

Energy transition.

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Calorific values of energy sources and sinks

Energy source	Energy unit (y=year)	Ref	Calorific value	Average power (W)	Remarks
Electricity	Watt		-	1	
	Kilowatt		-	1000	
	Kwh/y		-	0.114077	
Solid	Kg/y Coal (IEA)	[2]	23.56 MJ/Kg	0.7465713	
	Kg/y Brown coal (Lignite)	[5]	15 MJ/Kg	0.4753213	
	Kg/y Peat (dry)	[5]	15 MJ/Kg	0.4753213	
	Kg/y Wood	[5]	15 MJ/Kg	0.4753213	
	Kg/y Fat	[1]	37 MJ/Kg	1.1724592	
	Kg Battery (Li-Po, Li-Hv)	[1]	1.8 MJ/Kg	0.0570386	
	m² Solar panel	[3]	140-275 Kwh/y	31.6564	Average, depends on geographic location and weather
Liquid	Liter/y petrol automotive	[6]	34.2 MJ/L	1.0837326	
	Liter/y diesel oil	[6]	38.6 MJ/L	1.2231602	
	Liter/y heating oil	[6]	37.3 MJ/L	1.1819657	
	Liter/y Hydrogen (700 bar)	[1]	9.17 MJ/L	0.2905798	
	Liter/y Alcohol (Ethanol)	[6]	23.4 MJ/L	0.7415013	
	Liter/y LNG	[1]	22.2 MJ/L	0.7034755	
	Liter/y LPG (mixture)	[6]	25.7 MJ/L	0.8143839	
	Liter/day heating oil	[6]	37.3 MJ/L	431.713	
	Liter/day LNG	[1]	22.2 MJ/L	256.944	
	Liter/day LPG (mixture)	[6]	25.7 MJ/L	297.454	
Gaseous	m³/y natural gas (IEA)	[2]	38.95 MJ/m³	1.234251	
	m³/y natural gas (Dutch)	[5]	33.4 MJ/m³	1.0583821	"Low calorie" Dutch natural gas, average
	m³/y Hydrogen	[1]	0,016905 MJ/L	0.5357	Average value
	m³/day natural gas (IEA)	[2]	38.95 MJ/m³	450.81	
	m³/day natural gas (Dutch)	[5]	33.4 MJ/m³	386.574	
	m³/day Hydrogen	[1]	0,016905 MJ/L	195.664	
Phase transition	m³/day water to ice	[4]	334 J/g	3865.74	From 0°C water to (slurry-)ice, theoretical
Nuclear fusion	g/y Thorium	[1]	79420 GJ/Kg	2516.6679	In breeder, experimental

References

- [1] **Energy density**
https://en.wikipedia.org/wiki/Energy_density
- [2] **The Energy and Fuel Data Sheet**
<https://bit.ly/2CNy3GN>
- [3] **How many kWh will 1 sq meter of solar panel produce in 1 year?**
<https://bit.ly/2PoDX80>
- [4] **Enthalpy of fusion**
https://en.wikipedia.org/wiki/Enthalpy_of_fusion
- [5] **Verbrandingswarmte**
<https://nl.wikipedia.org/wiki/Verbrandingswarmte>
- [6] **List of common conversion factors (Engineering conversion)**
<https://bit.ly/2AvsyLa>