Emissions Scenario Portal

Data Upload Guide

After you've received the invitation email and created your user account, follow these steps to configure the site for your team. The site contains the following elements:

Team: entity to group users and which can be linked to one or more **models**.

Model: a model in this context is a computer program used to investigate climate change mitigation and/or adaption options as well as other potential targets, like economic targets or energy targets. It can be run using different input assumptions and the inputs and outputs of one model run are collectively referred to as a "scenario". A model's metadata information is maintained by the team that develops it.

Scenario: For each **model**, a series of scenarios can be defined. Scenarios will define specific conditions for the running of the model and can set goals/constraints for when running the model. Each scenario belongs to a single **model** and has its own set of metadata.

Indicator: An indicator is a metric that can be tracked for the various **scenarios.** Indicators can be things like CO_2 emissions, consumption of fuel, etc. Indicators are curated by ESP admins and have a standard description of what they are. Users have no ability to edit, add and/or delete the indicators. Acknowledging that there might be subtle differences between indicators of different models, there is a way to add "model specific notes" in the system. These notes can be used by modelers to make sure that users of the portal understand model-specific choices for each indicator.

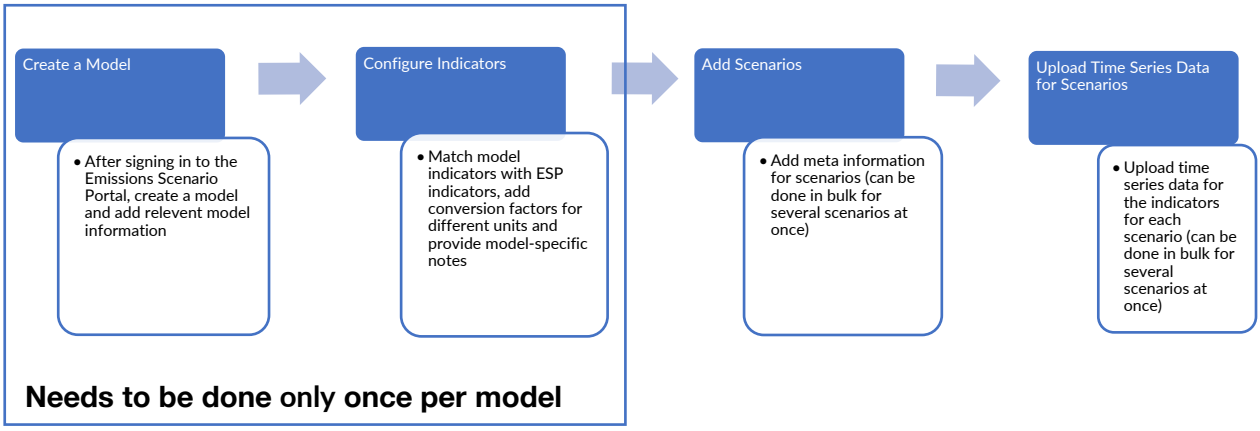
Time Series Data: This is the actual data that will end up being visualized on the front end of this tool. Each time series set will be related to one **indicator** and one **scenario**, establishing a connection between those two entities. Each set of data will have values for a varying number of years (some might have predictions for 50 years, others for 100 years). For each row of data, a unit that is valid for the selected indicator should be defined. Each set of data will also be related with a country.

Overview

As a scenario exploration tool for a wide variety of models, the ESP strives to balance two main objectives:

1. **Flexibility** to reflect each model's idiosyncratic characteristics, its specific purposes and strengths in certain areas.
2. **Comparability** to be able to look across results of different models.

To be able to achieve both purposes we settled on a data upload system that starts with a large standardized set of indicators as a basis for comparison. Modelers can add their own specific notes for these indicators. In case a model group has indicators that are not on the system indicators list, they can send the list of these indicators to the portal administrators, who can add them to the system after reviewing the system indicator list.



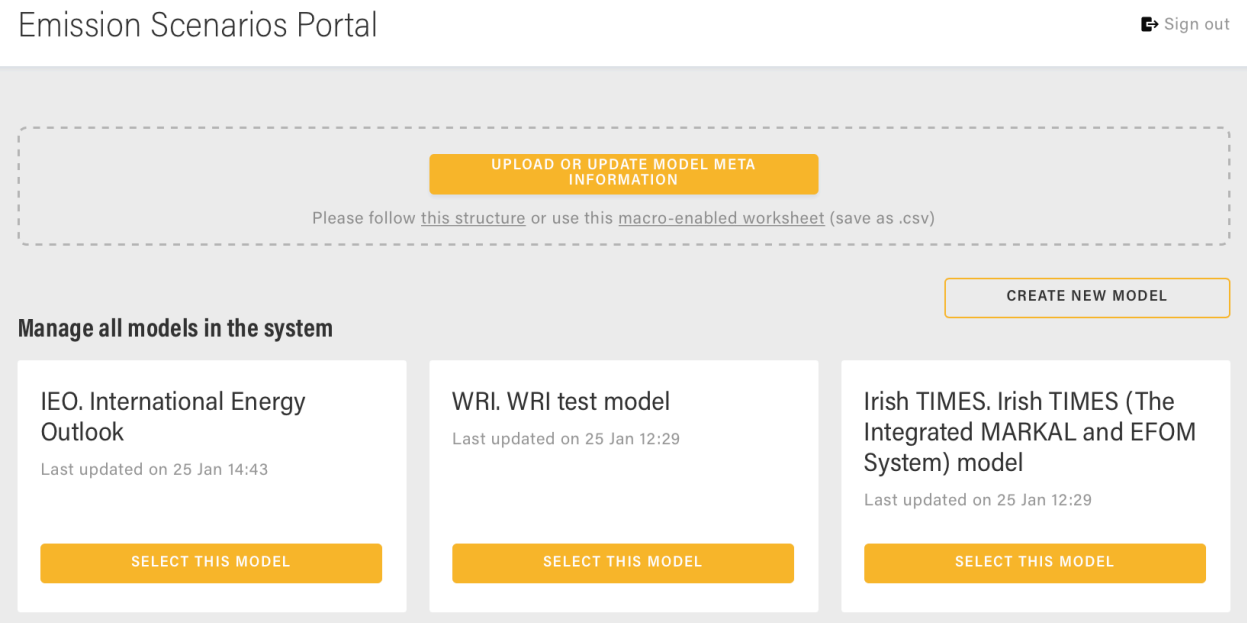
Steps

Create a model

After signing in you would want to create a new model. You can do this in the following ways:

- Through a csv upload using the template provided (recommended)
- Manually by selecting the create new model button.

If you choose to add the model manually you'll be presented with a page containing a series of fields (the same fields are found in the template). Fill out the meta information about the model that is asked and save it.



Below is a screenshot of the macro-enabled excel upload file. Column D describes the type of data that needs to be filled for each row. When the Data Type says Picklist, the cell adjacent to that in column F will have a drop-down menu from which multiple selections can be made. It is recommended to fill out as much information as possible on this sheet; it will help other users of the ESP front-end find your model.

After the information has been entered in the macro-enabled excel file save the file as a csv and upload it using the "Upload or Update Meta Information" button. This should create your model.

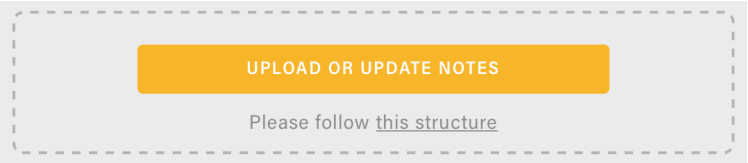
	A	B	C	D	F
1	Category	Indicator	Definition/ Input Explanation	Data Type	Model 1
2	About	Model Abbreviation	What is the model abbreviation?	Text (Alphanumeric)	
3	About	Model Full Name	What is the full model name?	Text (Alphanumeric)	
4	About	Current Version(s)	What is the most recent version of the model?	Text (Alphanumeric)	
5	About	Maintainer Name	Who is the institute or enterprise responsible for development of the model?	Text (Alphanumeric)	
6	About	Description	Provide a brief overview of the model and it's key focus areas.	Text (Alphanumeric)	
7	About	URL	Where can basic model information be accessed?	Text (Alphanumeric)	
8	About	Programming Language	What programming language is used to write and run the model code?	Text (Alphanumeric)	
9	About	Development Year	When was the model first developed?	Year	
10	About	License	What is the licensing status?	Text (Alphanumeric)	
11	About	Availability	Is the model available for direct use by others?	Picklist	
12	About	Expertise	What is the skill level required to run the model?	Picklist	
13	About	Platform Detailed	Describe the platform(s) that the model runs on.	Text (Alphanumeric)	
14	About	Publications & Notable Projects	What are some studies or notable projects that have used the model?	Text (Alphanumeric)	
15	About	Citation	Is there a preferred citation for referencing the use of this model?	Text (Alphanumeric)	
16	About	Point-of-Contact	Who is the point-of-contact for the model?	Text (Alphanumeric)	

Configure indicators

After you have successfully created your model, you can familiarize yourself with the indicators on the Emissions Pathways module. You can do so by clicking at the "Indicators" tab on the model page. Here you can find all indicators that currently exist on the site. They are ordered into overarching categories like "Emissions", which are sub-divided into more detailed sub categories. You can filter the list by categories or use the search function to look for a particular indicator.
Now you have two choices for how to proceed with uploading data. You can either:

1. Use the indicators as they appear in this list and upload data directly for them. IMPORTANT: make sure that the UNIT of your indicator exactly matches the unit given in the list. Otherwise please convert your data to this unit or use the process explained in further detail in the next section. If you decide to use the indicators without change you can skip straight to the “Add Scenarios” section below.
2. You can add your preferred unit of entry and model-specific notes for indicators if you want to. The next section explains how to do this

Add custom units for entry and model-specific notes



The “Upload or Update Notes” function allows the user to upload a csv file containing the model specific notes, units of entry and the conversion factors for indicators. Click here or on the link “this structure” located below the “Upload or Update Notes button” on the “Indicators” page to download the template (a csv file called “notes_upload_template”) in which the notes and units’ data are to be uploaded.

The fields are, “Model Name”, “ESP Indicator Name”, “Unit of Entry”, “Conversion Factor”, “Note”. The unit of entry and conversion factor need to be provided even if the unit of entry is the same as the ESP unit (with conversion factor “1”).
NOTE: the unit displayed on the front-end of the emissions pathways module will always be the standardized one. You can enter a custom unit of entry if this makes the upload process easier, but it will always have to be converted to the standardized unit, which is why you will need to supply a conversion factor if you want to do this.

- **Model Name:** In this field, enter exactly the same abbreviation of the model name which has been entered in the “**Model Abbreviation**” field while creating the model. If the Model Name does not match, the system will not accept the data and give an error message saying, “The Model Doesn’t Exist”
- **ESP Indicator Name:** In this field enter the name of the indicator for which specific notes or unit conversion factors have to be uploaded
- **Unit of Entry:** In this field, enter the unit (Model Unit) in which the original data is available. If the data is available in the same unit as the standardized unit, enter the standardized unit

- **Conversion Factor:** In this field, enter a factor of conversion which when multiplied by the model unit results in the standardized unit. If the data is available in the same unit as the standardized unit, enter the conversion factor as 1. For example, if the original unit in which energy data is available is "TWh", the standardized unit is "EJ" and the conversion factor will be 0.0036.
  For converting non-CO2 greenhouse gases to CO2e please use IPCC AR4 (2007) guidelines for the 100-yr global warming potential; CH4: 25, N2O: 298.
- **Note:** In this optional field, you can enter a note for a particular indicator to explain particular modeling choices for this indicator.

Once the upload file is ready, click on the "Upload or Update Notes" button and upload the file. You can also drag and drop the file into the field shown above. For larger files the upload can take a while. Please do not close the browser window while the upload is in process even if the site seems unresponsive for a while.

Adding new indicators

If there is an indicator that is used by a model but is not present in the system indicators list, please use the following convention and send the portal administrators an email with the csv file:

ESP Indicator naming scheme:
"<Category>|<Subcategory>|<Name>"
E.g. "Energy|Final Energy|Electricity"

Categories are fixed within the system and the available options are:

- Emissions
- Climate and Health Impacts
- Population and Economy
- Energy
- Electricity
- Industry
- Buildings
- Transportation
- Agriculture, Land Use and Forestry
- Policy
- Technology
- Financial

Before you request a new indicator, we strongly encourage you to check whether a similar indicator already exists. If you do decide to add a new indicator, please try to fit it within one of the available categories and sub-categories.

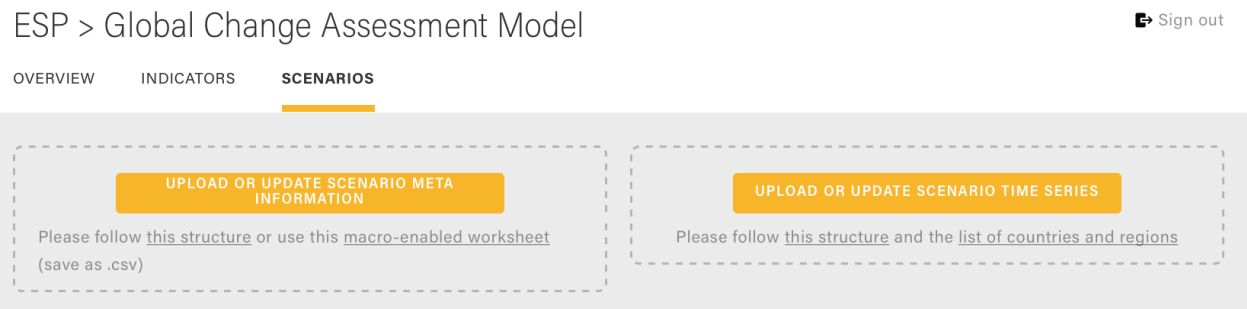
Add scenarios

Information for scenarios consists of two sets of data:

1. Meta Information: this is information about the scenario as a whole. E.g., what regions and gases are covered, what policies and technologies are included, who is the contact point for the scenario and where it is published (if available)
2. Time Series: these are the numeric outputs of the model for a set of indicators over the range of time given by the model.

Add scenario meta information

You also need to add scenarios, and meta information about those scenarios, to your model before you can upload time-series data. Again, you can complete this en masse using a csv upload (recommended), following the structure and the abbreviations used in the template that will be provided. If you want to view or edit any of the meta information data for your scenario, just click the edit button in the row for that scenario.



The scenario meta information upload is very similar to the model meta information upload, so you can copy and paste much of the information between those sheets where needed. The more information you do add the easier it will be for people to find and use your scenarios in the front-end application. As for the model meta information upload, there are a series of standard labels in Column D of the upload template that you can use to describe your scenarios (starting in Column F). When the Data Type (Column D) says Picklist, the cell adjacent to that in column E will have a drop-down menu from which multiple selections can be made. Once done, **save the excel workbook as a csv** to be able to upload it directly. Again, please make sure you delete all the empty "scenario" columns. For instance, if you have only 2 scenarios, please delete the columns "Scenario 3", "Scenario 4", and so on before uploading.

After you have prepared the file for meta-information and saved it as csv you can upload it by dragging and dropping it into the "Upload or update scenario meta information" box. When the file has been uploaded without problems you will see a message in a small green box in the bottom right corner of your browser window stating "File has been queued for processing. Please refresh." Once you refresh your browser window you should be able to see the scenario appear in the list.

	A	B	C	D	F	G	H	I
1	Category	Indicator	Definition/ Input Explanation	Data Type	Scenario 1	Scenario 2	Scenario 3	Scenario 4
2	Model and provider	Model Abbreviation	What is the model abbreviation?	Text (Alphanumeric)				
3	Scenario context	Scenario Name	What is the scenario name?	Text (Alphanumeric)				
4	Scenario context	Category	What category does this scenario fit under?	Picklist				
5	Scenario context	Purpose/Objective	What was the original purpose or objective of the scenario? Why was it created?	Text (Alphanumeric)				
6	Scenario context	Description	What is a description of the scenario?	Text (Alphanumeric)				
7	Scenario context	Key Usage	What is this scenario known for? What topical area(s) is it especially useful for?	Text (Alphanumeric)				
8	Scenario context	Project	If applicable list model comparison or individual project	Text (Alphanumeric)				
9	Scenario context	Literature Reference	Was the scenario used in a publication? provide literature reference	Text (Alphanumeric)				
10	Coverage	Geographic Coverage-Country	What countries are covered by the scenario?	Picklist				
11	Coverage	Sectoral Coverage	What economic sectors are covered by the scenario?	Text (Alphanumeric)				
12	Coverage	Gas & Pollutant Coverage	What greenhouse gases and other pollutants are covered by the scenario?	Picklist				
13	Coverage	Policy Coverage	What policies are covered by the scenario?	Picklist				
14	Coverage	Technology Coverage	What technologies are covered by the scenario?	Picklist				
15	Coverage	Energy Resource Coverage	What fuel types are covered by the scenario?	Picklist				
16	Coverage	Time Horizon	How far does the model run into the future?	Picklist				

Adding time series data

Once the scenario meta information and team indicators has been added, you can upload time series for scenarios on the scenario page. The data must be available in a certain format to be uploaded. Click here or on the link “this structure” located below the “Upload of Update Scenario Time Series” button on the “Scenarios” Page to download the template (a csv file called “time_series_values_upload_template”) in which the data should be uploaded. The template is divided into two sections which are the information section and the time series section.

The information section contains five fields namely “Model”, “Scenario”, “Region”, “ESP Indicator Name” and “Unit of Entry”.

- **Model Name:** This field must contain exactly the same abbreviation of the model name which has been entered in the “**Model Abbreviation**” field while creating the model. If the Model Name does not match, the system will not accept the data and give an error message saying, “The Model Doesn’t Exist”
- **Scenario:** This field must contain names of the scenario corresponding to the time series
- **Region:** This field must contain the region corresponding to the time series
- **ESP Indicator Name:** This field must contain the name of the indicator corresponding to the time series. The names of the indicators are curated by the system administrators and cannot be changed. A list of available indicators can be found on the “Indicators” page in the portal.
- **Unit of Entry:** This field must contain the unit (Model Unit) in which the original data is available. If the data is available in the same unit as the standardized unit, enter the standardized unit

The time series section must contain the data corresponding to the indicators in the information section. The column names (years and time intervals between them) should be changed to match with the model data.

You can upload multiple scenarios in a single file. Please follow the structure provided and remember to be consistent with the scenario name used in the meta information and the time series csv data. Please keep in mind to not have any commas (thousand separators) in the time series data as it will throw a format error. Decimal points are accepted (but not as a thousand separator). Please see screenshot for further clarification.

Where the upload file allows to specify a country/region, please make sure to use names of regions and countries exactly as presented in the reference list. The link is provided next to the structure link. New

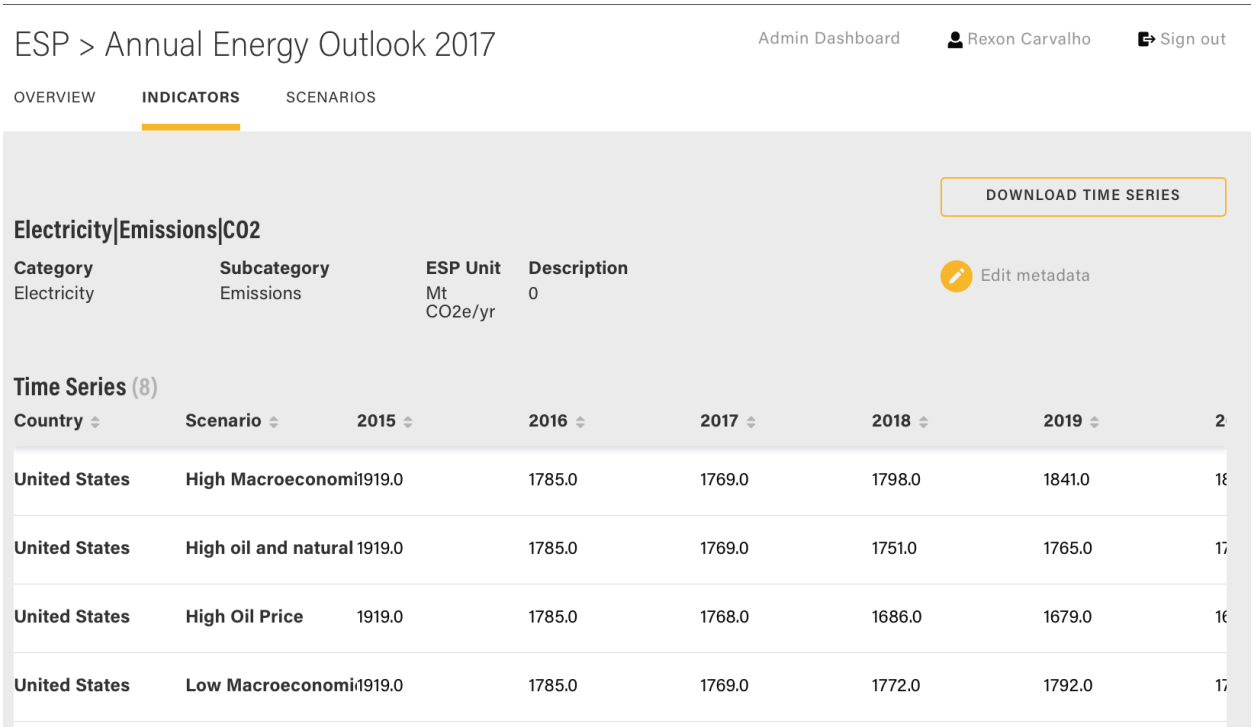
geographical entities may only be added by system administrators, which is why the system will fail with “Location does not exist” if the name you specified does not match.

Make sure that there aren’t any blank rows (blank cells are acceptable) in the time series section because having blank rows will not be accepted by the system and an error message will be displayed.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Model	Scenario	Region	ESP Indicator Name	Unit of entry	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
2	AEO	Reference	United States	Emissions|GHG Emissions by Sector|Industry	Mmt CO2	1438	1436	1446	1485	1522	1541	1549	1554	1566	1572	1570	1565	
3	AEO	Reference	United States	Emissions|GHG Emissions by Sector|Transportation	Mmt CO2	1864	1866	1865	1877	1879	1872	1866	1854	1838	1818	1794	1771	
4	AEO	Reference	United States	Emissions|GHG Emissions by Sector|Electricity	Mmt CO2	1919	1785	1787	1785	1820	1820	1776	1715	1692	1677	1659	1633	
5	AEO	Reference	United States	Buildings|Emissions By Sub-Sector|Residential	Mmt CO2	1041	977	993	990	995	986	961	932	918	909	901	890	
6	AEO	Reference	United States	Buildings|Emissions By Sub-Sector|Commercial	Mmt CO2	917	878	879	870	876	873	854	829	818	811	804	795	
7	AEO	Reference	United States	Population and Economy|Population by age|Aged 16 a	Millions	256.7	259.3	261.9	264.3	266.8	269.3	271.7	274.1	276.6	279	281.2	283.5	2
8	AEO	Reference	United States	Population and Economy|Population by age|Aged 65 a	Millions	48	49.6	51.3	53	54.8	56.7	58.5	60.5	62.4	64.2	66.2	68	
9	AEO	Reference	United States	Population and Economy|Economy|GDP PPP	Billion US 2009$	16397	16652	17114	17499	17817	18236	18734	19221	19650	20127	20558	20906	2
10	AEO	Reference	United States	Energy|Final Energy Use by Sector|Industry	quadrillion Btu	31.01	30.85	31.37	32.36	33.21	33.64	34.18	34.77	35.33	35.64	35.74	35.79	3
11	AEO	Reference	United States	Energy|Final Energy Use by Sector|Transportation	quadrillion Btu	27.95	28.27	28.48	28.64	28.63	28.53	28.42	28.27	28.04	27.76	27.43	27.1	2
12	AEO	Reference	United States	Energy|Final Energy Use by Sector|Electricity	quadrillion Btu	38.19	37.53	37.57	37.87	38.26	38.41	38.55	38.67	38.86	38.95	38.89	38.71	3
13	AEO	Reference	United States	Buildings|Energy Use By Sub-Sector|Residential	quadrillion Btu	20.54	20.01	20.27	20.38	20.37	20.24	20.12	20.02	19.96	19.91	19.85	19.76	
14	AEO	Reference	United States	Buildings|Energy Use By Sub-Sector|Commercial	quadrillion Btu	17.96	17.82	17.83	17.78	17.78	17.77	17.75	17.71	17.71	17.7	17.67	17.6	1
15	AEO	Reference	United States	Energy|Primary Energy Use|Coal	quadrillion Btu	15.47	13.93	14.12	14.13	14.82	15.24	14.94	14.45	14.22	13.88	13.47	13.01	1
16	AEO	Reference	United States	Energy|Primary Energy Use|Gas	quadrillion Btu	28.19	28.59	28.77	29.02	28.76	28.22	28.09	28.07	28.23	28.67	29.14	29.57	2
17	AEO	Reference	United States	Energy|Primary Energy Use|Oil	quadrillion Btu	36.57	36.89	37.21	37.8	37.98	37.85	37.81	37.76	37.62	37.38	37.03	36.7	
18	AEO	Reference	United States	Energy|Primary Energy Use|Other Renewables	quadrillion Btu	2.64	3.04	3.34	3.58	3.72	4.2	4.83	5.64	6.07	6.17	6.2	6.24	
19	AEO	Reference	United States	Energy|Primary Energy Use|Biomass	quadrillion Btu	2.92	2.76	2.74	2.77	2.81	2.82	2.84	2.86	2.89	2.91	2.91	2.9	
20	AEO	Reference	United States	Energy|Primary Energy Use|Nuclear	quadrillion Btu	8.34	8.34	8.28	8.15	8.05	7.97	8.08	8.11	8.14	8.15	8.09	8	

Note: The data upload is not completed until a green box saying, “x records saved” (x is the number of records in the data file) appears in the bottom right corner of your screen. Depending on the size of the file, the might need to be refreshed a until before it appears.

Once the data has been uploaded you can preview the data by clicking the scenario and then clicking on the available indicators there. You can also download the time series for the whole scenario by clicking the “Download Time Series” button in the top right of the page. Once you are done uploading your data it will be reviewed by admins to make sure it has uploaded correctly and then will be published on the front-end of the site.



Error messages during upload

If you experience errors during csv upload, you will see error messages on your screen explaining which rows have errors and what kind of error occurred. There will also be some instructions to help you resolve the error as necessary.

Managing your team

You can invite new members to your team by email. Once they leave the team, simply use the trash can icon to remove them. Note, this removes them from your team; it does not remove the user account altogether.

Feedback

Please let us know if you have any feedback on the Emissions Scenario Portal backend. You can get in touch with Roman Hennig (roman.hennig@wri.org). We look forward to hearing your thoughts.