Malé Declaration emissions inventory workshop Delhi, India, 2010

Exercise 3: Filling in dummy data for – Combustion Activities in the Energy Industries

1. Open workbook, save as **'Malé Inv workbook Version 3_test data.xls'**

2. Go to **Main menu** and fill in inventory year as '**2005**'

3. Go to **Menu 1** and then go to **Sheet: 1.1.1b 'Fuel consumption in thousands of tonnes oil equivalent per year (ktoe/year)'**

4. Look at the first data input column (C) for '*Public Electricity and Heat Production'*. In the white cells, enter **1000** for fuel consumed for **Other Bituminous Coal & Anthracite** and the same for **Natural gas** (but not for the other fuel types).

5. At bottom of the window click the tab with number 1.1.2 to get to **Sheet: 1.1.2 Default net calorific values for fuel (toe/t).**

6. In **Sheet 1.1.2**, enter net calorific value (NCV) of 0.650 toe/t for *'Other bituminous Coal and Anthracite'* burnt in '*Public Electricity and Heat Production'*. (The default NCV value is already there for natural gas because this does not vary much between different countries.) Hit Return (or Enter) button.

7. Go to **Sheet 1.1.3 Error check sheet for net calorific values for fuel (toe/t)** to see if all cells are 'OK'. (If any cells say **"NCV needed"** this indicates that a value for fuel consumption *has* been entered in Sheet 1.1.1 but a net calorific value (NCV) *has not yet* been entered into Sheet 1.1.2. If so, locate and correct error.)

8. Click **'Back to menu'** and go to **Sheet 1.2.1 Sulphur dioxide (SO_2) - Calculation of emission factors and emissions for Energy Industries.** (**Or** you can just **click the worksheet tab labelled 1.2.1**. at the bottom of the window.) Column A should show 41868 TJ for **Other Bituminous Coal & Anthracite** and **Natural Gas** consumed in *'Public Electricity and Heat Production'*.

9. Enter default '**Sulphur content of fuels**' values: for the coal assume 0.84 % S.

10. Enter default '**Retention in ash'** value given in column C.

11. Go to bottom of worksheet and find the first *'Public Electricity and Heat Production'* **Emission control calculator** table. Look at the column headed **% hard coal fired generation capacity subject to the APCD.** For all 5 'Air pollution control devices' (APCDs) listed enter 10 % as the percent of generating capacity having that APCD. (**Notice** that the average emission control rate of 18.7% is calculated automatically and transferred to column D)

12. ***Congratulations!*** You have now calculated the **SO_2 emissions** from coal combustion in *Public Electricity and Heat Production* – check that the totals now appear in the worksheet 9 **(Summary sheet - Annual emissions of each pollutant by source sector**) near the end of the workbook. (**Did you get the correct values?** See table below (Please ask Harry or other helpers if you have gone wrong and can't work out why!)

13. Go back to **Menu 1** then to **Sheet: 1.3.1 Nitrogen oxides (NOx) - emission factors (kg/TJ)** and enter default EFs for **Other Bituminous Coal & Anthracite** and **Natural Gas** in *Public Electricity and Heat Production*.

14. Go to next worksheet (**Sheet: 1.3.2 Nitrogen oxides (NOx) - combustion emission controls (%)**) - just use tab at bottom of Excel window to do this. Scroll to bottom of worksheet 1.3.2 to find the **NOx emission control calculators for gas combustion** in the *Public electricity* sector and **enter 5%** for all APCDs. (**Notice** that the average emission control rates are calculated automatically and transferred to the *Public Electricity and Heat Production* column in the main table.)

15. Use tabs to go to **Sheet 1.3.3** where you will see that **Total NOx emissions** have been automatically calculated. Again, check that the **NOx emission totals** for the Energy industries now appear in the **Summary sheet (worksheet 9)** near the end of the workbook. **(Did you get the correct values?** See table below).

16. If you have time, enter default EFs for CO, NMVOC and ammonia (NH_3) in worksheets **1.4.1, 1.5.1 and 1.7.1. (Did you get the correct values in the Summary sheet?** See table below.)

17. **<u>Save your workbook</u>** (You will continue to use this for the next exercises).

From Summary sheet – Annual emissions of each pollutant by source sector in kt/yr.

Sub-sector	Total emissions (kilotonnes pollutant per year (kt/yr))						
	SO_2	NO_x	CO	NMVOC	NH_3	PM_{10}	$PM_{2.5}$
Public Electricity and Heat	19.99	16.80	1.67	0.42	0.06	0.00	0.00
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