Carbon Neutral

(A Board Game About Decarbonizing Society)

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Why a Board Game?

We chose to use a board game as it offers an interactive medium for players to gain a deeper understanding of how different factors affect the environment.

Board games are hands on which can be a useful tool for learning as opposed to other forms of sharing information.

Having a game also puts players in the shoes of people in power stimulating thought about their potential motivations in the real world.

A game also promotes reflection on how the current people in power are handling the situation of the climate.

Goal of Our Game

We want our game to teach the players about the intricacies of managing the climate from both an economic and environmental perspective.

Our Game will do this by incorporating various aspects of switching to carbon neutral technologies with gameplay featuring:

- Energy transitions
- Economic constraints
- Carbon emission impacts
- Long-term vs short-term decision tradeoffs

Game Layout & Core Mechanics

Player Role & Resources

- Players act as national policymakers.
- There are three main resources represented with tokens:
    - **Energy**
    - **Money**
    - **Carbon Emissions**
- There is a deck of “project” cards containing possible energy sources and even some carbon sinks.
- Each player will start with a colored set of tokens used to represent their buildings and an amount of initial money.
- Each “project” card will have an associated resource cost which a player can spend to obtain.
- Each “project” card will also have some effect, generating energy, money, and carbon emissions.
- There is also an “event” deck containing cards that can affect all players, these cards resolve as stated on the cards.

Draw Pile	Discard Pile
Communal “Purchasable” cards	Communal “Purchasable” cards
Communal “Purchasable” cards	Communal “Purchasable” cards

Turn Structure & Player Decisions

- During a players turn they may, in order:
    1. Gain resources as stated on their owned cards.
    2. Purchase a land plot.
    3. Spend resources to purchase one “project” card per turn and placing a representative token on an owned plot.
    4. Replace empty communal slots.
    5. Draw an event card and respond to it.

Project Cards and Land Plots

- There are two main types of Project Cards:
  - Renewables → generally higher money cost but lower long-term emissions.
  - Fossil fuels → fast and cheap but increase carbon penalties.
  - There are also some additional cards like carbon sinks that have special effects.
- Each Project Card has a cost, effect, size, and location
  - The cost represents how much of each resource is needed to purchase it.
  - The effect tells the player what the card generates/does.
  - The size represents how much “space” it lakes up on a land plot.
  - The location indicates where on the map the project can be built.
- Land plots are limited and once they have all been purchased no one can get any more.
  - Each player will have a tracker for how many land plots they have, the more you have the more expensive it is to purchase another.

Real-World Integration, Event Cards, and Complexity

Realistic Event Cards

- Event cards represent actual global change challenges:
  - Natural disaster cards affecting energy supply
  - Technological breakthroughs lowering renewable costs
  - Diplomatic tensions altering resource access
  - Market fluctuations
- Some event cards might even be able to be kept by a player to do a special action, rewarding risk.

System of The Game

Systems Thinking Built Into the Game

- Discuss how the game models systems-level interactions:
    - Delayed feedback (emissions accumulate over time)
    - Path dependence (early decisions lock in future possibilities)
    - Tradeoff dynamics (economic costs vs environmental benefits)
    - Tipping points (critical thresholds where small changes trigger large irreversible shifts)
- Emphasize that players get to *experience* consequences that policymakers face.

Connections to Real World Climate

Educational Climate Connections

- Link game mechanics to real climate policy concepts:
    - Net-zero goals
    - Energy transition timelines
    - National economic constraints
    - International cooperation
    - Renewable energy standards
- Reinforce that the game is grounded in scientific and economic principles.

Endgame Mechanics

Scoring and Victory Conditions

- The game ends after a predetermined number of rounds, or when all project card slots/land plots have been exhausted

Scoring is based on the final totals of the three major tracked resources:

- **Energy** → A higher energy output reflects economic/technological development.
- **Money** → Shows how efficiently players managed financial constraints over time and with extenuating circumstances
- **Carbon Emissions** → The most important metric in game - lower emissions lead to better final scores. (subtracted from total)
- No perfect solution - only better or worse strategies, reflecting real world complexity.

Players also gain or lose points in the three categories depending on:

- The types of projects they built (renewables vs fossil fuels vs carbon sinks).
- How efficiently they used land plots (large fossil projects vs compact renewables).
- The long term effects of their project choices based on resource generation each turn.

No single “correct” winning strategy or win condition — a balanced approach typically outperforms extremes

Educational Outcomes & Real-World Lessons

The cost of delaying climate actions:

- Fossil fuel projects are cheap early but create heavy long term carbon penalties.
- Renewable investments pay off over multiple turns, echoing real energy transition timelines.

The importance of spatial limitations:

- Limited land plots reflect real geographical, political, and infrastructural constraints.

Tradeoffs between energy supply, money, and emissions:

- Every project card has a cost and a consequence; increasing one resource usually stresses another.

The unpredictability of global systems:

- Event cards (disasters, technological breakthroughs, market swings) force players to adapt — just like policymakers must in reality.

Systems thinking:

- Players experience how decisions accumulate and interact across turns, teaching the core logic of global climate systems.

Broader Implications for Players & Climate Understanding

- Shows the real tradeoffs nations face between land, money, energy, and carbon emissions
- Demonstrates how early decisions create long-term sustainability or long-term problems.
- Highlights how unpredictable events can disrupt climate strategies and require adaptation.
- Encourages systems thinking by showing how resources interact and influence each other.

Final Message: The game makes complex climate decisions understandable and engaging, helping players grasp why achieving sustainability requires planning, cooperation, and long-term vision, and ultimately, there is no “correct” solution, same as reality.