Exercise 1: Filling in test data for –
Large Point Sources (LPS)

1.   Open workbook, save as **'Malé Inv workbook Version 2.3_test data** *your* *initials***.xls'**

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: 23⁰ 44' 17" N   86⁰ 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 NOx and SO$_2$
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 (SO$_2$)** and enter **Fuel type**, **S-content of fuel** (assume = 1.0 % S) and **S retention-in-ash** (see Sheet 1.2.1) , **SO$_2$ emission control efficiency** (no controls) and type in E in column H for method of SO$_2$ 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 - PM$_{10}$** and enter **ash content A of 27.8%** , calculate uncontrolled **PM$_{10}$ EF = 1.23 x A/100 kg/t** 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 27.8%** , calculate uncontrolled **PM$_{2.5}$ EF = 0.52 x A/100 kg/t** 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 (NH_3)** 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	0.18	0.08
	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

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: 21º 42' 09" N   72º 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 (SO_2).** Enter uncontrolled **SO_2 emissions factor** (see Sheet 2.3) and **SO_2 emission control efficiency of 98.5%.**

15. **Repeat** step 14 for **NMVOC (no control)** and **PM_{10}** and **$PM_{2.5}$** with hot ESP **(98% emission control for both).**

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

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)							