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Classifying and browsing LCA studies: the new functionalities of the LCA Resource directory

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Abstract: To support life cycle based EU policies, the European Commission created the "European Platform on Life Cycle Assessment (EPLCA)". The platform aims at providing coherent and quality-assured life cycle data, methods and studies. The LCA Resource Directory (RD) is one of the deliverables of the Platform. This application has been containing so far lists of services, tools, databases and the corresponding developers and providers. The Directory has recently been further developed so that it can contain and organize LCA studies and associated metadata. The new functionalities of the Directory allow users (experts and non-experts) to browse a database of LCA studies. Many of the fields of the template used to characterize the studies are based on the ISO 14040:2006 [1]; and on the ISO 14044:2006 [2]. Some fields of the template are mandatory in order to ensure that the information showed in the application fulfills the requirements of the ISO 14044 for reports to be disclosed to the public. Any research group, company or university owning a relevant LCA study is now able, after registration, to upload the study and associated metadata using a template. With these new capabilities of the RD, the EPLCA makes progress in its aim of promoting life cycle thinking when making available to all kind of LCA practitioners a database of LCA studies, together with a searching tool.

Keywords: LCA studies, searching tool, Directory, European Platform on LCA.

1. Context

The European Commission (EC) recognized Life Cycle Assessment as "the best framework for assessing the potential environmental impacts of products". It also identified "the need to improve data availability and quality worldwide by international cooperating on LCA data and methods". The Life Cycle approach is also part of the 2011 Communication [3] on "a resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy".

To support these life cycle based EU policies, the EC created the "European Platform on Life Cycle assessment (EPLCA)" in 2005. The Joint Research Center (JRC) implemented the platform in close collaboration with DG Environment. The Institute for Environment and Sustainability coordinates and ensures the information and services provided in it. The EPLCA works on the basis of coherent and quality-assured life cycle data, methods and studies.

The LCA Resource Directory (RD) is one of the deliverables of the Platform, together with the International Reference Life cycle System (ILCD) [4], the European Reference Life Cycle Dataset (ERLCD) and the LCT Forum mailing list. The RD has been running since 2006 and contains information related to services (e.g. consulting or research services), tools (e.g. LCA tools, ecodesign tools), databases (e.g. LCI databases) and the corresponding developers and providers.

The EPLCA aims at increasing and/or improving "existing practice and knowledge" and "scientific robustness" in Life Cycle Thinking. In order to achieve these two objectives, the JRC recently developed a new section called "Studies" within the Directory. The new section provides a directory of LCA studies and European Product Declarations (EPDs). It has been designed to be used by all type of LCA users, such as policy makers, LCA practitioners, researchers, students, etc. The application includes a searching tool that facilitate the seeking of studies

The current RD is divided then in three different sections:
 - User guidance; this section includes a quick guide to help users to find information related to Life Cycle Thinking according to the user functionalities (environmental manager, product designer, purchaser, LCA professional or policy).
 - Providers; the user will find here a list of providers divided in three categories: databases, services and tools. This section also includes a searching tool to facilitate search as per user needs.
 - Studies; the user will find in this new section LCA studies and EPDs.

This new version of the RD will be launched during the fall 2011.

This paper aims at presenting the new functionalities of the RD. Next section will present them, discussing in particular the classification criteria used. Section 3 will summarize the expected benefits of the new application. The two last sections will draw conclusion and give perspectives for further work.

2. New functionalities of the Resource Directory

The new functionalities of the Directory allow users (LCA expert and non-expert) to easily access to a database of LCA studies and compare different studies. Additionally, any user, after registration, can upload and populate the Directory with his/her studies, becoming a "contributor" for the RD. To insert this information, the user needs to register (contributor) in the application. After registration, the

"contributor" will be able to modify his/her profile and add the information/metadata for the study in the template. Once all mandatory information has been filled, the study can be uploaded.

The template to be filled is structured in six sections: general, goal, scope, inventory, interpretation and verification and compliance.

The criteria used to develop the template have been defined based on the ISO 14040:2006 and ISO 44:2006 and the ILCD handbook. Some fields of the template are mandatory in order to ensure that the information showed in the application fulfills –in a simplified way- the requirements asked in ISO 14044 for reports to be disclosed to the public. Each of the six sections that form part of the template is divided in several fields to be filled by the contributor with the metadata of a study. These fields have been described following the norms mentioned before. The contributor will find two kinds of fields: enumeration lists and free text boxes. For example, in the first section "General", i.e. the contributor has to choose the type of the study that he/she is adding: LCA, EPD or LCA supporting EPD. In the section "Goal" a list describing 24 intended applications is given. The contributor has to select which option(s) match better with the study. Some of these options are: "identification of key environmental performance indicators", "weak point analysis of a specific product" or "comparison of specific goods or services". In case none of the options match with the intended application of the study, the contributor can choose "others" and describe the adequate application in the free text box.

In the section "Scope" there is a field to select the Life Cycle Inventory modeling applied in the study: the enumeration list includes five different types of modeling (attributional, consequential and LCI modeling according to ILCD situation A, B and C), and also a free text for "other" in case the modeling used in the study is not listed. The life cycle impact categories listed are the eleven most used ones: climate change; ozone depletion; human toxicity; respiratory inorganics; ionizing radiation; photochemical ozone formation; acidification; eutrophication; ecotoxicity; land use and resource depletion.

The study report has also to be uploaded.

The contributor is asked in the template to give information on the verification process and on the compliance scheme achieved by the study. Some of the information asked is shown in Table1.

Table 1. "Verification and Compliance" field included in the template.

Verification / review type	No review; Dependent internal review; Independent external review; Panel review; Independent internal review; Other, please specify
Separate review report	No; Yes, disclosed; Yes, not disclosed
Compliance	ILCD A; ILCD B; ILCD C1; ILCD C2; ADEME; ISO 14044; PAS2050; Other, please specify

As mentioned before, the sections of the template include other fields that require free text from the contributor. The following examples can be cited: "Method, assumption and impact limitation", "Description of the system being studied" and "Conclusions".

The new section "Studies" includes also a searching tool. This tool can sort the different studies included in the LCA directory based on keywords defined by the user. The searching tool makes the application more useful by showing only the studies that the user is interested in. Users will find all the meta-data included in the Directory by the contributor, as well as contact information of the author and a study report.

The web application has an intuitive and easy to use interface although a user manual is included if necessary.

The application will be soon be open worldwide. Any research group, company or university, will be able, after registration, to upload studies and associated meta-data. Meanwhile, any type of user (e.g. LCA practitioner, students, policy makers, etc.) looking for material related to LCA will be able to find relevant information and studies.

JRC/IES will be in charge of the maintenance and updating of the application and will populate the Directory with the first set of studies during the fall 2011. An open call to relevant research groups and institutions will be sent later on in order to populate further the Directory with registered users and studies.

3. Expected benefits

The new functionalities of the Directory offer to contributors the possibility to publish their LCA studies in an international platform with non-commercial interest. This offers the opportunity to share the knowledge and results of the studies, and therefore to contribute to other initiatives such as new LCA studies or policy initiatives. Contributors will also be able to promote their know-how.

On the other hand, users (including LCA non-experts such as students, policy makers or industries) will be able to identify LCA studies relevant for their needs, to easily access to these studies so that they can analyze scope, goals, hypotheses or results. This important information can help them in their future studies or reports.

4. Conclusions

The new section "Studies" of the Resource Directory of the European Platform on Life Cycle Assessment gives to users access to real LCA studies, and not only to normative text or methodologies. This offers the possibility of analyzing and comparing hypotheses adopted or decisions taken in various studies.

The contributors registered in the Directory will be able to upload their studies and describe them with meta-data, making their work available to others.

Thanks to the searching tool the application will display only the LCA studies that match the requirements defined by the user, and consequently make a more proficient use of the Directory.

With these new capabilities of the Directory, the EPLCA makes progress in its aim of promoting life cycle thinking, as it makes available to all kinds of LCA practitioners, companies, research groups, policy makers, etc. a good quality database of case studies.

5. Perspectives

JRC/IES will be the first contributor of the Directory by adding some case studies before the application will be launched. A call of contribution will be then sent to possible contributors.

JRC/IES also plans to develop new functionalities for this section of the Resource Directory to extend its scope. For example, another entry level of new types of documents such as ecolabel criteria and ecodesign criteria is planned.

Acknowledgments

Conflict of Interest

The authors declare no conflict of interest.

References and Notes

[1] ISO 14040: *Environmental management – Life cycle assessment – Principles and framework*; 1st ed.; 2006

[2] ISO 14044: *Environmental management – Life cycle assessment – Requirements and guidelines*; 1st ed.; 2006

[3] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions; *A resource-efficient Europe – Flagship initiative under the Europe 2020 Strategy;* Brussels; 2011

[4] European Commission – Joint Research Centre – Institute for Environment and Sustainability. *International Reference Life Cycle Data System (ILCD) Handbook – General guide for Life Cycle Assessment – Detailed guidance,* 1st ed.; Publications Office of the European Union; Luxemburg, 2010

[5] http://lct.jrc.ec.eropa.eu