BESS - Benchmarking and Energy management Schemes in SMEs

Description of the
BESS Web based monitoring and benchmarking

21. May 2008

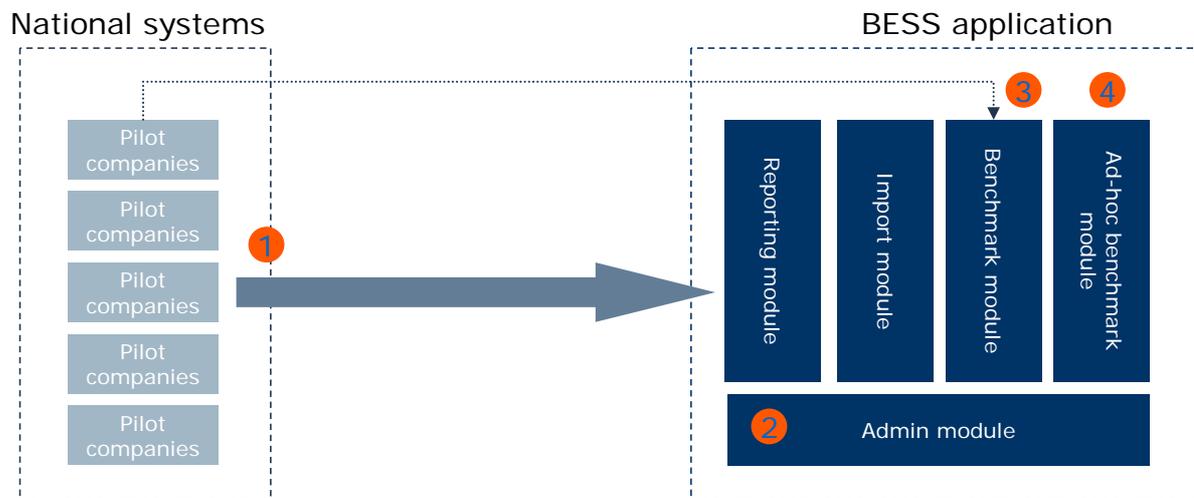# BESS - Web based monitoring & benchmarking

A web-based tool for international benchmarking of key indicators for selected sectors within Europe is developed. The tool which is currently tested by pilot companies from the dairy, bakery and meat industries within the BESS project builds upon the Norwegian benchmarking system. As a part of the ExBESS-project the database will now be expanded with data from small breweries, laundries and textile industry. The benchmarking tool has strong links to the e-learning module, and the benchmarking data-input will be one e-learning activity during the pilot phase.

The web-application system is designed to enable yearly benchmarking of energy data in Europe based on national data gathered by national systems. The illustration below describes how pilot companies, national systems (for energy reporting) and the BESS web application will interact.

National systems   BESS application

Pilot companies	Reporting module
Pilot companies	Import module
Pilot companies	Benchmark module
Pilot companies	Ad-hoc benchmark module
Pilot companies	Admin module

1. Registered pilot companies reports energy data in to the BESS application. An identification key (GUID-code), distributed by the national administrator, is necessary to store the data into the database.
   Alternatively blocks of data from several companies can be imported directly by a global administrator in the import module.
2. Quality assurance of reported data is done by the national administrator. As soon as the data are approved the benchmark results will be available in the benchmark module. Configuration and set up of benchmark classes is done by a global administrator.
3. Registered pilot companies access BESS-application by their identification key and benchmark their own energy use with other companies in the same benchmark-class (industry sector).
4. Non-registered users can use an ad-hoc/demo benchmark module to compare energy performance against actual data in the database. These data are not stored in the system and cannot be used or seen by others.

The access to the BESS benchmarking application has several provisions to ensure access to correct data and to safeguard confidentiality of the data to be provided by the pilot companies.

The application has options for four different kinds of adjustment; boiler efficiency, climate, production utilization and production mix. The users have the possibility to choose, whether or not to use adjustment factors. A description of the methodology for the different adjustments is available at the web site.

In order to be able to do these adjustments, some additional data has to be reported. These data are optional, the companies do not have to report them, but it would be of great interest if as many as possible could report also these data, since the benchmarking will gain a lot in quality by that.

For some sectors there has been worked out additional spreadsheets to do pre-calculation and adjustments that not can be configured into the web-application. These fixed-input spreadsheets can be downloaded in the benchmark-section on http://www.bess-project.info. If you are going to use these spreadsheets then send the completed spreadsheet to your national administrator and he/her will import your data into the database.

1. Registration of pilot companies

All pilot companies that want to enter company data into the database need an identification key (GUID). This unique identification key ensures access to correct data and anonymity. Company name are not stored in the database and will not be displayed in the web-application. National administrators generate, administrate and distribute the identification key so pilot companies can directly access their company specific web-page by an URL on the following format:

http://bess.bekk.no/bess/default.aspx?id=xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx

Where xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx is the GUID-code. Each x can be a character in the range A-F or 0-9 (A hexadecimal number). There is 16^{32} different combinations of this ID, so no matter where the GUID is generated is supposed (or guaranteed) to be globally unique.

The link between company name and GUID is only known by the national administrator. This connection is essential due to the quality assurance of data. Company name are not stored in the database.

2. Registered users

As registered pilot company you will have access to the unique company specific web-page that allows you to register data and see benchmark results.

2.1 Introduction

This page is the first page you will see as a registered company. If you get the following message; "The supplied ID is not a registered GUID in the database", then please check your identification key or contact your national administrator.

In the top of the page there is a menu that acts as a wizard. You can only navigate to previous pages. To advance to the next page you have to click the "Next button". When navigating to a previous step the data you entered earlier will be remembered and shown.

Below the text there is a set of links. The user can click these to attain files which contain more information on adjustment factors, specific industries and contact persons. These documents are pdf-files, and the user must therefore have Acrobat Reader installed.

On the right hand side there is a filter that sets different parameters to how each report is calculated. The filter is also present on each report and the parameter values selected by the user will be remembered when navigating to a new report. On some of the reports parameters may be disabled where they do not have impact on the calculation result.

The "Register data in ad hoc module" button in the right corner lets the user edit data which is not yet approved by an administrator. Only approved data will be shown in the benchmarks.

The "Go to benchmark" button causes the same action as if the user had chosen the "Specific energy consumption" item from the top menu. This button is not visible first time you enter the web-page since you don't have any benchmark-results to illustrate.

2.2 Information about the company

After you have selected "Register data in ad hoc module" you get access to enter data.

In the second page you can enter information about your company; which country you are located in, the industry and information about climate and utilization of capacity. More information about adjustment factors is available on the introduction page.

Entering illegal values will result in a popup message that tells you what to correct.

2.3 Input of energy use

In the third page you can enter the energy usage for different energy carriers. You can choose whether to report in kJ, kWh, GJ or GWh by checking the corresponding radio button in the top.

Entering illegal values will result in a popup message that tells you what to correct.

2.4 Input of Production

In the fourth page you can enter values for your production. There is one row for each product belonging to your industry. For each product you may choose between the units that are allowed for the particular product, set in the Industry/Product Conversions part in the Administration module.

Entering illegal values will result in a popup message that tells you what to correct.

2.5 Results

The last page shows a summary for all the data you have entered.

When clicking the "View Benchmark" button you are transferred to the Benchmark module.

"Lock data for approval" is used for signalling to the National Administrator that the data is not incomplete, but are ready for approval to be imported into the data set for the application. Before this button is clicked, the user can access the application with the supplied link several times to edit data. After the data are locked the user can still however edit the data, but this is not recommended.
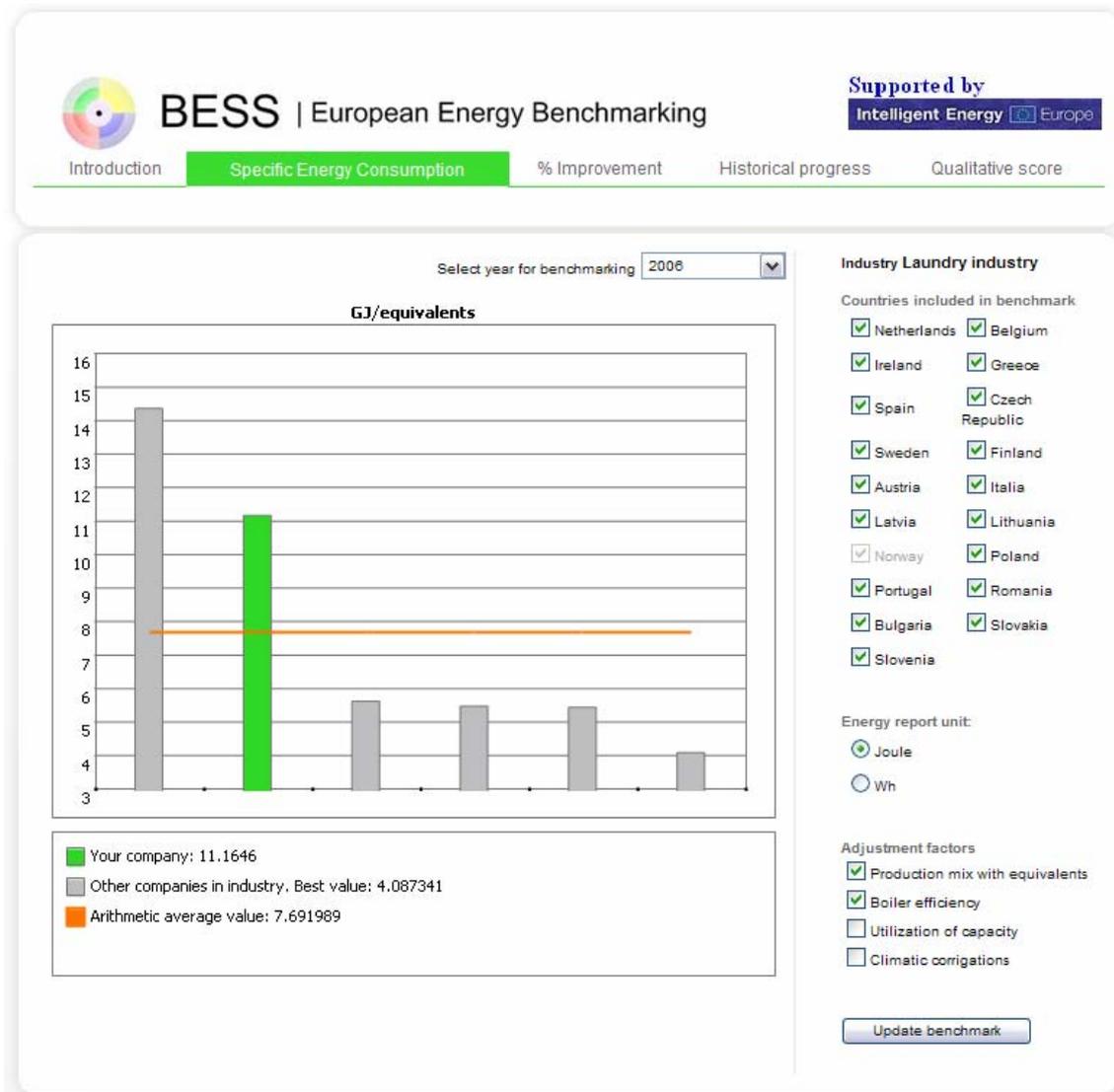
When your data has been approved by your national administrator data for approved years can not any longer be edited. These years will not be displayed on the screen. However you can still edit and lock data for years that not has been approved.

3. Benchmarking

The benchmark reports for an Ad-Hoc/demo (not registered user) is mainly the same as for a normal benchmark user, but in addition to the stored data, the reported data from the Ad-Hoc part is also calculated.

Not registered user (Ad-Hoc/demo) does not have access to the Qualitative Score report.

3.1 Specific Energy Consumption

The Specific Energy Consumption report shows a column chart where each company in the selection scope is represented with a column. The column that represents the user is marked with a green colour.

The values that are reported are Specific Energy Consumption (SEC) which is the total energy consumption divided by the total production.

In addition there is a line for the arithmetic average value.

On top of the chart there is a dropdown list where you can choose the year for which you want to generate the report.

On the right hand side there is a filter that sets different parameters to how each report is calculated.

The filter is made out of three sets of parameters:
* Countries included in benchmark
* Energy report unit
* Adjustment factors

The first part is a list of each country that is registered in the system. Here you can select which of the countries that will be included in the calculations.
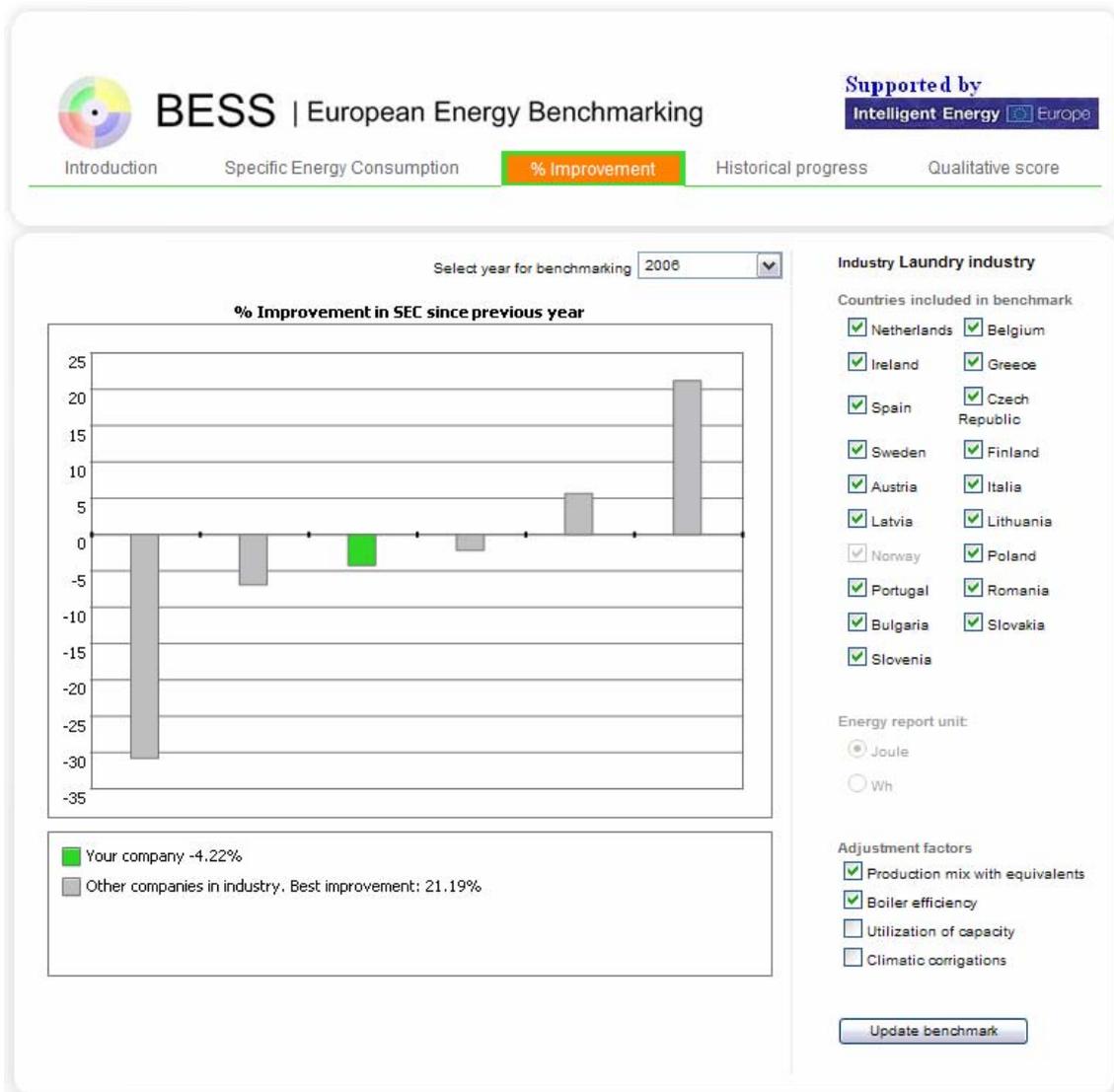
In the second part you can select if you want to generate the reports with the energy consumption calculated in Joule or Watt hours.

In the third part you can select different calculation methods:

- "Production mix with equivalents" sets if you wish to take into energy cost of producing different products (i.e. beer and mineral water). If not set, the each product will count equally against the total production for a company.

    o When checked, the set of products will be those that are checked for "include in weighted calculations" in the Industry/Product Conversion part of the Administration module.

    o When unchecked the set of product will be those that are checked for "include in un-weighted calculations" in the Industry/Product Conversion part of the Administration module.

- "Boiler efficiency" sets if electrical energy carriers should be calculated with the Boiler efficiency factor or not.

- "Utilization of capacity" sets if *utilization of capacity* and *basic energy consumption* is a part of the calculation. When checked, only the companies with "Include Utilization" set to "1" in the import files are included in the result set.

- "Climatic corrections" sets if *Heating Degree Days* (HDD) and *Heating Dependent Share* (HDS) is included in the calculations. When checked, only the companies with "Include HDD" set to "1" in the import files are included in the result set.

After your have completed your selection in the filer-menu, then push the button "Update benchmark" to see the updated benchmark-results.
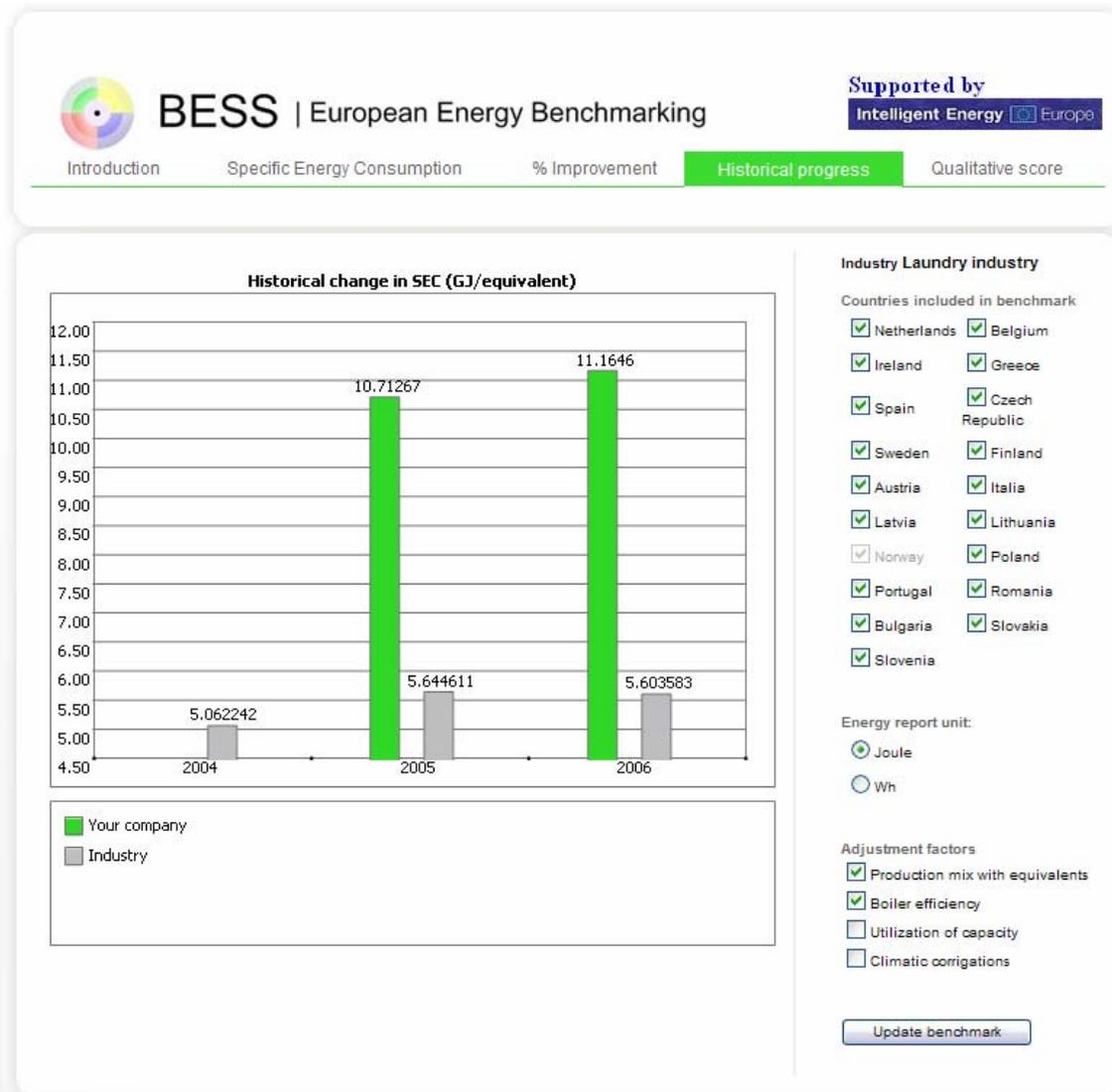
3.2 % Improvement in SEC since last year

This chart shows the difference in Specific Energy Consumption (SEC) between the selected year and the year before. The values are shown as a percentage of improvement since the previous year.

Here you can also select for which year you want to show the report.

3.3 Historical Progress

This graph shows your company's SEC and the average of SEC for the industry, year by year.

3.4 Qualitative score

This graph shows your score in the qualitative questionnaire from the e-learning application. It is divided into each main segment; Basic, Implementation, Policy, Documentation and Evaluation. The average score for the industry is also shown in the grey columns.

4. Demo-user

The Ad Hoc/demo module is for users who want to make a temporary report with their own data, and compare it with the data stored in the application. The data the demo user enters into the application is not stored or added to the data pool that is available in the normal benchmark reports.

4.1 Introduction

The Intro page tells the user about the Ad-Hoc module, how the data is entered but not permanently stored, and how the reports are calculated.

The benchmark report for an Ad-Hoc/demo (not registered user) is mainly the same as for a normal benchmark user, but in addition to the stored data, the reported data from the Ad-Hoc part is also calculated.

Not registered user (Ad-Hoc/demo) does not have access to the Qualitative Score report.