

UBA R+D Project FKZ 204 67 456 / 02

OECD Matrix Project

Branch- and product-related emission estimation tool for manufacturers, importers, and downstream users within the REACH-system

Supplement M5

IT System Manual (Part I), IT Design Document (Part II) (project part B2)

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This publication is part of the OECD Matrix Project (“Branch- and product-related emission estimation tool for manufacturers, importers, and downstream users within the REACH-system”, UBA R+D Project FKZ 204 67 456).

The results of the OECD Matrix Project are documented in a summary report with six supplements.

The **summary report** contains the main results of the OECD Matrix Project

The additional reports (**supplement M1 – M6**) refer in detail to specific parts of the OECD Matrix Project:

Supplement M1: Results of Project Part A

Supplement M2: Results of Project Part B1

Supplement M3: The ESD Matrix

Supplement M4: Manual for Emission Estimation, Plastic Additives (project part B2)

Supplement M5: IT System Manual (Part I), IT Design Document (Part II) (p. part B2)

Supplement M6: Document Emission Estimation Photochemicals (project part B2)

The summary report and the supplements are available as a zip-file. Please contact us.

R+D Project FKZ 204 67 456/02

**Branch- and product-related emission estimation tool for
manufacturers, importers, and downstream users within
the REACH-system
OECD Matrix Project**

**IT System Manual
for the Emission Estimation Tool (EET)
Part I of Supplement M 5**

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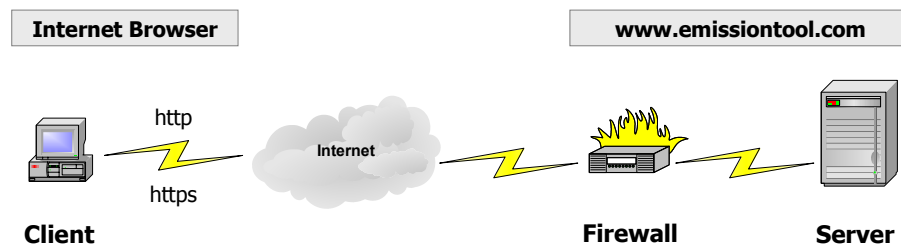
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1. System Architecture

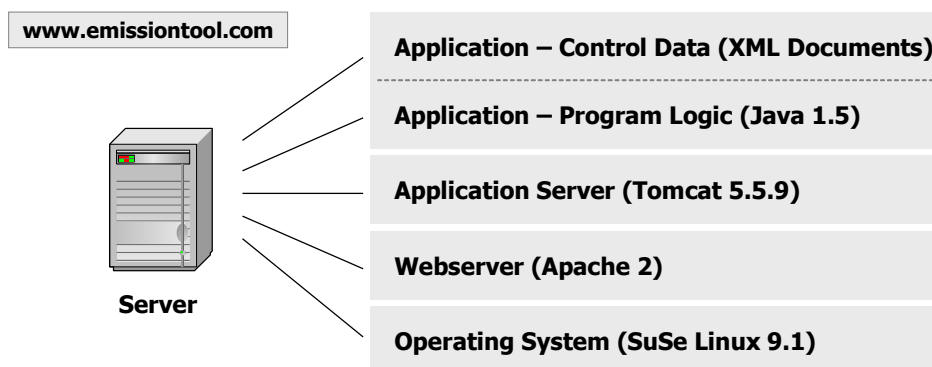
The Emission Estimation Tool (EET) is a web based application.

It is the central component of the *Emission Estimation Website*. This website has been set up in the framework of this R&D project. It is installed on a web server and will be kept available to the public at least for the upcoming 24 months.

Using the standard http protocol, the Emission Estimation Website can be found at the URL: <http://www.emissiontool.com> (http). Alternatively, a secure connection via SSL can be established to <https://www.emissiontool.com>.



The Emission Estimation Website resides on a Linux / Apache based web server (SuSe Linux 9.1/ Apache 2.0.49).



The software architecture of the EET web application relies entirely on open source products, using the following software components:

- Tomcat 5.5.9 has been chosen as servlet engine. It is connected to the Apache web server via the JK connector 1.2.6. All requests targeted at www.emissiontool.com are automatically redirected to the Tomcat Engine, allowing for URLs without port specification.

Two separate web applications are installed in the Tomcat working directory:

/tool	comprising the EET and all static pages,
/jforum	providing for the user forum of the website.

- Both web applications (EET and the user forum) are based on Java 5 (jdk 1.5.0_04). In addition, the EET web application uses Struts (1.2.8) as a framework.

The user forum web application is adopted from the JForum (2.1.4) open source discussion board. It has been configured to meet the specific needs of an EET discussion board.

2. Installation Guide

As explained above (see chapter 1.1), the Emission Estimation Website will be kept online and maintained for at least 24 months.

Therefore, the authors do not expect a need for Umweltbundesamt to set up another installation of the website with its components.

Should – for any reasons - this need arise, an installation can be carried out according to the following guideline:

Prerequisites

- The deployment server should have a unix based OS (a Linux distribution like SuSe, RedHat), HP-UX, Tru64 or the like).
- An Apache webserver (min. version 2.x) has to be installed.
- All system services which support typical web server tasks should be configured and maintained. This includes security services. Of course, the implementation of a firewall is highly recommendable. Incoming requests addressing the Emission Estimation Website with all its components can (and should) be restricted to http (port 80), https (port 443) and ftp (port 21) traffic.
- For https support, a server certificate should be provided. Use a qualification level according to your policies.

- For deployment of the binary distribution, a Java runtime environment is sufficient (JRE, min. version 1.5.x). If server based compilation of the source distribution is an option, the full Java development kit will be needed instead (JDK, min. version 1.5.x).
- The Tomcat servlet engine has to be installed on the deployment server (min. version 5.0.x, version 5.5.x or higher recommended). The CATALINA_HOME system variable should point at the location of the tomcat installation (placeholder: \$TOMCAT_HOME). The access port for requests addressing tomcat has to be configured in the tomcat's server.xml file, located at \$TOMCAT_HOME/conf.

```
<Connector port="{port number, e.g. 8090}" maxThreads="150"
minSpareThreads="25" maxSpareThreads="75" enableLookups="false"
redirectPort="8443" acceptCount="100" debug="0" connectionTimeout="20000"
disableUploadTimeout="true" />
```

Installation

- For access via the Apache webserver (without addressing a specific port number), an Apache Tomcat connector module will be needed. We recommend the JK connector in its current version (1.2.6 has been tested successfully under SuSe Linux 9.1 with Apache 2.0.49). The JK connector is an open source component and can be downloaded from the website of the apache foundation at the following URL:

<http://www.apache.org/dist/jakarta/tomcat-connectors/jk/binaries/linux/jk-1.2.6/>.

Installation instructions are delivered with the download.

- The EET web application uses Struts, a commonly accepted framework for the separation of presentation and business logic layers in Java applications. Struts is an open source component. If not already installed on the deployment server, it can be downloaded from the website of the Apache foundation at the following URL:

<http://struts.apache.org/download.cgi>

Struts 1.2.8 has been successfully tested with the EET web application, higher versions should also comply. Unzip the download into a directory of your choice (placeholder: \$STRUTS_DIST).

Attn.: If the Struts framework is only needed for use with the EET web application, it is not necessary to download and install Struts from the Apache site. Instead, all Struts related files will be automatically installed together with the binary distribution of the Emission Estimation Website, as explained below.

- The Emission Tool Website uses a JForum component to provide for an EET user forum. JForum is an open source module which can be downloaded from the following URL:

<http://www.jforum.net/>

After download and installation under the \$TOMCAT_HOME/webapps directory, the JForum web application can be addressed and configured via the installation path (e.g. <http://www.myserver.com/jforum>).

Attn.: Instead of a full manual installation and configuration, we recommend to install the binary distribution (JForum version 2.1.4) on the CD provided with this document. It is already configured to serve as an EET user forum.

The binary distribution of the pre-configured Emission Estimation Website JForum component can be found on the companion CD in the "jforum" folder. It contains a file "jforum-for-eet-v2.1.4.zip". Unzip this file and upload all of the resulting files to a "jforum" subfolder of the \$TOMCAT_HOME/webapps directory on the deployment server. Observe to maintain exactly the same subfolder structure as defined in the zip archive.

In the \$TOMCAT_HOME/webapps/jforum/WEB-INF folder, open the file "log4j.xml" in an editor and look for the following lines:

```
<appender name="jforum.log" class="org.apache.log4j.RollingFileAppender">
  <param name="MaxFileSize" value="1024KB"/>
  <param name="MaxBackupIndex" value="4"/>
  <param name="File" value="/tomcat/webapps/jforum/jforum.log"/>
```

Compare the path shown in the last line with your settings. If a logical path called "/tomcat" pointing to the \$TOMCAT_HOME directory has been defined within your operating system, no adjustments should be necessary.

- Finally, the EET web application has to be installed. A binary distribution can be found in the "tool" subfolder on the companion CD. This distribution is intended for deployment of the EET application. This folder contains a file "eet-binary-dist-v1.0.zip". Unzip this file to a local folder and upload its full contents, including all subfolders, to a "tool" subfolder of the \$TOMCAT_HOME/webapps directory on the deployment server. Take care to maintain the same subfolder structure as defined in the zip archive.

In the \$TOMCAT_HOME/webapps/tool/WEB-INF/classes folder, open the file "log4j.properties" in an editor and look for the following lines:

```
log4j.appender.file=org.apache.log4j.RollingFileAppender
log4j.appender.file.File=/tomcat/webapps/tool/log/emissiontool.log
```

Compare the path shown in the second line with your settings. If a logical path called "/tomcat" pointing to the \$TOMCAT_HOME directory has been defined within your operating system, no adjustments should be necessary.

3. Contents of the companion CD

This attachment is delivered together with a CD. In case the CD is missing in your copy of the report, you are invited to order it via e-mail (eet@chemiedaten.de).

The CD contains all components needed for another installation of the Emission Estimation Website, together with the source code documentation and the XML files containing all control data of the program logic.

All information contained on the CD belongs to the Umweltbundesamt and Chemie Daten company. No part of this information may be distributed further or used outside the specific scope of this project without prior written permission by Umweltbundesamt.

3.1. Installation files

/tool/eet-binary-dist-v1.0.zip

This zip file contains all files necessary for the application to run in a prepared Apache / Tomcat environment and with Struts installed, as described in the Installation Guide.

3.2. Documentation of the program logics

The source code documentation is delivered in the JavaDoc format according to the current standards. The JavaDoc consists of various html documents and can be found in the /javadoc folder of the CD. You can access the documentation directly from the CD by opening the file "index.html"

Should it be necessary to access the source files as such, please contact us using the following e-mail address: eet@chemiedaten.de.

3.3. XML control data

The program logic has been designed in a highly flexible way to provide the option to adjust all user dialogs and calculations performed to current demands, as well as to set up further emission scenarios for different industry branches without having to change the Java source code.

The XML format has been used to store all specific logic of the emission scenarios implemented so far. Even if you have no profound IT background, it might be interesting to catch a glimpse of the XML control data files. For this purpose, the following three XML files are contained on the companion CD (see folder /xml-control-data).

- **config.xml**

In this file, all elements of the user dialogs are defined in all details. In all user dialogs of the EET web application, the term 'item' refers to single topics separated from each other by horizontal grey-coloured lines. For the items concerned, config.xml contains references to look-up tables or underlying calculations.

- **lookup-config.xml**

In this file, all elements of the look-up tables are defined in full detail (see references to these tables, as established in config.xml).

- **calc-config.xml**

In this file, all calculations performed in the EET web application are thoroughly defined (see references to calculations, as defined in config.xml).