Energy System Modelling Using OSeMOSYS

Hands-on 7

Please use the following citation for:

- **This exercise**

Plazas-Niño, F., Alexander, K. (2025, February). Hands-on 7: Energy System Modelling Using OSeMOSYS (Version 1.0.). Climate Compatible Growth. DOI: 10.5281/zenodo.14871306

- **OSeMOSYS UI software**

Climate Compatible Growth. (2024). MUIO (Version v5.0.0). GitHub. https://github.com/OSeMOSYS/MUIO/releases

- **OSeMOSYS forum**

Please sign up to the help forum here. If you are stuck, please ask questions here. If you get ahead, please answer questions in the same forum. Please state that you are using the MUIO Interface.

Learning outcomes

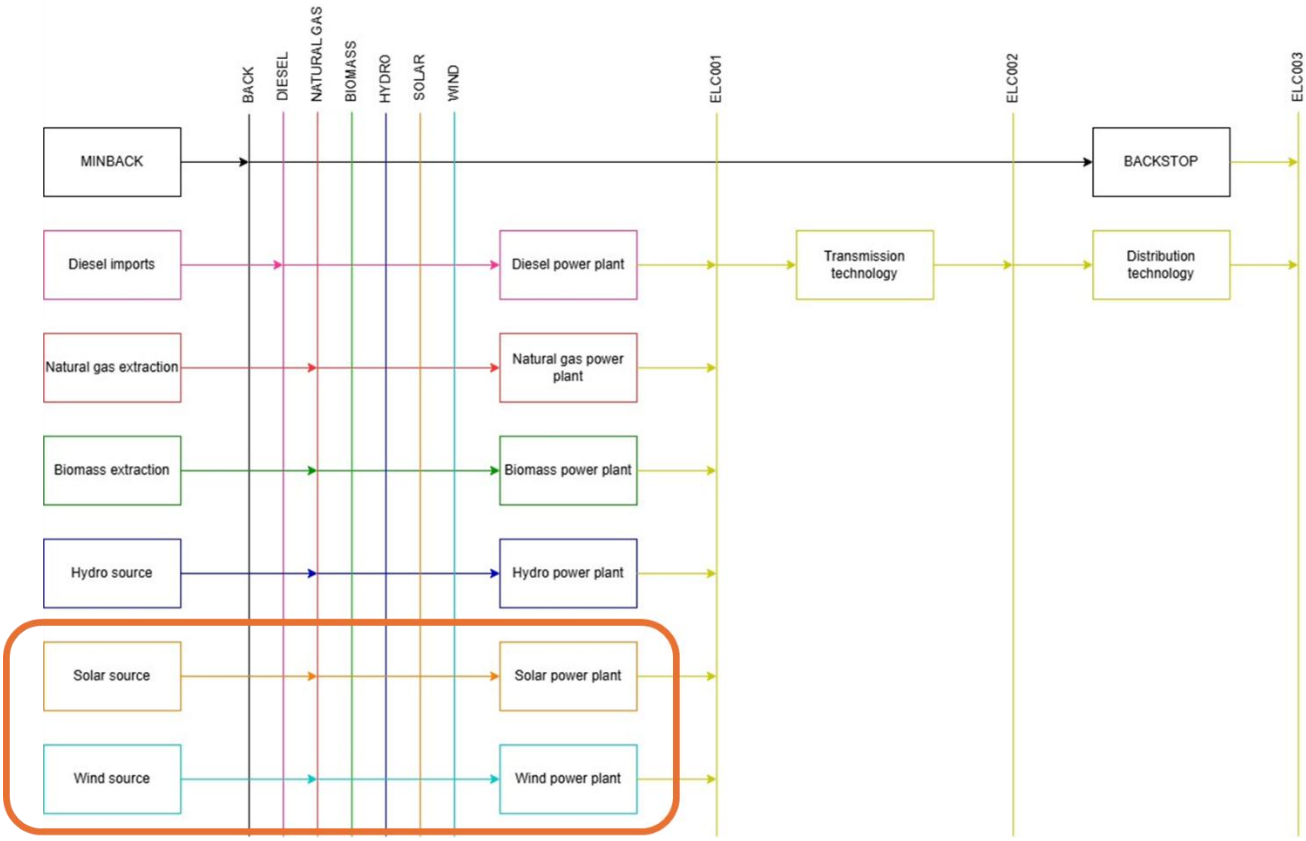
By the end of this exercise, you will be able to represent the following in OSeMOSYS:

1) Solar power plants and the solar primary supply technology

2) Wind power plants and the wind primary supply technology

Add Solar and Wind Technologies

In this Hands-on we will add **4 technologies** in total: 2 power plants (PWRSOL, PWRWND) and 2 primary supply technologies (MINSOL, MINWND). **Two** new fuels **(commodities)** will be added to the model: SOL (Solar energy) and WND (Wind energy). We will build the highlighted parts of the RES below. **Note:** Update your RES in diagrams.net.



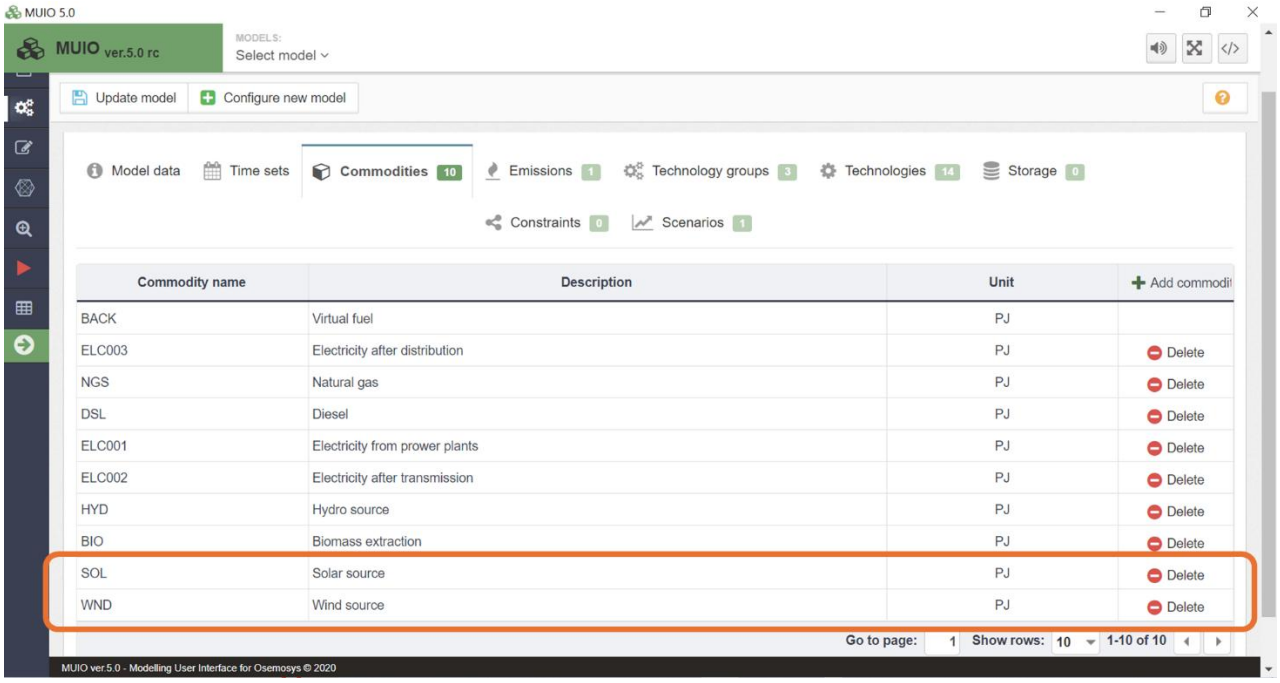
IMPORTANT: Before you can do anything else, you must copy the model and rename it in the same way you have before (OSeHO7 this time).

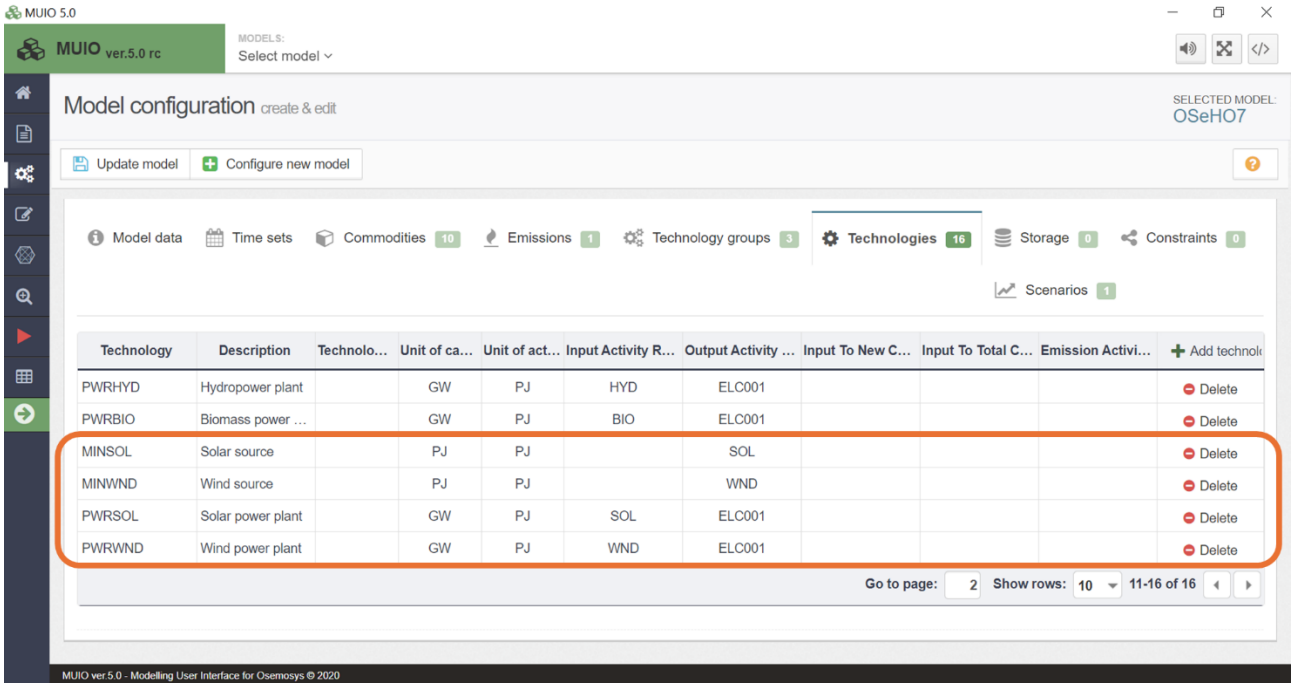
We will add the new technologies and commodities using the same steps covered in hands-on exercises 5 and 6.

Try it: Add 4 new technologies using the Data Preparation File OSeHO7.

1. **MINSOL –** Solar Source
2. **MINWND –** Wind Source
3. **PWRSOL –** Solar PV Power Plant
4. **PWRWND –** Onshore Wind Power Plant

Repeat the same steps shown for Primary Supply Technology and Power Plants in **Hands-on 6.** Don't forget to add **Capacity Factors**! And of course, two new Commodities into the model config page: **SOL** and **WND**!



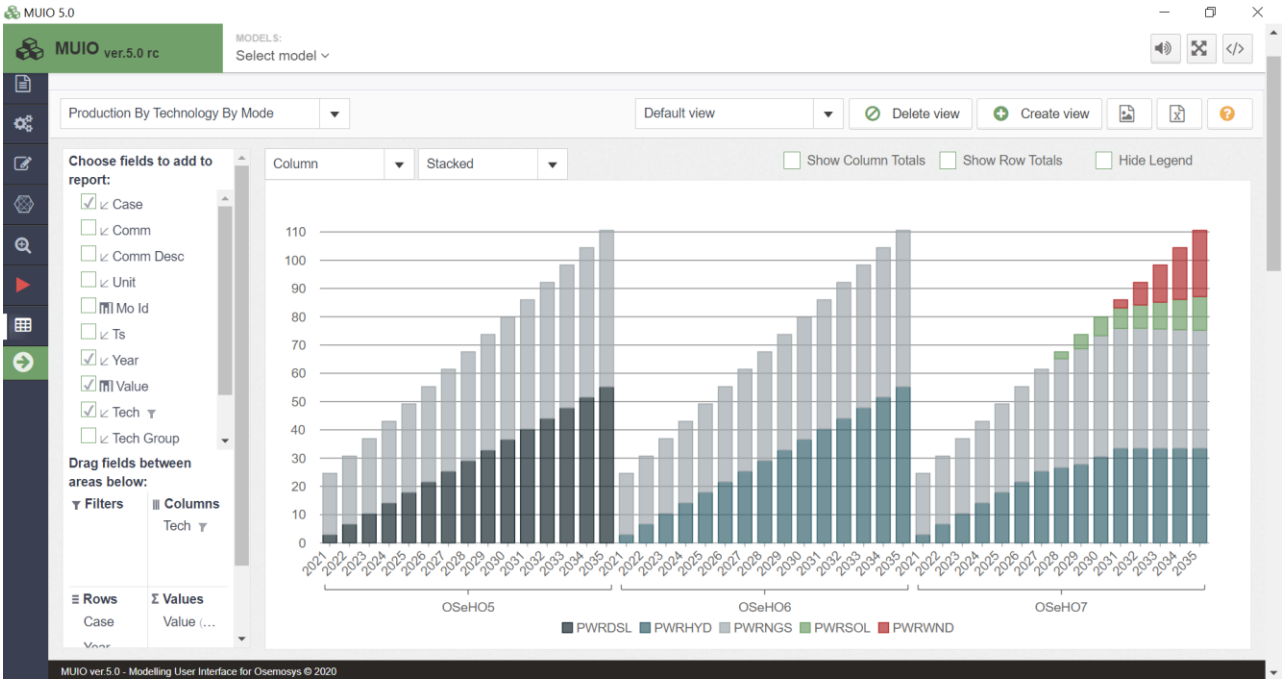


Run the model and check the results

Run the model in the user interface as demonstrated in hands-on 3 to obtain the results. The **Production by Technology by Mode** (PJ) graph you should get after running the hands-on 7 model is shown below.

In this case, wind and solar power plants are initially not competitive with hydropower. However, starting in 2028, solar power plants begin contributing to the energy mix, with wind power making significant contributions from 2031 onward. These new renewable energy sources also reduce the reliance on natural gas for electricity production.

Question to consider: If hydropower were not available, which technology do you think would become the main power supplier? How can we model this situation?


MUIO 5.0
MUIO ver.5.0 rc
MODELS:
Select model
Production By Technology By Mode
Default view
Delete view
Create view
Choose fields to add to report:
Case
Comm
Comm Desc
Unit
Mo Id
Ts
Year
Value
Tech
Tech Group
Drag fields between areas below:
Filters
Columns
Tech
Rows
Case
Values
Value (...
Column
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Show Column Totals
Show Row Totals
Hide Legend
110
100
90
80
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40
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20
10
0
OSeHO5
OSeHO6
OSeHO7
PWRDSL
PWRHYD
PWRNGS
PWRSOL
PWRWND
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