Sustainable Recycling Industries
Component A: Life Cycle Inventories

Invitation to tender for LCI data collection and submission to ecoinvent Centre

April 2017
Call for Tenders

for Life Cycle Inventory (LCI) model development, LCI data collection, LCI dataset creation and submission to ecoinvent

This is an open invitation for tender.

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1. Background & project description

ecoinvent is the world’s leading supplier of consistent and transparent LCI data of renowned quality. ecoinvent is a proud partner of the Sustainable Recycling Industries (SRI) programme, a programme funded by the Swiss State Secretariat for Economic Affairs (SECO) and jointly implemented by the Swiss Institute for Materials Science & Technology (Empa), the World Resources Forum (WRF) and ecoinvent, through three interconnected programme components:

Component A - Life Cycle Inventories: SRI gathers and provides local LCI data for the assessment of agricultural and industrial activities through the enhancement of local and regional LCA expertise with the aim to provide freely available regionalized LCI data for India, India, South Africa and Egypt.

Component B - Recycling Initiatives: SRI improves local capacity for sustainable recycling activities together with private and public institutions, as well as the informal sector in a number of partner countries (Peru, Colombia, Ghana, Egypt, India).

Component C - SRI Roundtable: SRI facilitates a stakeholder consultation for the development of sustainability criteria for secondary raw materials.

ecoinvent is in charge of component A of the SRI project.

With this call ecoinvent aims to subcontract the tasks of developing an LCI model and LCI dataset submission to the ecoinvent database.

2. Eligibility Criteria

Proposals can be submitted by public and/or private entities which are eligible according to their respective national/regional regulations, such as, but not limited to higher education institutions, public research institutes, private research institutes, companies, etc.

Tender shall come from a consortium of institutions. The consortium shall include institutions from one or several of the geographies of interest for this call (India, South Africa, Brazil, Colombia, Peru). In addition, at least 70% of the budget shall be assigned to the institutions(s) based in the above regions.

The number of project partners should be reasonably balanced to correspond to the aims, duration and deliverables of the project.

No subcontracting of tasks to external institutions is permitted.

3. Task description

The tender shall collect LCI data and provide new undefined Unit Process (UPR) LCI datasets in ecospold2 format, related to the freight transport sector in the list of geographies brought in
Table 1. The tenderer(s) shall submit the created datasets to ecoinvent through appropriate means as explained in this Call for Tender (CfT).

In more detail, the tender shall collect LCI data, construct datasets in the form of undefined unallocated unit process (UPR) activities, validate the constructed datasets to ensure consistency and compliancy with the ecoinvent version 3 quality guidelines, document these datasets, submit them to ecoinvent v3 database by employing the free ecoEditor software, and apply the corrections required by editors and reviewers organized by ecoinvent until the acceptance of the datasets by the ecoinvent in the form of publication in a release of the ecoinvent database.

Appendix B provides more technical details regarding the scope and specifications of this call for tender.

Table 1: Scope of required LCI data

<table>
<thead>
<tr>
<th>Geography</th>
<th>Southern Asia (India), Southern Africa (South Africa) and Latin America (Brazil, Peru, Colombia)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products/services*</td>
<td>Transport sector namely road transport, rail transport, water transport (inland waterways and transoceanic shipping), and air transport (inter- and intra-continental).</td>
</tr>
</tbody>
</table>

The data provider shall report to and collaborate with the ecoinvent management and respective editors during different phases of the project.

A more detailed task description includes:

a. **Data collection**
   - Acquiring data, which are needed for the creation of datasets in the form of unallocated unit process activity (UPR), through appropriate and coherent means, such as field measurements, interviews, questionnaires, literature research, estimations or calculations, or publicly available statistics, for the sectorial data detailed in Table 1. The data represents the information required to create transforming datasets¹ (LCI data), as well as Market datasets. The data collection project has to be carried out in alignment with Data Quality Guidelines for the ecoinvent database version 3.

b. **Datasets creation and entry to ecoEditor**
   - Using the collected data, construct datasets in the form of UPR activities. The dataset creation has to conform to the instructions provided in the ecoinvent Data Quality Guidelines of version 3. Existing ecoinvent datasets may serve as starting point or template for such datasets. Datasets shall integrate with and build on top of the existing ecoinvent database.

¹ A market dataset collects all activities with the same reference product in a certain geographical region. Furthermore, it includes average transports of that product within the geography, as well as inputs of the product itself to cover losses in trade and transport. In other words, they are consumption mixes of a certain product in a certain geographical region. For more information on Market datasets and other types of datasets in ecoinvent, please refer to Data Quality Guidelines for the ecoinvent database version 3.
- Enter the created datasets in the ecoEditor tool, i.e. the tool to create, edit, review and upload datasets for the ecoinvent database, to create LCI datasets in ecoSpold 2 format. The software "ecoEditor for ecoinvent version 3" is free to use and can be downloaded from the ecoinvent website.

c. **Datasets validation: compliancy and consistency**
- Run the off-line and on-line validation checks of datasets created in ecoEditor software, using the respective functions of the software, according to the instructions provided in chapter 12 (Validation and review) of Data Quality Guidelines of ecoinvent version 3.
- Perform an internal review of the created datasets to ensure comprehensiveness, adherence to the quality guidelines (compliancy with ecoinvent version 3), consistency with similar activities in other geographies or using similar technologies, and to eliminate data entry errors.

d. **Datasets documentation**
- Document the datasets to be compliant with the ecoinvent “good practice for documentation”, as described in section 7 of the Data Quality Guidelines for the ecoinvent database version 3.

e. **Dataset submission and integration into ecoinvent database**
- Gather the necessary information for submission according to the Data Quality Guidelines of ecoinvent database version 3, and submit the UPR datasets to ecoinvent by using the ecoEditor. The submission process has to be done according to the procedure detailed in Data Quality Guidelines of ecoinvent database version 3.
- Upon receiving the feedback from the ecoinvent editors as well as its external and the technical reviewers, apply for the corrections required by the editors until the final acceptance of the datasets by the ecoinvent. This is an iterative process, and it is concluded when Life Cycle Impact Assessment (LCIA) results are checked and approved by the data provider as well as ecoinvent and the datasets are published in a release of the ecoinvent database.

4. **List of deliverables**

A set of LCI datasets, in UPR format, which has been constructed, documented and reviewed according to the quality requirements of ecoinvent version 3, submitted to ecoinvent, and passed the review and validation phase of ecoinvent management and its editors to be published in a release of the ecoinvent database. The datasets shall conform to the scope (type of sector and geography) shown in Table 1. Datasets refer to both transformation and Market datasets. **Appendix B** provides more technical details regarding the scope and specifications of the list of deliverables.

The datasets and the related documentation shall be provided in English language.

5. **Support during project implementation**
Ecoinvent management and its editors, who will be selected based on the type and sector of the LCI data, will provide support and guidance to a certain extent during different phases of data collection, dataset creation, review and submission processes. Table 2 demonstrates the supporting role of ecoinvent management and its editors in different phases of data collection and submission to ecoinvent.

Table 2: Supporting role of ecoinvent centre during different phases of data submission

<table>
<thead>
<tr>
<th>Data provider</th>
<th>ecoinvent management</th>
<th>ecoinvent editor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of the list of data to be collected and datasets to be developed</td>
<td>Identify and contact the responsible editor</td>
<td>--</td>
</tr>
<tr>
<td>Data collection</td>
<td>Guidance during the data collection and modelling</td>
<td>Guidance during the data collection and modelling</td>
</tr>
<tr>
<td>Dataset creation, entry into ecoEditor, and datasets validation</td>
<td>Guidance during the dataset creation in the ecoEditor and datasets review</td>
<td>--</td>
</tr>
<tr>
<td>Submission of datasets into review</td>
<td>Guidance during the dataset submission</td>
<td>Start reviewing the dataset, enter notes on what shall be corrected</td>
</tr>
<tr>
<td>Final submission of datasets following the review of ecoinvent</td>
<td></td>
<td>Approval of the dataset</td>
</tr>
<tr>
<td>Checking and Approving the LCIA results after integration of the datasets into the working version of ecoinvent database</td>
<td></td>
<td>Approval of LCIA results</td>
</tr>
<tr>
<td></td>
<td>Upload the datasets to ecoinvent database and extract and send out the LCIA results to the data provider</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guidance during the LCIA results verification</td>
<td></td>
</tr>
</tbody>
</table>

6. Reporting procedure

The project implementer shall report to ecoinvent, through appropriate means such as telephone conversation or written documents, the status and progress of the project according to the original plan of action submitted along with the proposal.

7. Transfer of rights and acknowledgements

During the data submission process, data providers shall grant ecoinvent the non-exclusive right to use the datasets. All copyrights to the submitted data remain with the authors of the dataset. The exact text of this agreement follows:
"I confirm to hold the copyright to the uploaded data and to be entitled to dispose of these copyrights. I hereby transfer the non-exclusive right of use of the uploaded data to the ecoinvent Centre for publication in the ecoinvent database, including but not limited to the right to publish, republish, transmit, sell, distribute, modify, change, complete and otherwise use the contributed dataset in electronic and print form and in derivative works throughout the world, in all languages, and to license or permit others to do so. This transfer of non-exclusive right of use cannot be withdrawn without a full payment of compensation to the ecoinvent Center to cover damages or a replacement of the withdrawn data. I maintain the right to use the transferred data for my own scientific work as well as to use it with third parties on a non-exclusive basis, including for commercial purposes."

In addition, the funding and supporting institutions in collecting the LCI data and preparing the datasets shall be acknowledged.

8. Schedule and timeframe

It is required that the workload is finalized by the end of November 2017. The tenderers shall provide a precise schedule according to which they would start and finalize each of the tasks described in the “Task Description” section of this CfT.

Within one month of the start of the project, the data provider shall submit to ecoinvent the updated list of data to be collected and datasets to be developed. This list shall include all the datasets included in the original proposal for the call for tender, as well as any related datasets that will be required to be submitted along with the datasets in the proposal, in order to make the submission version 3-compliant.

Furthermore, early commencement of datasets submission to ecoinvent—e.g. within few months of the start of the project—to allow for a prompt review procedure by the ecoinvent centre and its reviewers, is highly valued.

9. Budget

The funding ceiling to carry out the subcontracted tasks is limited to CHF 100,000 (one hundred thousand Swiss Francs), including any applicable VAT. The budget shall include all costs, including personnel and operational costs to carry out the project. The contract will be issued in CHF.

10. Application requirements

Interested tenders shall provide a list of LCI datasets they propose to submit, along with an estimated time (in terms of hours) to create and submit each batch of datasets, by filling-in the template (Table A.1) provided in the Appendix A of this call for tender. Table A.1 shall be filled-in by the data providers with the appropriate information and submitted to ecoinvent as one of the required documents for the evaluation of proposal.

The tenderers shall also indicate in the proposal the required budget to carry out the offered data collection and delivery.
In addition, the tenders must demonstrate that they possess the resources and thus are competitive enough to fulfil the project. The tenders shall provide the name and CV of all the key persons who will participate in different tasks of the data collection project, along with their expertise level, estimated time devoted to the project, and their respective charging fee (per day).

A tender shall come from a consortium of organizations. No subcontracting of tasks to external institutions is permitted.

11. Evaluation criteria

Step 1: Eligibility validation

Ecoinvent will assess the eligibility of the received proposals according to the following criteria:

- applying institutions and composition of the consortium
  a. at least one partner from list of countries in Table 1
  b. 70% or more of the budget assigned to institutions coming from the countries listed in Table 1
- all required information is correctly provided.

Step 2: Assessment

The assessment to select the project partner(s) will be based on the following criteria:

Expertise and experience of the institution or combination of institutions (60%)

- composition of the consortium. Higher points are awarded to consortia of institutions which include partners from all or most of the countries listed in Table 1 (20%)
- demonstrated knowledge and expertise in the sector detailed in Table 1 of this call for tender (10%)
- experience in LCA and in LCI data collection activities, specifically related to the activities/sectors detailed in Table 1 (10%)
- experience in working with ecoinvent version 3, the LCI data preparation to create LCI datasets according to ecoinvent Data Quality Guidelines v3, and the submission process to ecoinvent version 3, using the ecoEditor tool (10%)

List and quality of proposed deliverables (40%)

- List of datasets (type, quality, and quantity of the LCI data) the tender commits to submit to ecoinvent database, which shall be related to sector listed in Table 1 (15%)
- a timetable that presents the plan according to which the tender intends to deliver each type of dataset (or batch of datasets), with speedier delivery being considered a bonus (20%)
- required budget to carry out the proposed project, with offers significantly below the maximum offer (100’000 CHF) being rewarded extra points up to the maximum for free offers (5%)

12. Question and answer period

A question and answer period is envisaged for interested parties to submit questions related to the preparation and submission of the full proposal. All such inquiries and technical questions shall be directed to Amir Safaei via email: safaei@ecoinvent.org. The deadline to register your questions is 24th of April 2017.

13. Closing date for proposal submissions

1st of May 2017

14. Submission procedure

Tenderers shall submit tenders by email to safaei@ecoinvent.org before the closing date for proposal submission indicated above.

The evaluation will be performed within two weeks of the deadline for tender and the bidders will be informed immediately. The draft contract will be issued within 2 weeks after the selection of the successful bidder and work has to start within one week after the signature of the contract. In case of any questions, please contact Amir Safaei at safaei@ecoinvent.org.
Appendix A

Scope of the data call: list of datasets

Table A. 1: Proposed dataset submission template (includes example data that can be discarded)

<table>
<thead>
<tr>
<th>Process (activity) name</th>
<th>Number/detail of related UPRs</th>
<th>Hours required to gather/submit data</th>
<th>Proposed delivery date</th>
<th>Similar existing global datasets in ecoinvent (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean production</td>
<td>4 regions, plus required datasets on deforestation and land transformation, as well as 4 datasets for organic fertilizer not present in ecoinvent so far, plus 1 irrigation dataset for India adapted from existing ecoinvent data</td>
<td>48</td>
<td>4 months after contract signature</td>
<td>Soybean production, Soybean production, on land recently transformed</td>
</tr>
<tr>
<td>Chicken production</td>
<td>1 dataset on chicken production, 1 dataset on feed</td>
<td>6</td>
<td>4 months after contract signature</td>
<td></td>
</tr>
<tr>
<td>Cement production</td>
<td>4 states in India, plus required datasets (8 total) on upstream processes of clinker production</td>
<td>20</td>
<td>4.5 months after contract signature</td>
<td>Cement production, Portland, CH 2010</td>
</tr>
</tbody>
</table>
Appendix B

Scope of the LCI datasets

The main purpose of this CfT is to collect LCI datasets (in ecospold 2 format) representing the transportation of freight in specific geographies as well as on international scales. Table B.1 summarizes the relevant modes of transport and geographies of interest for this CfT:

Table B.1: Relevant modes of transport and geographies of interest

<table>
<thead>
<tr>
<th>Mode of transport</th>
<th>Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail transport</td>
<td>List of geographies in Table 1</td>
</tr>
<tr>
<td>Inland water transport</td>
<td>List of geographies in Table 1 (if relevant)</td>
</tr>
<tr>
<td>Transoceanic water transport</td>
<td>Global</td>
</tr>
<tr>
<td>Air transport</td>
<td>List of geographies in Table 1 (if relevant)</td>
</tr>
<tr>
<td></td>
<td>and global</td>
</tr>
<tr>
<td>Road transport</td>
<td>List of geographies in Table 1</td>
</tr>
</tbody>
</table>

Overall, the focus is on the operation of the vehicles (transport services), and not in the vehicle construction. Nevertheless, it is expected that the tenderer includes in the offer the data concerning eventually required new vehicles not yet included in the database, when they are needed in the transport services offered. A similar reasoning applies for update of existing vehicles/crafts.

While the focus of this CfT is to collect LCI datasets for the transportation of freight, often freight and passenger transport utilize the same or similar infrastructure, and in some cases (for instance in air transport), freights and passengers are transported together using the same vehicle. **Supplying the datasets for passenger transport is not the main aim of this CfT, but it is considered a bonus if the tenderer(s) commit to provide those for the relevant passenger transport modes listed in Table B.1, specifically for air transport services.**

The tenderer(s) shall also collect the related information to create new market datasets for (relevant) freight transport modes in geographies listed in Table 1.

The rest of this appendix provides some information regarding the structure of transportation sector in ecoinvent database, and presents an overview of the LCI data and parameters which should be provided for each type of transport mode.

**Rail Transport**

In ecoinvent database, the life cycle of rail transport is categorized in three components:
Goods transport equipment (vehicle infrastructure): which is further divided in locomotives and wagons (often referred to as cars) and contains all processes that concern the vehicle life cycle (excluding the operation) such as manufacturing, maintenance as well as disposal.

Rail infrastructure: comprises railway track construction, maintenance and disposal.

Rail operation: contains all processes that are directly associated with the operation of trains including shunting processes.

The aim is to provide LCI datasets representing the rail transport of freight in the relevant regions to this CfT. The focus is on the operation of the trains (rail operation). The tender shall provide regional representative values for the operation of rail transport, and create new LCI datasets for freight rail transport in the focus regions. Updating the LCI datasets regarding the infrastructure, specifically rail infrastructures with regards to energy requirements and land use, with more regional and/or representative and/or updated values are valuable and considered as a bonus in the evaluation phase.

There are ongoing data collection projects that concern the electricity and refinery (liquid fuel mix and quality) of the focus SRI countries listed in Table 1. To consistently model the energy flows, the tenderer(s) should exchange information with these ongoing data projects. Ecoinvent will provide support for this mean once the data providers for this CfT are selected and contracted. To learn more about ecoinvent data collection projects, please see currently open and past, on the ecoinvent website.

In addition, market datasets for freight rail transport services for the list of geographies in Table 1, shall be created and submitted to ecoinvent.

Roads Transport

Life cycle of road transport is composed of the following stages:

Vehicle infrastructure: manufacturing, maintenance as well as disposal of vehicles.
Road infrastructure: including the maintenance
Vehicle operation

The existing LCI datasets in the ecoinvent database regarding road transport mainly represent European conditions. The aim is to provide LCI datasets representing the road transport of freight within the geographies of interest for this CfT (Table 1). The focus is on the operation of the fleet (vehicle operation). The tender shall provide regional representative values for the operation of road transport, and create new LCI datasets (including market datasets) for freight road transport in the focus regions.

Updating the LCI datasets regarding the infrastructure, specifically road infrastructures with regards to energy requirements and land use, with more regional and/or representative and/or updated values are valuable and considered as a bonus in the evaluation phase.
It is encouraged to use the existing classification in ecoinvent regarding vehicle size categories and emission standards. In the case that a certain class/category of vehicles are dominantly used in the regions listed in Table 1, and these classes/technologies are not represented in the ecoinvent database, or the vehicle/classification does not align with those existing in ecoinvent database, the tenderer is requested to provide information on the vehicle, propose classifications, and justify the chosen classification for the datasets he/she intends to submit to ecoinvent. The decision to accept the classification will be taken jointly with ecoinvent editors.

There are ongoing data collection projects that concern the electricity and refinery (liquid fuel mix and quality) of the focus SRI countries listed in Table 1. To consistently model the energy flows, the tenderer(s) should exchange information with these ongoing data projects. Ecoinvent will provide support for this mean once the data providers for this CfT are selected and contracted. To learn more about ecoinvent data collection projects, please see currently open and past, on the ecoinvent website.

Ecoinvent database already includes the prevalent European standards for road transport emissions. In case the same standard is also valid for the list of geographies in Table 1, or the established standard(s) in the region(s) is(are) parallel to European counterparts (such as the case of Proconve in Brazil), the tenderer can provide the LCI datasets with reference to such standards. If the regional standards are not parallel to European standards, the tenderers are requested to provide sufficient information on this regard. The final decision to choose and apply a certain classification for the datasets shall be taken at a later stage jointly with the respective ecoinvent editors, however; the tenders shall demonstrate in the proposal that such considerations are taken in to account.

In addition, the market datasets for road transport for the regions listed in Table 1 shall be created and provided to ecoinvent.

**Transoceanic and inland water transport**

The life cycle of the water transport services includes the following stages:

**Vessel Infrastructure:** Vessel production, maintenance, and end of life

**Port infrastructure:** construction, maintenance and disposal

**Operation of the vessel**

The ecoinvent database currently contains the LCI datasets representing one (size) category of freight ship (50'000 dwt dry bulk carrier; average of slow speed engine and steam turbine propulsion of transoceanic ships), one (size) category of transoceanic tanker (~ 150'000 dwt; average of slow speed engine and steam turbine propulsion), and one (size) category of barge tanker (average barge tanker (1000 t) operating on inland waterways). Ecoinvent also includes the reefer transportation using the above fleet.
The primary aim is to update these datasets with more recent and representative values, and provide new datasets representing the infrastructure and operation of further common sizes of vessels, mainly used for transoceanic shipping. The focus should be on the operation of the fleet (vessels). For the construction of the vessels, the current related datasets in ecoinvent database can be used as a starting point. Vessels refer to both cargo (bulk carries and container ships) as well as Tankers, which are used for the transportation of liquid cargos. The LCI datasets regarding the operation of ports can also be updated with more recent and represented values. This is not mandatory, but considered as a bonus in the evaluation phase. The proposal shall include the type of the vessels for which the tenderer(s) aim to create and supply LCI datasets. The classification of vessels is typically based on their capacity (size). The decision of the vessel sizes to include shall be taken considering the estimated number of operating ships and traffic in each size category, with priority given to size categories with higher number of operating vessels and/or highest contribution to international traffic. For inland water transport, the existing datasets in ecoinvent can be updated with more recent and updated values, and other datasets representing other types of common barges used globally or in regions listed in Table 1 is a bonus, but not mandatory.

In addition, the existing market datasets for freight sea transoceanic shipping, and for freight transport in inland waterways, shall be updated, and new market datasets for the new types of vessels and possibly for the regions mentioned in Table 1 (if relevant) shall be created.

**Air transport**

The air transport is divided in three components:

**Aircraft Operation:** contains all processes that are directly connected with the operation of the aircrafts.

**Aircraft Fleet:** the vehicle life cycle (excluding the operation) such as aircraft and part manufacture, aircraft maintenance and support as well as disposal of aircrafts and parts.

**Airport Infrastructure:** airport infrastructure life cycle, including airport construction, airport operation and maintenance as well as airport disposal.

Ecoinvent distinguishes 3 types of aircraft operation (long haul (intercontinental), short/medium haul (intra-European), and average. The tenderer(s) shall update the existing datasets in the ecoinvent database with more updated and representative data. Similar to other transport means, the focus is on the operation of the aircrafts. For infrastructure (aircraft fleet and airport infrastructure), the tender can update the existing datasets with more recent and/or representative and/or regional data (specifically for the case of airport infrastructure). This is not mandatory, but considered as a bonus in the evaluation phase of the proposal.
The relevant markets in this sector would also need to be updated, and possibly new local markets generated, in the geographies listed in Table 1.

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