



Energy and Flexibility Modelling

Hands-on 7

Please use the following citation for:

- **This exercise**

Cannone, Carla, Allington, Lucy, & Howells, Mark. (2021, March). Hands-on 7: Energy and Flexibility Modelling (Version 2.0.). Zenodo. <https://doi.org/10.5281/zenodo.4609932>

- **clicSAND Software**

Cannone, C., Allington, L., de Wet, N., Shivakumar, A., Goynes, P., Valderamma, C., & Howells, M. (2021, March 10). ClimateCompatibleGrowth/clicSAND: v1.1 (Version v1.1). Zenodo. <http://doi.org/10.5281/zenodo.4593100>

- **OSeMOSYS Google Forum**

Please sign up to the help Google 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 'clicSAND' Interface.

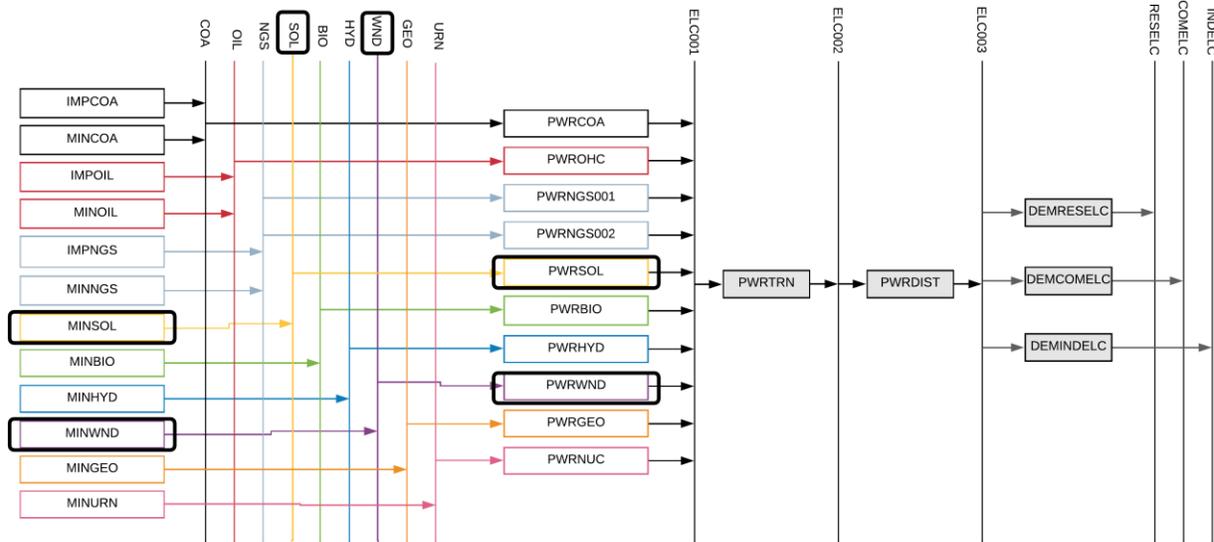
Learning outcomes

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 (PWR SOL, PWR WND) and 4 primary supply technologies (MIN SOL, MIN WND). Two new fuels will be added to the model: SOL (Solar energy) and WND (Wind energy). We will build the highlighted parts of the RES:



Try it: add 4 new technologies using the [Data prep file](#):

1. **MINSOL** – Solar Potential
2. **MINWND** – Wind Potential
3. **PWRSOL** – Solar Power Plant
4. **PWRWND** – 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 **Residual Capacity**! And of course, two new Commodities in the SETS sheet: **SOL** and **WND**!



	A	B	C	D	E	F
1		Technologies			Commodities	
2		<i>Code</i>	<i>Description</i>		<i>Code</i>	<i>Description</i>
3		BACKSTOP	Backstop technology		ELC003	Electricity after distribution
4		MINCOA	Coal domestic production		COA	Coal
5		MINOIL	Oil domestic production		OIL	Oil fuel
6		MINNGS	Natural gas domestic production		NGS	Natural Gas
7		IMPCOA	Import of coal		ELC001	Electricity from power plants
8		IMPOIL	Import of oil		ELC002	Electricity after transmission
9		IMPNGS	Import of Natural gas		BIO	Biomass
10		PWRCOA	Coal power plant		HYD	Hydro
11		PWRDHC	Light Fuel Oil Power Plant		GEO	Geothermal
12		PWRNGS001	Gas Power Plant (CCGT)		URN	Uranium
13		PWRNGS002	Gas Power Plant (SCGT)		SOL	Sun
14		PWRTRM	Electricity Transmission		WND	Wind
15		PWRDIST	Electricity Distribution		COM013	Additional Fuel
16		MINBIO	Biomass Extraction		COM014	Additional Fuel
17		PWRBIO	Biomass Power Plant		COM015	Additional Fuel
18		MINHYD	Hydro Potential		COM016	Additional Fuel
19		PRWHYD	Hydropower Plant		COM017	Additional Fuel
20		MINGEO	Geothermal Potential		COM018	Additional Fuel
21		PWRGEO	Geothermal Power Plant		COM019	Additional Fuel
22		MINURN	Uranium Potential		COM020	Additional Fuel
23		PWRNUC	Nuclear Power Plant		COM021	Additional Fuel
24		MINSOL	Solar Potential	—	COM022	Additional Fuel
25		PWRSOL	Solar Power Plant	—	COM023	Additional Fuel
26		MINWND	Wind Potential	—	COM024	Additional Fuel
27		PWRWND	Wind Power Plant	—	COM025	Additional Fuel
28		TEC025	Additional Technology		COM026	Additional Fuel
29		TEC026	Additional Technology		COM027	Additional Fuel
30		TEC027	Additional Technology		COM028	Additional Fuel
		TEC028	Additional Technology		COM029	Additional Fuel

Run the model and check the results

This is the Annual Electricity Production graph you should get after running the Hands On 7 model – we can see now that Solar and Wind have a share in the energy mix.

