Works 2013

# Landfill gas

***Version 7.0.0***



# USER GUIDE



TECHNO logismiki
Advanced Technical Software

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# Landfill gas

*TechnoLogismiki*

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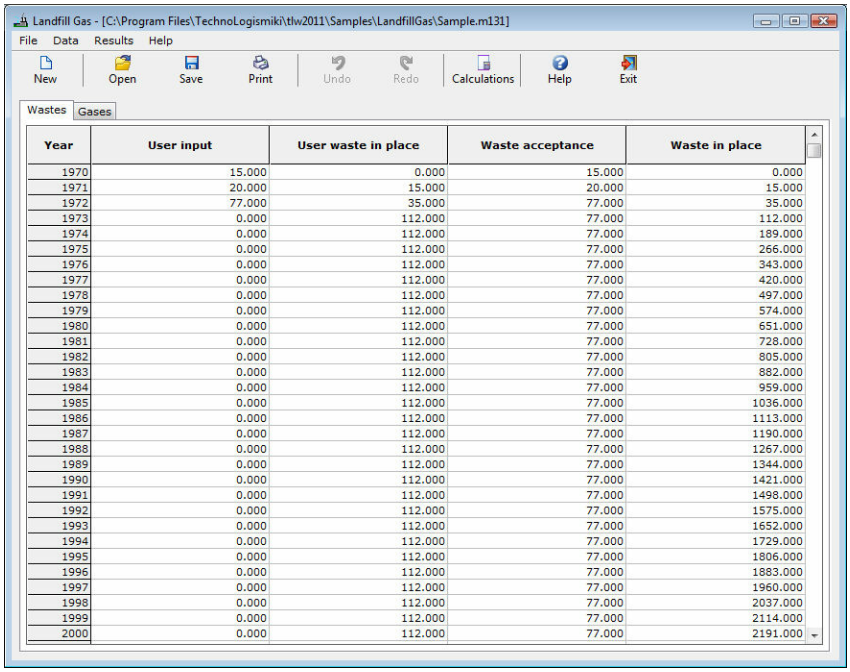
# 1 About the program

## 1.1 What does the program do?

This program is based on the well-known EPA LandGEM v3.02 model. It is an automated estimation tool that can be used to estimate emission rates for total landfill gas, methane, carbon dioxide, non-methane organic compounds and individual air pollutants from municipal solid waste (MSW) landfills.




| Year | User input | User waste in place | Waste acceptance | Waste in place |
|---|---|---|---|---|
| 1970 | 15.000 | 0.000 | 15.000 | 0.000 |
| 1971 | 20.000 | 15.000 | 20.000 | 15.000 |
| 1972 | 77.000 | 35.000 | 77.000 | 35.000 |
| 1973 | 0.000 | 112.000 | 77.000 | 112.000 |
| 1974 | 0.000 | 112.000 | 77.000 | 189.000 |
| 1975 | 0.000 | 112.000 | 77.000 | 266.000 |
| 1976 | 0.000 | 112.000 | 77.000 | 343.000 |
| 1977 | 0.000 | 112.000 | 77.000 | 420.000 |
| 1978 | 0.000 | 112.000 | 77.000 | 497.000 |
| 1979 | 0.000 | 112.000 | 77.000 | 574.000 |
| 1980 | 0.000 | 112.000 | 77.000 | 651.000 |
| 1981 | 0.000 | 112.000 | 77.000 | 728.000 |
| 1982 | 0.000 | 112.000 | 77.000 | 805.000 |
| 1983 | 0.000 | 112.000 | 77.000 | 882.000 |
| 1984 | 0.000 | 112.000 | 77.000 | 959.000 |
| 1985 | 0.000 | 112.000 | 77.000 | 1036.000 |
| 1986 | 0.000 | 112.000 | 77.000 | 1113.000 |
| 1987 | 0.000 | 112.000 | 77.000 | 1190.000 |
| 1988 | 0.000 | 112.000 | 77.000 | 1267.000 |
| 1989 | 0.000 | 112.000 | 77.000 | 1344.000 |
| 1990 | 0.000 | 112.000 | 77.000 | 1421.000 |
| 1991 | 0.000 | 112.000 | 77.000 | 1498.000 |
| 1992 | 0.000 | 112.000 | 77.000 | 1575.000 |
| 1993 | 0.000 | 112.000 | 77.000 | 1652.000 |
| 1994 | 0.000 | 112.000 | 77.000 | 1729.000 |
| 1995 | 0.000 | 112.000 | 77.000 | 1806.000 |
| 1996 | 0.000 | 112.000 | 77.000 | 1883.000 |
| 1997 | 0.000 | 112.000 | 77.000 | 1960.000 |
| 1998 | 0.000 | 112.000 | 77.000 | 2037.000 |
| 1999 | 0.000 | 112.000 | 77.000 | 2114.000 |
| 2000 | 0.000 | 112.000 | 77.000 | 2191.000 |

The program contains two sets of default parameters, CAA defaults and inventory defaults. The CAA defaults are based on federal regulations for MSW landfills laid out by the Clean Air Act (CAA) and can be used for determining whether a landfill is subject to the control requirements of these regulations. The inventory defaults are based on emission factors in EPA's "Compilation of Air Pollutant Emission Factors (AP-42)" and can be used to generate emission estimates for use in emission inventories and air permits in the absence of site-specific test data.

## 1.2 Minimum requirements

The minimum requirements for the usage of the programs are the following:

- Windows 2000/ XP/ 2003/ Vista/ 7 (for each case, the latest service packs, updates & patches must be installed)
- Pentium III 800 MHz
- 800x600 with 256 color palette
- 700 MB free disk space
- CD-Rom

If your system does not meet one or more of the above requirements, it is highly recommended that you upgrade it before installing the programs. The recommended system configuration is the following:

- Windows 2000/ XP/ 2003/ Vista/ 7 (for each case, the latest service packs, updates & patches must be installed)
- Pentium IV 2.0 GHz
- 1280x768 with 16-bit color palette
- 1.2 GB free disk space
- CD-Rom
- Internet connection

## 1.3 Technical support

**Support through the Internet**

TechnoLogismiki offers technical support 24 hours per day, 365 days per year, through the web site where you can get information on the latest programs and services.

**Support by e-mail**

Please use the dedicated e-mail addresses for better customer service:

- for questions regarding sales: sales@technologismiki.com
- for questions regarding the usage of programs: support@technologismiki.com
- for any other question or comment: info@technologismiki.com

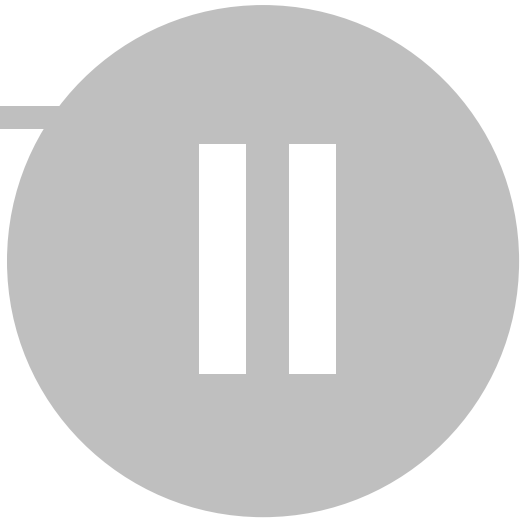
The normal response time is within two business days. If your inquiry cannot be answered by e-mail, a customer service representative will contact you by telephone.

**Interactive Support**

Business days, 09:00 - 17:00 Eastern European Time:

- Telephone [3 lines]: ++30-210-656-4147
- Fax: ++30-210-654-8461
- Address: 5, Imittou street, Cholargos, 15561, Athens, Greece.

# Chapter



# 2 File

## 2.1 File menu

With this menu, you can perform file operations and print reports. In the **File** menu you can select one of the following options:

- New project
- Open project
- Save project
- Save project as
- Print setup
- Print
- Print to
  - Print to file
  - Print to Word
  - Print to Word (Formatted)
  - Print to Excel
- Exit

## 2.2 New project

With this option, a new project is started. All data, results, graphs, titles etc. of the previous project are erased.

To create a new project:

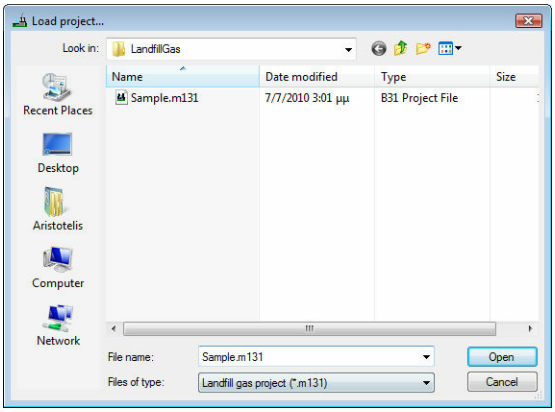
**1.** Select **New project** from the **File** menu.
**2.** If a project is already loaded and changes have been made, a warning message will appear that asks the user whether to save the changes or not.
**3.** The current project is erased and a new project is started.

## 2.3 Open project

With this option, an existing project is loaded. The project may be located locally, in a network or in an external media device such as a CD-Rom. If a project is already loaded and changes have been made, a warning message will appear that asks whether to save the changes or not. When a project is loaded, all data of the previous project are lost.

To open an existing project:

**1.** Select **Open project** from the **File** menu.
**2.** Select the path of the file.
**3.** Select the file type from the **Files of type** drop-down list. The default option is "Landfill gas project" with the extension .m31.
**4.** Select the file by clicking on it.
**5.** Select **Open** to open the selected file. Select **Cancel** to cancel the operation.




**NOTE**: You can find sample projects in the installation folder of the program:
C:\Program Files\TechnoLogismiki\TLW2013\Samples\LandfillGas

**Supported file types**

- **M31** (Landfill gas project): Files created by Landfill Gas version 2012 and 2013.
- **M131** (Landfill gas project): Files created by Landfill Gas versions 2011, 2010, 2009, 2008 or 2007.
- **BCK** (Backup files): If you have selected from program options the creation of backup copy when a file is loaded, then the file can be loaded by selecting Backup files (*.bck) from the Files of type drop-down list.
- ***.*** (All files): Displays all files in the current folder.

**NOTE**: If a message "Could not load project. File may be corrupt or saved by an unknown or incompatible version of the program" then either you are trying to load a project that does not belong to this program or the file is used (and locked) by another process in your computer.

## 2.4 Save project

With this option, you can save all data of a project into a file. The file may be saved locally, in a network location or in an external media device such as a disk.

The filename and path will be asked only the first time you are saving a project. When the filename and path are set, all subsequent saves will be made to the same file.

When you want to rename a file or save it in a new location, use Save project as... from the **File** menu.

To save the current project:

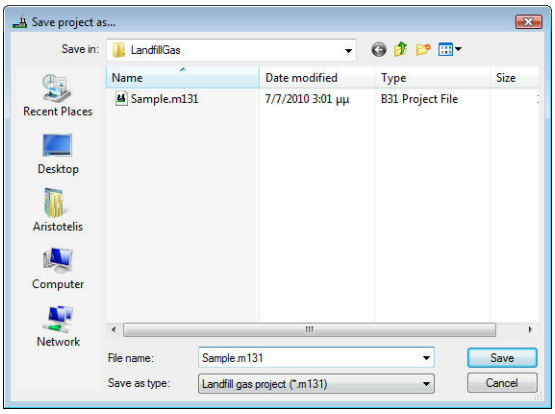
**1.** Select **Save project** from the **File** menu.
**2.** If the location of the file is already set, the project is saved to this file without any messages. If the filename is not set, a dialog box will appear that allows the selection of the filename and path.

## 2.5 Save project as

With this option, the current project is saved just as in the case of Save project, but with the difference that the name and/or location of the file can be changed. In this way, you can create backup files or move a project to another media device.

To save a project with another name and/or to another location:

**1.** Select **Save project as** from the **File** menu.
**2.** Select the path of the file.
**3.** Type the filename in the **File name** text box.
**4.** Select **Save** to save the project with the selected filename and path. Select **Cancel** to cancel the operation.



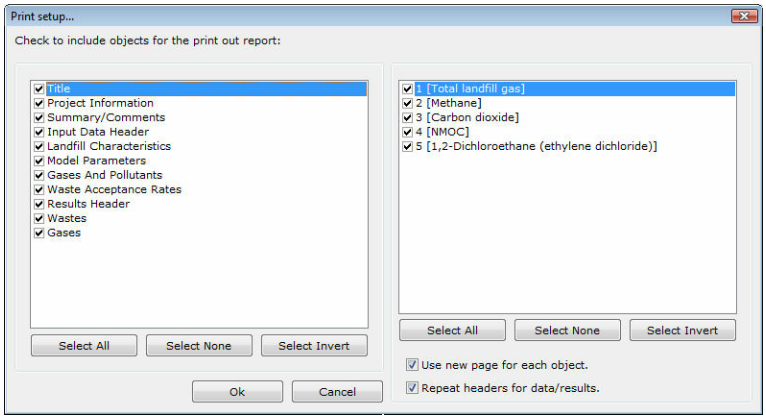

**NOTE**: If a file with the same name and in the same path already exists, a warning message will appear that asks whether to overwrite the file or not. If you answer Yes, then the existing file is erased and the new file takes its place. If you answer No, the existing file remains intact but NO changes of the current project are saved.

## 2.6 Print setup

With this option, you can select which parts of the project will be included in the printouts. When a new project is created, a full report is selected by default.

To modify the print setup:

**1.** Select **Print setup** from the **File** menu.
**2.** Select the **sections** (Title, Project information etc) that will be printed for each solution, from the list on the left.
**3.** Select the **gases** that will be included in the report from the list on the right.
**4.** Check **Use new page for each object** if you want to use a new page for each solution in the report.
**5.** Check **Repeat headers for data/results** if you want to repeat the headers when large tables span multiple pages.
**6.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.




The quick keys (**Select all, Select None, Select Invert**) can be used to quickly select all objects, deselect all objects and invert the current selection of a list.

**NOTE**: The changes are saved with the project. The above preferences are used to all printouts, either to the printer or to other formats such as Word file, Excel file etc.

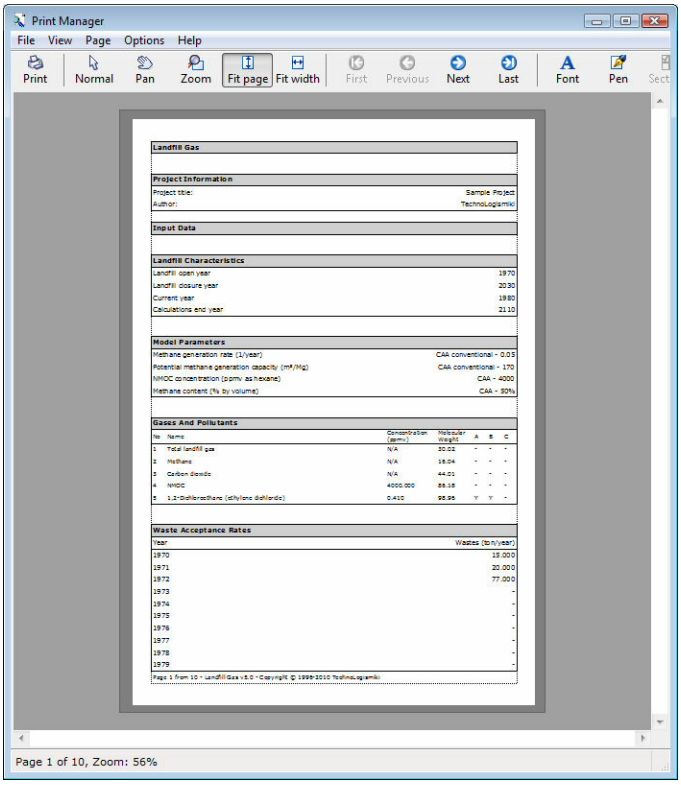
## 2.7 Print

With this option, you can prepare a report to be printed to a local, network or virtual printer such as Adobe PDF Writer. The parts of the project that will be included in the report are determined from print setup.

By selecting **Print**, the report is not printed directly; instead, a document is prepared and a preview of the printout is created by the **Print manager.** You can print the report by clicking the **Print** button of the toolbar of **Print manager.**

To create a report:

**1.** Select **Print** from the **File** menu.
**2.** A report is prepared and sent to **Print manager.** A preview of the document appears.
**3.** You can print the report by clicking the **Print** button of the toolbar.




**NOTE**: A complete user manual on the capabilities of **Print manager** can be found in the corresponding help file.

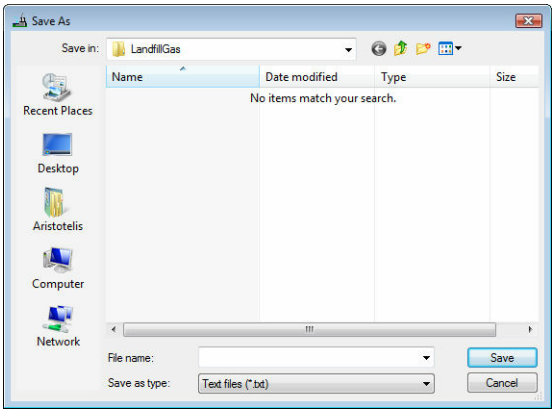
## 2.8 Print to

### 2.8.1 Print to File

With this option, you can create a simple text file containing a report of the project. This file is recognized and can be further modified by word processors such as Microsoft Word, OpenOffice Writer etc.

To print to a text file:

**1.** Select **Print to** from the **File** menu.
**2.** Select **Print to file** from the **Print to** menu.
**3.** Select the path of the file.
**4.** Type the filename in the **File name** text box.
**5.** Select **Save** to create the file.




The parts of the project that will be included in the report are determined from print setup.

**NOTE**: If a file with the same name and in the same path already exists, a warning message will appear that asks whether to overwrite the file or not. If you answer Yes, then the existing file is erased and the new file takes its place. If you answer No, the existing file remains intact but the report is NOT printed.

### 2.8.2 Print to Word

If Microsoft Word (version 97, 2000, XP, 2003 or later) has been installed in the system, then a Microsoft Word file containing the report can be created. Note that Microsoft Word is a separate program and it is not included in TechnoLogismiki's products. Moreover, no technical support is offered regarding the usage of Microsoft Word.

To print the report to a Microsoft Word file:

**1.** Select **Print to** from the **File** menu.
**2.** Select **Print to Word** from the **Print to** menu.

The parts of the project that will be included in the report are determined from print setup.

### 2.8.3 Print to Word (Formatted)

If Microsoft Word (version 97, 2000, XP, 2003 or later) has been installed in the system, then a Microsoft Word file containing the report can be created. Note that Microsoft Word is a separate program and it is not included in TechnoLogismiki's products. Moreover, no technical support is offered regarding the usage of Microsoft Word.

To print the report to a formatted Microsoft Word file:

**1.** Select **Print to** from the **File** menu.
**2.** Select **Print to Word (Formatted)** from the **Print to** menu.

The parts of the project that will be included in the report are determined from print setup. This operation is much slower than the regular print to word function. However, the final output requires minimal user intervention as it comes fully formatted with tables, alignment, font styles, etc.

**NOTE**: Do not use Copy (CTRL+C) on any of the programs running during this operation. If you do so, it will most likely affect the communication between Microsoft Word and the clipboard and as a result the final document will be corrupt.

### 2.8.4 Print to Excel

If Microsoft Excel (version 97, 2000, XP, 2003 or later) has been installed in the system, then a Microsoft Excel file containing the report can be created. Note that Microsoft Excel is a separate program and it is not included in TechnoLogismiki's products. Moreover, no technical support is offered regarding the usage of Microsoft Excel.

To print the report to a Microsoft Excel file:

**1.** Select **Print to** from the **File** menu.
**2.** Select **Print to Excel** from the **Print to** menu.

The parts of the project that will be included in the report are determined from print setup.

## 2.9 Exit

With this option, you can exit the program. If there are changes in the current project that have not been saved then the program will:

- either ask the user to save the changes
- or save the changes
- or ignore the changes

depending on what you have selected in General preferences.

To exit the program:

**1.** Select **Exit** from **File** menu.
**2.** If you are asked whether to save the changes or not, you can save changes or ignore them.
**3.** The program is terminated.

# Chapter

# 3 Data

## 3.1 Data menu

With this menu, you can add and modify data. In the **Data** menu you can select one of the following options:

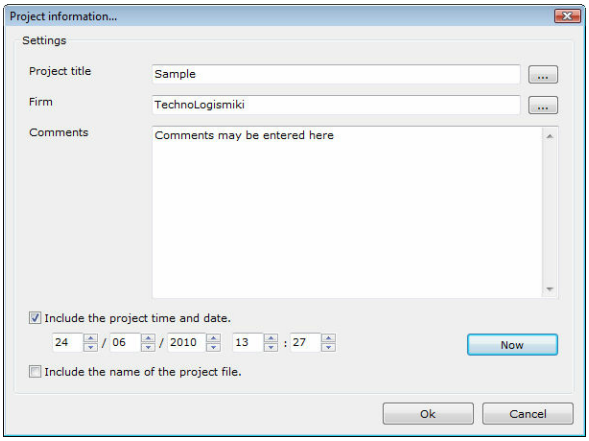
- Project info
- Undo
- Redo
- Landfill characteristics
- Model parameters
- Gases and pollutants
- Waste acceptance rates
- Units
  - Metric
  - English
- Options
  - General preferences
  - Grid editing
  - Customize toolbar

## 3.2 Project info

With this option, you can add project information that include, optionally, title, author and comments. If you want, this information can be included in the reports. The empty fields are ignored.

To add or modify the project information:

**1.** Select **Project info** from the **Data** menu.
**2.** Type the project title, author and comments.
**3.** Check **Include project time and date** if you want to include the time and date in the project.
**3.1.** Type the day, month, year, hours and minutes in the corresponding text boxes. Alternatively, you may click on the up/down arrows to increase or decrease the respective value in the text box.
**3.2.** If you click on **Now** then all text boxes are filled with the current values automatically.
**4.** Check **Include the name of the project file** if you want the full path and filename of the project to be included in the report.
**5.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.



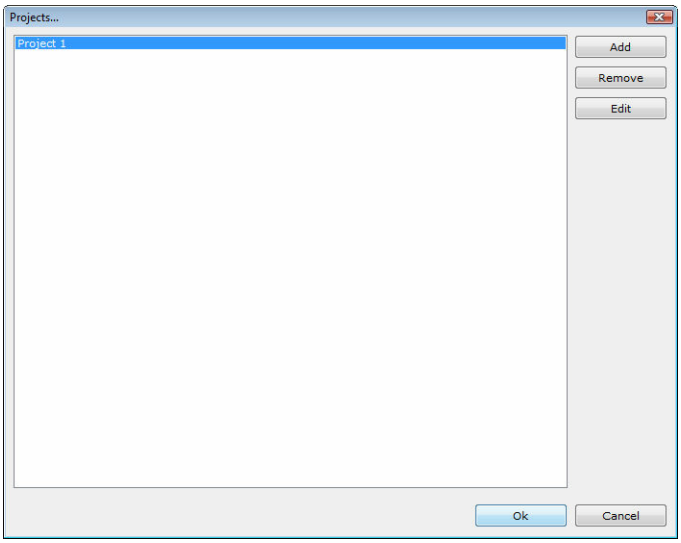

By selecting the buttons with the ellipses (...) next to the project title and author, you can access the corresponding databases.

### Project title database

For the completion of a project, more than one programs may be needed. For convenience, you can add the project title to the database and retrieve it from all programs.

To use the project title database:

**1.** Select the button with the ellipses (...) next to the project title text box. The project title database appears.
**2.** Select **Add** to add a new title to the database.
**3.** Select **Remove** to remove the selected entry from the database. You will be asked for confirmation only if you have selected to confirm deletions in the General preferences tab.
**4.** Select **Edit** to modify the selected entry.
**5.** Select **Ok** to use the currently selected project title and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.

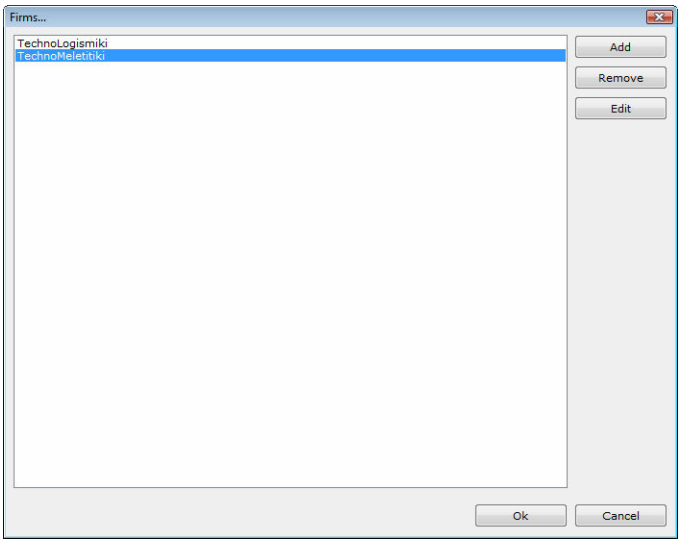



### Author database

An engineer may be involved in multiple projects. For convenience, you can add the author name to the database and retrieve it from all programs.

To use the author database:

**1.** Select the button with the ellipses (...) next to the author text box. The author database appears.
**2.** Select **Add** to add a new author to the database.
**3.** Select **Remove** to remove the selected entry from the database. You will be asked for confirmation only if you have selected to confirm deletions in the General preferences tab.
**4.** Select **Edit** to modify the selected entry.
**5.** Select **Ok** to use the currently selected author and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.




## 3.3 Undo

Undo cancels the last committed change in the project.

To cancel the last committed change:

**1.** Select **Undo** from the **Data** menu.
**2.** The last committed change is canceled.

To cancel an undo command, you may use the redo function which is described below. Redo becomes available once undo is used.

It is possible to undo more than one recent changes and to redo them, by following the step described above. The number of actions that are kept in memory and may be undone or redone is 20 by default. This means that the program is able to keep track of up to 20 successive changes and undo them. This number may change for all programs, using the option in the main menu. For more information, please consult main menu user guide.

**NOTE**: Some changes cannot be undone like the new project or the save project

functions.

## 3.4 Redo

Redo cancels the latest undo command.

To redo the latest change that was undone:

**1.** Select **Redo** from the **Data** menu.
**2.** The latest undone change is redone.

To undo a redo, you may use the undo command.

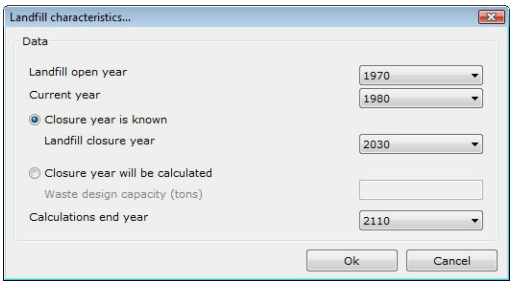
It is possible to redo more than one changes that were previously undone by following the steps described above. The number of actions that are kept in memory and may be undone or redone is 20 by default. This means that the program is able to keep track of up to 20 successive changes that are undone and redo them. This number may change for all programs, using the option in the main menu. For more information, please consult main menu user guide.

## 3.5 Landfill characteristics

From the landfill characteristics menu, the user can control the operation status of the landfill.

To edit the landfill characteristics:

**1.** From the **Data** menu, select **Landfill Characteristics**.
**2.** Select the **landfill open year** from the drop-down list. This is a required input and represents the year that the landfill began accepting waste.
**3.** Select the **current year** from the drop-down list. This is a required input and represents the last year that the user can enter a waste acceptance rate.
**4.** Select whether the **closure year** is known or not. If it is known, then it must be supplied by selecting the appropriate value from the drop-down list. If not, it will be calculated by the model, provided that the user supplies a value for the **waste design capacity**.
**5.** Select the **calculations end year** which is a required input. This parameter defines the duration of the calculations, regardless of the landfill closure year. For example, if the calculations end year is set to 2100 and the landfill closure year is set to 2050, then from 2051 to 2100, the model will continue calculating the emitted pollutants from the landfill.
**6.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.



**NOTE**: The model does not have the 80-year limitation in the closure year parameter that the original LandGEM model has.

## 3.6 Model parameters

With this option, you can specify the model's parameters, which are used to calculate the emissions.

To edit the model's parameters:

**1.** From the **Data** menu, select **Model Parameters.**
**2.** Select the **methane generation rate** from the drop-down list. If no preset value is satisfactory, select User Specified from the drop-down list and enter the desired value in the custom rate field below the drop-down list.

The Methane Generation Rate, k, determines the rate of methane generation for the mass of waste in the landfill. The higher the value of k, the faster the methane generation rate increases and then decays over time. The value of k is primarily a function of four factors:

- Moisture content of the waste mass,
- Availability of the nutrients for microorganisms that break down the waste to form methane and carbon dioxide,
- pH of the waste mass, and
- Temperature of the waste mass.

**3.** Select the **potential methane generation capacity** from the drop-down list. If no preset value is satisfactory, select User Specified from the drop-down list and enter the desired value in the custom rate field below the drop-down list.

The Potential Methane Generation Capacity, depends only on the type and composition of waste placed in the landfill. The higher the cellulose content of the waste, the higher the value of Lo. The default Lo values used by the model are representative of MSW. The capacity value, as it is used in the first-order decomposition rate equation, is measured in metric units of cubic meters per mega gram to be consistent with the CAA.

**4.** Select the **NMOC concentration (ppmv as hexane)** from the drop-down list. If no preset value is satisfactory, select User Specified from the drop-down list and enter the desired value in the custom rate field below the drop-down list.

The NMOC Concentration in landfill gas is a function of the types of waste in the landfill and the extent of the reactions that produce various compounds from the anaerobic decomposition of waste. NMOC Concentration is measured in units of parts per million by volume (ppmv) and is used by the model only when NMOC emissions are being estimated. The NMOC Concentration for the CAA default is 4,000 ppmv as hexane. The NMOC Concentration for the inventory default is 600 ppmv where co-disposal of hazardous waste has either not occurred or is unknown and 2,400 ppmv where co-disposal of hazardous waste has occurred.

The default NMOC Concentration is the CAA value. If you use a site-specific value for NMOC concentration, then you must correct for air infiltration. EPA Method 25C is

recommended for obtaining a site-specific concentration of NMOCs.

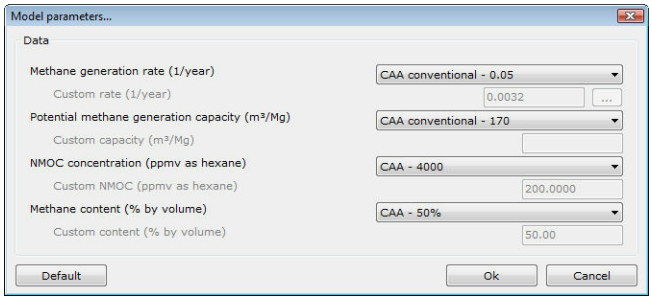
**5.** Select the **Methane content (% by volume)** from the drop-down list. If no preset value is satisfactory, select User Specified from the drop-down list and enter the desired value in the custom rate field below the drop-down list.

For the model, landfill gas is assumed to be 50 percent methane and 50 percent carbon dioxide, with additional, trace constituents of NMOCs and other air pollutants. When using the model for complying with the CAA, Methane Content must remain fixed at 50 percent by volume (the model default value).

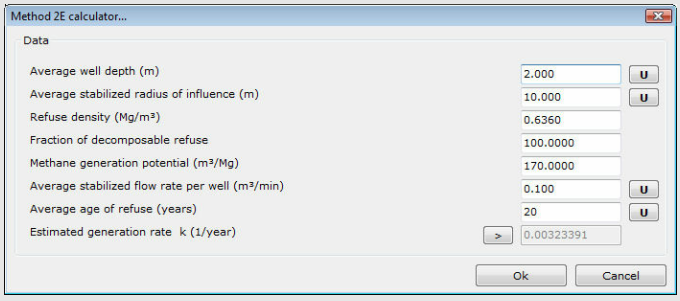
You may choose other methane amounts for the Methane Content using the User-specified selection if data exist to support using another concentration. However, using the model at landfills that have methane content outside the range of 40 to 60 percent is not recommended. The first-order decomposition rate equation used by the model to determine emissions may not be valid outside of this range.

The production of methane is determined using the first-order decomposition rate equation and is not affected by the concentration of methane. However, the concentration of methane affects the calculated production of carbon dioxide. The production of carbon dioxide ($CO_2$) is calculated from the production of methane ($CH_4$) and the methane content percentage ($CH_4$).

**6.** Optionally, you may click on **Default** to set all parameters to their default values.
**7.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.




**NOTE**: If the value of the methane generation rate is unknown, then it can be estimated, using the Method 2E built-in calculator. To use the calculator, set the value of the methane generation rate equal to User Specified, and click the button with the ellipses (...) to invoke the calculator.



**1.** Enter all the required parameters:

**Average Well Depth**: On average, the depth of extraction wells in meters.
**Average Stabilized Radius of Influence**: The radius, in meters, of the assumed cylinder from which the extraction wells will be removing landfill gas.
**Refuse Density**: The mass of refuse contained in a given volume, expressed as Mg/ cubic meter (default is 0.636).
**Fraction of Decomposable Refuse**: The fraction of the landfilled waste that is expected to decompose (default is 1.0).
**Methane Generation Potential**: The amount of methane a given quantity can be expected to produce (default varies depending on mode).
**Average Stabilized flow rate per well**: The flow rate in cubic meters per minute.
**Average Age of Refuse**: The average age of all the landfilled waste. Ideally, this should be calculated using a weighted average.

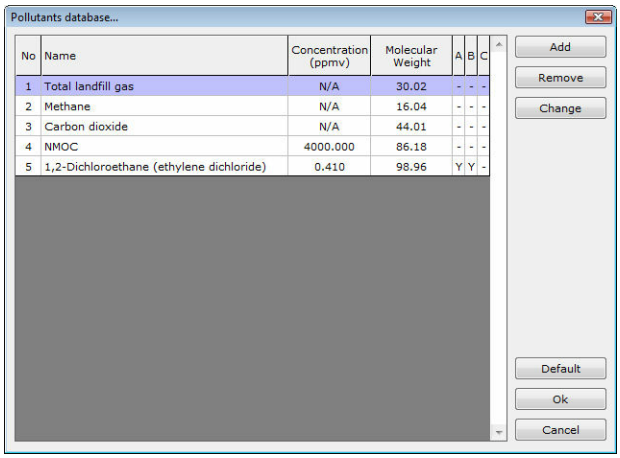
**2.** Click the calculation button **(>)** to estimate the value of the generation rate k.
**3.** When finished, press **Ok** to transfer the calculated value to the respective field of the Model Parameters form. Press **Cancel** to close the form without transferring the value.

## 3.7 Gases and pollutants

With this option, the user can select which pollutants will be calculated and customize their properties.

To manage the pollutants database:

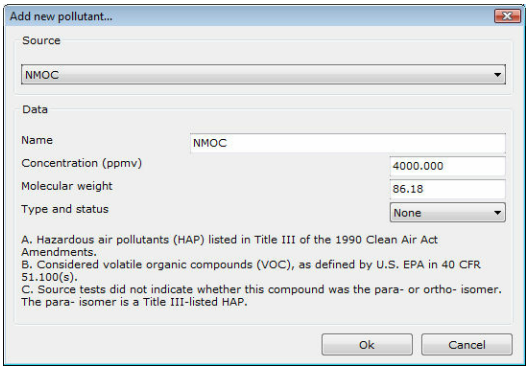
**1.** Select **Gases And Pollutants** from the **Data** menu.
**2.** Pollutants in the list will be calculated by the model. Use the **Add**, **Remove** and **Change** buttons to manipulate the list.
**3.** Optionally, click on **Default** to include only the default pollutants in the calculations.
**4.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.




To add a pollutant, present in the database, to the list:

**1.** Click on the **Add** button.

**2.** Select a pollutant from the drop-down list in the **Source** frame.
**3.** Click **Ok** to add it to the list or **Cancel** to close the form without adding it.




To remove a pollutant from the list:

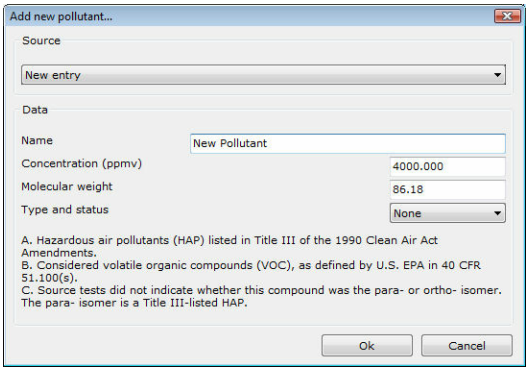
**1.** Select the pollutant that will be removed.
**2.** Click on **Remove**. The model will ask for confirmation if the removal confirmation option has been set in the general preferences.
**3.** The pollutant is removed.

To change an existing pollutant:

**1.** Select the pollutant which is going to change.
**2.** Click on **Change**.
**3.** Make the appropriate changes.
**4.** Click **Ok** to save all changes or **Cancel** to close the form without saving changes.

To add a pollutant, not present in the database, to the list:

**1.** Click on the **Add** button.
**2.** Select the "**New Entry**" record from the drop-down list in the **Source** frame.
**3.** Type-in the pollutant's **name**. This name must be unique. If the name is already taken by another entry in the database an error message will appear.
**4.** Enter the **concentration** of the pollutant in parts per million by volume.
**5.** Enter the **molecular weight** of the pollutant.
**6.** Optionally, select a **status** and **type** combination from the drop down list.
**7.** Click **Ok** to add it to the list or **Cancel** to close the form without adding it.

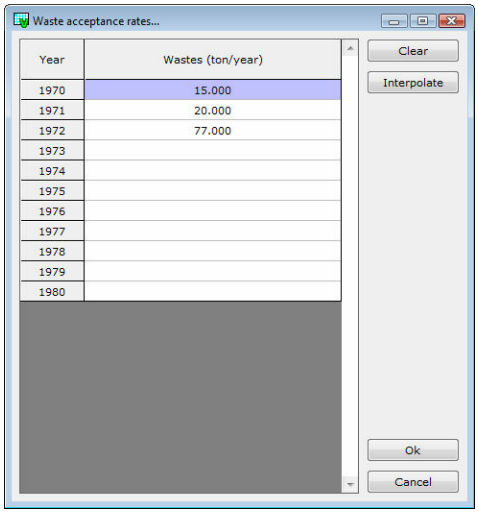


## 3.8 Waste acceptance rates

Enter the waste acceptance rates of the landfill. The available years depend on the landfill open year and current year settings, set in the landfill characteristics form.

To edit the waste acceptance rates:

**1.** From the **Data** menu select **Waste Acceptance Rates**.
**2.** Type-in the desired values.
**3.** Optionally, click on **Clear** to remove all data currently present in the table.
**4.** It is also possible to interpolate between two values of the table. For example, assume that in 1970 the rate is 100 tons/year and in 1980 the rate is 200 tons/year. Between 1970 and 1980 the acceptance rate increases linearly. To perform a linear interpolation, enter 100 next to 1970 and 200 next to 1980. Drag and select the values from 1970 to 1980 and click **Interpolate**.
**5.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.




## 3.9 Units

### 3.9.1 Metric

With this option, the metric unit system is used for both the input data and the results.

To use the metric unit system:

**1.** Select **Units** from the **Data** menu.
**2.** Select **Metric System** from the **Units** menu. The metric unit system is used.

### 3.9.2 English

With this option, the English unit system is used for both the input data and the results.

To use the English unit system:

**1.** Select **Units** from the **Data** menu.
**2.** Select **English** from the **Units** menu. The English unit system is used..

## 3.10 Options

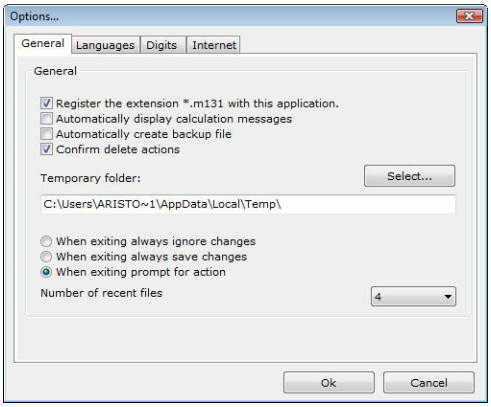
### 3.10.1 General preferences

With this option, you can modify the general preferences of the program.

To modify the general preferences:

**1.** Select **Options** from the **Data** menu.
**2.** Select **General preferences** from the **Options** menu.
**3.** The general preferences dialog box appears. The preferences are grouped into four tabs. You can select a tab by clicking on its name.

**General Tab**




This tab contains general preferences regarding the usage of the program.

Check **Register the extension *.m31 with this application** to associate the extension .m31 with this program. This extension is used by the program when saving a project. In this way, you will be able to run the program and load a project by double-clicking on the project filename in Windows Explorer.

Check **Automatically display calculation messages** if you want report details to be automatically displayed when you calculate the results.

Check **Automatically create backup file** if you want a backup file (with the extension .bck) to be created every time a project is loaded. By default, this file is created in the temporary folder of Windows.

Check **Confirm delete actions** if you want to be asked for confirmation each time an object is about to be deleted.

You can also modify the temporary folder that will be used for the creation of backup files. By default, this folder is the temporary folder of Windows.

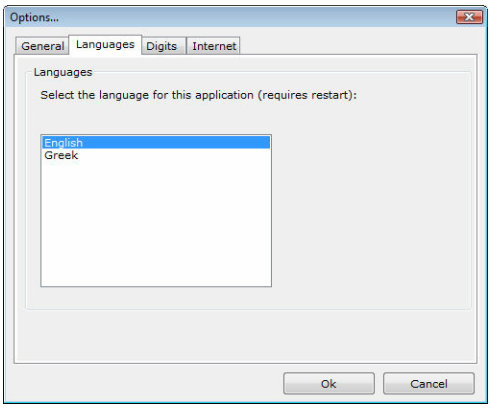
Finally, there are three options regarding the termination of the program:

- **When exiting always ignore changes** - All changes since the last save of the

project are ignored.

- **When exiting always save changes** - All changes in the current project are automatically saved. If the filename of the project is not set, a dialog box will appear that allows the selection of the filename, as when selecting Save project as from the **File** menu.
- **When exiting prompt for action** - If there are changes in the current project, then a dialog box will appear. You can choose to save or ignore the changes. If the filename of the project is not set, a dialog box will appear that allows the selection of the filename, as when selecting Save project as from the **File** menu.

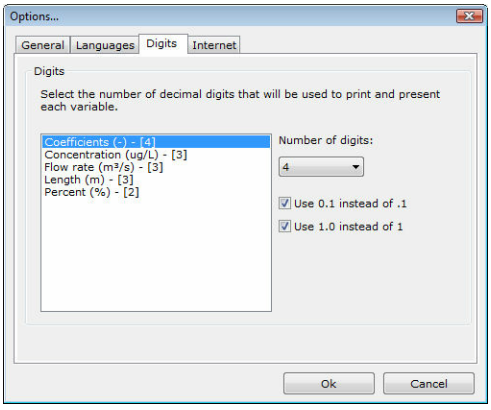
### Languages Tab




If more than one language packs have been installed, then you can choose the language of the program. In the above case, there are two language packs; English (that are already selected) and Greek. If you change the language, all forms, menus, messages, help files will reflect the chosen language.

In order for the changes to take effect, you must restart the program.

### Digits Tab




With this tab, you can modify the way the results are presented. All values used in the program are displayed in the list on the left.

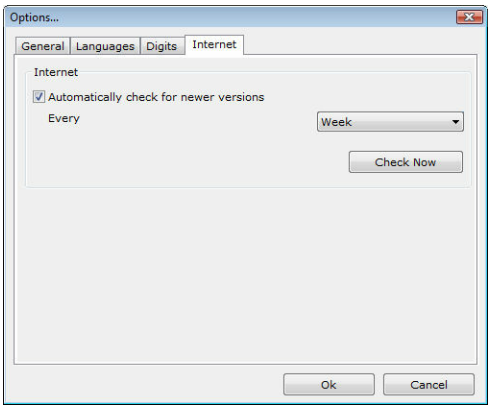
For each value, you can select the number of decimal digits using the **Number of**

**digits** drop-down list.

Check **Use 0.1 instead of .1** to use a preceding zero when displaying numbers between -1 and 1, for example -0.08 instead of -.08 and 0.98 instead of .98.

Check **Use 1.0 instead of 1** to use trailing zeros (when necessary) in order to display a number with the decimal digits selected in the **Number of digits** drop-down list, for example 1.1600 instead of 1.16 (when the number of digits is set to 4).

#### Internet Tab




The program can automatically check for newer versions over the Internet. Check **Automatically check for newer versions** to enable this feature. The check is automatically performed at an interval specified in the **Every** drop-down list. Select **Check now** to manually check for newer versions.

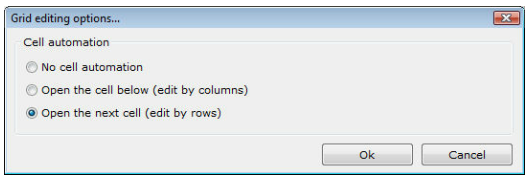
When a newer version is found, you will be prompted to download and install the latest version.

**NOTE**: TechnoLogismiki protects your privacy. During the check for newer versions, no data is transferred from your computer to the Internet.

Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.

### 3.10.2 Grid editing

With this option, you can modify the behavior of grids.




The behaviour of all editable grids is controlled by the preferences in this dialog box.

Select **No cell automation** if you want the active cell to remain the same when hitting ENTER.

Select **Open the cell below (edit by columns)** if you want to activate the cell below

when hitting ENTER. This is particularly useful when editing tables by columns.

Select **Open the next cell (edit by rows)** if you want to activate the next cell on the right when hitting ENTER. This is particularly useful when editing tables by rows.

In some cases, the program may automatically fill some missing values (for example, when performing linear interpolation). In this case, you can select a distinctive color in order to recognize these values. You can choose the color by clicking on the button in the **Auto-complete settings** frame.

**NOTE**: These preferences affect all projects, old and new.

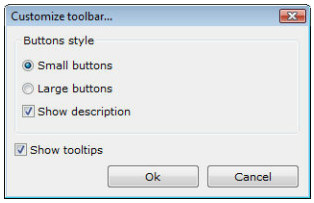
Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.

### 3.10.3 Customize toolbar

With this option, you can customize the toolbar of the main form.

To customize the toolbar of the main form:

**1.** Select **Options** from the **Data** menu.
**2.** Select **Customize toolbar** from the **Options** menu.
**3.** Make the appropriate changes.
**4.** Select **Ok** to apply the changes and close the dialog box. Select **Cancel** to close the dialog box without applying any changes.




The toolbar may contain small or large buttons.

Check **Show description** if you want a small description to be displayed under the buttons.

Check **Show tooltips** if you want tooltips to be displayed when the mouse pointer hovers over a button for 2-3 seconds.

**NOTE**: These preferences affect all projects, old and new.

# Chapter

# 4 Results

## 4.1 Results menu

With this menu, you can perform calculations and view the results. In the **Results** menu you can select one of the following options:

- Perform calculations
- Graphs

## 4.2 Perform calculations

With this option, you can perform calculations. The results are displayed in the main form.

To perform calculations:

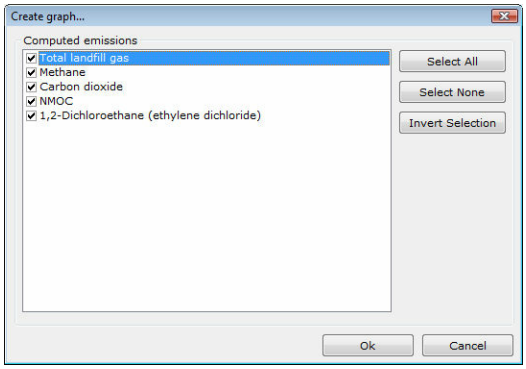
**1.** Select **Perform calculations** from the **Results** menu.
**2.** The calculations are performed and if successful, the results table appear on the main form.

## 4.3 Graphs

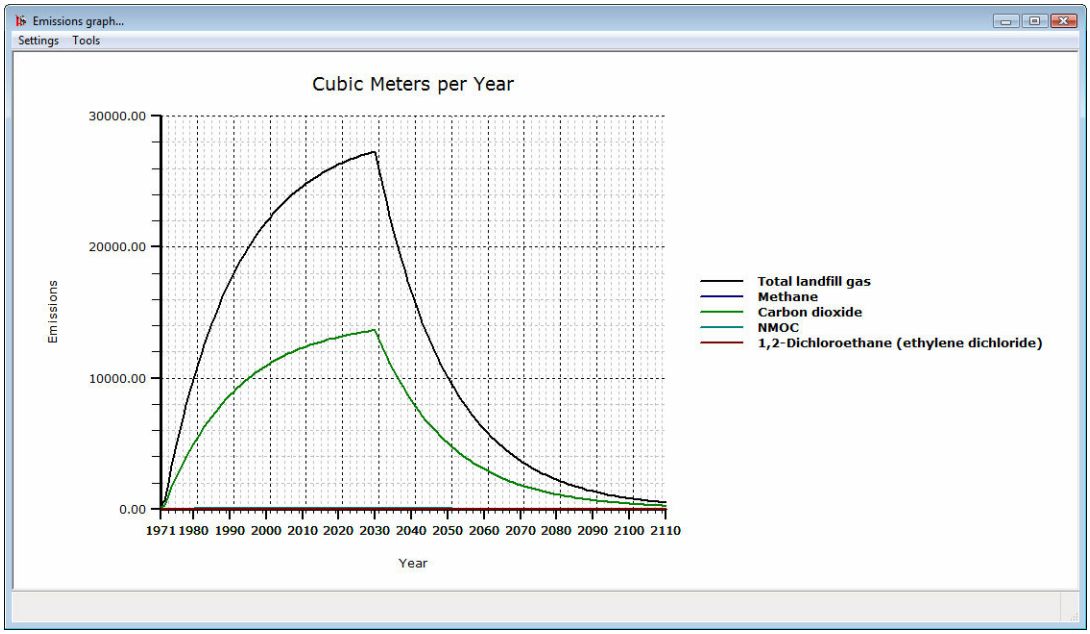
With this option, you can create custom graphs which you can include in your reports.

To create a custom graph:

**1.** Perform the calculations**.**
**2.** Select **Graphs** from the **Results** menu.
**3.** Select one or more pollutant gases from the list of computed emissions.
**4.** The quick keys (**Select all, Select None, Select Invert**) can be used to quickly select all objects, deselect all objects and invert the current selection of the list.
**5.** Press **Ok** to create the graph or press **Cancel** to close the form without creating the graph. The button Ok becomes available once one or more gases have been selected.




**6.** The graph is displayed in a new form.




**7.** Hit ESC to close the form.

For advanced users only:

In the **Settings** menu, you can select one of the following options:

- **Customize**: you can customize the appearance of the graph (colors, axes, line styles, text etc).
- **Save settings**: the current settings are saved in a file.
- **Load settings**: the settings are loaded from a file.
- **Export to BMP**: the current image is saved in BMP format.

In the **Tools** menu, you can select one of the following options:

- **Copy to clipboard**: the current image is copied to the clipboard and becomes available to many programs such as Microsoft Word.
- **Set total graph width**: the total image width (in pixels) is set. This is particularly useful when creating images with certain dimensions.
- **Set total graph height**: the total image height (in pixels) is set. This is particularly useful when creating images with certain dimensions.
- **Set graph width**: the internal graph width (in pixels) is set. This is particularly useful when creating images with certain dimensions.
- **Set graph height**: the internal graph height (in pixels) is set. This is particularly useful when creating images with certain dimensions.

# Chapter

# 5 Help

## 5.1 Help menu

In the **Help** menu you can select one of the following options:

- Contents
- User guide
- Tutorials
- Tip of the day
- Unit conversion
- TechnoLogismiki website
- Buy products
- TechnoLogismiki NOMOS
- TechnoLogismiki Live!
- About the program

## 5.2 Contents

With this option, you can access the online help which contains detailed information regarding the usage of the program.

To view the online help:

**1.** Click **Contents** from the **Help** menu.
**2.** The online help appears.

**NOTE**: If an error message appears then the online help has not been installed. You can install the online help from the installation CD or the Internet.

## 5.3 User guide

With this option, you can access the user guide which contains detailed information regarding the usage of the program.

To view the user guide:

**1.** Click **User Guide** from the **Help** menu.
**2.** The user guide appears.

**NOTE**: If an error message appears then the online help has not been installed. You can install the online help from the installation CD or the Internet.

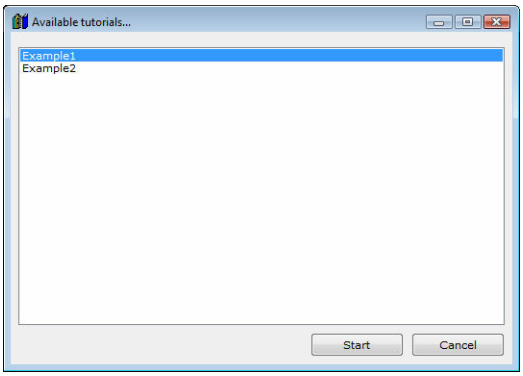
**NOTE**: Adobe Acrobat Reader or a similar program that can display pdf files is required in order to view or print the user guide.

## 5.4 Tutorials

With this option, you can access the tutorials of the program. The tutorials are step-by-step examples that allow you to decrease the learning cycle of the programs dramatically.

To access the tutorials:

**1.** Click **Tutorials** from the **Help** menu.
**2.** The tutorial selection dialog box appears.
**2.** Select the appropriate tutorial and click **Start** to proceed. Click **Cancel** to close the dialog box.



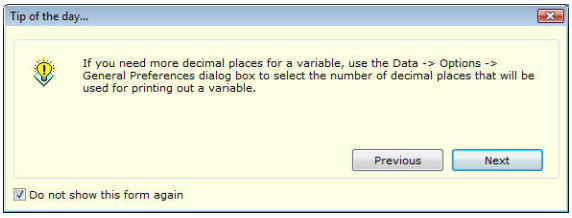

**NOTE**: The number and content of the tutorials is changed frequently. Use the live update system of TechnoLogismiki's products to download the latest tutorials.

## 5.5 Tip of the day

With this option, you can access the tip database of the program. The tips are short guidelines regarding the usage of the programs which may be of great help to the user.

To access the tips:

**1.** Click **Tip of the day** from the **Help** menu.
**2.** The tip of the day form appears.
**3.** Check **Do not show this form again** to prevent the program from showing the tip of the day when starting. Press the **Previous/Next** buttons to browse all available tips.
**4.** Press **Esc** to close the form.



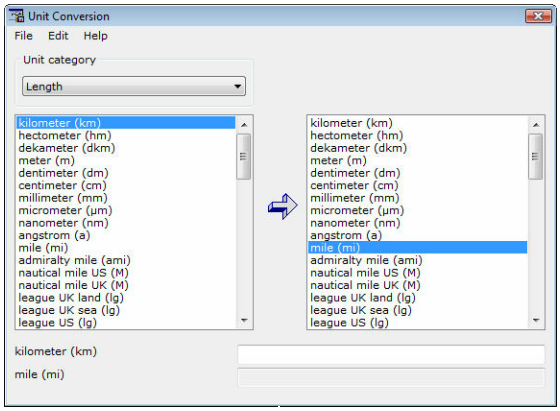

**NOTE**: The number and content of the tips is changed frequently. Use the live update system of TechnoLogismiki's products to download the latest tips.

## 5.6 Unit conversion

With this option, you can access the unit conversion tool. You can find more information about its usage in its help system.

To launch the unit conversion tool:

**1.** Click **Unit conversion** from the **Help** menu.
**2.** The unit conversion tool is launched.




**NOTE**: If an error message appears then the unit conversion tool has not been installed. You can install the unit conversion tool from the installation CD or the Internet.

## 5.7 TechnoLogismiki website

With this option, you can load on your Internet browser the website of TechnoLogismiki's.

## 5.8 Buy products

With this option, you can load on your Internet browser the main product page of TechnoLogismiki's website.

## 5.9 TechnoLogismiki NOMOS

With this option, you can load on your Internet browser the **NOMOS** service of Technologismiki.

## 5.10 TechnoLogismiki Live!

With this option, you can load on your Internet browser the **Live!** service of Technologismiki.

## 5.11 About the program

With this option, a form containing the name, version and licence information of the program appears.

To show this form:

**1.** From the **Help** menu, select **About the program**.
**2.** The form appears.
**3.** Click anywhere on the form or hit ESC to close the form.

# Keyword index

## - A -



## - B -



## - C -



## - D -



## - E -

# - F -



# - G -



# - H -



# - I -



# - L -



# - M -



# - N -



# - O -

# - P -



# - R -



# - S -



# - T -



# - U -



# - V -



# - W -



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