Space hazards
- Agriculture
- Logistics
- Energy efficiency
- Constructions
- Climate change



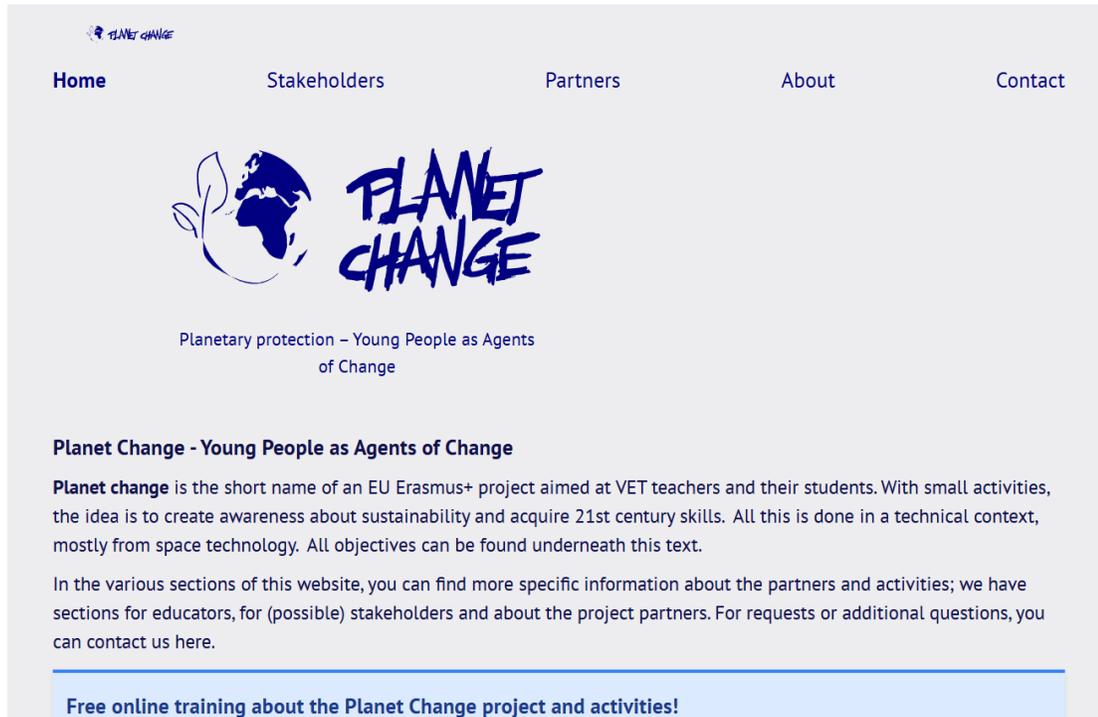
Pollution	Air pollution
	Light pollution
Energy efficiency	Solar panel alignment
	Solar panels from space
	Energy and green professions
Space Hazards	Space debris
	NEO's
Constructions	Phase I
	Phase II
	Phase III

Agriculture	Agriculture in space
	Space for crop optimisation
Climate change	Deforestation
	Wildfires
	Monitoring the health of the oceans
	Salmon and rainforest
Logistics	Space Data
	GNSS

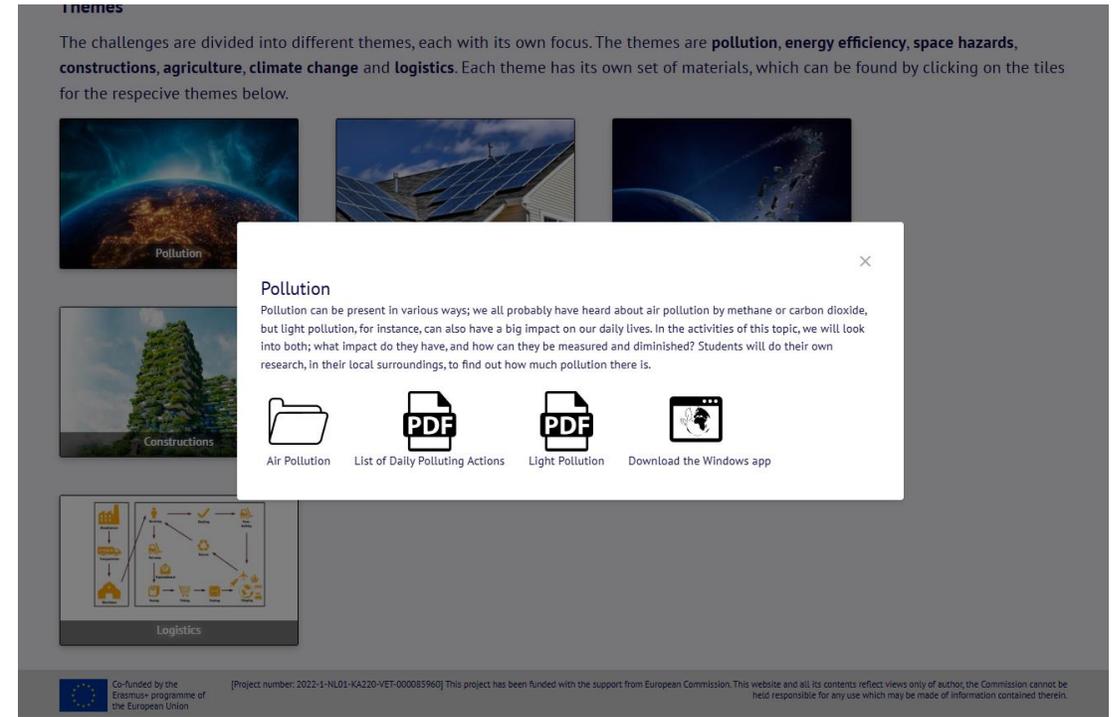
Tutorials	Tutorial EObrowser
	Tutorial google earth pro



# Website



The screenshot shows the home page of the Planet Change website. At the top, there is a navigation menu with links for Home, Stakeholders, Partners, About, and Contact. Below the menu is the Planet Change logo, which features a stylized globe with a leaf and the text "PLANET CHANGE". Underneath the logo is the tagline "Planetary protection – Young People as Agents of Change". The main content area has a heading "Planet Change - Young People as Agents of Change" followed by a paragraph explaining the project's goals: "Planet change is the short name of an EU Erasmus+ project aimed at VET teachers and their students. With small activities, the idea is to create awareness about sustainability and acquire 21st century skills. All this is done in a technical context, mostly from space technology. All objectives can be found underneath this text." Another paragraph states: "In the various sections of this website, you can find more specific information about the partners and activities; we have sections for educators, for (possible) stakeholders and about the project partners. For requests or additional questions, you can contact us here." At the bottom, there is a blue banner with the text "Free online training about the Planet Change project and activities!".



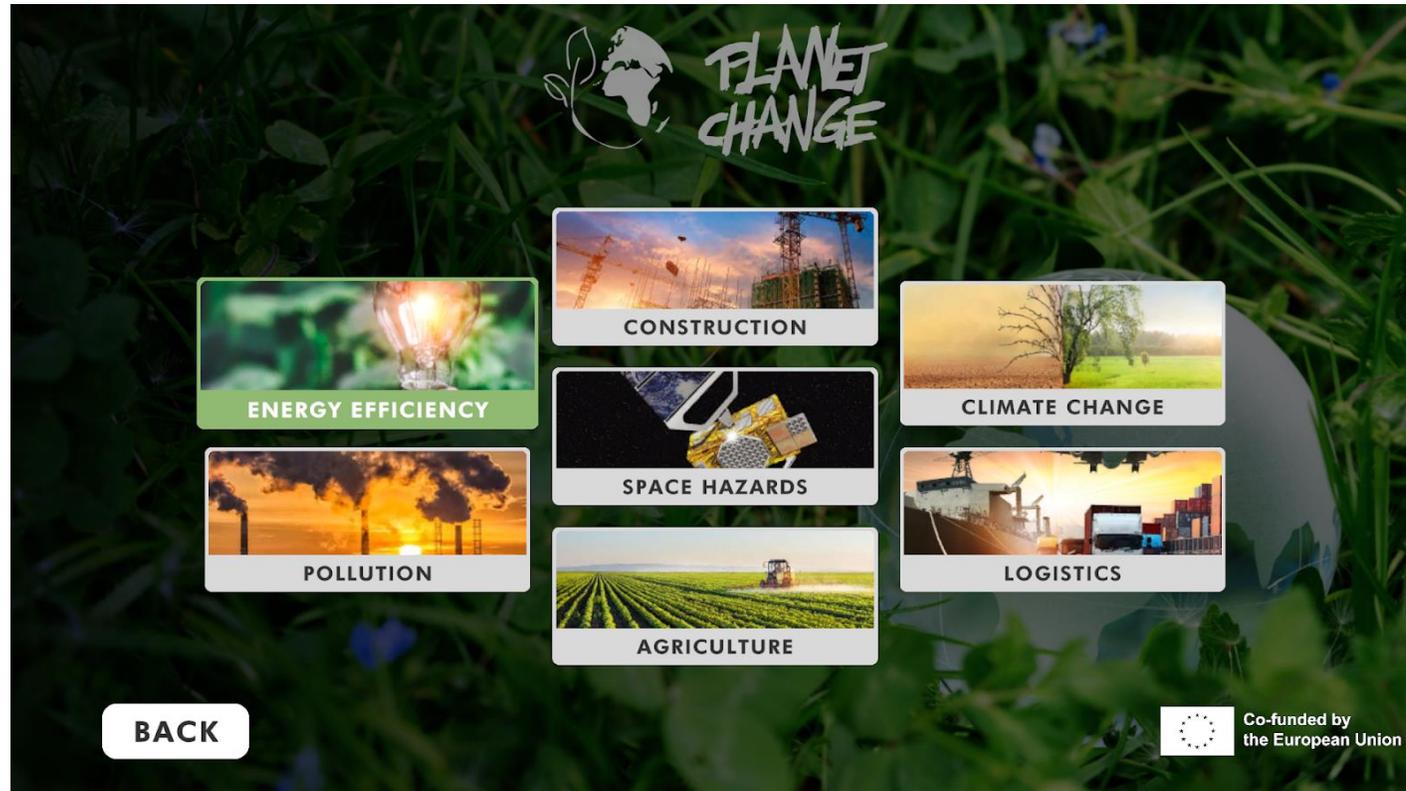
The screenshot shows the "Themes" page of the Planet Change website. The text reads: "The challenges are divided into different themes, each with its own focus. The themes are **pollution**, **energy efficiency**, **space hazards**, **constructions**, **agriculture**, **climate change** and **logistics**. Each theme has its own set of materials, which can be found by clicking on the tiles for the respective themes below." Below this text are three image tiles: "Pollution" (showing a polluted landscape), "Constructions" (showing solar panels), and "Logistics" (showing a factory). A modal window is open over the "Pollution" tile, titled "Pollution". The modal contains the following text: "Pollution can be present in various ways; we all probably have heard about air pollution by methane or carbon dioxide, but light pollution, for instance, can also have a big impact on our daily lives. In the activities of this topic, we will look into both; what impact do they have, and how can they be measured and diminished? Students will do their own research, in their local surroundings, to find out how much pollution there is." Below the text are four icons representing different resources: a folder icon for "Air Pollution", a PDF icon for "List of Daily Polluting Actions", another PDF icon for "Light Pollution", and a Windows app icon for "Download the Windows app". At the bottom of the page, there is a footer with the European Union flag and the text "Co-funded by the Erasmus+ programme of the European Union" and a project number: "[Project number: 2022-1-NL01-KA220-VET-000085960] This project has been funded with the support from European Commission. This website and all its contents reflect views only of author; the Commission cannot be held responsible for any use which may be made of information contained therein."



# Multimedia activities



# Multimedia activities



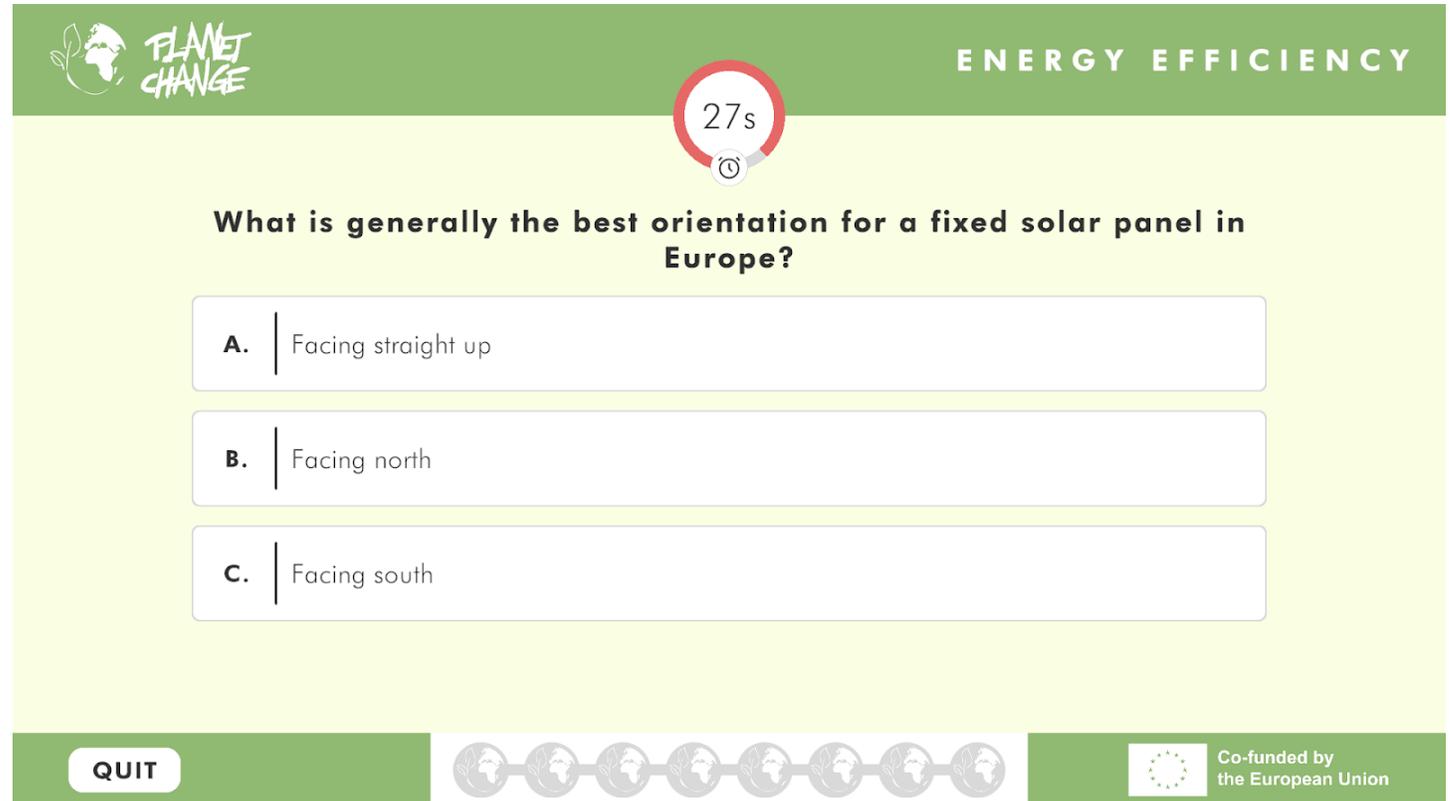
# Multimedia activities

The screenshot shows a digital interface for 'ENERGY EFFICIENCY' activities. At the top left is the 'PLANET CHANGE' logo, which includes a stylized globe with a leaf. The main title 'ENERGY EFFICIENCY' is centered in large white letters. Below the title are three activity cards: 'QUIZ' (depicting a paper cutout of a head), 'FIND THE SUN' (depicting a sun with question marks and a solar panel), and 'SOLAR PANEL ALIGNMENT' (depicting three solar panels on a field). A 'BACK' button is located at the bottom left. In the bottom right corner, there is a logo for the European Union and the text 'Co-funded by the European Union'. The background of the interface is a dark green field with a faint globe.



# Multimedia activities

- Quiz
- Simulation
- Game



**PLANET CHANGE**

ENERGY EFFICIENCY

27s

What is generally the best orientation for a fixed solar panel in Europe?

A. Facing straight up

B. Facing north

C. Facing south

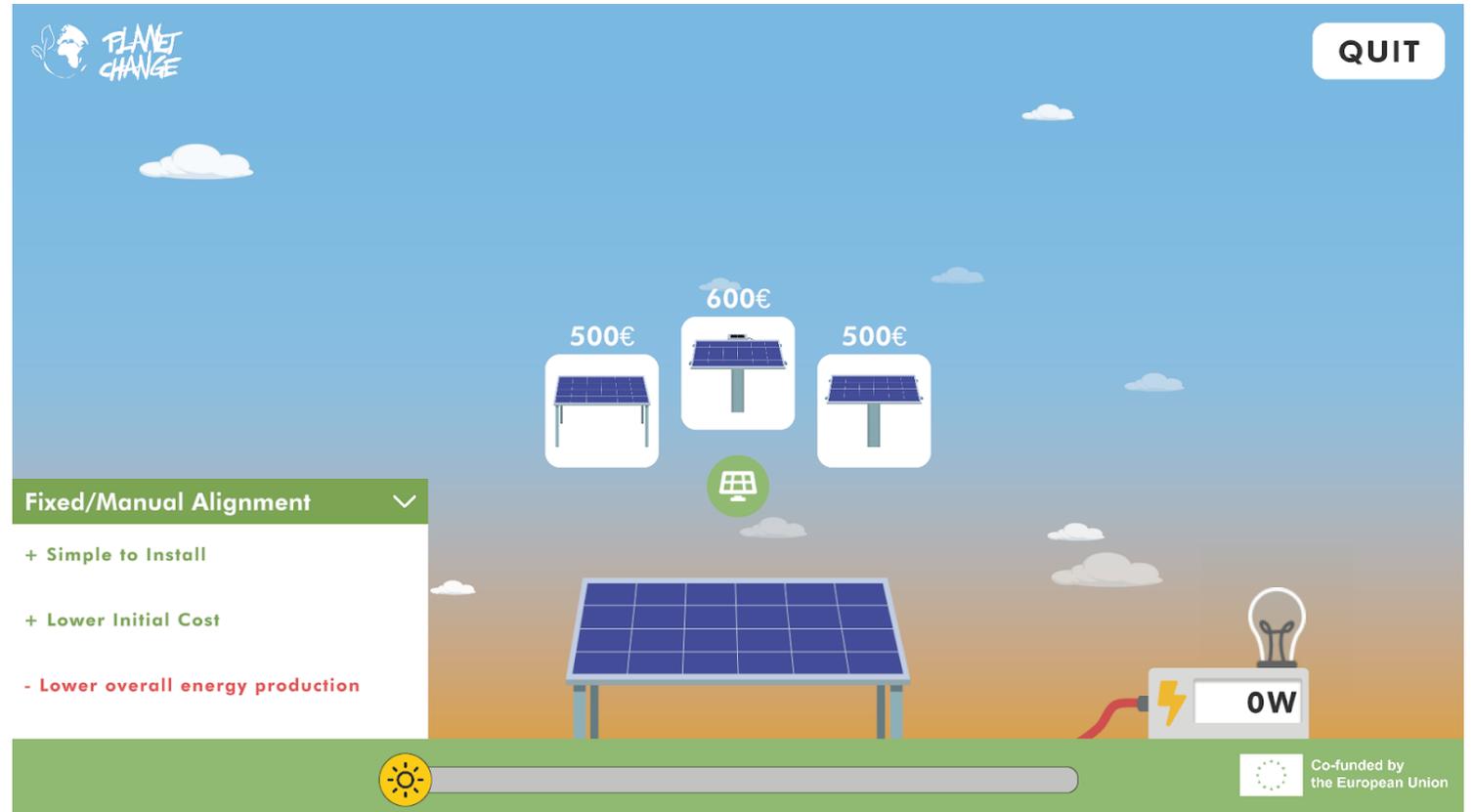
QUIT

Co-funded by the European Union



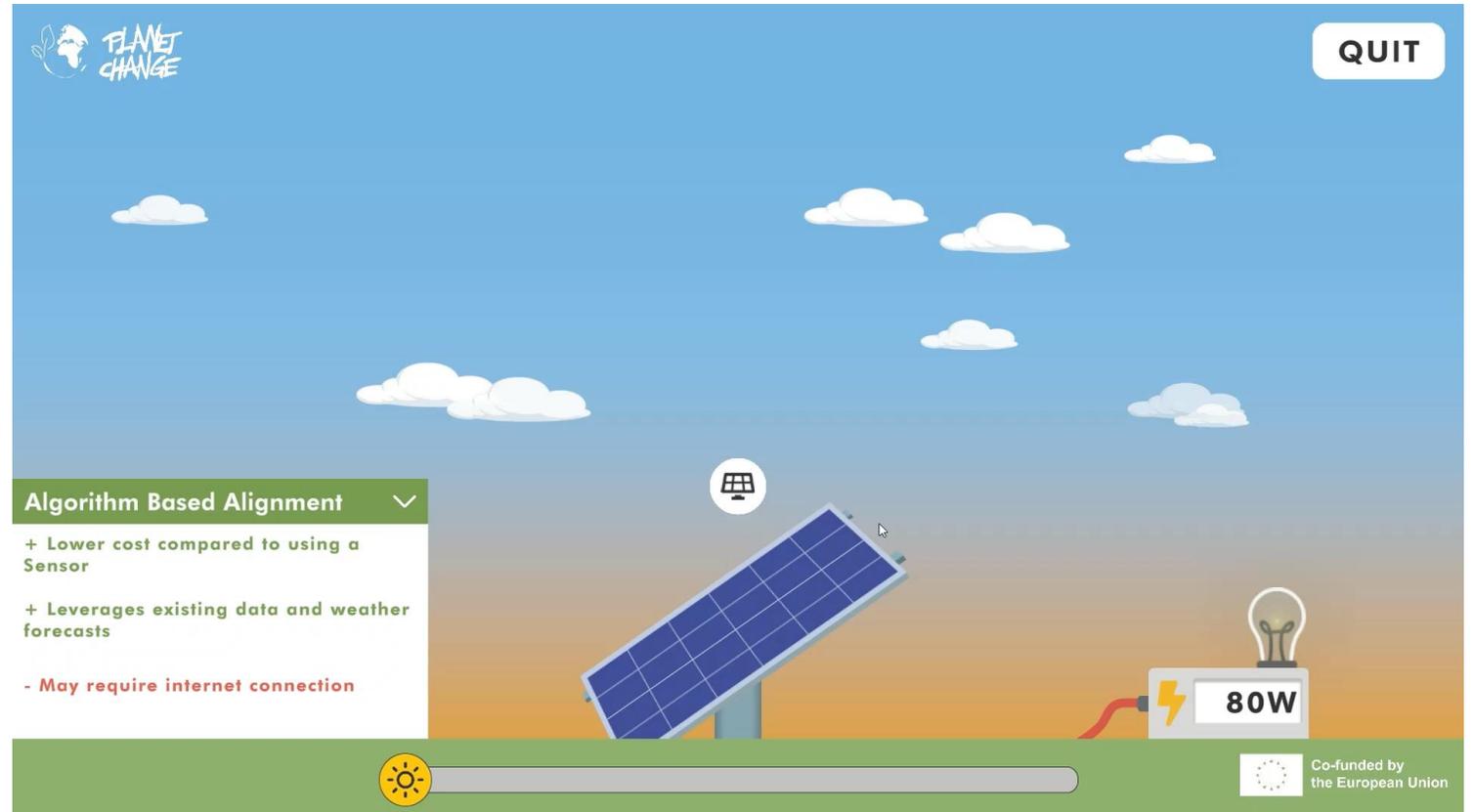
# Multimedia activities

- Quiz
- **Simulation**
- Game



# Multimedia activities

- Quiz
- **Simulation**
- Game

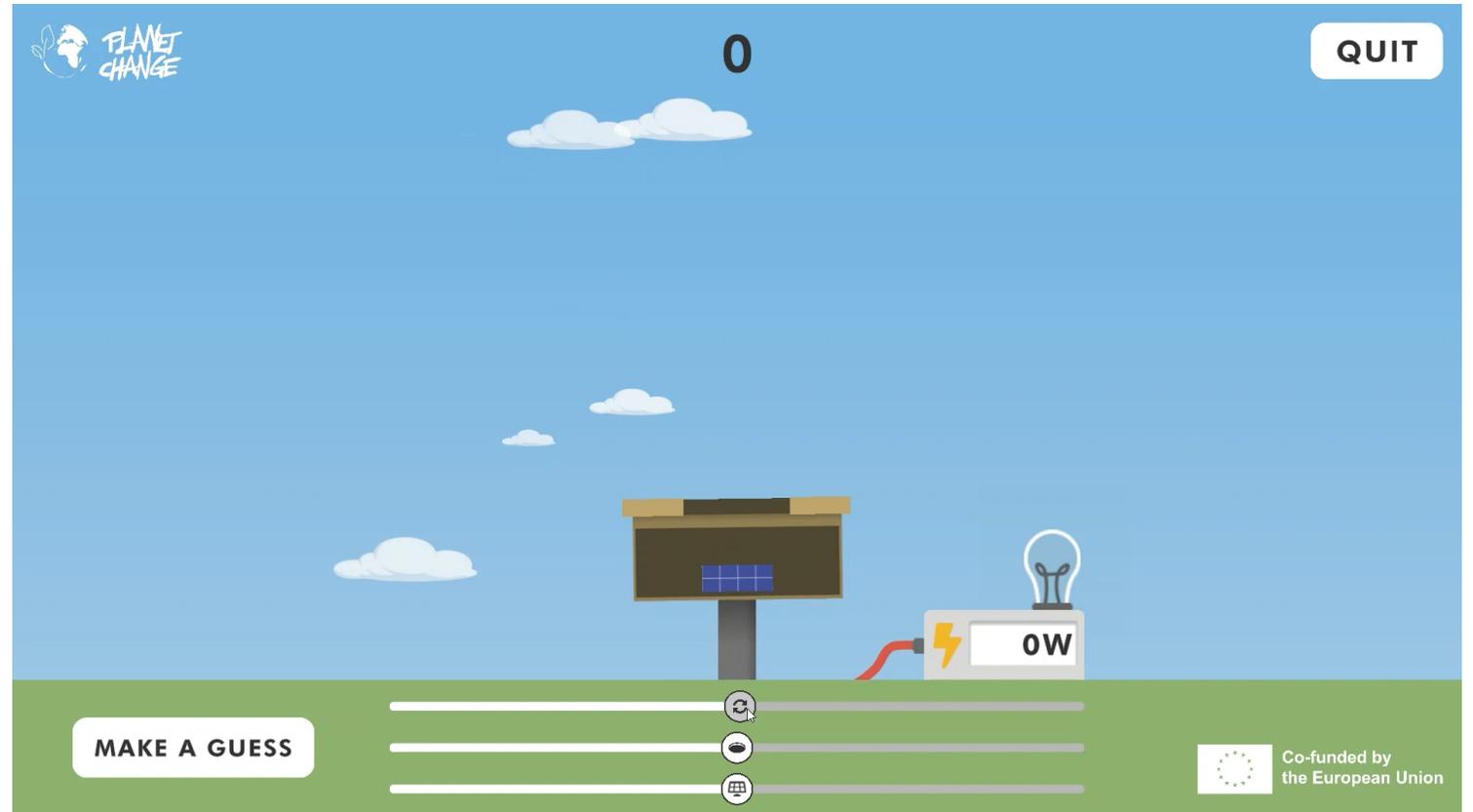


The screenshot shows a simulation interface for a solar panel system. At the top left is the 'PLANET CHANGE' logo, and at the top right is a 'QUIT' button. The background is a blue sky with white clouds. In the center, a solar panel is tilted towards the sun. To the right of the panel is a battery labeled '80W' with a lightbulb icon on top. A green dropdown menu titled 'Algorithm Based Alignment' is open, showing the following text: '+ Lower cost compared to using a Sensor', '+ Leverages existing data and weather forecasts', and '- May require internet connection'. At the bottom, there is a sun icon and a progress bar, and a logo for 'Co-funded by the European Union'.



# Multimedia activities

- Quiz
- Simulation
- **Game**



# Today

- Space for crop optimisation
  - Make use of Earth observation
  - Browser tutorials
- Reflection



# Activity Space for crop optimisation

## Space for crop optimisation

- Duration 2 x 45 minutes
- European qualifications level: 3-4
- Topic: agriculture and climate change



# Activity Space for crop optimisation

Introduction

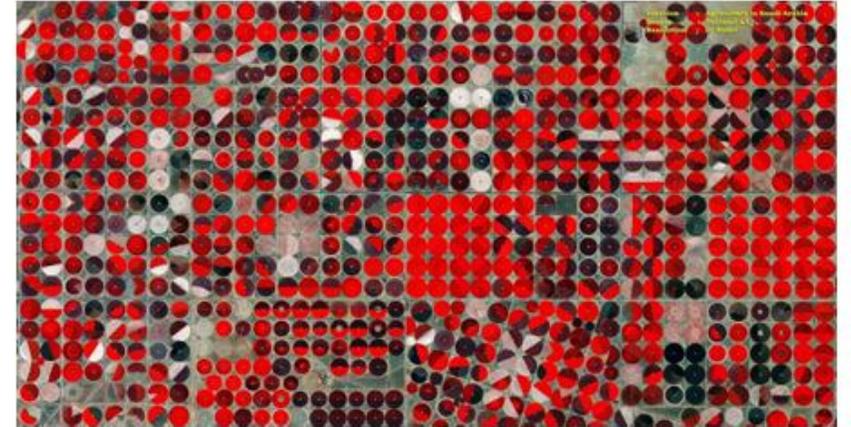
Part 1: Satellites eyes help from space

[EO browser](#)

Part 2: Satellites for optimising agriculture: How?

Part 3: Reflection and next steps

Part 4: A possible future in the space sector



Sentinel 2 monitoring agriculture in Saudi Arabia. Light red means healthy crop. Credits: ESA

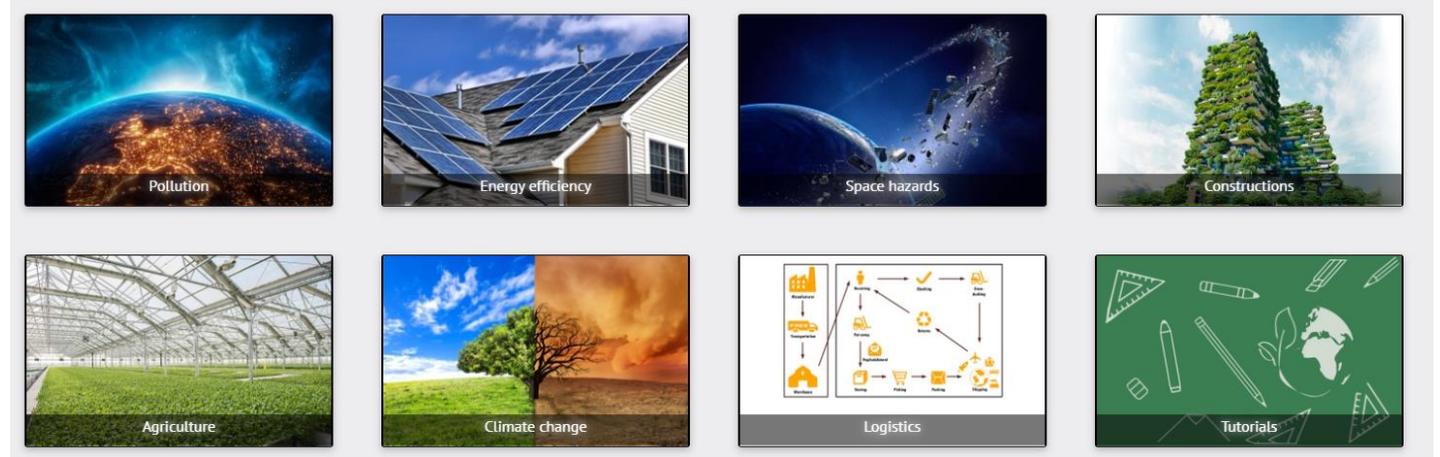


# Tutorials

[Google Earth Pro](#)

[EO Browser](#)

Copernicus browser



# Reflection

- How would you like to implement space technology in your activities?
- How would you like to implement sustainability in your activities?
- What aspect of the training would you like to implement in your activities?



# Implementation of sustainability and space

- 8th of April, 15.00 - 16.30 CET
- Try other activities
- Talk with other professionals
- Learn best practices on how to implement sustainability and space

