



# FINAT

Empowering the label industry

## PCF & LCA TOOLS AND METHODOLOGIES

WHAT PCF STANDARDS AND TOOLS ARE OUT THERE?  
WHAT ARE THE DIFFERENCES AMONG THEM?

# PCF & LCA TOOLS AND METHODOLOGIES



In the framework of sustainability, FINAT is working towards harmonizing the CO<sub>2</sub> accounting for the label sector. With great success, an [Introduction to Life Cycle Analysis \(LCA\)](#) and [Product Carbon Footprint \(PCF\)](#) and a [video](#) were launched to understand their concepts, the differences and the complexity of both. The second step is now to answer the following questions...

## WHAT PCF STANDARDS/APPROACHES ARE OUT THERE? WHAT ARE THE DIFFERENCES AND RELATIONS OF THESE DIFFERENT TOOLS ?

When it comes to determining the PCF (Product Carbon Footprint) for a product or process, there are many different names for the standards/methods/tools which are available. It is not always obvious what these are, how they might differ from one another or even how they might relate to one another. In this document we want to help explain the differences/similarities of these different aspects and their relevance to the self-adhesive label industry.

### DEFINITIONS

There are many different acronyms used for the different aspects of PCF evaluation, but in order to better understand how they 'fit' into the process of evaluating a PCF we need to split them into three broad groups:

- (a) **METHODOLOGIES/STANDARDS**
- (b) **CALCULATION TOOLS (SOFTWARE)**
- (c) **DATABASES**

*Note: See Annex on pages 4 & 5 for a list of methodologies, calculation tools and databases.*

**METHODOLOGIES/STANDARDS** – The first group are the methodologies and standards. These are all examples of different approaches of HOW to approach a PCF (or in some cases LCA). This includes some of the ISO standards which have been

established (under the ISO 14000 'umbrella' which includes ISO 14040 for LCA and ISO 14067 for PCF), as well as other methodologies which have been recommended by different global and regional organisations (GHG, PACT, IPCC 2013, TfS etc...). It can be the case where some methodologies can present grey areas or miss specification so another methodology can be used to help in the decision making process. For example, TfS methodology could play a part when ISO 14067 present grey areas in the chemical industry.

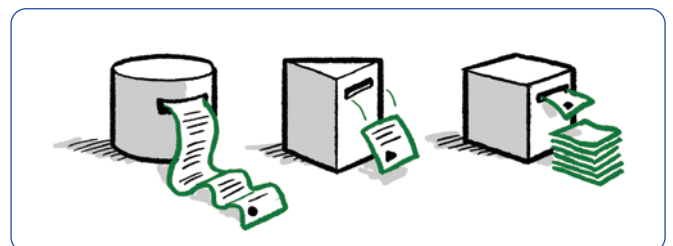


These outline the requirements and guidelines on the processes to follow as well as recommendations on how to make the calculations of PCF, but they are not tools to actually make the calculations themselves.

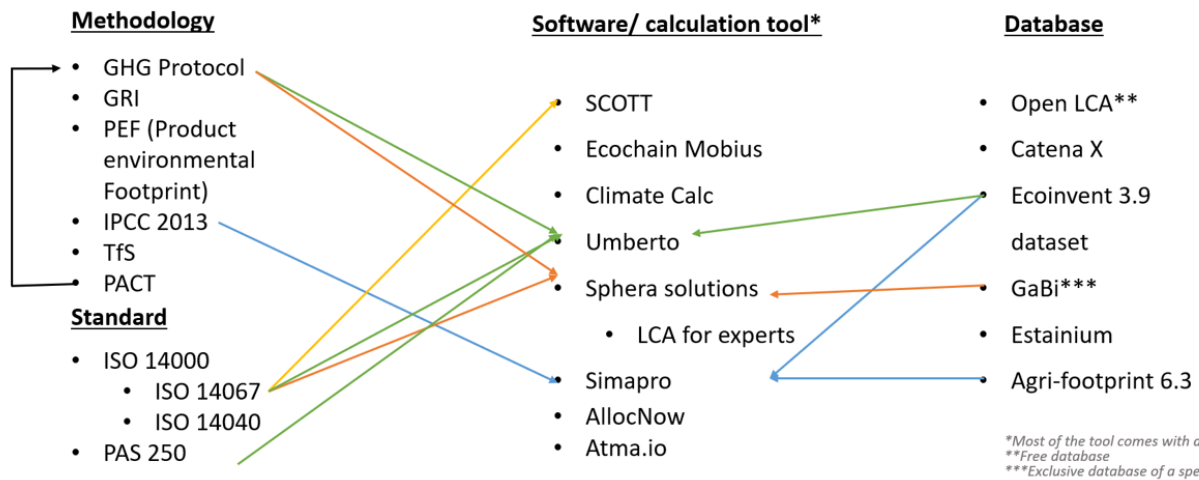


**CALCULATION TOOLS (SOFTWARE)** – The second group are the calculation tools (software), that are used to make the calculations of PCF based on a model of your process and materials. There is a wide range of tools that have been developed, sometimes with a specific industry in mind or linked to a specific standard/methodology. These tools require not only information inputs on the process but also some additional data on carbon footprints of materials and standard manufacturing/handling steps (such as transport carbon footprint data). They often rely on additional 'databases' to source/provide these data. For the SCOTT tool (developed by BASF), there is also the further connection/relationship that aspects of their tool have been licensed to other companies (namely iPoint, Sphera, AllocNow and AtoS).

**DATABASES** – The final group are the databases (both open 'free to access' and private), where some of the basic carbon footprint



## CONNECTIONS



data are stored for different aspects of PCF calculations. This can range from generic data on carbon footprint of different transport options to specific data for raw materials. In the case of some of the data they may have been openly available or shared from specific sources or studies of the existing literature, but there are also cases where the data have been 'added' to the database by some of the manufacturing suppliers as part of other PCF calculations. This second case is often true for the 'private' databases which are often linked to a specific calculation software/tool.

### CONNECTIONS

In order to perform a calculation of a PCF for a given product or process, it is necessary to select the right calculation tool and database that are compatible with the methodology/standard which you have chosen for your approach. Whilst some standards and methodologies will work with almost any of the calculation tools, there are some cases where they are linked to specific calculation tools. The figure above shows how some of the specific software/calculation tools are linked to certain methodologies or standards, as well as how some of the databases are linked to the different Software/Calculation tools. These connections may also impact the cost of using a specific tool, depending on whether they are 'open access' or 'pay-to-use' tools.

The connections to specific databases are important not only in terms of the cost of using such tools (& cost of accessing private databases), but also in terms of what data are being used for the PCF calculations as generic (reference) values as this may vary depending on the database in use. There may also be questions regarding access to information from databases since some are "sharing" data entered by other users. This may become an issue if proprietary information needs to be entered into such databases.

### PITFALLS AND CHALLENGES

Whilst most of these methodologies, tools and databases offer an excellent opportunity to build a better understanding and evaluate the impact of a product or raw material on the final PCF, there are still some challenges and pitfalls which must be borne in mind when following them. The two most important to understand are "RANGES" (data) and "REFEREING" (external auditing).

**RANGES** – When calculating a PCF, data are used from many different sources. In many cases there may be more than one source for the same material/service for which there could be a different Carbon footprint. The final calculated PCF will then be either an 'average' or a 'range' of PCF values. With each step in the value chain, there are inevitably more of these 'average' or 'range' values accumulating, so that simply stating a single final "result" for the PCF may not be appropriate and hide the natural variation in the materials/processes involved. For PCF to be comparable it is important also to understand the "range" of variability for each PCF measurement.

**REFEREING** – When PCF values have been calculated by one party it is often important to have some level of auditing or 'refereing' of the calculation to avoid so-called 'greenwashing'. Ideally any PCF/LCA should be reviewed (audited) by a reliable third party. Another option is to certify the calculation process instead of a single PCF certification. Both processes can be time consuming and expensive but it is very important to build trust in the final calculated PCF. This can often be the most important aspect of PCF calculation that the figures have been reviewed by the most reliable external referees.

## LIST OF CO2 ASSESSMENT TOOLS, STANDARDS AND DATABASES FOR COMPARISON

WHAT IS IT?	APPROACH	COMMENTS	STANDARD	DATABASE	PRO/CONS
Tool/Software	UPM Raftatac	Provides essential LCA metrics and PPP (for product-specific footprints).	PEF, ISO 14040 / 14044 and ISO 14067	Sphera	+ Is focused on the label industry. + Provides product specific LCA's. + Is a good product even for small companies.
Tool/Software	SimaPro	Widely known, applies impact assessment methods like ReCiPe, the Environmental Footprint Method (EF), or single-issue methods (like Aware, IPCC, or USEtox). It allows to create SimaPro's own impact assessment method, including new substances or normalization and weighting sets.		Ecoinvent 3/9/1, Agri-footprint 6.3 databases, Updated data in Industry data 2.0	- Pay to play + Can be tailored to final needs
Tool/Software	Sphera Solutions	Experience in packaging among other industries. AFERA is working in using this tool.		GaBi	- Pay to play + Experience with packaging industries
Tool/Software	SCOTT	BASF has its own methodology to calculate PCF and uses the calculation tool SCOTT.	ISO 14067:2018, ISO 14040:2006 and 14044:2006 for LCA. WBCSD Chemicals and PlasticsEurope have been used for decision making on allocation schemes	The company Carbonminds provides PCF datasets in line with BASF methodology	+ Only open to the market via BASF partners (partners mentioned below)
Tool/Software	Carbonminds	LCA Consulting		Simapro, Open LCA, iPoint, Brightaway..	+ BASF granted a license to use their dataset. Strong in the chemical industry
Tool/Software	Umberto	Used by some chemical companies. Eg. BASF, HELM	ISO 14067, GHG Protocol and PAS 2050	Ecoinvent & Carbon Minds	- Pay to play
Tool/Software	Open LCA			LCA offers the largest collection of data sets and database worldwide for LCA software, some for purchase, some for free; altogether, almost 100,000 different data sets are available.	+ Free or paid version available + Flexible to make a separate system
Tool/Software	ClimateCalc	Calculation tool that provides customers and manufacturers relevant information concerning the total carbon footprint of a print and packaging product. Intergraf's standard is the only international standard in the world which has defined specific boundaries for carbon footprint calculations of printing companies and printed products.	Intergraf, ISO 14064-1, ISO 16759 and the international Green House Gas Protocol (GHG Protocol).	Not specific: <a href="https://www.climatecalc.eu/standards-and-data/data-and-references/">https://www.climatecalc.eu/standards-and-data/data-and-references/</a>	+ Focused on print and packaging products - Pay to play  A certification is needed to access the data. A certification entails an annual audit from climatecalc
Tool	AllocNow	Management tool for LCA/PCF	ISO 14044/67 and TrS		+ Focus in the chemical sector + Accurate primary data-based model + BASF granted their license under the pcf methodology
Tool	iPoint	Integrated Software Solutions for Compliance and Sustainability. Measure, model, and improve the sustainability performance of products, supply chain, and operations.	ISO 14067, PAS 2050 or GHG Protocol	Leverage various data from multiple processes as well as internal and external sources and systems like ERP, CAD, ecoinvent, cm.chemicals etc.	+ Offers consulting services in an holistic view. + Strong in the automotive and chemical industry + BASF granted their license under the pcf methodology
Tool	Ecochain Mobius			Ecoinvent 3.8, Environmental Footprint (EF) and the Dutch Nationale Milieudatabase (NMD)	
Standard	ISO 14000: 14001, 14021, 14040:2006, 14044, 14067, 50001	ISO 14067 can be used as a basis, as the most recent internationally recognized standard available today. An ISO 14067 study may most easily be translated into a broader LCA study that is compliant with the 14040-44 requirements.			- Pay to play + Most softwares are based on these iso standards

WHAT IS IT?	APPROACH	COMMENTS	STANDARD	DATABASE	PRO/CONS
Standard	EN 15804	European standard for Environmental Product Declarations (EPD) in the construction industry			- Focused on the construction sector
Standard	PAS 2050 & GHG Protocol	PAS 2050 and the GHG Protocol are standards to define and measure emissions. BSI sponsored series of standards for sustainability reporting/ calculation (multiple standards for different aspects)			- Pay to play - Just a standard
Standard	Life Cycle Accounting and Reporting Standard	This standard defines how the Life Cycle can be accounted for and reported on.			
Service provider	Atos	Advisory on net-zero journey, carbon offsetting, digital transformation. A leader in cloud and digital workplace, and managing security services. Provides tailored end-to-end solutions for all industries. A pioneer in decarbonization services and products.			+ Integrates csr approaches + BASF granted their license under the pcf methodology
Guideline	IPCC 2013	Guideline for impact methods			
Guideline	PACT (Partnership for Carbon Transparency)	Is a consolidation of standards, Powered by the WBCSD and has several collaborators in the chemical industry			+ Chemical industry - Members of wbcscd have access. - Currently up to scope 2, working in scope 3 + Big end consumer companies are supporting this guideline
Guideline	GRI data framework environment	The Global Reporting Initiative provides a framework to assess the environmental impact of companies and their supply chain.			
Guideline	European Energy Efficiency Directive (EED)	The European Energy Efficiency Directive is a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. Under the Directive, all EU countries are required to use energy more efficiently at all stages of the energy chain, from production to final consumption.			
Guideline	PEF (Product Environmental Footprint) and OEF (Organisation Environmental Footprint)	PEF and OEF are currently under development. With PEF and OEF, the European Commission aims to harmonize methodologies for the calculation of the environmental footprint of products and organizations. The system has been under development for several years now, and will in the end provide a standardized impact assessment method, a database with background LCA data and calculation rules for different industrial sectors (PEFCRs).	Uses other standards: ISO, ILCD, Ecological Footprint, GHG Protocol (WRI/WBCSD)		+ Complies with eu regulations
Guideline	TfS (Together for Sustainability)	Can help to get a good overview and shows what chemical industry has developed. PCF Guideline.			+ Focus on chemical industry
Guideline	Citpa	Focused on a paper-based packaging converters	GHG Protocol	Excel database only available to members	
Database	GaBi	Uses most of the standards mentioned in the European Commission	GHG, ISO 14040/44, EN 15804+A2, ILCD DN entry level,	Subset of data: EF 2.0 and 3.0	- Pay to play. The software of gabi is sold as sfera
Database	CatenaX	Open source data eco-system to allow sharing of information ... Automobile value chain			- Specific to Automobile sector + Open source
Database	ESTANIUM	Decentralised system/database for sharing information across the supply chain			- Pay to play
Database	Ecoinvent 3.9 dataset	It is possible for a company to just buy a licence to have access to the dataset and make the calculation separately. Eg. Citpa has an excel.			- Pay to play - Calculations separately is needed

Disclaimer: It is important to note that this table is not exhaustive, and information may be subject to changes and updates. FINAT based the content on publicly available information, own experience and feedback from colleagues and members. FINAT cannot be held responsible and/or liable for any mistakes or omissions in this overview.

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