	Variable name	Type	Meaning	Measurement Unit	Inital value	Variable value	Notes
perType	Adjustment factor	Constant	overhead expenses factor which is an important factor in matching supply with demand		1.4		In paper (australian sector) value ranges from 1.2 to 1.4 depending on the energy resource. 1.35 (coal and gas), 1.4 (wind power), 1.25 (solar power), 1.3 (hydro and biopower)
GL	Approved %	Auxiliary		percentage		ROIC - "Min % to invest"	
GL	Birth rate	Constant		per person	0.097		
perType	Capacity bankruptcy	Auxiliary		GWh/year		Energy production capacity* Unprofitable Capacity /100	
perType	Capacity lifespan	Constant		year	25		from Australian case paper
GL	Capacity retirement	Auxiliary		GWh/year		Energy production capacity/Capacity lifespan	
GL	Capacity under construction	Level		GWh	5 GW (43800 GWh if I converted properly...)	New capacity orders rate-"New capacity start-up rate"	added off and on shore from https://www.government.nl/topics/renewable-energy/wind-energy-on-land https://www.government.nl/topics/renewable-energy/offshore-wind-energy
perType	Capital expenditure rate	Auxiliary		$/year		Capex costs*"New capacity start-up rate"	
perType	Capex costs	Constant		$	1600000		quick calculation based on the Australian paper, I would like to maybe search the real cost in NL
perType	Construction delay	Constant	time delay required for the construction	year	10		seen 8-10 months, with COVID and Russia I think 12 months is a good first approximation and maybe we can chech various values. https://www-tandfonline-com.proxy.uba.uva.nl/doi/full/10.1080/14693062.2019.1615858
perType	Depreciation rate	Auxiliary		$/year		0.02*Investment	
GL	Death rate	Constant		per person	0.088		
GL	Desired new capacity addition	Auxiliary		GWh/year		max (0,Energy production capacity * "Approved %"/100)	
GL	Energy demand per citizen	Constant		GWh/year	0.047972222 GWh (statista 2019)		https://www.statista.com/statistics/701612/primary-energy-consumption-netherlands/ https://data.worldbank.org/indicator/EG.USE.ELEC.KH.PC?locations=NL
perType	Energy production capacity	Level		GWh	0.011508(2019) 0.017894 kWh (2021)	("New capacity start-up rate")-Capacity Bankruptcy-Capacity Retirement	https://www.cbs.nl/en-gb/figures/detail/82610ENG?q=wnd%20energy%20production%20capacity https://www.government.nl/topics/renewable-energy/wind-energy-on-land https://www.statista.com/statistics/421525/total-wind-power-in-the-netherlands/ https://www.government.nl/topics/renewable-energy/offshore-wind-energy
GL	Energy security	Auxiliary	in general, can be seen as ensuring uninterrupted access to energy resources at an affordable price	percentage		Energy production capacity/Gross demand	https://www.cbs.nl/en-gb/news/2021/22/11-percent-of-energy-consumption-from-renewable-sources-in-2020 https://www.iea.org/reports/the-netherlands-2020
GL	Gross demand	Auxiliary		GWh/year		Energy demand per citizen*Population	
GL	Initial population	Constant			1.73E+07		
perType	Investment	Level		$/year	3.00E+11	(Capital expenditure rate-Depreciation rate)*Investment	
perType	"Min % to invest"	Constant		percentage	10		used in Au paper, I can check the Paris agreement and use a value derived from there maybe?
GL	"Net profit."	Auxiliary		$/year		(Total Supply*Wholesale price)-(Depreciation rate*Total supply cost)	
GL	New capacity orders rate	Auxiliary		GWh/year		max(1, Desired new capacity addition * RANDOM UNIFORM(1,0.8,Seed))	
GL	"New capacity start-up rate"	Auxiliary		GWh/year		Capacity under construction/Construction delay	
GL	Population	Level		people	Initial population	Total births-Total Deaths	
GL	ROIC	Auxiliary	profitability ratio. It measures the return that an investment generates for those who have provided capital, i.e. bondholders and stockholders.	percentage		Net profit/Investment*100	ROIC = (net income – dividends) / (debt + equity)
GL	Total available resources	Auxiliary	(area)			1-"New capacity start-up rate"	I think we should have an if statement here. Else I am not sure it makes sense to incorporate it in the diagram.
GL	Total births	Auxiliary				Population*Birth rate	
GL	Total deaths	Auxiliary				Population*Death rate	
GL	Total supply	Auxiliary		GWh/year		IF THEN ELSE (Energy security > 0, Energy production capacity *(1-Energy security/100), Energy production capacity)	https://opendata.cbs.nl/#/CBS/en/dataset/83989ENG/table https://www.iea.org/countries/the-netherlands https://ourworldindata.org/energy/country/netherlands 10994 PJ = 3053888.891332 GWh
GL	Total supply cost	Auxiliary		$/GWh		Investment/Energy production capacity	
GL	Wholesale price	Auxiliary		$/GWh		Adjustment factor*Total supply cost/Energy security	https://www.sciencedirect.com/science/article/pii/S0301421518308061
perType	Unprofitable Capacity	Auxiliary		GWh/year		20+PULSE(20, 1)	
	PREVIOUSLY USED						
perType	Capacity bankruptcy lifespan	Constant		GWh/year	100		
GL	crude birth rate	Constant	((births-deaths)/population size)*100		9.7/1000 people 0.97 for the model	crude birth rate per thousand of people (value for 2019)	https://data.worldbank.org/indicator/SP.DYN.CBRT.IN?end=2019&locations=NL&start=2017 https://www.statista.com/statistics/1037802/crude-birth-rate-netherlands-1830-2020/ https://data.worldbank.org/indicator/SP.DYN.CDRT.IN?locations=NL