

Below is the email file EN-ROADS sent back to me for my assumptions. Modeling errors and deficiencies I am seeing is discussed at the end of this page and on the next page.

Advanced nuclear scenario.

Here is a link to a custom-built global climate scenario created with the En-ROADS simulator:

<https://en-roads.climateinteractive.org/scenario.html?v=23.2.1&p1=110&p7=100&p198=22&p204=2040&p10=5&p200=24&p16=0.02&p18=2030&p20=2023&p21=52&p22=2025&p23=30&p30=-0.07&p33=50&p34=2025&p39=250&q0=2&q1=62>

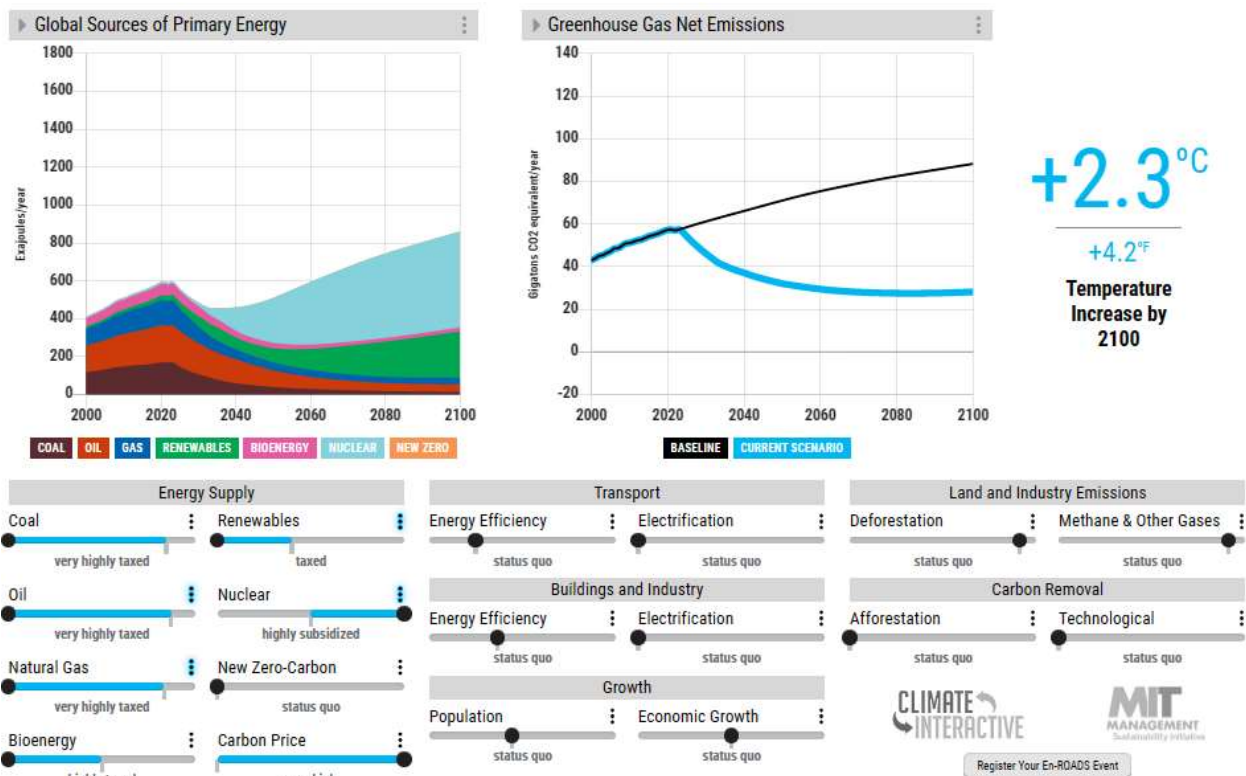


En-ROADS was developed by *Climate Interactive* and the *MIT Sloan Sustainability Initiative*. For more information visit en-roads.org.

The EN-ROADS model lacks transmission which is detrimental to the development of distant wind power sources. Even 30 miles off shore wind is very distant for both ERCOT and Maryland off shore wind. The Great Plains wind is very distant from the eastern US load centers and very distant from ERCOT and distant from the Western System WECC and very distant from the California CAISO. This is absent in the model.

Solar in Texas is probably better than in other states because the desert areas west of load centers peaks later in the afternoon. Just the opposite is true for desert solar in California which is east of the load centers. The distant wind and solar sources require so much new transmission the cost and operation and acceptance by the public is not a realistic pathway into the year 2100 future. Customer end use solar is more realistic.

ERCOT is entering a period where the rapid expansion of wind and solar coupled with problems building new fossil plants is resulting in a form of grid planning lockup in which there is not sufficient generation nor transmission to keep up with the growing load. My PUC testimony gives more information on this looming problem [PUC 54335](#) (in color).



Model Shortcomings:

1) The model shows a large dip in the energy right after 2023 due to the need for a massively large price on CO2 to get nuclear to even be used to its potential. This is a programmed bias against nuclear power. I don't think there every will be a carbon tax at all because of its unfair burden it places. However I had to do this in the model.

- 2) The model is overly dependent on taxes, tax breaks, and innovation to get nuclear power back into the mix. What nuclear needs is cooperation instead of confrontation.
- 3) The cost to customers of the different options is not visible if it is being calculated.
- 4) The model has no hourly modeling where many dispatch details are observed such as peaking gas generation needed and a reliable source of no CO2 base load power.
- 5) The model has no transmission modeling. Transmission constraints greatly limit the development of remote resources of all power sources, not just wind. This flaw in the model makes renewables more achievable than is possible. Nuclear can be placed much more closely to load centers eliminating the need for long transmission lines to bring in power from remote wind and solar.
- 6) The inner workings are not transparent. Transparent models such as mine on my web page <https://egpreston.com> in excel are posted for everyone to see the workings clearly.
- 7) The temperature rise by 2100 is a failure. Better plans are needed to limit the temperature rise. Building more renewables does not help. Since nuclear is limited to 50% of the total energy we never know what it would have been capable of later in the century if more than 50% were allowed. So in this sense the model is a failure to show us what is needed to have an even lower CO2 level for 2100 and beyond.

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<https://egpreston.com>