

Non-road database: instructions for use

1. Dezember 2015 | Anleitung_Online-Non-Road-DB.docx

von Benedikt Notter, INFRAS

1. Functionality

General information

The online non-road database provides the necessary data for calculating non-road pollutant emissions. It is intended as a tool to support planners (e.g. for preparing environmental impact reports) and to facilitate easy download of the results of the Swiss non-road inventory. The database of the Swiss Federal Office for the Environment (FOEN) forms the basis for this tool, and its structure and methodology are described in FOEN report UW-1519 "Nonroad energy consumption and pollutant emissions".

The tool provides two types of results:

- specific results, i.e. operating hours per machine and year, and emission factors in kg/h, of mobile non-road machinery;
- or total results, i.e. stock, total operating hours (of all machines), and total emissions in tons per annum.

Queries in different degrees of detail are supported.

The following options are available to users:

- Choice of language (German, English, French)
- Selection of parameters
- Aggregation level
- Export of query results

Available datasets

The available datasets are described in the following paragraphs.

- **Result type 1 („Emission factors, specific operating hours...“)** provides information independent of activity data (i.e. number of machines, total operating hours). It is intended for users who want to use their own activity data. With this result type selected, the output comprises the following information:

- Specific operating hours (in hours per machine and year) as an indicator of the intensity of use of a specific type of machine. Users can modify these figures in their applications if necessary. The data are provided at the chosen differentiation and aggregation level, i.e. the appropriate weighted average is produced;
- Specific emission factors (in kilograms per hour) as a basis for calculating pollutant emissions. Again, the appropriate weighted average for the chosen level of aggregation is produced. Three types of emission factors are shown:
 - EF: Emission factors for a machine fleet partially equipped (according to realistic estimates) with particle filters (PF)
 - EF [w/o PF]: Emission factors for a machine fleet without particle filters.
 - EF [with 100% PF] Emission factors for a machine fleet with 100% particle filters.

A detailed description of emission factors can be found in the FOEN non-road report (UW-1519).

- **Result type 2 („Total stock, operating hours and emissions...“)** provides information based on the activity data (i.e. number of machines, total operating hours) of the Swiss non-road inventory. It is intended for easy download of the results of the inventory. With this result type selected, the output comprises the following information:
 - Total stock (per reference year);
 - Specific operating hours (as for result type 1 above);
 - Total operating hours (in 1000 hours per year) of all machines used in Switzerland;
 - Total emissions or fuel consumption (according to the selection made)

2. Application options

2.1. Selection of parameters

Machine category

You can query data from the following machine categories:

Baumaschinen

- 1) Construction machinery
- 2) Forestry machinery
- 3) Garden-care/hobby appliances
- 4) Industrial machinery

- 5) Agricultural machinery
- 6) Navigation machinery
- 7) Railway machinery
- 8) Military machinery

Pollutants/fuel consumption

Sie können Emissionsfaktoren von folgenden Komponenten abfragen:

- 1) HC: Hydrocarbons
- 2) CO: Carbon monoxide
- 3) NOx: Nitrogen oxides
- 4) PM: Particulate matter
- 5) FC: Fuel consumption
- 6) CO₂: Carbon dioxide
- 7) CH₄: Methane
- 8) NMHC: Non-methane hydrocarbons
- 9) N₂O: Nitrous oxide
- 10) C₆H₆: Benzene

Reference years

You can query data for the period 1980 to 2050 in five-year intervals.

2.2. Aggregation level

The data can be queried based on four segmentation criteria (machine type, motor type, engine capacity and emission concept).

- "Aggregated" means that you will receive mean values weighted across all sub-categories for the specific operating hours and emission factor.
- "Differentiated" means that you will receive a figure per sub-category (provided corresponding values are available).

Machine/appliance type

The stock of all machines is differentiated by machine types. Each machine type is allocated to a particular machine category. For a detailed listing of all machine and appliance types, please refer to Appendix 2 of the non-road report. The database distinguishes 119 machine types.

Engine type

The nonroad database distinguishes the following engine types:

- 4-stroke petrol engines
- 2-stroke petrol engines
- Diesel engines
- Liquid gas engines
- Steam engines (fuelled with extra-light heating oil)
- Electric motors

Engine capacity

In the nonroad database, machines with a similar nominal engine capacity (power) are grouped together. This classification by capacity range is based on the groupings used in emission legislation. The main capacity ranges are as follows:

- for 2-stroke petrol engines: <20 ccm, 20-50 ccm, >50 ccm
- for 4-stroke petrol engines: <66 ccm, 66-100 ccm, 100-225 ccm, >225 ccm
- for diesel engines and electric motors: <18 kW, 18-37 kW, 37-75 kW, 75-130 kW, 130-300 kW, 300-560 kW, >560 kW

Emission concepts

The inventory of non-road mobile machinery in Switzerland contains machines and appliances of different ages (i.e. years of manufacture). Depending on the year of manufacture, different emission levels apply, i.e. a machine's specific emission level is higher or lower. Machines of the same age group and with similar emission levels have been grouped together.

2.3. Running queries and exporting results

To run a query, press the "Start query" button. The result will be displayed on screen if it comprises up to 1000 lines of data. If the result comprises more than 1000 lines, only the download link (see below) is shown.

Exporting and saving results

Above the table containing the results of your search you will see a link called "Download table in CSV format". Click this link to save the result as a CSV file (which can be opened in MS Excel) in a directory of your choice.