



EU CHP DIRECTIVE – PRIMARY ENERGY SAVING (PES)

INSTRUCTIONS FOR COMPLETION OF A SPREADSHEET FOR THE CALCULATION OF CHP SCHEME EFFICIENCY AND PRIMARY ENERGY SAVING

The workbook (spreadsheet) “PES_Calc_1.xls” has been developed in Microsoft Excel. All of the information required to perform the calculations (apart from the grid connection voltage in kV) may be found either on your CHPQA Certificate, on the F2 scheme description form or on your F4 self-assessment form.

The spreadsheet calculates CHP efficiency and primary energy saving as required by the EU CHP Directive 2004/8/EC.

Overall efficiency

The UK has adopted Article 12.2 of the Directive to permit the calculation of overall efficiency (on a net calorific value basis) without the exclusion of heat-only boilers.

Primary Energy Saving (PES)

PES, percent, in comparison with the separate production of heat and power is calculated using the reference values and adjustments that will be included in the published version of the Guidelines for Implementation of the CHP Directive.

LAYOUT OF SPREADSHEET

The spreadsheet is divided up into a number of worksheets (pages) to permit analysis of up to 10 Schemes. Additional Schemes may be analysed by copying the original spreadsheet to a different name (e.g. “PES_Calc_2.xls”, etc). There is a “STATS” page that automatically tabulates the results of the calculation for each Scheme. An example is included; the page “Example Data” contains the data input and “Example Calc” has the calculation and results. There is provision for analysis of up to 10 Schemes (S1 to S10) each with a data entry page (e.g. “S1 Data”) and a calculation page (e.g. “S1 Calc”). The final page is “REF VALUES”, which contains the efficiency reference values. All except the data input pages are protected to prevent inadvertent changes to the calculation and reference values.

INSTRUCTIONS FOR DATA INPUT

1. Open the workbook “PES_Calc_1.xls” in Microsoft Excel. [Any version from Excel 97 onwards should work.]
2. After familiarisation by examination of the “Example Data” and “Example Calc” go to the worksheet (page) named “S1 Data” by clicking on its name tab.
3. Complete the data entry in the cells that have a green background.
 - (a) Enter the year for which the data applies in cell G1 (e.g. 2005 Data).
 - (b) Enter data from your CHPQA Certificate in cells C1 to C5.
 - (c) Enter the grid connection voltage (or generator voltage if there is no grid connection) in cell C6.

- (d) Enter the percent indirect use of heat (e.g. as steam or hot water) in cell C7.
- (e) Enter data from your CHPQA Certificate in cells and C10 to C13.
- (f) If the Scheme does not meet its QI threshold (i.e. QPO less than TPO) complete cells C15 to C19. If the Scheme meets its QI threshold (QPO = TPO) leave cells C15 to C19 blank.
- (g) Calculate the percent of the generated power that is exported (from the F4) and enter this in cell C22 (two decimal places e.g. 25.03).
- (h) Calculate the percent of each type of fuel (or heat) input and enter these in cells C29 to C41 (two decimal places e.g. 75.65). Where there is no fuel in a particular category leave the cell blank. When you have completed this section cell C42 should show 100.00.

INTERPRETATION OF RESULTS

Annex III(c) of the Directive requires two tests (a) overall efficiency and (b) PES.

- (a) Schemes with a capacity in excess of 25 MWe are required to achieve an overall efficiency of 70% (net calorific value basis). For Schemes of capacity 25 MWe or below there is no requirement to meet an efficiency threshold.
- (b) Schemes may also be required to meet a PES threshold but this is still under discussion so this is yet to be announced (hence PES threshold cell C70 shows TBA).

The calculated values for Scheme S1 appear in the page "S1 Calc". The results in column C (cells C59 & C66) represent the whole CHP Scheme without any scale-back of power outputs. For Schemes that do not meet their QI threshold (Partial Schemes) the calculations are repeated in column E with the power output scaled back to the QPO value as determined under CHPQA.

ANALYSIS OF ADDITIONAL SCHEMES

Additional CHP Schemes may be analysed in the same workbook by use of input data pages "S2 Data" to "S10 Data". The results for all of the Schemes analysed are shown in the "STATS" page.

END