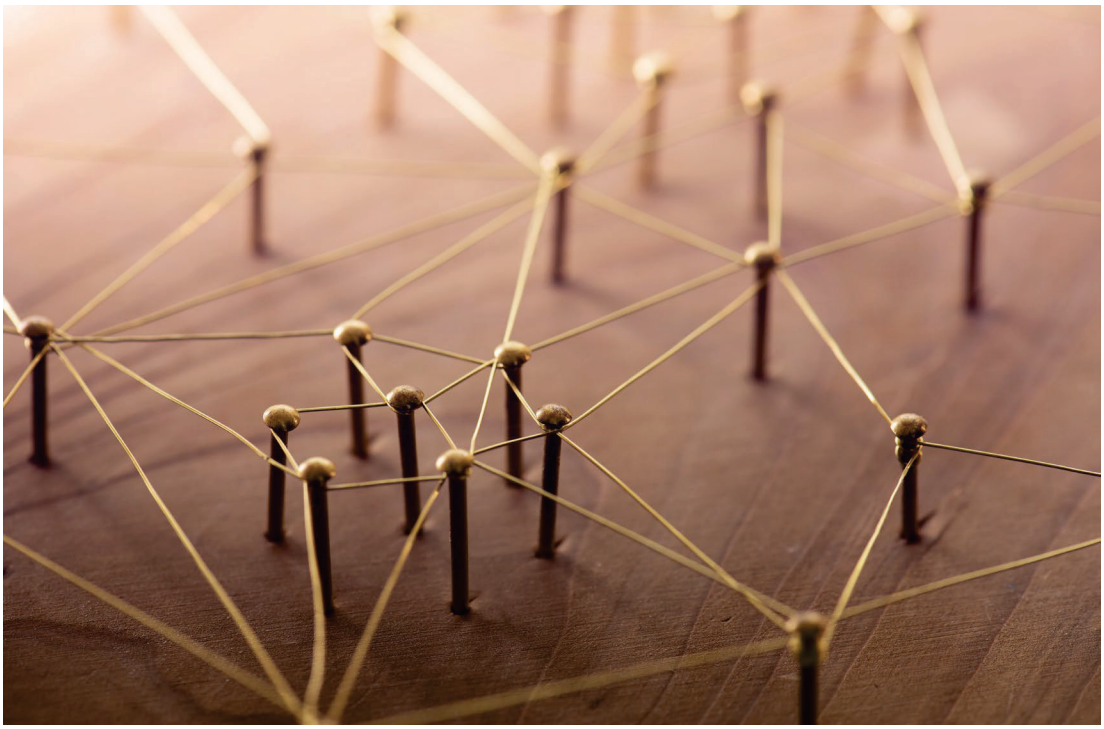
ASSIST

Relay industrial supply chain sustainability data

Public report



Authors: Anna Hedlund Åström, KTH Royal Institute of Technology; Raul Carlsson, RISE Research Institutes of Sweden; Sara Palander, Swedish Life Cycle Center; Tomas Rydberg, IVL Swedish Environmental Research Institute

Date: 2022-09-29

Project: Project within the utlysning Hållbar produktion - FFI - juni 2021

FFI Fordonsstrategisk Forskning och Innovation

VINNOVA Energimyndigheten TRAFIKVERKET FKG VOLVO SCANIA VOLVO

Contents

1 Summary/Executive summary

The pre-study and feasibility study ASSIST (relAy induStrial Supply chaIn Sustainability daTa) aimed to conceptualize and focus the perceptions, needs and potentials for improved understanding, integration, methodologies, tools and harmonization with purpose to facilitate access to sustainability data exchange throughout industrial supply chains. This is necessary to improve the environmental performance of their products and services (over the life cycle), as well as increase their competitiveness. An efficient strategy of data collection is needed to respond to an increasing interest in life cycle assessment (LCA) and LCA dataThe work was performed as literature study and as interviews and workshops between industry partners and experts. The result of this work is the following:

1) There is much partial work ongoing in several of the companies, in the industry sectors, in EU and internationally that tries to solve some of the addressed challenges. For industry to commit to any project in this field, it is important that a part of such a project includes monitoring, positioning and interaction with other relevant approaches.
2) To optimize the outcome, a full-scale project aimed towards ASSIST's approach, need to also build up a more detailed and fact-based view of how and by whom sustainability data from supply chains are used inside the industrial organizations and for their stakeholders.
3) Part of facilitating exchange of data throughout supply chains is harmonization and standardization. Therefore, a full-scale project with the ASSIST's aim needs to both be based on existing relevant standards and also identify possibilities or needs for further harmonization or formal standardization.

Therefore, the result of this pre-study suggests that full-scale projects should be established on a combination of 1-3.

2 Background

Generally, focus on life cycle management has increased among companies due to awareness connected to the industrial production system´s effect on the planetary boundaries. The life cycle perspective ensures that decisions are managed without sub-optimisation and without environmental impact being moved along value chains.

This perspective has led to pressure from end markets, new regulations and legislation. Also, investors via rating institutes focus on life cycle aspects regarding Environmental, Social and Governance (ESG) sustainability business risks. Companies now also work towards different goals where credible and reliable data is of outmost importance. The following examples on activities connected to this are to:

- Track the reduction of greenhouse gas (GHG) emissions from the supply chain;
- rank suppliers based on component's embedded emissions;
- inform potential and current customers;
- feed R&D department with up-to-date primary life cycle data;
- produce life cycle based Environmental Product Declarations (EPD).

Understanding the environmental performance of the value chain both upstream and downstream is necessary to identify and follow up the measures needed to help achieve companies' goals and strategies, as well as fulfilling customer's needs.

From workshops arranged by the Center and from individual interviews with experts working with life cycle data inside companies actively involved in the Center a common need was identified. Whereas background life cycle data is most often acquired from readymade databases, collection of specific supply chain data is made manually. This manual work increases in time as

the demand for life cycle data increases. Supply chains are complex, all suppliers do not have competence or capacity to provide the data needed. Personal contacts to explain adds to costs. In many cases there is also a reluctance to share data. Industry expresses a need for approaches that can be shared and harmonized throughout different supply chains and sectors, and that can be even standardized and scaled up. Life cycle data is used by many different roles in different organizational functions, such as supply chain management and purchasing, product development, manufacturing, different sustainability functions and sales. Therefore, the life cycle data must represent information that can be used for many different purposes.

3 Aim & Methodology

This report is written to summarize outcomes and findings from the project ASSIST - Relay industrial supply chain sustainability data, to better understand needs and potential ways forward within the field of collecting life cycle data and life cycle inventory data from suppliers.

ASSIST was a feasibility study between a range of companies with an overall aim to investigate how to improve the collection of life cycle assessment data from suppliers.

A team of researchers with much experience and knowledge from life cycle data together with a facilitator was set up to manage the project and its work packages, including 1) Inventory of current and future expected practice; 2) Outlook analysis of trends in business and society; 3) Analysis of gaps and challenges; and 4) Synthesis and design of solution options and action plan.

The study was carried out in collaboration with representatives from the different business functions in the participating companies actively involved in the Center; Research & Innovation, Product development, Sustainability & LCA and Purchasing.

3.1 Outlook analysis of trends in business and society

Trends in society and business was investigated by means of search in literature and through established networks. A review was carried out over upcoming legal requirements, voluntary agreements and technical innovations about sustainability information communication. This included scanning through on-going research projects regarding data sharing and data relaying also in related areas of potential importance, such as Artificial Intelligence and machine learning.

3.2 Inventory of current and future expected practice

All project partners were interviewed to acquire knowledge, requirements and experiences in industry, regarding the company’s current practice and experienced characteristics relating to producing and relaying value chain sustainability data. This study was performed to better understand obstacle and challenges with data management.

Together with the interviews and the interviewees two workshops were held virtually to discuss the outlook analysis, the diverse needs, challenges and their vision for a future mode of action of data flow and expected and foreseeable obstacles to overcome.

3.3 Gap analysis and design of solution options

Based on current and future needs and obstacles and a gap analysis, the team of researchers developed a vision and design of solution options for a common implementation project. This idea has been communicated with companies both inside the project partners and with other companies and result in an upcoming application for a joint research project.

4 Goal

The project goal was to identify an industrially grounded map and plan for action areas and resources (technology, competence, funding) needed to meet near and future demands for supply chain sustainability data flow. The following work packages were carried out.

1. Inventory of current and future expected practice
2. Outlook analysis of trends in business and society
3. Analysis of gaps and challenges
4. Synthesis and design of solution options and action plan

The goal has not changed, but a lot more dialogues have been taken to better understand how this project consortia can contribute to other ongoing initiatives within the transport sector and where the consortia can contribute to these initiatives, and therefore the project did not cover the whole picture of resources needed to implement the plan for actions.

5 Results and achievements

The project has resulted in dialogues within companies, between companies and between researchers and companies to better understand needs and understand this huge field of work and ongoing initiatives. A lot more effort has been taken to find a common and realistic way to move forward within the field of LCA data collection in the supply chain to contribute to and build upon ongoing initiatives and policy development.

The project has concretized a map of ongoing initiatives and trends in society, all with a relation to increased need and demand from the market, customers, and legislations for LCA data (both real-time data and specific supply chain data). Furthermore, the interviews gave a picture of the current situation among companies on how their LCA data collection were managed, furthermore their future vision of this management. These findings were used as a basis for dialogues and workshops on a common vision and solution options and actions forward where other companies have been invited to participate.

The part on best practice was brought up and discussed both in the research group and in the workshop with the industrial partners. Both these groups/discussions could not find one best practice, but large initiatives (e.g. Catena X) within the transport sector towards a fully digitized solution with real-time data or legislative proposals (e.g. product passport). Therefor this project focused on parts of solutions and small actions towards an effective LCA data collection is in place to be prepared for what is upcoming and if these huge initiatives will fail.

The pre-study targeted how the entire automotive supply and value chains may address the FFI challenge and program area "Resource efficiency in production for reduced environmental impact and increased competitiveness". This was done with aim to strengthen industry's capacity for sustainable and competitive manufacturing systems for innovative, environmentally friendly and safe vehicles, powertrains and vehicle components. The pre-study included both how to better overcome challenges regarding data collection and also tried to look into best practices, including best ways to utilize existing global and sector standards. The intention was to lay a foundation for harmonizing and setting a universal standard for how data about emissions throughout the entire life cycle of vehicles may be acquired, compiled, estimated and calculated.

This pre-study aimed to establish the foundation of one or more full-scale projects to boost the acceleration towards the transition to a circular economy by making data available to for example close material loops, by facilitating reuse of product and component before material recycling. The pre-study was in particular intended to look into technologies, such as big data and AI, agile

and innovation processes, circular business models and value networks to support data sharing to also open up for shared circularity stewardship. Hence, the pre-study intended to deliver a plan for full-scale projects to achieve better management of resource efficiency and reduced environmental impact. The project therefore addresses the USDG goals: Goal 9: Sustainable industry, innovation and infrastructure and Goal 12: Sustainable production and consumption, but thus also, implicitly, Goal 13: Combating climate change. It will do so by exploiting a broad potential of digitalization throughout the whole supply chain and production system.

6 Dissemination and publication

6.1 Knowledge and results dissemination

ASSIST was a pre-study project, aimed at formulating a full-scale project.

Dissemination intentions and plans		
How will the result be used?	Mark with X	Comment
Increase knowledge in the area	X	The result of the project will be used to communicate with industry how to realize full-scale projects that effectively solves whole or key-parts of the challenge of sustainability data throughout the supply chain.
Transfer knowledge to other advanced technology development projects	X	The project result is intended to be used to design whole or parts of other projects relating to data exchange and processing in or between companies, potentially ranging from competence and organizational agreements, to design and implementation of IT systems.
Transfer to product development projects	X	See previous points.
Introduce on market	X	The intention of the whole task is to harmonize data handling over industrial supply chains, so market introduction is a necessity.
Use in assessments/ regulations/ permit request/ political decisions, etc	X	The full-project results are intended to utilize, merge into and maximize utilization of upcoming regulations about for example digital product passports, carbon footprint reporting and traceability of sourcing for innovation critical materials.

The pre-study identified the existence and the importance of parallel projects and other initiatives, and therefore intends to align with those in the best way to accelerate and harmonize results.

6.2 Publication

ASSIST – Relay industrial supply chain sustainability data, Report no (Swedish Life Cycle Centers' report series): 2022:08. Available here, https://www.lifecyclecenter.se/publications/

7 Conclusions and ways forward

What is needed to get there? Several pieces need to be at place for effective environmental data handling. These pieces are described and built upon the following vision and activities:

Industry partners working on the full projects we intend to run and who chose to commit to the results from such projects, in 2026 these industry partners have adopted a roadmap towards content and scope of their globally harmonized LCA data management. This roadmap lay clear for these companies, in the sense that they adopt a “sustainability forefront” ambition. This will imply that those companies have sufficient confidence in their decision making, disclosures and strategies concerning the sustainability impacts of their products and operations over their value networks.

To reach the vision the following activities are needed

7.1 Synergies and relationships

A better understanding is needed of ongoing activities influencing the way of working with Life cycle assessment and life cycle data. Stronger relationships need to build with important initiatives to acquire knowledge, to contribute and to impact.

7.2 Value-creating and cost-effective data management

A better understanding is needed about how LCA data is used in decision making activities and in disclosure requirements within the companies and of what different data requirements these uses imply.

7.3 Harmonization and standards

To achieve effectiveness and credibility a harmonized way of data sharing is needed within the LCA fields, including for example different upcoming footprints and circular economy related requirements.

These actions need to be made to fit together in proper ways.

Inside companies one may start with identifying which type of data is necessary for different activities, such as primary data or data found in databases such as Ecoinvent. What data is needed for Environmental Product Declarations, environmental labeling, sustainability reporting, LCA for comparing different material in a product development phase etc. The last activity can for example connect to comparing different suppliers of material, then of course primary data is of utmost importance.

Along value chains one may start to investigate how to collect primary data from suppliers and how to act as supplier when data is requested, in which forms and in which formats. Here many alternatives exist, from the simplest forms of questionnaires, such as excel sheets to more advanced digitalization efforts to support design, manufacturing and even AI solutions for enhanced decision making. Many of these solutions exist in other parts of the companies and should be investigated if they can be of help here as well. This also connects to communication within the companies and also with the suppliers so that they understand which data is needed. Here also future environmental data must be considered, not only carbon footprint, for example recycled materials content, water footprint, land use, toxicity and other impact categories as well as data for social impact.

In parallel the legal platform is already existing and new legislation is continuously being developed. This may both set additional requirements, as well restrict both contents and forms of data. What directives and legislation are coming where new data is needed for sustainability analysis and decision taking on product development for sustainability?

The continual monitoring of ongoing and finished research projects/initiatives concerning data collecting and certification is also needed. Also, the possibility for standardization is important to

investigate and here already standards in other areas might be of help. Through standardization the obstacles around data gathering as also described above might be overcome.

8 Participating partners and contact persons

Chalmers University of Technology, Sara Palander
IVL Swedish Environmental Research Institute, Tomas Rydberg
KTH Royal Institute of Technology, Anna Hedlund Åström
RISE Research Institutes of Sweden, Raul Carlsson
Scania, Erik Nellström
SKF, Mats Berglund
Vattenfall, Lena Landström
Volvo Buses, Maria Wallenius Henriksson
Volvo Cars, Jennifer Davis