

ESTIMATING EMISSIONS FROM PART B INDUSTRIAL PROCESSES

Summary

Base Year: 2008

Because of lack of recent, representative and reliable activity datasets, atmospheric emissions from Part B Processes for the 2008 base year were not estimated; they were simply assumed to be the same as those in the LAEI 2006 base year (2006). In the LAEI 2006, most of the London boroughs provided updated versions of their activity data for the Part B Processes, which were updated accordingly and integrated into the LAEI 2006.

Projection Years: 2011 and 2015

Because of lack of recent, representative and reliable activity datasets for the 2008 base year, projection of atmospheric emissions from Part B Processes to 2011 and 2015 were not undertaken; instead projections of atmospheric emissions from Part B Processes to 2011 and 2015 were basically assumed to be the same as those in the LAEI 2004 (using 2010 projection).

2008 emission estimation methodology: Same as the LAEI 2006 methodology

The 2008 methodology used to estimate atmospheric emissions from Part B processes mirrors the LAEI 2006 methodology and that used in the original Part B Processes Inventory commissioned by the London Research Centre (LRC) in 1997. Where monitoring data from the Part B Processes have been made available, this has been included in the LAEI 2008. However, in the majority of cases no monitoring data was supplied. In these cases, two techniques were applied to estimate emissions.

Emission factors

US EPA emission factors (*Document AP42: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*)¹ were used to update the LAEI 2004 because these were used in the compilation of the previous inventories. In most cases, the emissions factors are simply averages of all available data of acceptable quality, and were generally assumed to be representative of long-term averages for all facilities in the source category. Where possible, the activity rate for a given process has been obtained. When this has not been available, a process average has been used. For each process, the method of deriving the emission has been noted.

Weight percentages

For processes where volatile organic compounds (VOCs) are considered to be the major air pollutant, a different approach was used to derive the emission. Here, the total amount of VOC consumed annually is assumed to have been vented into the atmosphere. From this unspciated emission, the proportion of different organic compounds within the total emission was derived using a document titled *Emissions*

¹ It is recommended that in future inventory updates the emissions should be converted into UK emission factors to enable comparison between other inventories.

of Volatile Organic Compounds from Stationary Sources in the UK by N R Passant. From this data, it is therefore possible to derive speciated emissions from the annual VOC consumption of a process. When the total VOC consumption has not been available, a process average has been used. Again, for each process, the method of deriving the emission has been noted.

The scope of this work dictated that the Part B processes and their associated throughput that existed in the LAEI 2003 were crudely assumed to remain unchanged in the base year 2004, unless otherwise specified by the local authority. The same applies to incidences where a company name change has been carried out, but the site details and process description remain the same. The limitation being that processes, which have altered their throughput within the last two years, will not be adequately reflected in the LAEI 2004.

Process averages were used to calculate the throughput of processes where data was not provided. There are obvious limitations associated with using this calculation and so it is recommended in order to increase the accuracy and ease of production for future updates of the LAEI that each local authority should be sent a copy of a spreadsheet template for them to fill in and return, either on disk or via Email. The spreadsheet should include the following columns for each process in order to obtain the essential information required to produce an inventory:

- Name of process
- Type of process
- Address
- Postcode
- Eastings
- Northings
- Total Annual Throughput of process

Concerning the throughput of the process, it should be relatively straightforward for each local authority to provide. For example, the total throughput for vehicle re-sprayers would equal the total annual VOC usage in tonnes per annum. In the case of cement batchers, the throughput would correspond to the amount of cement produced per year given as tonnes per annum. Finally, in the case of petrol stations these would need to specify whether they are above 500, 1000 or 2000 cubic metres of petrol delivered per annum.

Process types

- Adhesive coating process
- Aluminium and aluminium alloy processes
- Animal by product rendering
- Asbestos process
- Bitumen
- Blending, packing, batching and/or loading of bulk cement
- Cadmium plating and associated activities

- Cement and lime production
- Ceramic production
- Clinical waste incineration
- Coating in drum reconditioning
- Coating of metals, plastics and wood products
- Combustion
- Concrete crushing
- Cremation
- Di-isocyanate Process
- Drum Manufacturing and Reconditioning
- Dry cleaning
- Fat and oil refining
- Ferrous and non-ferrous metal production and processing
- Foundry process
- Haulage/demolition
- Hot dip galvanising processes
- Incineration
- Industrial
- Manufacture of concrete products
- Manufacture of printing inks
- Manufacture of timber and wood based products
- Melting and casting of non-ferrous metals
- Metal decontamination
- Mobile concrete batching, crushing and screening
- Mobile concrete crushing process
- Oil refinery
- Other coating processes
- Other mineral activities
- Painting and enamelling
- Powder coating
- Printing works
- Quarry processes
- Respraying of road vehicles
- Road stone coating process
- Rubber process
- Timber processing
- Unloading of petrol and/or vapour recovery at storage terminal/service station
- Waste oil burner
- Wood coating
- Wood combustion

Blending, packing, batching and/or loading of bulk cement (PG3/1)

An average throughput of 100,000 tonnes per annum was used for cement works within the M25. This average was derived from calculations submitted by RMC London, a major chain of cement producers. For this process, particulate matter, including PM₁₀, is taken as the only pollutant of concern. Using AP 42, Section 11.12

the total particulate emissions of each cement works was calculated. Calculations were based on a pneumatic conveying of cement to a truck mix facility, and did not include vehicle traffic or wind erosion from storage piles. According to Appendix B.2 (Generalised Particle Size Distributions) of document AP 42, 51% of particulate matter generated through the action of cement batching may be assumed to be PM less than or equal to 10µm, in other words, PM₁₀. The PM₁₀ value has therefore been assumed to be 51% of total suspended particulate.

Waste oil burners

An average throughput has been calculated as 5m³ waste oil per annum. AP 42, Section 1.11 – Space heaters (vaporizing/atomising burners) emission factors were used for the calculation of emissions for waste oil burners. Using this data, PM, PM₁₀, NO_x, SO₂, CO and CO₂ emissions were calculated.

Mobile concrete batching, crushing and screening (PG3/16)

A process average throughput of 160 tonnes/annum has been calculated for the mobile crushing processes. An average of 325 tonnes/annum was used for static concrete crushing processes. AP 42, Section 1.3 emission factors were used for the calculation of emissions.

Wood combustion

A process average throughput of 102 tonnes/annum has been used for the amount of wood combusted. AP 42, Section 1.6 (Wood Waste Combustion in Boilers) emission factors were used for the calculation of emissions for wood combustion processes.

Manufacture of timber and wood based products (PG6/2)

A process average of 5,000m³ wood per annum has been used. Particulate was derived using Appendix B.2 (Generalised Particle Size Distributions) of document AP42.

Powder coating (PG6/31)

Where no monitoring data was available, a process average has been used. This average was established in the original inventory.

Incineration (PG5/1-4)

Where no monitoring data was available, a process average has been used. This average was established in the original inventory.

Unloading of petrol and/or vapour recovery at storage terminal/service stations (PGs 1/13 & 1/14)

There is no emission associated with the normal running of these processes. The London Research Centre (LRC) calculated the saving in emissions that petrol vapour recovery represents. Data was supplied for service stations that have a throughput

over 1,000 tonnes per annum, as these are the only sites that are presently required to have vapour recovery systems installed.

Ferrous and non-ferrous metal production and processing (PG2/4)

A process average throughput of 350 tonnes/annum has been calculated and applied in some instances where a value for the throughput has not been available. AP42, Section 12.5 (Iron & Steel Production) emission factors were used for the calculation of emissions.

Respraying of road vehicles (PG 6/34)

Data from the *Emissions of Volatile Organic Compounds from Stationary Sources in the UK* by N R Passant has been used to derive values for speciated VOCs. In section 1.1 of the document, the weight percent of different compounds within paint solvents is given, as supplied by the paint industry. Multiplying the amount of annual VOC consumption by the corresponding weight percentage then derived a value for the emission of each compound. Where the annual VOC consumption for a given process was not readily available, a process average value has been used. A value for particulate from respraying processes was derived from the AP 42 document, Appendix B.1: 'Particle Size Distribution Data and Sized Emission Factors for Selected Sources'.

Printing works (PG 6/16)

Data from the *Emissions of Volatile Organic Compounds from Stationary Sources in the UK* by N R Passant has been used to derive values for speciated VOCs. In section 1.2 of the document, the weight percent of different compounds within printing solvents is given. Multiplying the amount of annual VOC consumption by the corresponding weight percentage then derived a value for the emission of each speciated compound. Where the annual VOC consumption for a given process was not readily available, a process average value has been used. A value for particulate from printing processes was derived from the AP 42 document, 'Generalized Particle Size Distributions'.

Coating of metals, plastics and wood products (PG6/23)

Data from the *Emissions of Volatile Organic Compounds from Stationary Sources in the UK* by N R Passant has been used to derive values for speciated VOCs. In section 1.1 of the document, the weight percent of different compounds within paint solvents is given, as supplied by the paint industry. Multiplying the amount of annual VOC consumption by the corresponding weight percentage then derived a value for the emission of each speciated compound. Where the annual VOC consumption for a given process was not readily available, a process average value has been used.