

Exercise 9: Filling in test data for – Large Point Sources (LPS)

1. Continue working with the workbook 'Malé Inv workbook Version 3_test data.xls' you saved at the end of Exercise 8.
2. Go to **Menu 9** and then go to **Sheet: 8.1 'Large point source combustion emissions, general plant-specific details'**
3. **Enter plant specific details for a power station:**

Name: Chandrapura Thermal Power Station,

Location: Jharkhand, India

Grid ref: 23° 44' 17" N 86° 07' 38" E (Convert into decimal notation for workbook using 'lat long.xls')

Stack height: 250 m

Type of emission controls: Electrostatic precipitator (ESP) for PM; none for NO_x and SO₂

Fuel type: bituminous coal

Fuel consumption: 5.34 Mt/yr

Lower heating value (LHV): 20.93 MJ/kg (First convert this to toe/t **Note:** 1 toe = 41.868 GJ)

4. Go to **Sheet 8.1.1 Large point source combustion emissions - sulphur dioxide (SO₂)** and enter **Fuel type**, **S-content of fuel** (assume = 1.0 % S) and **S retention-in-ash** (see Sheet 1.2.1), **SO₂ emission control efficiency** (no controls) and type in E in column H for method of SO₂ emission estimate chosen.
5. Go to **Sheet 8.1.2 Large point source combustion emissions - nitrogen oxides (NO_x)** and enter **IPCC default EF 300 kg/TJ**, assume **no emission controls** and type **D in column G** for method of emission estimate chosen.
6. Repeat step 5 for **CO (default EF 20 kg/TJ)**, **NMVOC (default EF 5 kg/TJ)** (**Sheets 8.1.3 and 8.1.4**)
7. Go to **Sheet 8.1.5 Large point source combustion emissions - PM₁₀** and enter **ash content A of 28%** and average **emission control of 90%** and type **E in column H** for method of emission estimate chosen.
8. Go to **Sheet 8.1.6 Large point source combustion emissions - PM_{2.5}** and enter **ash content A of 28%** and average **emission control of 90%** and type **E in column H** for method of emission estimate chosen.
9. Go to **Sheet 8.1.7 Large point source combustion emissions - ammonia (NH₃)** and enter **default EF 0.00028 kg/t**, assume **no emission controls** and type **D in column G** for method of emission estimate chosen.

10. Check totals are carried forward to final **Summary Sheet 9**.

11. **Did you get the correct values?** See table below

Sector	Sub-sector	LPS emissions (kilotonnes pollutant per year (kt/yr))						
		SO ₂	NO _x	CO	NMVOC	NH ₃	PM ₁₀	PM _{2.5}
1. Combustion in the Energy Industries	Public Electricity and Heat	101.46	33.54	2.24	0.56	0.00	18.39	7.78
	Petroleum Refining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Manufacture of Solid Fuels and Other Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Optional extension work/Homework

12. Go to **Sheet 8.2 Large point source process (non-combustion) and fugitive emissions, general plant-specific details**.

13. **Enter plants specific details for an Indian copper smelter:**

Name: Birla copper smelter

Location: Gujarat, INDIA

Grid ref: 21° 42' 09" N 72° 32' 20" E (Convert to decimal notation for workbook using 'lat long.xls')

Stack height: Unknown

Activity rate: 500000 t/yr Primary, unrefined

Type of emission controls: Sulphuric Acid plant (estimated 98.5% recovery of S)

14. Go to **Sheet 8.2.1 Large point source process (non-combustion) emissions, sulphur dioxide (SO₂)**. Enter uncontrolled **SO₂ emissions factor** (see Sheet 2.3) and **SO₂ emission control efficiency of 98.5%**.

15. **Repeat step 14 for NMVOC (no control) and PM₁₀ and PM_{2.5} with hot ESP (98% emission control for both).**

16. **Did you get the correct values in Summary Table?**

17. **Save your workbook.**

Sector	Sub-sector	LPS emissions (kilotonnes pollutant per year (kt/yr))						
		SO ₂	NO _x	CO	NMVOC	NH ₃	PM ₁₀	PM _{2.5}
6. Industrial processes	Mineral products	0.00		0.00	0.00		0.00	0.00
	Chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Metals	15.90	0.00	0.00	0.02		2.30	1.93
	Pulp and paper	0.00	0.00	0.00	0.00		0.00	0.00
	Food and drink				0.00		0.00	0.00
	Major construction site activities (Fugitive PM only)							