# Vibe Coding Challenge: CO2 Browser Game

## Task

Develop a browser game (HTML + Three.js) that playfully conveys how many trees a single person in Germany would have to plant to neutralize their own CO2 footprint. The game should interactively communicate how many tons of CO2 emissions an individual person causes on average and what can be done about it.

### Recommended Approach:

1. Concretize your game idea and then create a detailed briefing for your programmer (Gemini) so that he can program the game for you. Tip: AI is your friend and helper!
2. Open Google AI Studio and select the AI model Gemini 2.5 Pro Preview. Gemini (your developer) is now ready and waiting for your briefing.
3. Share the briefing with Gemini so that the AI can develop the game for you.
4. Download the code developed by Gemini and open the downloaded HTML file in your browser (double-click) to test the game.
5. Further customize the game in dialogue with Gemini (optional).

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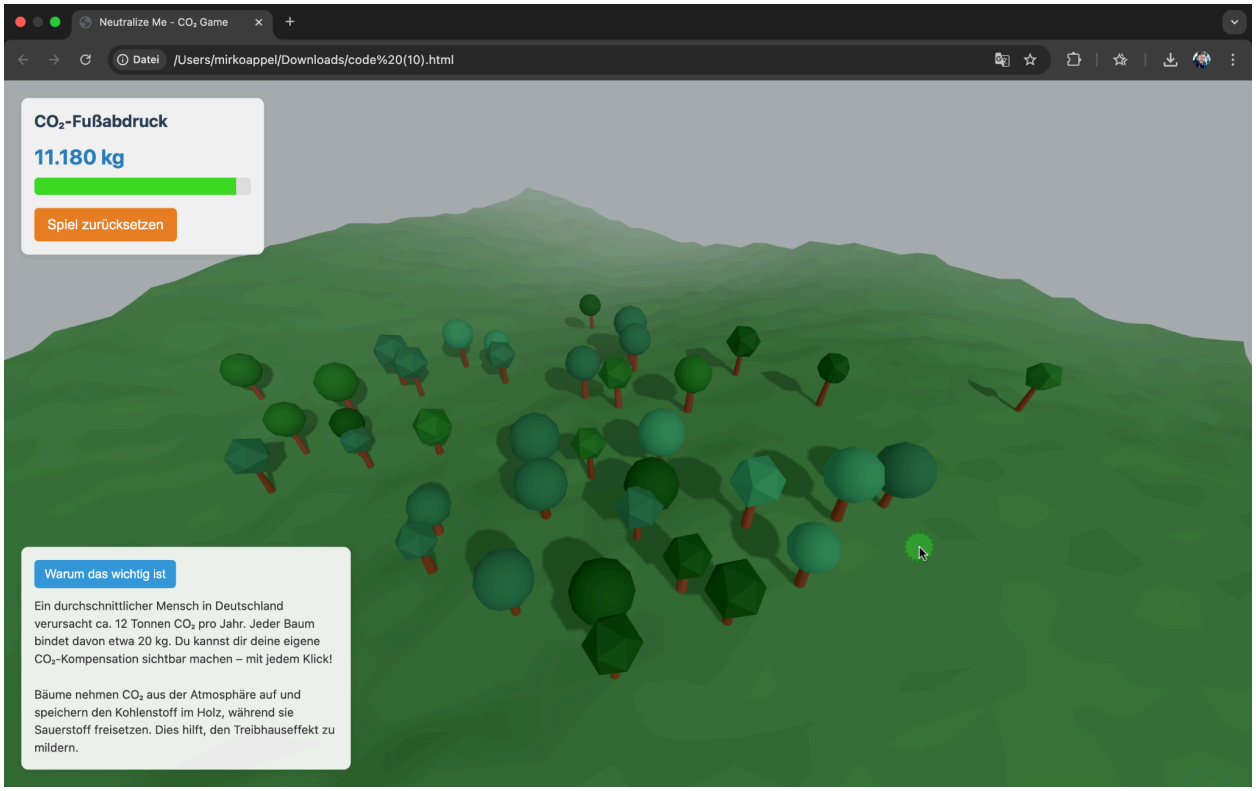
# Sample Solution




# AI Tools:

1. ChatGPT 4o ← Research, conception, visualization and development of the briefing for Gemini to develop the game
2. Google AI Studio with Gemini 2.5 Pro Preview ← Development of the code for the game

## Prompt for Developing the Briefing (Instructions for Gemini)

— after in-depth research and brainstorming with ChatGPT —

Okay, let's make a game out there. The player should plant trees until their own CO2 footprint is neutralized. The whole thing will be implemented with Tree.js in a 3D world with camera control. With a click, you plant a tree. It then also appears in the scene. And then there is somewhere in a barometer that shows how CO2-neutral you already are. And somewhere there is also an info box that you can open, where that is also explained. Maybe a popup or something will appear. Make a really good briefing out of it that I can use for the game developer who will implement the whole thing.

## Prompt for Developing the Game (Instructions for Gemini):

# # Project Briefing: $CO_2$ Game "Neutralize Me"

An interactive tree-planting game for $CO_2$ compensation

Technology: Three.js (WebGL-based)

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## Goal of the Game

The player playfully learns how many trees need to be planted to neutralize the average $CO_2$ footprint of a person in Germany (~12 tons per year). Each planted tree reduces this value. Goal: to get to 0 kg $CO_2$.

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## Core Gameplay

+ Game principle: The player clicks on the ground → a 3D tree is created at this point (visually animated, ideally with a gentle growth effect). Each tree reduces the $CO_2$ counter by 20 kg $CO_2$ (optimistic average).
+ + Goal: Bring the $CO_2$ barometer to 0. Default value at the start: 12,000 kg $CO_2$ (12 tons).

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## Interactions

📌 Controls

+ Camera: Freely movable (OrbitControls), zoom, rotation. Player can look around, but not fly through the world.
+ Tree planting: Left-click on terrain → tree grows at this point (possibly Raycasting).
+ Optional: Cursor shows tree preview before planting.

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## Visual Elements

🌳 The Game World

+ A simple, stylized 3D surface (Low Poly / Flat Color) as terrain.
+ Slight hill structure or island, so that it does not look too sterile.
+ Optional: Light change with $CO_2$ progress (e.g., smog → clear sky).

🌲 The Trees

+ Stylized models (e.g., simple sphere crown + trunk).
+ Variations (random size, color, type).
+ Animated growth when planting.

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# ## UI Elements

1. $CO_2$ Barometer (HUD at the top or side)

+ Shows: Remaining $CO_2$ footprint: XXXX kg
+ The value is reduced with each tree.
+ Progress bar (0% = neutralized).

2. Info box / Popup (foldable)

+ Contains an explanation of why trees compensate for $CO_2$.
+ Example text: "An average person in Germany causes about 12 tons of $CO_2$ per year. Each tree binds about 20 kg of it. You can make your own $CO_2$ compensation visible - with every click!"
+ Button: "Why this is important" → opens/folds out text.

3. Reset Button

- Resets game progress (counter + world).

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# ## Learning Content (as part of the UI or Popups)

+ Average $CO_2$ footprint

+ Binding per tree (realistic values)
+ Optional: Other sources of emissions (car, flight, clothing - with buttons/pictograms as bonus content)

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# ## Technical Requirements

+ Technology: Three.js, HTML/CSS/JS
+ Responsive: At least desktop, optionally mobile-capable
+ No backend necessary (only client-side logic)
+ Asset management: Local Models or CDN-based

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# ## Stretch Goals (Optional)

+ Animals appear when the $CO_2$ value drops (Gamification).
+ Mini-statistics: "You have bound as much $CO_2$ as... X Burgers, Y flight miles, etc."
+ Screenshot function: Player can share their neutralized garden.

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**## Success Criterion**

+ Fun, meditative gameplay with a real learning effect.
+ Good performance in the browser.
+ Working loop: Reduce $CO_2$ → Plant trees → See progress → Aha experience.

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Create everything in a single HTML file.