

REGIONAL TRAINING ON MODEL-BASED INTEGRATED ENERGY AND CLIMATE ANALYSES

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Alenka Kinderman Lončarević
Expert in energy statistics, SECCA

Additional tips for energy balance

Part 2. Transformations

- Sign „-” means fuel input into the transformation process, while sign „+” means the output

Uzbekistan
Terajoules

	Primary coal and peat	Coal and peat products	Primary Oil	Oil Products	Natural Gas	Biofuels and waste	Nuclear	Electricity	Heat	Total energy	of which: renewables
2020											
Transformation	-58688	1130	-156238	141969	-492944	..	..	203931	148714	-212128	..
Electricity plants	-31040	..	..	-64	..	..	..	11231	..	-19872	..
CHP plants	-26603	..	..	-5715	-457069	..	..	210174	74485	-204728	..
Heat plants	..	..	..	-992	-21395	..	..	*-17474	74229	34367	..

- For example, in „Electricity plants” flow:
 - Fuel input in the electricity plant is -31040 TJ of primary coal and -64 TJ of oil products, while
 - Electricity (energy) output is 11231 TJ

Exercise (1/3)

– recalculating volume to mass units and vice versa

Energy statistics (balance) usually report data on gas, diesel, and diesel trade production and consumption in mass units like „kg” or „tones”

Customers buy gas diesel and diesel in volume units: „litres”

In the case of recalculating litres to kg and vice versa, it is necessary to have available density of the fuels

Density = Mass / Volume

<https://unstats.un.org/unsd/energystats/methodology/documents/IRES-web.pdf>

Density diesel = 0,85 kg/litre

Density gasoline = 0,742 kg/lit



Exercise (2/3)

– recalculating volume to mass units and vice versa

Task: Calculate the mass of the one-filled car reservoir of 50 litres or how many kilograms have 50 litres of gasoline and 50 litres of diesel?

Answer:

50 liters of gasoline = ??? kg of gasoline

50 liters of diesel = ??? Kg of gasoline

Reminder

Density = Mass / Volume

Density diesel = 0,85 kg/litre

Density gasoline = 0,742 kg/lit



Exercise (3/3)

– recalculating volume to mass units and vice versa

Task: Calculate the mass of the one-filled car reservoir of 50 litres or how many kilograms have 50 litres of gasoline and 50 litres of diesel?

Answer:

50 liters of gasoline = $50 \text{ lit} * 0,724 \text{ kg/lit} = 37,1 \text{ kg}$ of gasoline

50 liters of diesel = $50 \text{ lit} * 0,85 \text{ kg/lit} = 42,5 \text{ kg}$ of diesel

Conclusion

The same volume of diesel is 14,5 % heavier than gasoline



Exercise (4/4)

– recalculating volume to mass units and vice versa

Task 1: Calculate the mass of the one-filled car reservoir of 50 litres or how many kilograms have 50 litres of gasoline and 50 litres of diesel?

Answer:

50 liters of gasoline = $50 \text{ lit} * 0,724 \text{ kg/lit} = 37,1 \text{ kg}$ of gasoline

50 liters of diesel = $50 \text{ lit} * 0,85 \text{ kg/lit} = 42,5 \text{ kg}$ of diesel

Conclusion

The same volume of diesel is 14,5 % heavier than gasoline.



Exercise (4/4)

– recalculating volume to mass units and vice versa

Task 2: Recalculate mass of diesel and gasoline into common energy unit?

Answer:

50 kg gasoline = XXXX MJ

50 kg diesel = XXXX MJ

Open IRES manual and read

Conclusion

1 kg of gasoline = XXXXXMJ

1 kg of diesel = XXXX MJ

