Name: Surname: Year:

Modelling Renewable Energy Integration Technologies in the EnergyPLAN Tool

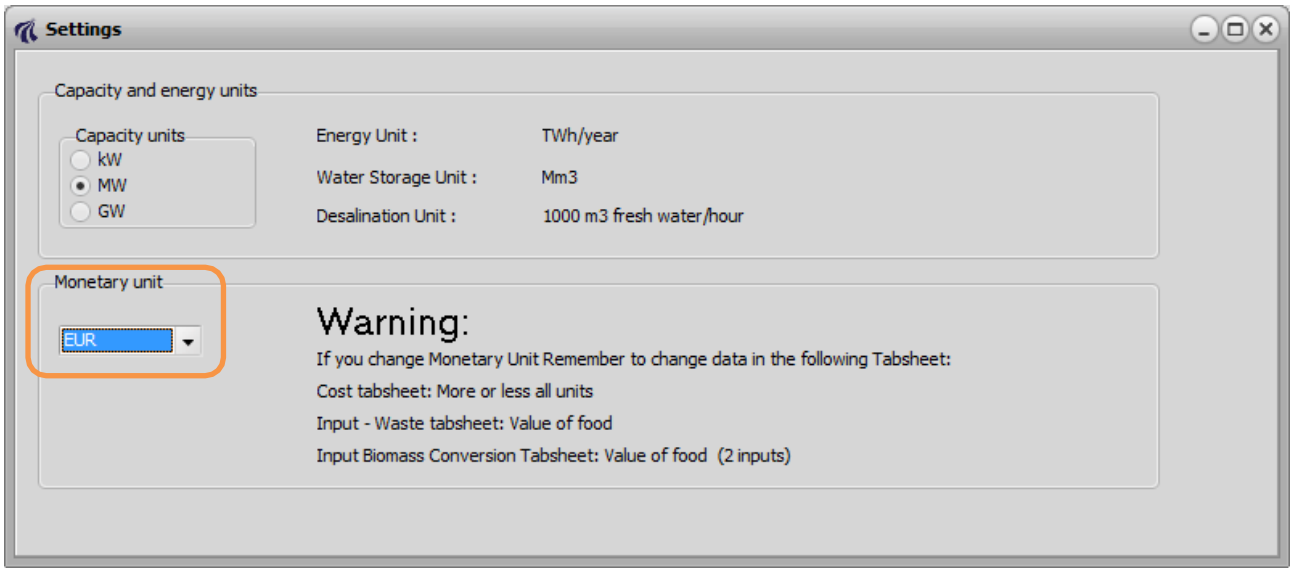
Exercise A: Creating the Reference Scenario (~60 minutes)

The name of our 'starting point' or 'case study' is Energyland. It is very similar to a typical country today. The only major difference is that there would be a greater variety of fuels and energy plants than utilised here. Below is an overview of the demand and supply for Energyland.

Sector	Demand (TWh)	Supply
Electricity	30	6000 MW of gas power plants
Heat	27	2 million individual oil boilers
Industry	25	Coal
Transport	70	Oil
Petrol	*35*	*2 million cars*
Diesel	*25*	*70,000 trucks*
Jet Fuel	*10*	

Try to model this in the EnergyPLAN tool. Before you do, make sure that you:

- Open the EnergyPLAN Tool
- Open the "initialize.txt" file. This will set all values in the tool to zero or for non-zero inputs such as efficiencies, to their default values.
- Go to "File->Save As" and save the file as "Energyland_step0_REF.txt"
- Go to the "Settings" tabsheet and change the "Monetary Unit" to "EUR" (euro).
- Save your file again.



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Investment costs:

	Unit	Investment (Unit)	Lifetime (years)	Fixed Operation and Maintenance (% of investment)
Exercise A				
Gas Power Plant	M€/MW	0.9	25	2.0
Oil Boiler	€/boiler	6600	20	3.8
Conventional Car	€/vehicle	12000	16	7.7
Truck/Bus	€/vehicle	160000	8	1.2

Fuel costs:

(€/GJ)		Coal	Diesel	Petrol/Jet Fuel	Natural Gas
Fuel Price		3	16.5	17.5	10
Fuel Handling Costs	To Central Plant	0	-	-	0.4
	To Decentral Plant	1.5	-	-	2
	To Individual Households	2.5	2	-	3
	To Road Transportation	-	1.9	1.9	2
	To Air Transportation	-	-	0.5	-

Distributions:

Sector	Name
Electricity	Hour_electricity.txt
Heat	Hour_distr-heat.txt

Results:

Metric	Electricity Sector Only	Electricity & Heat Sectors	Electricity, Heating, and Transport	Electricity, Heating, Transports, and Industry	Unit
Primary Energy Supply (PES)					TWh
Annual CO2 Emissions (CO2)					Mt
Annual Energy System Costs (Costs)					Million Euro (M€)

The Energyland system is now modelled in EnergyPLAN. Next, we will need to model some scenarios to analyse the impact of various integration technologies.