
CO2 PACMAN | Interreg Euro-MED | Co-funded by the European Union

# CO2 PACMAN

## COoperation and CO-designing PArtnership for CliMAte Neutrality

### DEVELOPING A CRITICAL THINKING

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## 1. Introduction

In December 2024, the CO2 PACMAN project launched the first phase of the Youth Think Tank pathway on the Island of Elba, involving students from local secondary schools. This initial phase, entitled “Developing a Critical Thinking”, aimed to introduce key concepts related to climate change, climate neutrality, landscape and decarbonisation, while fostering awareness, reflection, and personal positioning among young participants.

The activity represented the foundational step of a broader participatory process articulated in three main phases: developing critical thinking, transferring knowledge, simulating policy scenarios through the CO2 PACMAN Tool, and co-designing concrete projects to support the transition towards carbon neutrality at local level. During this first phase, the focus was not yet on scenario-building, but rather on strengthening students’ understanding of climate-related challenges and on stimulating reflection on the relationship between emissions, daily behaviours, and the island’s landscape.

Interactive presentations, visual materials and live questionnaires were used to actively engage students and to capture their perceptions, expectations and emotional responses before moving towards more technical and policy-oriented phases.

## 2. Materials Presented During the Workshop.

### 2.1 Key Concepts: Climate Neutrality and Decarbonisation

The workshop introduced students to a set of core concepts that underpin the CO2 PACMAN project. Climate neutrality was presented as the balance between greenhouse gas emissions and their removal or compensation, highlighting its relevance in limiting global warming to 1.5°C in line with international climate agreements. Closely connected to this, the notion of decarbonisation was explained as a systemic process involving energy production, mobility, waste management, food systems and everyday practices. The concept of carbon footprint was used as an entry point to connect global challenges to individual and household-level behaviours, showing how daily activities translate into emissions and how these emissions can be reduced.




## 2.2 Landscape and "Energies of the Landscape"

A distinctive element of the workshop was the emphasis on landscape as an active component of the climate transition. Rather than being framed as a passive background, the landscape was described as a living system shaped by human actions and capable, in turn, of influencing social, cultural and economic dynamics.

Students were introduced to the idea of "energies of the landscape", referring to the multiple renewable potentials embedded in specific territorial contexts—such as solar, wind, marine and land-based resources. This perspective encouraged participants to reflect on place-based solutions and on the importance of aligning technological choices with local characteristics.

## 2.3 Visualisation of Emissions and Household Carbon Footprint

Through visual materials and simplified data representations, the workshop illustrated how emissions are distributed across sectors at household and territorial scale. The use of spatial metaphors—such as the forest area required to offset emissions—helped make abstract quantities more tangible and facilitated a shared understanding of the scale of the challenge.

These materials prepared the ground for subsequent phases of the Youth Think Tank, in which students would be asked to actively explore mitigation options and build scenarios using the CO2 PACMAN Tool.


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## 3. Results from the Student Questionnaire

To assess students' perceptions and reactions, an interactive questionnaire was administered during the workshop using online polling tools, with responses collected from all 70 participants. The results provide valuable insights into their initial awareness, emotional engagement, and priorities.

**Perception of the Climate Crisis:** When asked how they feel about the climate crisis, the majority of students expressed concern or anxiety. Specifically, **51%** of participants declared feeling *worried*, while **24%** reported feeling *anxious*. A further **24%** stated that the topic does not interest them, and only **2%** described themselves as *optimistic*. These results indicate a strong emotional engagement with climate-related issues, characterised predominantly by concern rather than optimism, highlighting the need for structured spaces where these emotions can be processed and transformed into agency.

**Awareness of Climate Neutrality**: The questionnaire revealed a generally low level of prior familiarity with the concept of climate neutrality. **58%** of students stated that they did not know the term before the workshop, while **35%** associated it with an incorrect or ironic interpretation. Only **5%** reported already knowing the concept, and **2%** defined themselves as experts. This confirms the importance of the Youth Think Tank's introductory phase in establishing a shared vocabulary and conceptual baseline before moving towards more advanced discussions and co-design activities.

**Associations with Decarbonisation:** Through an open-ended wordcloud question, students were asked to associate a single word with the concept of decarbonisation. The most recurrent terms referred to **$CO_2$, emissions, pollution, carbon and plants**, indicating a general understanding of decarbonisation as a process linked to emission reduction and environmental protection.

**Perceived Priority Solutions:** Students were asked to identify the most relevant solutions to address climate change. Renewable energy options—particularly **solar photovoltaics and wind energy**—emerged as the most frequently mentioned solutions, followed by tree planting, sustainable mobility and behavioural change.




When asked to rank the best solutions for the island of Elba (on a scale from 1 to 5), the results were as follows:

- **Renewable energies** ranked first, with an average score of **3.52**;
- **Changing people's behaviours** ranked second (**3.31**);
- **Sustainable mobility** followed (**2.17**);
- **Planting trees** (**1.93**);
- **Improving energy efficiency in buildings** (**1.33**);
- **Circular economy-based solutions** ranked last (**1.12**).

This ranking highlights a strong orientation towards technological and behavioural solutions, while more systemic or infrastructural measures appear less prominent at this stage.

**The Role of Landscape in the Transition:** Students attributed a significant role to the landscape in the climate transition process. **65%** of participants considered the landscape *important* and stressed the need to protect it from degradation, while **24%** described it as *decisive*, recognising its potential to actively suggest appropriate transition pathways. Only **10%** viewed the landscape as merely a background element, and **2%** considered its role marginal. These results strongly align with the landscape-based approach promoted by CO2 PACMAN, confirming students' sensitivity to place-specific dimensions of decarbonisation.

**Overall Experience and Emotional Impact:** At the end of the workshop, students were asked how they felt after the experience. A majority (**58%**) reported feeling *more optimistic* than before, while **38%** felt *exactly the same*, and only **4%** felt *less optimistic*. This shift suggests that the activity contributed to transforming initial concern and anxiety into a more constructive and hopeful outlook, reinforcing the role of participatory and educational formats in empowering young people.


## 5. Conclusions and Next Steps

The Youth Think Tank session confirmed the strong interest and capacity of students to engage with climate neutrality pathways when supported by accessible concepts, interactive formats and clear methodological guidance. The results of the questionnaires show a high level of emotional engagement with climate-related challenges, coupled with an initial limited familiarity with key concepts such as climate neutrality and decarbonisation. At the same time, the activity contributed to increasing awareness and fostering a more constructive and optimistic outlook among participants.

By focusing on the development of critical thinking, this first phase successfully established a shared conceptual framework and a common language, enabling students to better understand the links between emissions, everyday behaviours and the specific characteristics of the island's landscape. This foundation is essential to ensure meaningful participation in the subsequent phases of the Youth Think Tank process.

Building on this groundwork, the following **Transferring Knowledge** phase will deepen students' understanding through the presentation of scientific data, territorial analyses and methodological tools. This will be followed by the **CO2 PACMAN Tool simulation**, during which students will be invited to explore different mitigation measures and policy options by constructing alternative decarbonisation scenarios for their island.

The final **Co-designing Scenarios** phase will represent the culmination of the Youth Think Tank pathway. In this stage, students will move beyond analysis and simulation to actively contribute to the island's transition towards carbon neutrality by proposing concrete, place-based projects to be implemented at local level. Through this progressive process, the Youth Think Tank aims to empower young people as informed and engaged actors of change, capable of translating knowledge and collective reflection into actionable proposals for territorial transformation.

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