

Introduction to AR6 Scenario Explorer & Database: IPCC TG-DATA Workshops

Regional workshops by TG-Data aim to demonstrate to regional stakeholders the use of the scenario explorer and the scenarios database in the IPCC WGIII report. The demonstration uses predefined “workspaces” which are customizable pages of data panels on Scenario Explorer.

Main learning outcomes

1. Opening and exploring pre-defined Workspaces
2. Adjusting panels for analysis of interest
3. Other different ways of exploring the data

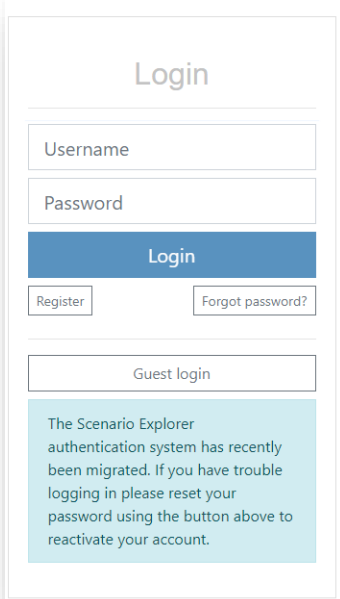
Instructions for participants

<https://data.ece.iiasa.ac.at/ar6>

Registration page

Scenario Explorer can be accessed as a guest, but there are various benefits of creating an account:

- Access to multiple scenario explorers through one account, e.g. SR15, NGFS, AR6, etc
- Saving workspaces that are available for use later, and sharing them with other users
- Access to downloads (not always available for guest users)



Workspaces

- A workspace is like a customizable dashboard developed by a user, comprising different panels. Each panel shows a chart of data. Users can develop multiple workspaces, saving the configuration, exporting the data and sharing the workspace with other users.
- We can see here, four workspaces that were made to show key characteristics of the Illustrative Mitigation Pathways – The IMPs were a selection of 9 scenarios chosen in the WG3 report, and are

highlighted due to their interesting, common and differing characteristics. These are introduced in the SPM Box on Scenarios, and also Chapter 3 in more detail.

- IMPs are high quality scenarios that show, for example, one scenario with low demands and high efficiency, one with very high renewables, or negative emissions
- These IMPs are shown at the Global level, but there is also data at the regional level
- We can also see two workspaces created specifically for this session, based on European data. Let's open the first one, on Europe C1 Pathways

Europe C1 Pathways

About this workspace

- This example compares key variables from C1 (1.5C) pathways for the Europe region.
 - E.g. what are the CCS or Final energy characteristics of scenarios in the C1 category
- The scenarios come from Global IAMs
 - Benefits – they are globally consistent, cost optimal, and cover energy & land system emissions
 - Limitations – lack detail compared to specifically national and regional models
- This is a multi-model/scenario comparison. This is useful for understanding the range of possible outcomes for scenarios that consistently limit warming to 1.5C
- The models don't always agree on all aspects - This is not bad thing – a diversity of outcomes can also lead to useful insights
 - So here we see 4 graphs – they each have a title, and underneath we see 97 scenarios, 1 variable, 1 region.
 - *In Chapter3 of the report, approx. 1200 global scenarios from IAMs were classified according to their climate outcomes, by peak temperature and end of century temperature. For example, these can be seen in table SPM 2 of the report. The most ambitious set are called C1, that limit warming to below 1.5 degrees (50% change) with a no or limited overshoot.*
 - So here we have a selection of 97 scenarios that we know are consistent with 1.5
- There is differentiated reporting in data across models – why?:
 - 3000+ scenarios from range of
 - global, multi-regional or national models. This is the first time that in the scenarios assessment that we have sought to include data from models that aren't of the global "integrated assessment" type. So whilst the majority of the scenarios are from IAMs and modelling intercomparison projects, AR6 included scenario data from ~100 models that had never participated in an IPCC scenarios process before, there was a 5x increase in the # of models included in the database.
 - Many models are national, of which
 - Some models focus primarily on the energy system, so primarily report only CO2
 - Some are sectoral (building, transport, land use)


- With all these different models, many report different numbers and types of variables. So what variables and regions are available, depends on which models are selected.

Customizing panels within a workspace

Choose a panel:

- Click regions tab - Change region (from EU28 to R10 North America)
 - There are different types of regions available.
 - Some scenarios are Global
 - R5/R6/R10 – these are regional aggregations. Models that have reported data that can be aggregated to these macro regions, for better comparison.
 - Country (ISO) – these are where models have reported individual data
 - Not all models/scenarios available for each region. Region should be selected after scenario selection, to see if/what data is available..
- Change variables, can be selected
 - Text search in the box
 - Exploring the structured variable tree
 - Using the **variable filters** (Socioeconomics | Energy | Emissions etc)
 - Toggle button to **show only available variables** for a model/scenario – this shows only variables that are available for the Scenarios/Regions that have been selected

Changing the visualization and panel options

- Click on **Panel Options** button, (top right) 
 - Click Options – here on can change the name and panel description
 - Click Ranges tab – show year range (do not change and update – might takes time)




- **Other buttons**
 - Legend on/off
 - Chart style (line / bar / table)
 - Change to Table to show the data structure
 - Download button – image, xlsx and csv formats
 - This is a good way to access small snippets of the data without working through the whole dataset. Simply configure a chart with the data you want and download directly from the panel.
 - Maximise / minimize panel size
 - Remove (delete) the panel

- Add timeseries panel (e.g. add a new clean panel)
- **Clone panel** – copy this exact panel, so that it can be easily configured for a similar but different panel

Now switch to Second Workspace

Comparison of two models – JRC-EU-TIMES vs REMIND-EU

About

- These two models have detailed representation of European energy system, down to national level
 - JRC-TIMES is the model used / developed by European Commission Joint Research Centre
 - REMIND-EU, is a regional version of the PIK REMIND IAM model
- Difficult to say to what global warming levels the scenarios are consistent with, as it is uncertain what the rest of the world is doing and assumptions regarding “fair share” of emissions.
- JRC-TIMES only goes to 2050 (as with many national models)
- Bottom two stacked bar chart panels are for the two scenarios with lowest Final Energy
 - The two bottom panels, we have selected only 1 scenario of each to show a different selection, of multiple variables
 - We have selected the subset variables of Final Energy, and present them as a stacked bar chart. Solids shows two sub-components, instead of the Total.
 - Select bar chart at the top, and click the Toggle stacked button. 

- **Click the documentation button, to highlight the information that can be seen in-panel (JRC-TIMES)**



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- *Explore the model/scenario/variable descriptions.*
- More documentation Available on the Documentation page (top right menu – to be shown later)

Change scenarios (more complicated)

- *Change REMIND-EU – click Scenarios*
- There are two main options here
 - Using category / indicator information – this is useful for exploration of the models and scenarios by different characteristics

- Using specific model-scenario list – here users need to know what models/scenarios to be explored. You can use text filter to search for specific model and scenario names.
- Category/indicator selection, explained
 - Scenario data uploaded is just timeseries data. But additional information, either submitted by the teams, or collected and derived by IPCC authors – has been added. For example:
 - First filter available is the model “regional scope” – here one can filter between global sectoral and national models.
 - Using the next dropdown box, we can add additional filters from which to select data, either categorical or numerical.
 - A lot of these are based on Emissions and Climate outcomes and were calculated and used extensively in the assessment to explore the scenario space. E.g. the GHG emissions reductions 2019-2050 ... – were used directly in Table SPM2 of the report.
 - Some, but not all, global scenarios have a “Category” – this is the classification of their Climate outcome
 - Category_subset – this was also used in Table SPM2, for the extra rows like C1 with positive / negative GHGs (+ve / -ve) – so for example to filter for scenarios with Net-Zero GHGs, or the 2C scenarios with Immediate Action vs NDCs to 2030 and then reductions.
 - A small set of scenarios were identified as IMPs – and thus we have similarly added a tag into the database. Deselect non-IMP to see only the Illustrative Pathways scenarios.
 - Lastly there are some indicators, such as Scenario_family, Project_study, that might be useful for identifying scenarios with a specific scenario design.

Building a new workspace

- Click on creating a new timeseries panel. Configure a panel.
- Now we can Edit the Workspace
 - Click top right to Edit Workspace
 - Enter name, description
 - Visibility
 - Private means it will be saved to your account only
 - Unlisted is designed for sharing – click the key to generate a scrambled share code – you can then share this with anyone.
- To save, we click the cloud to save it to server. You should press this any time that you make changes to your panels or the Workspace description.

Documentation

- This accesses a database of information about models, scenarios, variables, regions and metadata categories. This has varying levels of information. We haven't unfortunately been able to collect complete information from every model and scenario.

About

- The [About](#) page contains lots of information about the scenarios process and assessment, including:
 - the database process and where it was used in the report – with many more details in Annex III of the report that has a wealth of information about scenarios and the database.
 - [Tutorial videos](#)
 - Data releases
 - About the climate assessment and illustrative mitigation pathways.