

# Scenario Explorer

Temperature Explorer Documentation

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Welcome to the Scenario Explorer. This document will introduce you to the “Temperature Explorer” mode, which can be used to explore any number of scenarios simultaneously.

The URL for the Scenario Explorer is [www.scenesp.org](http://www.scenesp.org). The Scenario Explorer Website will initially display the “Home” page.

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## Home

We have almost certainly passed the point where greenhouse gas emission reductions alone can prevent very serious consequences from a changing climate (see Figure 1 below and the “About Scenarios” menu option), as the temperature increase will likely be over 2.0°C in 2050 for any realistic emissions pathway. The only way to avoid the very serious consequences appears to be by proactively reducing the amount of sunlight reaching the Earth’s surface until such time as sufficient CO2 can be removed from the atmosphere to reduce the temperature increase to 1.5°C or less.

The “Scenario Explorer” has been designed to help people to understand the assumptions that underly the temperature increase projections made by climate scientists so that they can make informed decisions about the climate policies that need to be implemented in order to avoid the likely serious consequences of global warming. It focuses primarily on giving users the ability to discover the amount of sunlight that must be reflected or CO2 that must be removed from the atmosphere to reach a specific temperature goal: the “Temperature Explorer” allows a specific temperature increase goal (initially set to 1.5°C) and calculates the amount of both solar radiation management and carbon dioxide removals to meet that goal, while the “Scenario Explorer” allows for the changing of many of the assumptions that are used to calculate the corresponding temperature increase.

This Website makes extensive use of “tooltips”, which are available whenever there is a “dotted underline” under the text.

There are nine menu options:

|                      |   |
|----------------------|---|
| Home                 | This page   |
| About Scenarios      | Define a climate scenario, discuss the data item from a scenario which the model uses, shows several of the data items for 18 scenarios, and has graphs showing the temperature increase projections for 51 scenarios that had 2025 data relatively close to expected 2025 values for CO2 emissions, CO2 PPM, and temperature increase. <a href="#">Please review the charts and graphs in this section as they demonstrate why a temperature increase of over 2.0°C is expected in a “mitigation only” scenario.</a> |
| Consequences         | This page will discuss the consequences of exceeding the 1.5°C temperature increase target for significant period of time   |
| Background           | Discusses some of the rationale for the Scenario Explorer   |
| Instructions         | Instructions on using this Web site   |
| Temperature Explorer | Allows a specific temperature increase goal (initially set to 1.5°C) and calculates the amount of both solar radiation management and carbon dioxide removals to meet that goal   |

To get to the “Temperature Explorer”, click the “Temperature Explorer” menu option.

## Temperature Explorer

### Select One or More Scenarios To Explore

When the "Scenario Explorer" tab is first selected, data for a "Moderate" CO2 emissions pathway is shown in the accompanying graphs. The emissions for this pathway are roughly in line with the CO2 emissions projected by major organizations (e.g., IEA, MIT, etc.) based on historical emissions and likely policies that the World's nations will implement in the coming years (where CO2 emissions are not expected drop much in the next decade or so). Note that the linear decline to emissions 5 GTCO2 is likely optimistic. This tab also assumes that the user is interested in the efforts that would be required to reach a specific temperature increase target in 2100. The default value for this is 1.5°C, and can be changed by checking the "Temp" checkbox to the right. Based on the selected temperature increase target the program calculates the amount of either solar radiation management (SRM) or carbon dioxide removal (CDR) that would be required meet the target temperature increase. (Note that for CDR the starting year defaults to 2045 and can be adjusted by checking the "CDR" checkbox to the right. There are over 30 graphs for displaying the data associated with the emissions pathway and these can be viewed by checking the various checkboxes under the "Select the Graphs to Show" text to the right.

To compare the data for this "Moderate" CO2 emissions pathway to other projections and scenarios, click the "Down Arrow" to the above left to display the available scenarios. Most of the scenario data was obtained from either the [IPCC AR6 Report](#) or from the [En-ROADS global climate simulator](#). For the former, data was based on model runs from over five years ago so their 2025 values may be off significantly. (Total CO2 emissions were about 41.6 GTCO2 in 2024 were about and are not expected to change much in 2025. In 2025 the atmospheric concentration of CO2 is expected to hit about 427 PPM and the average global temperature increase will likely be at least 1.5°C. Keep this in mind when reviewing any of these scenarios.)

Select

Costs & Temp

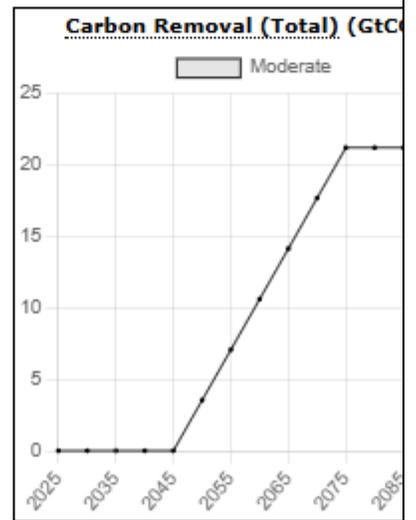
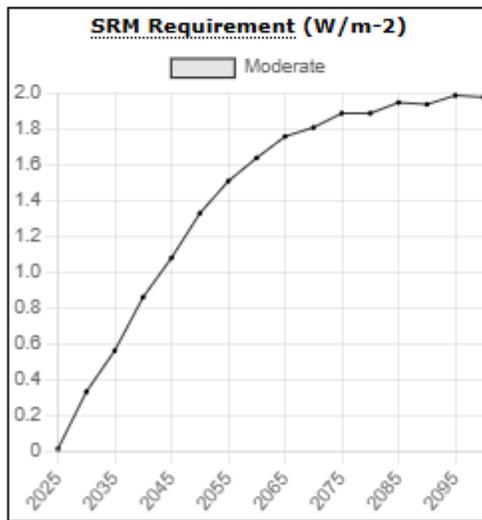
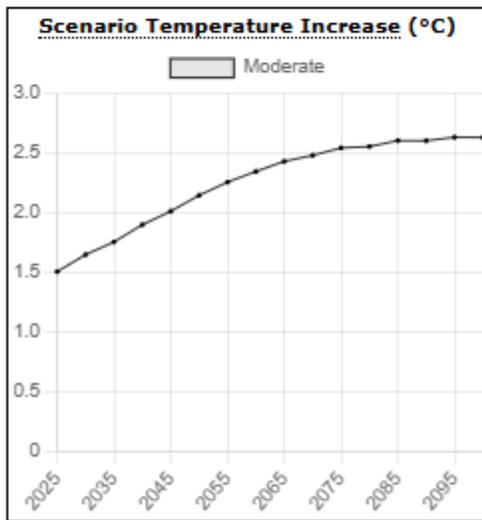
CO2e GHG

Other RFs

Options:  Temp

Most of the text on the page is hidden with it. For example, "Select the Graphs to Show" is not displayed. In some instances, graphs can be displayed by clicking on the "Show" indicated in the popup menu and additional information.

Click [here](#) to view a full "Scenario Explorer" mode.



The Web page initially provides some instructions on using the "Temperature Explorer". Click the "Down Arrow" (on the upper left of the page) to hide the instructions.

# Temperature Explorer

^ Select One or More Scenarios To Explore

**Shared Socioeconomic Pathways (SSPs)**

SSP1-19  
  SSP1-26  
  SSP2-45  
  SSP3-Baseline  
 SSP4-34  
  SSP4-60  
  SSP5-34  
  SSP5-Baseline

**Other Scenarios**

1.5° C (En-ROADS)  
  AR6 1.5°C  
  AR6 2.0°C  
 AR6 2.5°C  
  AR6 3.0°C  
  AR6 3.5°C  
 AR6 4.0°C  
  AR6 4.5°C  
  AR6 5.0°C  
 BAU (En-ROADS)  
  Mod CDR 1.5  
  Mod SRM 1.5  
 Mod Tmp Acc 1.5  
  Moderate

**Simplified Net-Zero Emission Scenarios**

| # Years | Peak Year of CO2 Emissions |                          |                          |                          |                          |                          |
|---------|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|         | 2025                       | 2030                     | 2035                     | 2040                     | 2045                     | 2050                     |
| 25      | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30      | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35      | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40      | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

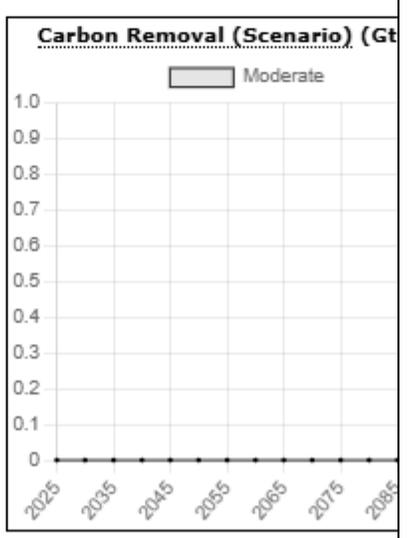
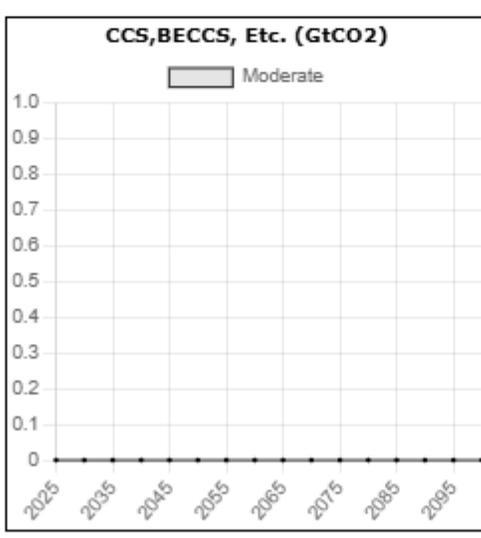
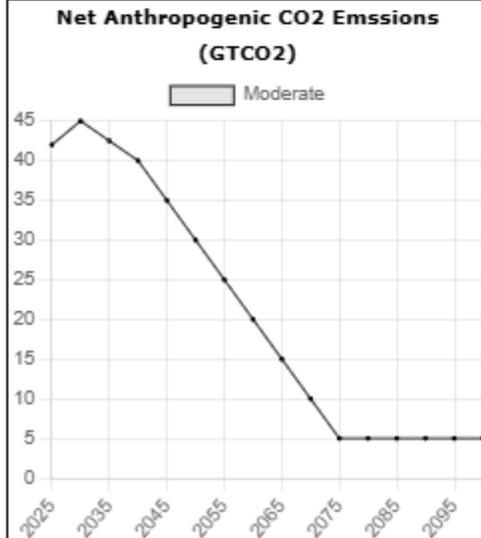
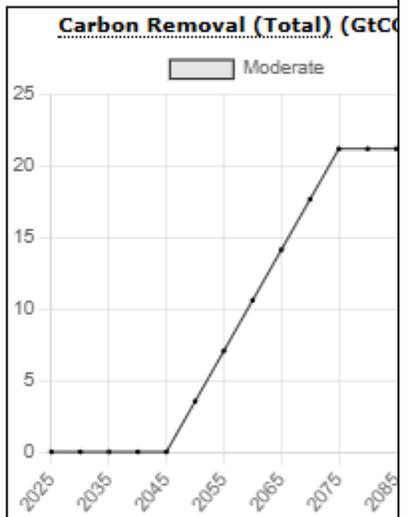
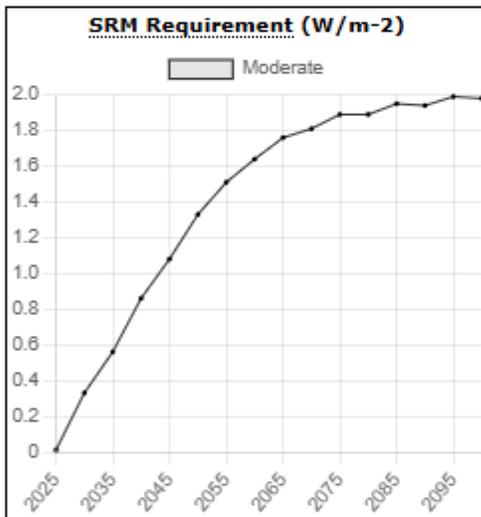
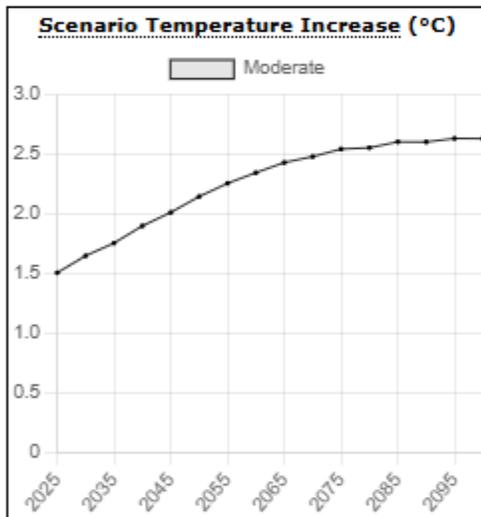
Select

Costs & Temp

CO2e GHG

Other RFs

Options:  Temp



The upper left part of the webpage displays the scenarios that can be explored. Note that in future versions there will be more scenarios to explore.

Most of the text on the Web page has popup text associated with it. For example, if you hover your mouse over the text “Shared Socioeconomic Pathways (SSPs)”, a popup window will be displayed.

| Select One or More Scenarios To Explore                        |   |  |
|--|---|--|
| <a href="#">Shared Socioeconomic Pathways (SSPs)</a>           | <b>Simplified Net-Zero Emission Scenarios</b>   | <input checked="" type="checkbox"/> <b>Costs &amp; T</b> |
| <input type="checkbox"/> SSP1-19 <input type="checkbox"/> SSP  | <i>Click 'Shared Socioeconomic Pathways for additional information</i><br>Shared Socioeconomic Pathways (SSPs) are climate change scenarios that project how global society, economics, and demographics could change by 2100. They are used to analyze how these changes could affect climate change and greenhouse gas emissions. The scenarios shown below were selected from the various SSP scenarios - they are generally the average of two scenarios developed for the IPCC's AR6 report . <i>Note that SSP1-19 and SSP1-26 are not included as their CO2 emissions in 2025 were less than 33 GTCO2 in 2025. Likewise SSP3-Baseline and SSP5-Baseline are not included as th CO2 emissions in 2025 were more than 48 GTCO2 in 2025.</i> |  |
| <input type="checkbox"/> SSP4-34 <input type="checkbox"/> SSP  |   |  |
| <input type="checkbox"/> 1.5° C (AR6) <input type="checkbox"/> |   |  |
| <input type="checkbox"/> 2.5° C (AR6) <input type="checkbox"/> |   |  |
| <input type="checkbox"/> 4.0° C (AR6) <input type="checkbox"/> |   |  |
| <input type="checkbox"/> Mod CDR 1.5 <input type="checkbox"/>  |   |  |
| <input checked="" type="checkbox"/> Moderate                   |   |  |
| <input type="checkbox"/> Basedon1-19B                          |   |  |

In some instances additional information can also be displayed by clicking on the text, and this will always be indicated in the popup. Note that additional popup windows and additional information will be added in future releases.



The “Simplified Net-Zero Emission Scenarios” provide an easy way to examine pathways where net CO2 emissions peak before 2050 and then decline to zero within 25-40 years

| Simplified Net-Zero Emission Scenarios |                            |                          |                          |                          |                          |                          |
|--|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|  | Peak Year of CO2 Emissions |                          |                          |                          |                          |                          |
| # Years                                | 2025                       | 2030                     | 2035                     | 2040                     | 2045                     | 2050                     |
| 25                                     | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30                                     | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35                                     | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40                                     | <input type="checkbox"/>   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

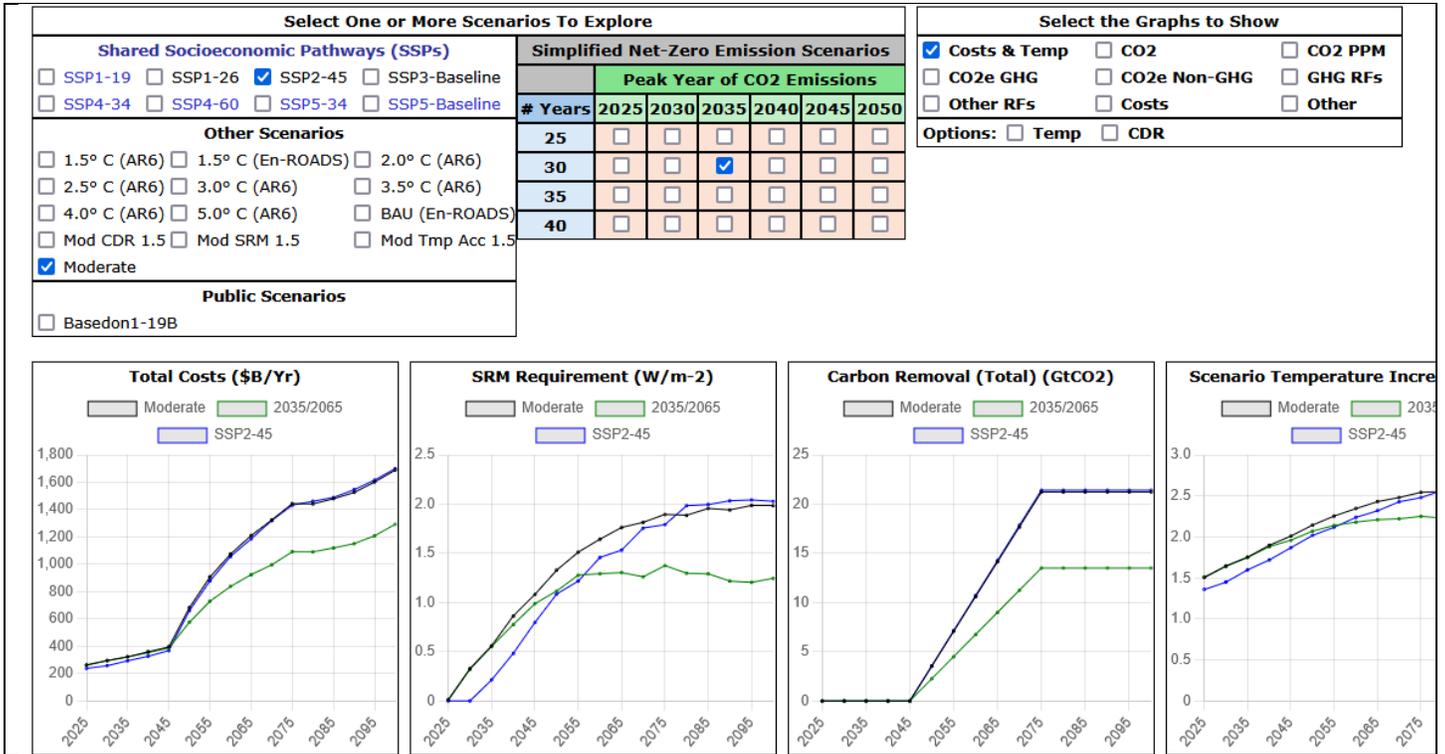
In addition to being able to visualize the scenario’s many data elements, the “Overview mode” was also designed to display the requirements for meeting a specific temperature increase for both solar radiation management and carbon dioxide removal. The initial temperature increase goal is set to 1.5°C, and this can be change by clicking the “Temp” checkbox on the upper right side of the web page.

|  |   |
|--|---|
| Options: <input checked="" type="checkbox"/> Temp <input type="checkbox"/> CDR   | As this value is changed the “Total Costs”, “SRM Requirement”, and “Carbon Removal (Total)” graphs will be updated. |
| <p><b>Desired Temperature Increase for 2100:</b></p>  |   |

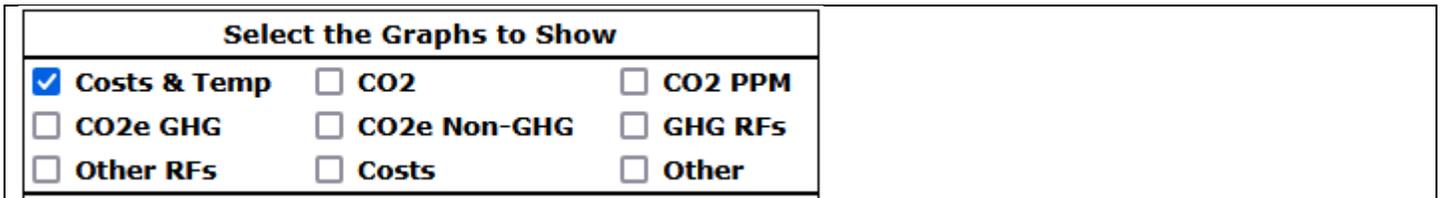
The model also defaults to having significant carbon dioxide removed from the atmosphere starting in 2045 and peaking in 2075. These values can be adjusted by clicking the “Temp” checkbox on the upper right side of the web page.

|  |  |  |
|--|--|--|
| Options: <input type="checkbox"/> Temp <input checked="" type="checkbox"/> CDR   | As these values are changed the “Total Costs” and “Carbon Removal (Total)” graphs will be updated. |  |
| <b>Carbon Dioxide Removal (CDR)</b>  |  |  |
| <p><b>Start Year</b> </p> <p><b>Peak Year</b> </p> |  |  |

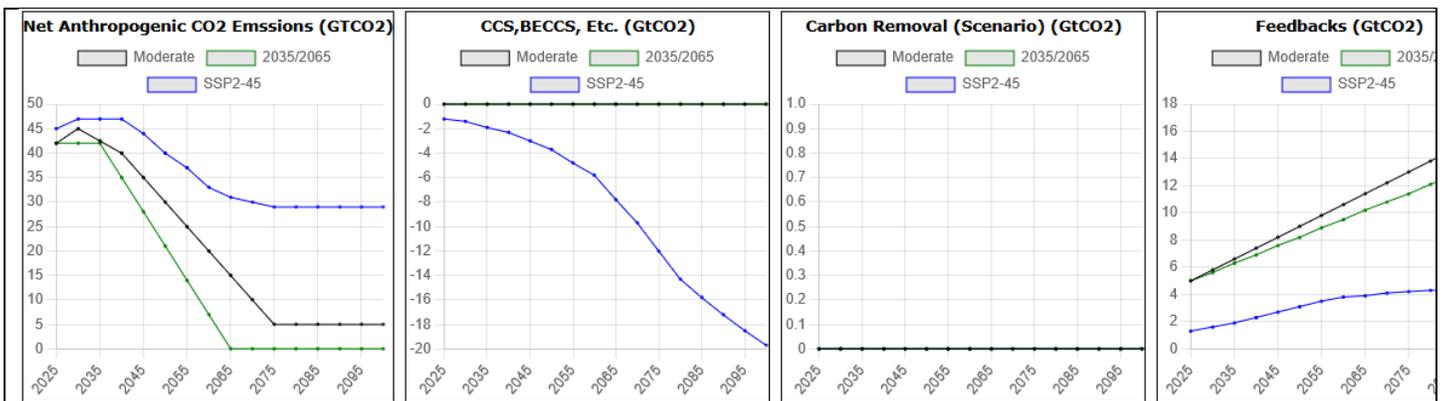
To view the data for other scenarios simply check the box to the left of the scenario name (or one of the check boxes in the “Simplified Net-Zero Emission Scenarios” table



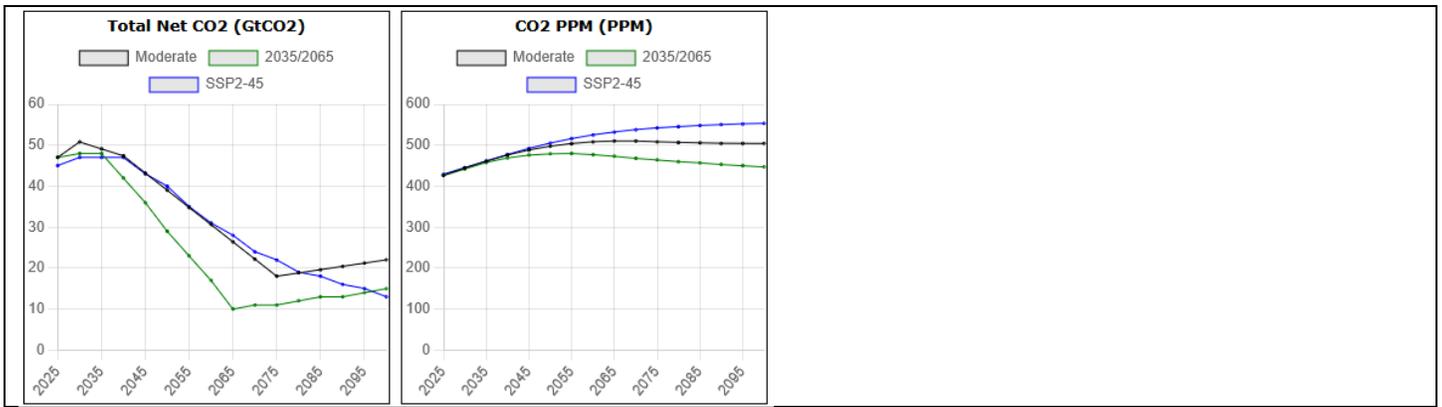
The “Overview” mode provides over 30 graphs for displaying the data for the “checked” scenarios. To display additional graphs simple check the appropriate checkbox under “Select the Graphs to Show”.



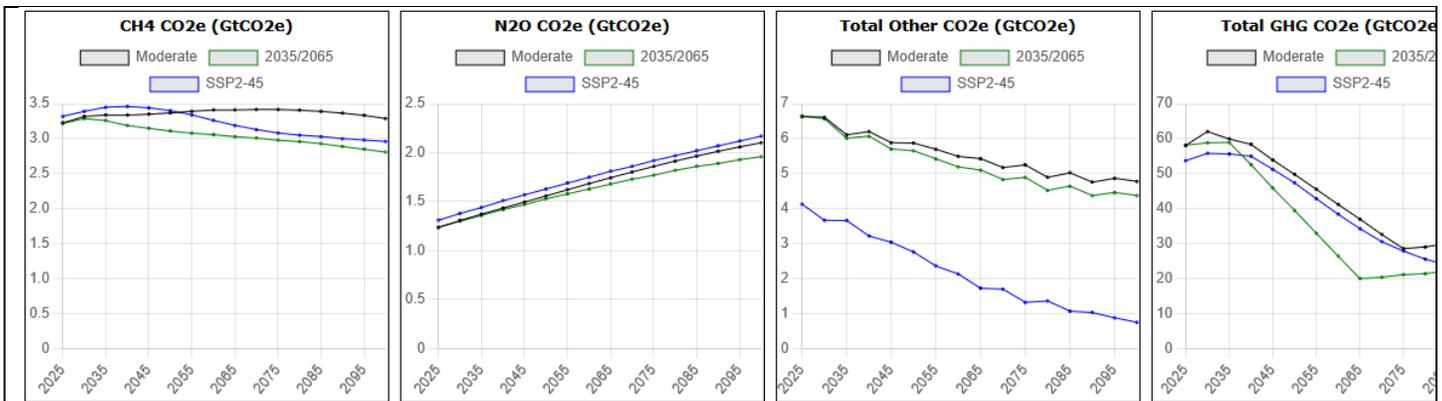
CO2



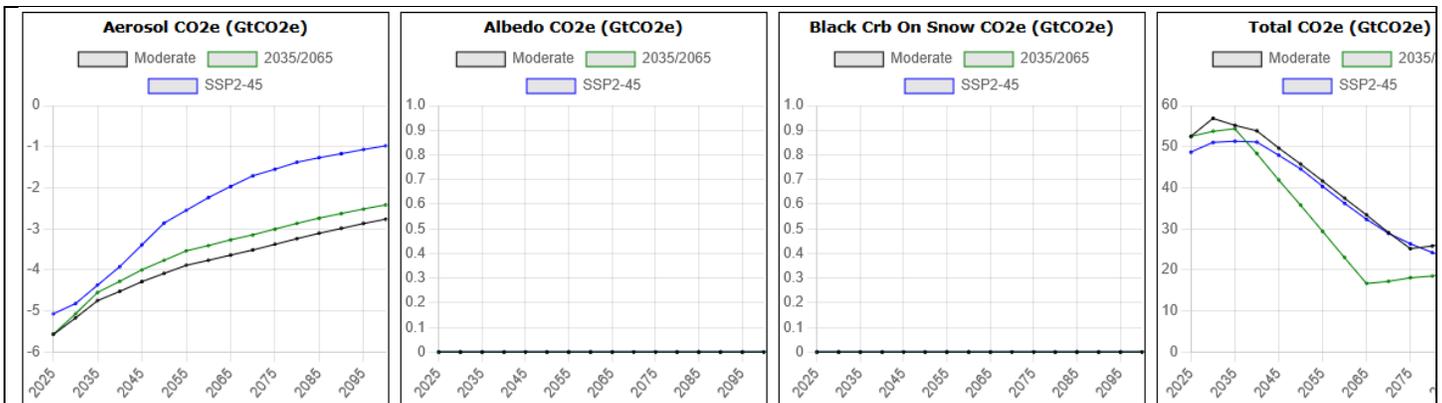
## CO2 PPM



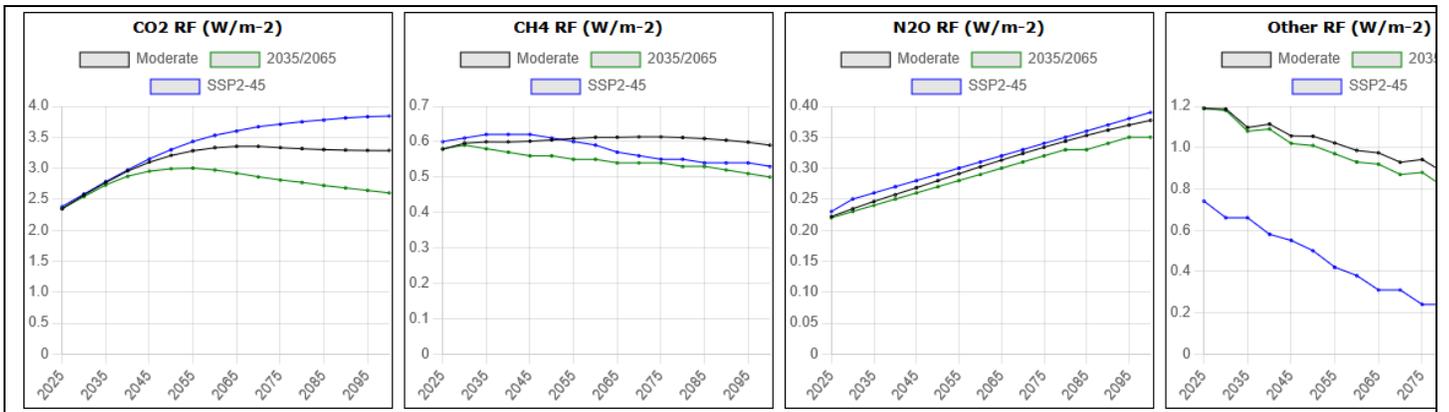
## CO2e GHG



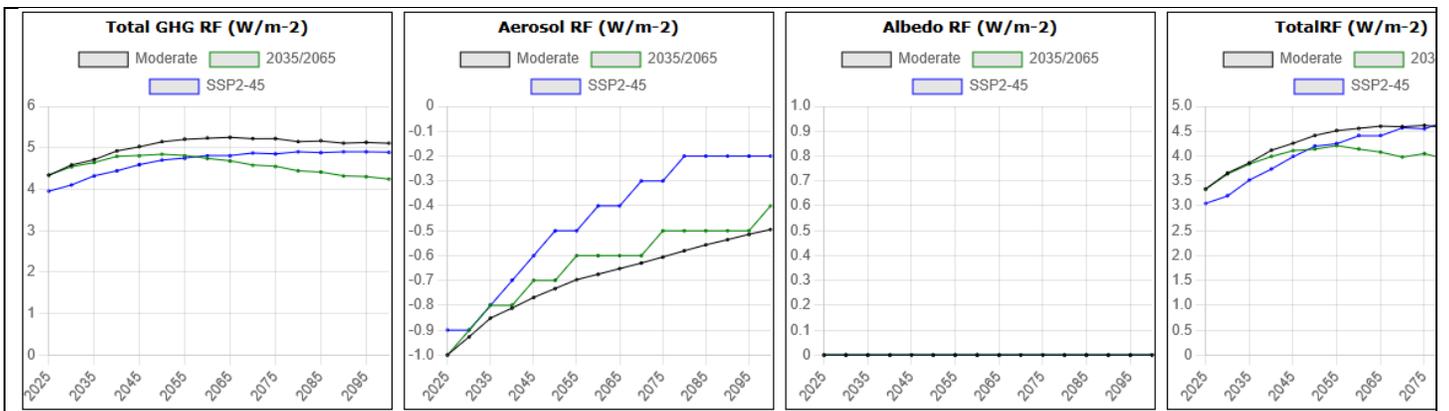
## CO2e Non-GHG



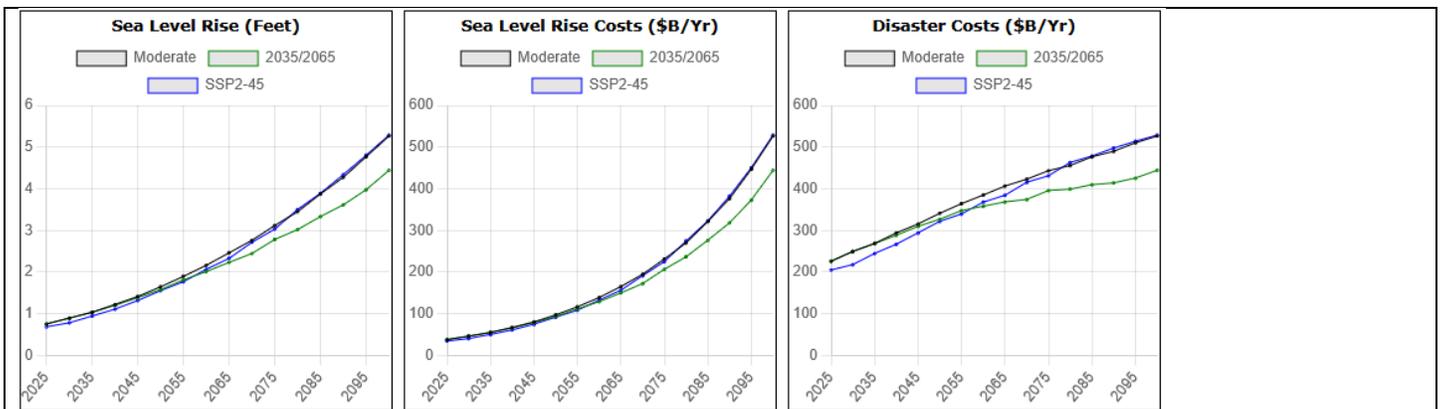
## GHG RFs



## Other RFs



## Costs



Other

