7 Environmental Impact Calculation

To give a short introduction into an environmental impact assessment a hypothetical example will be calcuated as a comparison between two processes. Both of them are designed to fulfill the same job but they take different workstep approaches. Within the environmental impact assessment the focus is on the environmental outcome for every process. The inventory analysis for both processes is shown in table 39.

Table 39: Inventory analysis of both processes (quantity per year)

Impact	Unit	Process 1	Process 2
CO_2-eq	Kg	582.000	300.000
NMVOC	Kg	4.100	0
Waste, non hazardous	Kg	138.000	0
Consumption of non renewable energy*	MJ	5.460.000	0
Consumption of renewable energy*	MJ	0	4.200.000
COD	Kg	0	2.600
Consumption of freshwater	m3	0	62.000

* to keep the example simple one energy source instead of an energymix is assumed
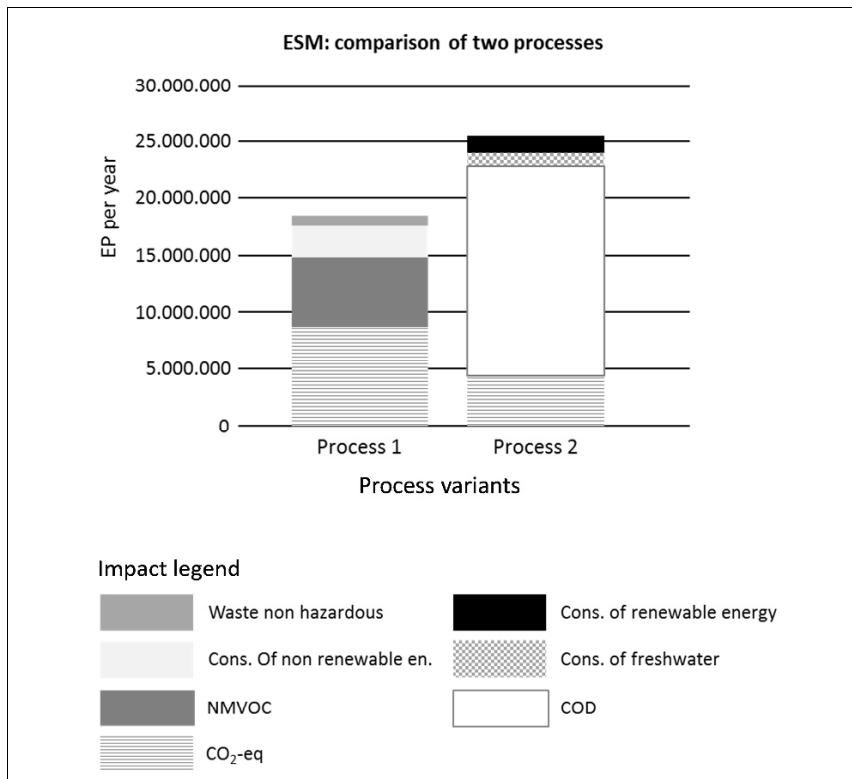
After the inventory analysis is clearly defined each corresponding ecofactor has to be assigned correctly (german ecofactors are used in this example). Throughout a simple multiplication between ecofactor and quantity parameter of the inventory analysis the ecopoints (EP) can be calculated. By repeating this procedure for every impact and adding up of the EPs the final overall environmental impacts of the two processes are optained. The calculation and the results are shown in table 43.

Table 43: Calculation of the ecopoints

Impact	Unit	EF [EP/unit]	Invent. proc. 1	Invent. proc. 2	EP process 1	EP prozess 2
CO2-eq	Kg	15	582.000	300.000	8.730.000	4.500.000
NMVOC	Kg	1475	4.100	0	6.047.500	0
Abfall, non hazardous	Kg	7,3	138.000	0	1.007.400	0
Consumption of non renewable Energie	MJ	0,506	5.460.000	0	2.762.760	0
Consumption of renewable energy	MJ	0,349	0	4.200.000	0	1.465.800
COD	Kg	7010	0	2.600	0	18.226.000
consumption drinking water	m^3	22,63	0	62.000	0	1.403.060
				Sum	18.547.660	25.594.860

The result of both analysed processes is clearly represented in figure 5 as sums of the ecopoints. In addition the influences of the single impacts are to be seen.

In this comparison it is clearly to be seen that process no. 2 shows a higher environmental load with 25.6 mio EP/y than process no. 1 with 18,5 Mio EP/y. The graphic representation provides a deeper insight into the influences of the single impacts for the overall result. Thus this divergent view allows a very specific analytical review of the calculation and the given results.

Figure 5:   Results