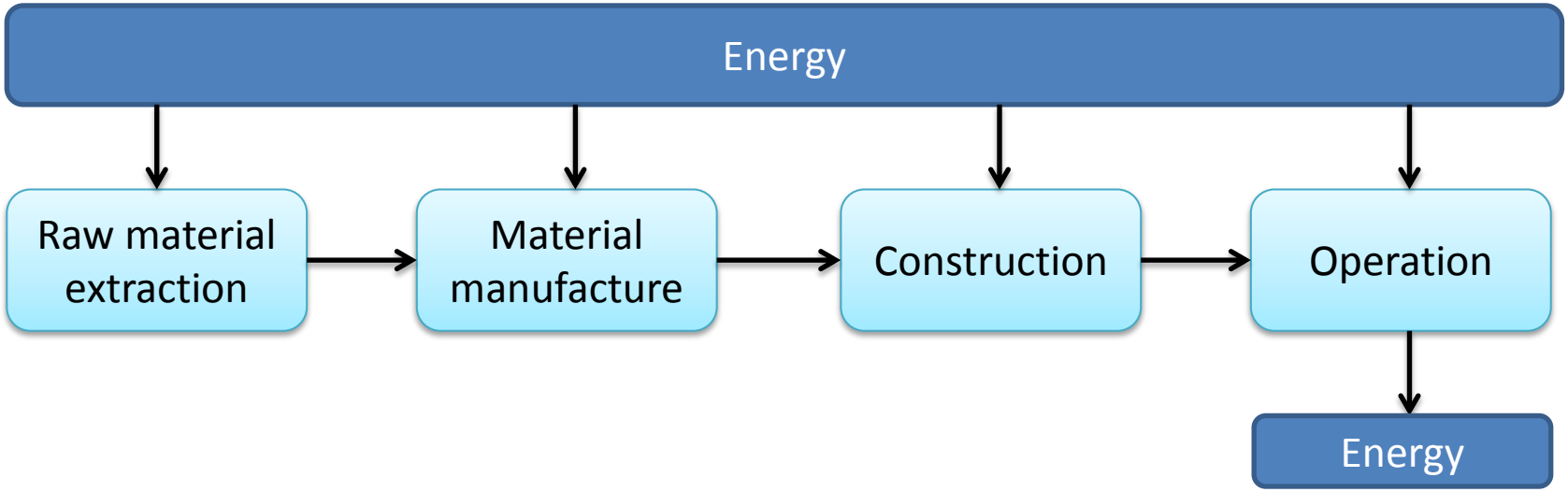
Example

- Wind Turbine V.S. Photovoltaic System
- Compare energy efficacy and environmental impact
- Use input-output-based life cycle inventory method

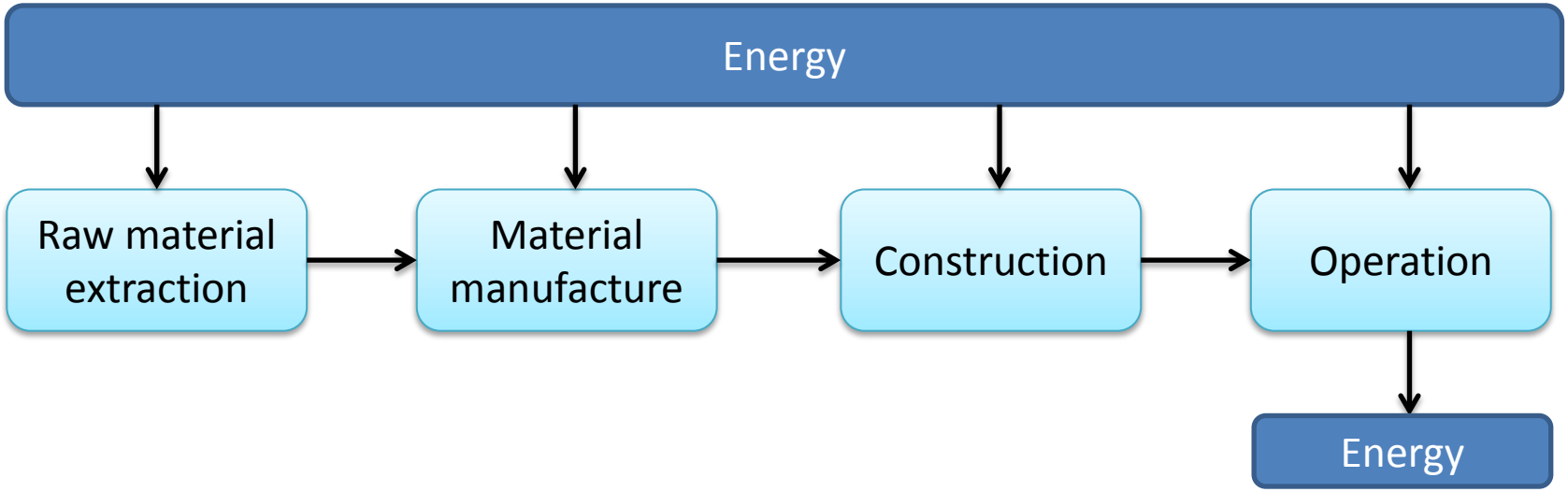
Wind Turbine Characteristics

- Total power output: 3000 kW
- Capacity factor: 33%
- Expected service life: 20 years
- Life cycle boundary:



Photovoltaic System Characteristics

- Total power output: 1 kW
- Capacity factor: 13.6%
- Expected service life: 25 years
- Life cycle boundary:



Data Input

- Input material data for each components

編輯 組裝 'Nacelle'

Input/output | Parameters

名稱: Nacelle

影像:

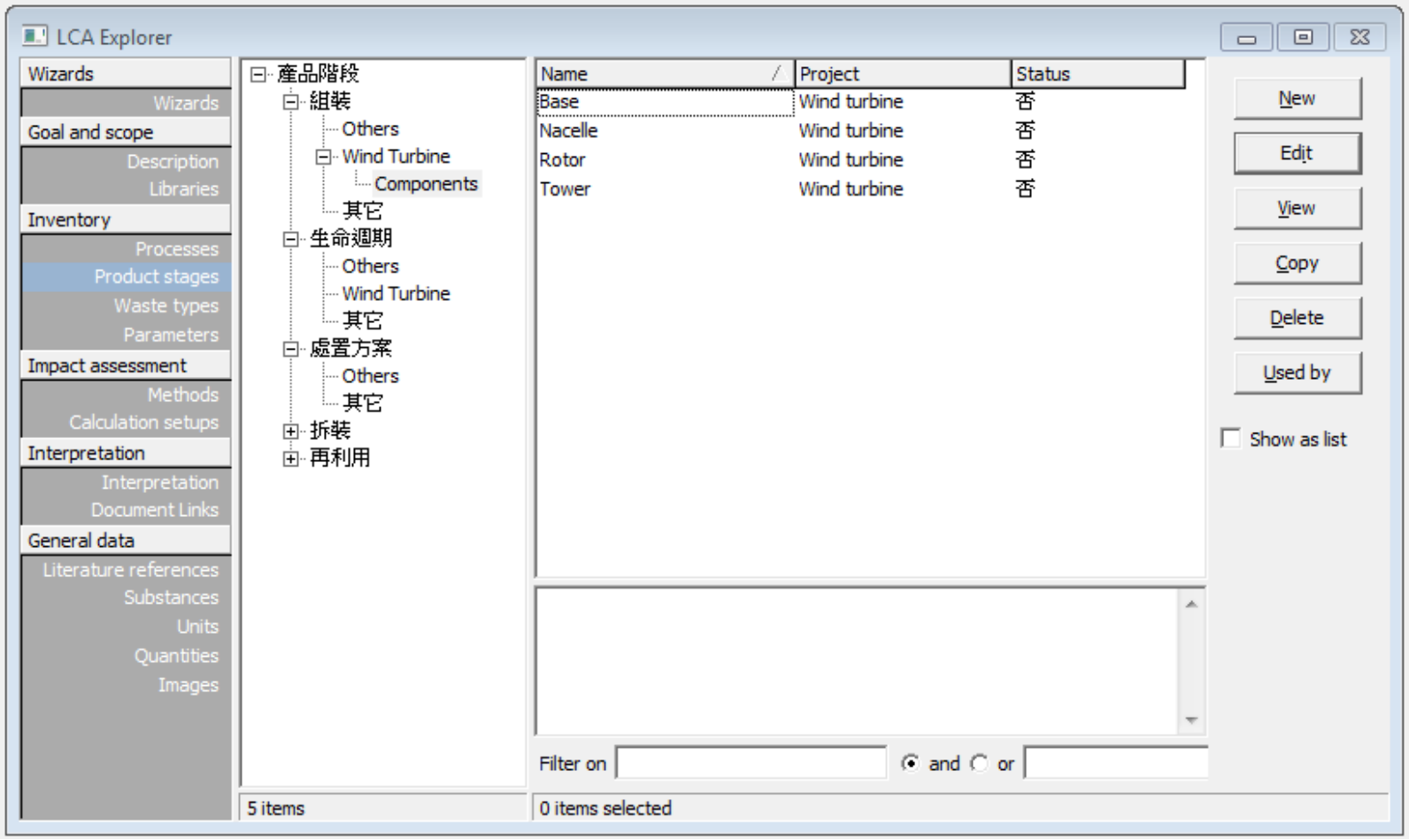
註解:

Status: 否

原料/組裝	數量	單位	分佈	SD^2 或 2*SD	最小值	最大	註解
Cold rolled sheet, steel, at plant/RNA	9.8	ton	未定義的				Cover
Cold rolled sheet, steel, at plant/RNA	13.65	ton	未定義的				Frame
Cold rolled sheet, steel, at plant/RNA	6	ton	未定義的				Generator
Cold rolled sheet, steel, at plant/RNA	1.07	ton	未定義的				Brake System
Cold rolled sheet, steel, at plant/RNA	24.76	ton	未定義的				Gear Box
Cold rolled sheet, steel, at plant/RNA	4.06	ton	未定義的				Revolving system
Cold rolled sheet, steel, at plant/RNA	1.07	ton	未定義的				Crane
Cold rolled sheet, steel, at plant/RNA	3.64	ton	未定義的				Other
Aluminium extrusion profile, primary prod., prod. mix, aluminiu	0.72	ton	未定義的				Cable
Aluminium extrusion profile, primary prod., prod. mix, aluminiu	0.25	ton	未定義的				Gear box
Copper wire, technology mix, consumption mix, at plant, cros	0.99	ton	未定義的				Cable
Copper sheet, technology mix, consumption mix, at plant, 0,6	0.25	ton	未定義的				Gear box
Copper sheet, technology mix, consumption mix, at plant, 0,6	1.46	ton	未定義的				Other
Aluminium extrusion profile, primary prod., prod. mix, aluminiu	1.46	ton	未定義的				Other
Polyvinylchloride resin (B-PVC), bulk polymerisation, productio	0.69	ton	未定義的				Other

Data Input

- Wind Turbine has four main components

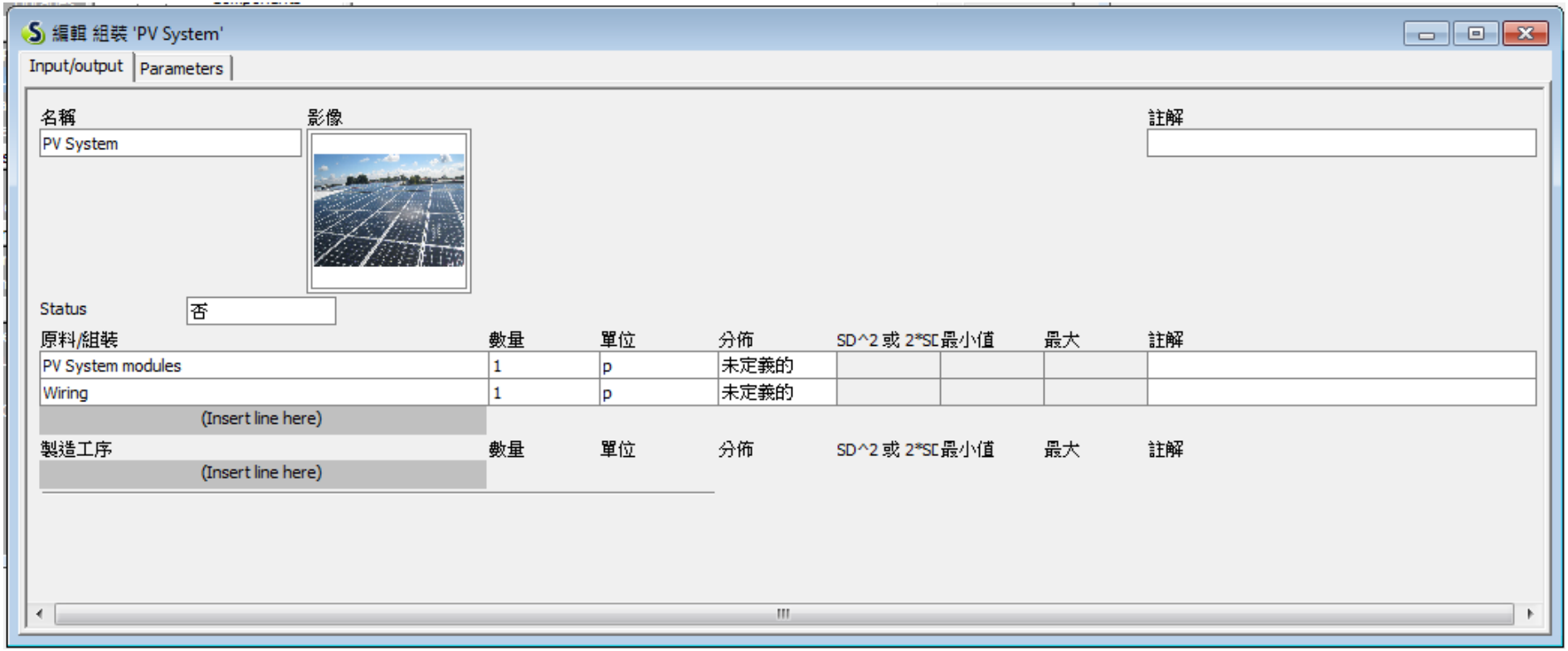


Data Input

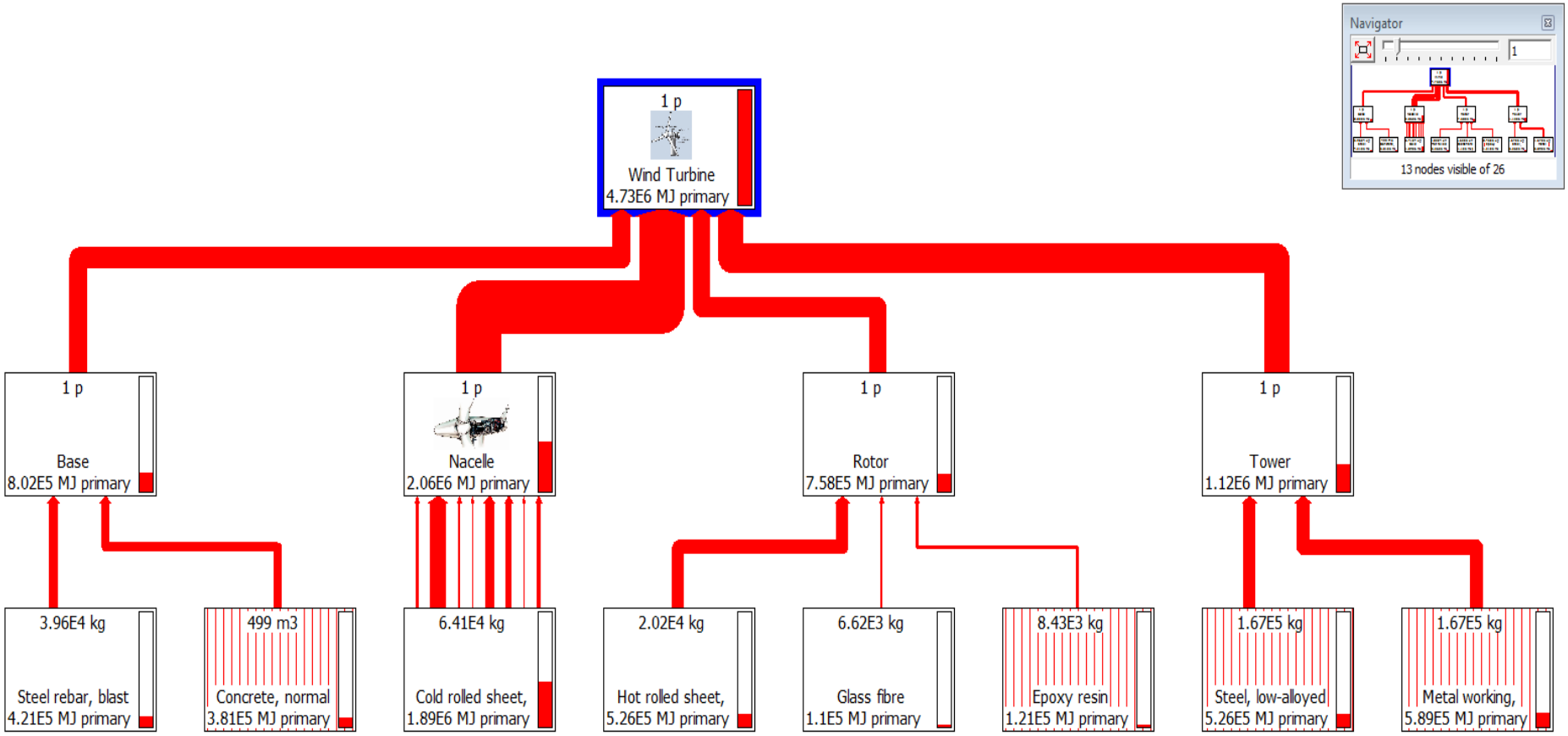
- Assemble Wind Turbine

Data Input

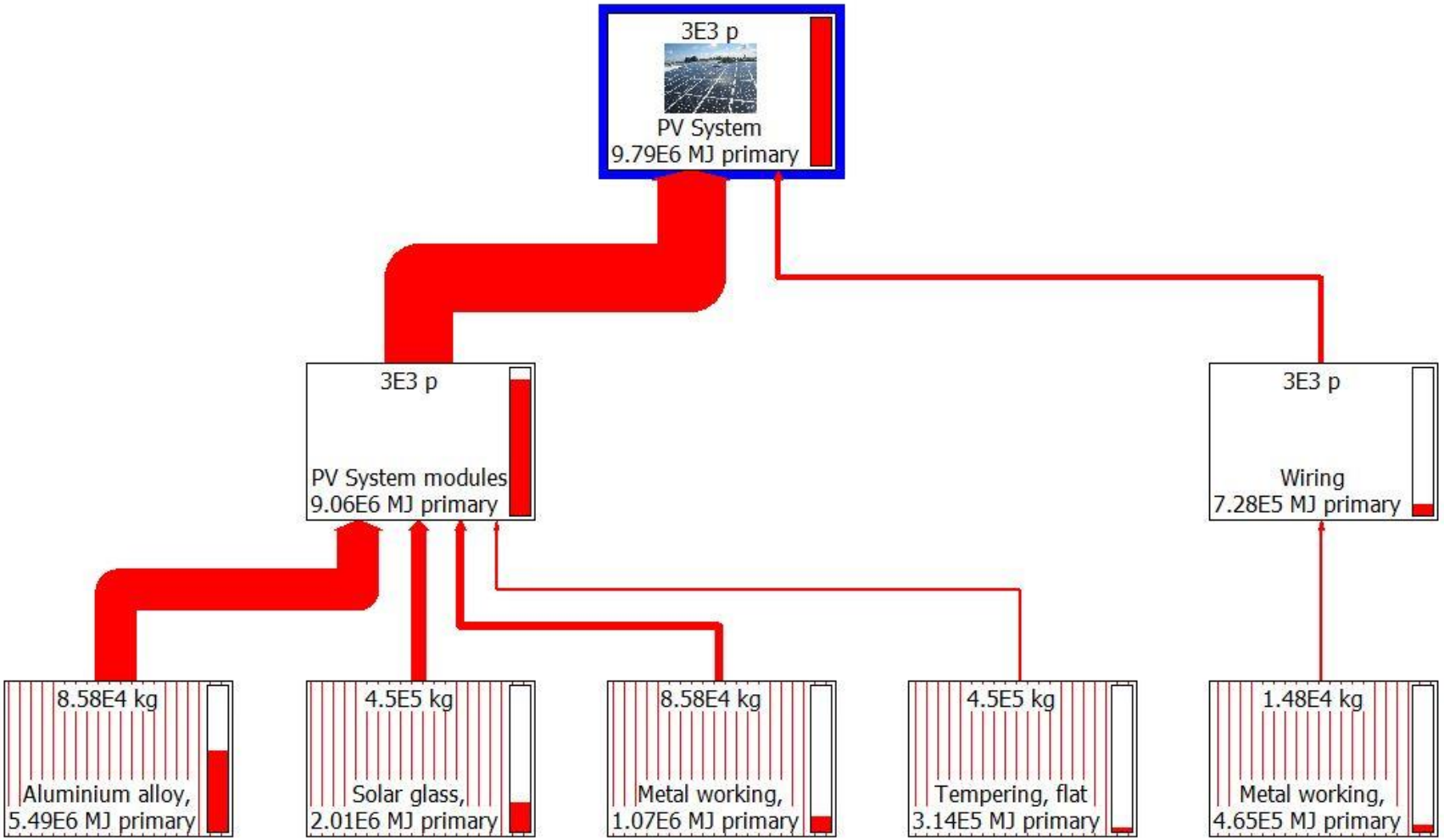
- Assemble PV System



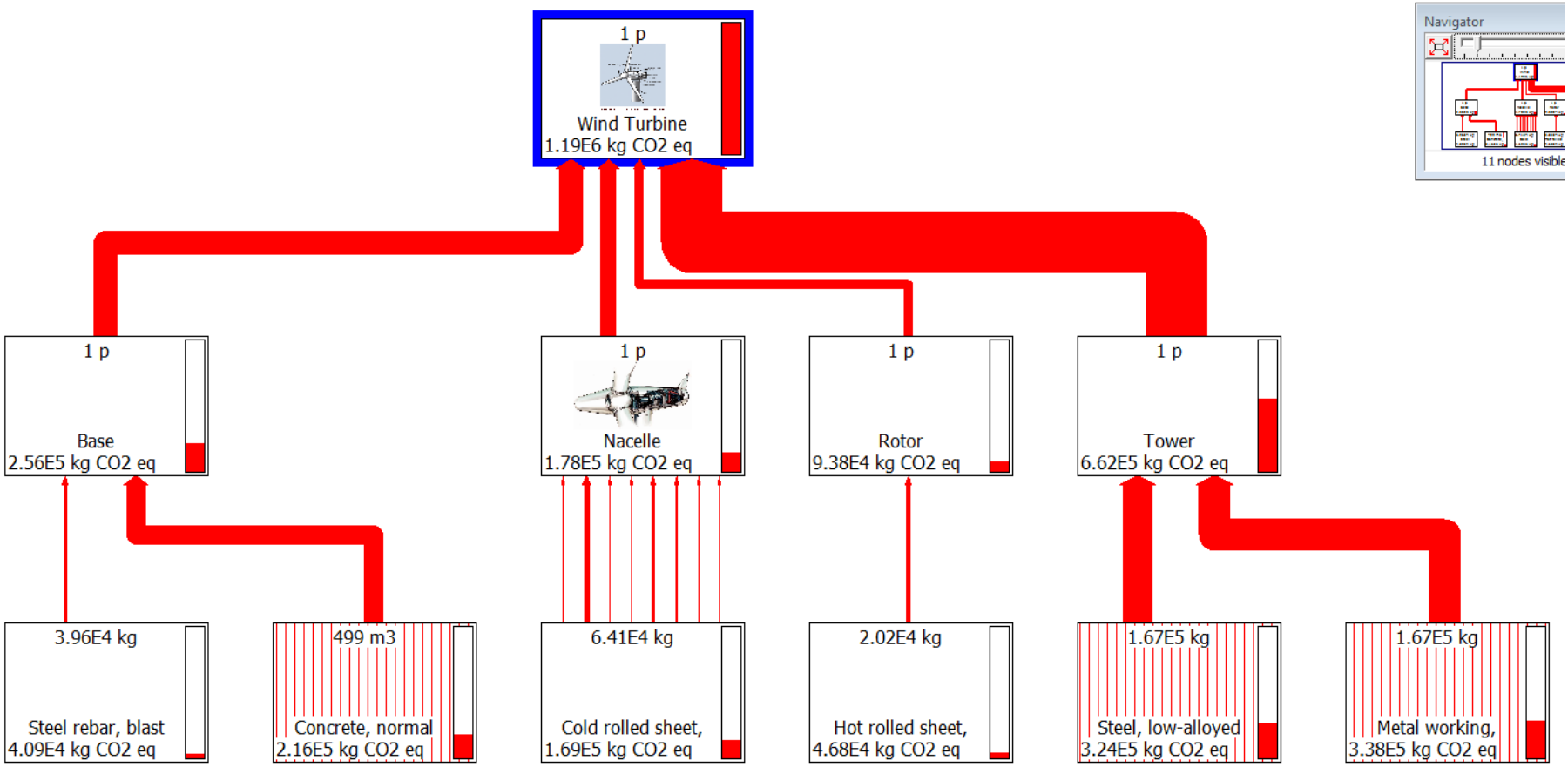
LCI Analysis – Primary Energy



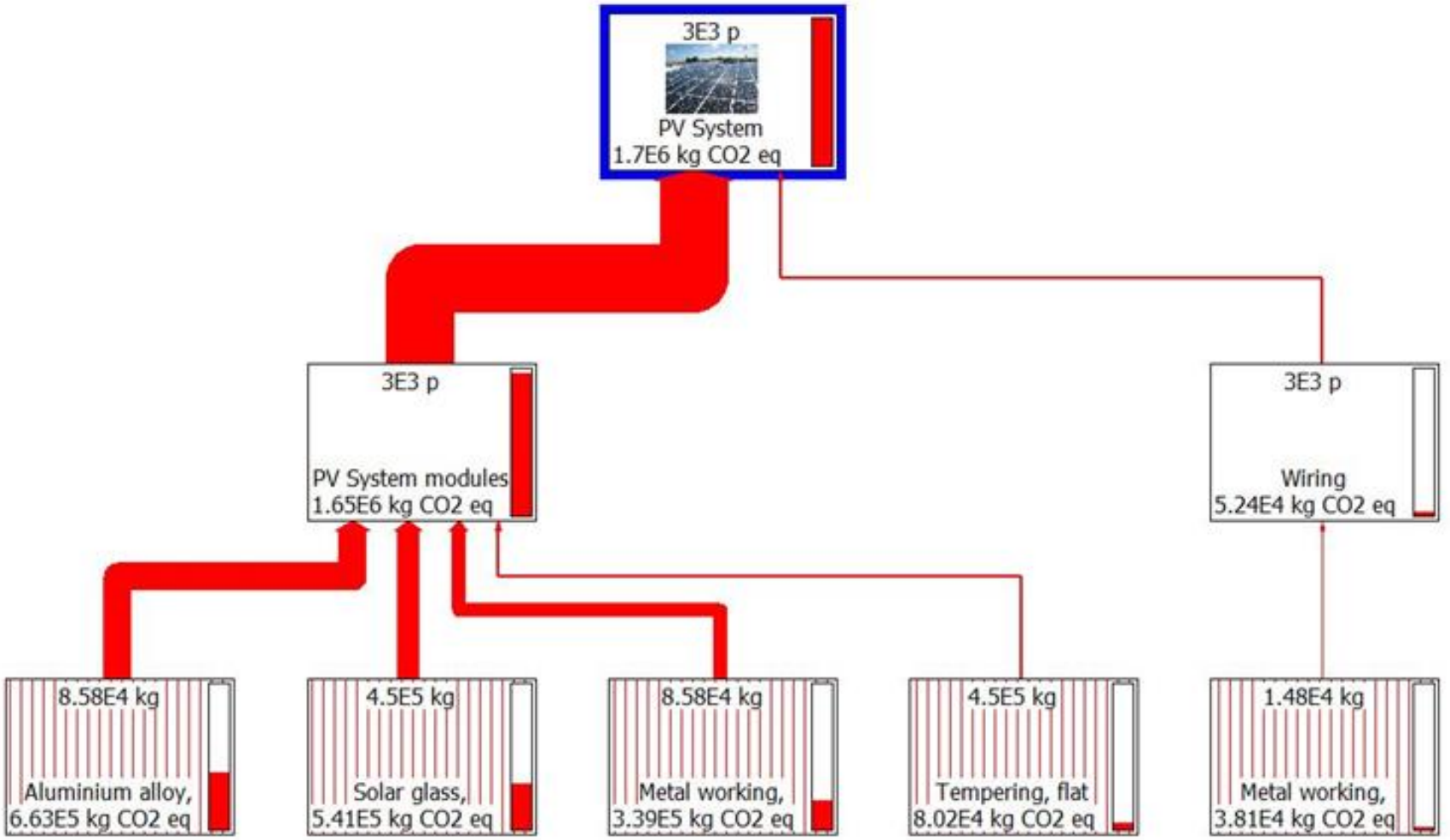
LCI Analysis – Primary Energy



LCI Analysis – CO_2 Emission



LCI Analysis – CO_2 Emission



Impact Assessment

- Wind Turbine

Life Cycle Stage	Primary Energy (GJ)	GHG	Total emissions produced/(avoid) (ton CO_2-e)*
Construction Energy	4370	CO_2-e	1190
Life Cycle Energy Output (20 years)	624,412	CO_2	(57,883)
	-	CH_4	(156)
	-	N_2O	(37,170)
Total Emission Avoided			94,019

- *Source: Department of Climate Change 2008: 202

Impact Assessment

- PV System (3000 units)

Life Cycle Stage	Primary Energy (GJ)	GHG	Total emissions produced/(avoid) (ton CO_2-e)*
Construction Energy	9,790	CO_2-e	1,760
Life Cycle Energy Output (25 years)	321,667	CO_2	(28,532)
	-	CH_4	(242)
	-	N_2O	(19,279)
Total Emission Avoided			46,293

- *Source: Department of Climate Change 2008: 202

Reference

- Department of Climate Change (2008) National greenhouse and energy reporting (measurement) determination 2008, Canberra: Commonwealth of Australia