

# Exercise 3.1:

Open the file Coal\_Exercise\_3.1.xls.

Table 1 and Table 4 are provided with some data in them.

However, Table 4 has not been carefully filled in and it appears to be mistaken on many points.

Make a list of the errors you spotted and explain how it should be filled instead for each point.

Here are some clues to start your investigation:

- \* Are GCVs and NCVs in the expected range of values?
- \* How are GCVs compared to NCVs?
- \* Are the calorific values flows balanced ?
- \* Do we have all the CVs we need?

		MJ/tonne
	Coal Tar	30000 - 44000
	Coking Coal	25000 - 33000
	Patent Fuel	25000 - 32000
	Coke Oven Coke	24000 - 32000
	Gas Coke	24000 - 32000
	Anthracite	22000 - 29000
	Other Bituminous Coal	22000 - 29000
	Sub Bituminous Coal	16000 - 24000
	Bkb	15000 - 21000
	Peat	7000 - 13000
	Lignite/Brown Coal	3000 - 18000

## Exercise 3.2:

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Open the file Coal\_Exercise\_3.2.xls.

Fill in Table 1 with the following indications:

This country produces 1,000,000 tonnes of coking coal and 1,500,000 tonnes of other bituminous coal both from underground mines.

All the coking coal is used in coke ovens.

The outputs of this process are 500,000 tonnes of Coke oven coke and 14,000 TJ (gross) of coke oven gas.

Half of the coke oven gas produced was consumed to heat the coke oven. The rest was used in the steel mill for heating purposes.

300,000 tonnes of the coke oven coke produced was used as input to blast furnaces, the rest was exported.

700,000 tonnes of other bituminous coal are used by a power plant; 600,000 tonnes are used by a heat plant. The rest of other bituminous coal is consumed by trains.

The country also imports 1,500,000 tonnes of sub-bituminous coal, 500,000 tonnes of which is consumed in the aluminium industry. The rest is used to build government stocks.

## Exercise 3.3:

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Open the file Coal\_Exercise\_3.3.xls.

Using the data reported in Tables 1 and 4, fill in the yellow cells and:

Calculate the Coke Oven Efficiency

Calculate the output of the Blast Furnace assuming it has an efficiency of 40%

Calculate the expected production of Electricity from other bituminous coal assuming the efficiency is 35%.

Calculate the efficiency of the Heat plant considering the input of other bituminous coal

Gas	Gross to Net Ratio
Gas-works gas	0.9
Coke-oven gas	0.9
Blast-furnace gas	1.0
Oxygen steel-furnace gas	1.0