

Digitisation and integration of carbon footprint into corporate ERPs in the animal feed production sector (CARBOPETJA)

Summary

The climate emergency declaration of 19 May 2019 and the Catalan Climate Change Act, Law 16/2017, of 1 August, passed by the Government of Catalonia, calls for a reduction in greenhouse gases (GHG) by 20% by 2020 compared to 1990 levels, 40% by 2030, 65% by 2040 and to reach neutrality by 2050. Spain and the European Commission have also subsequently published climate change laws with similar reduction targets.

The Catalan Climate Change Act contains elements that are among the most ambitious in the world: — A legally binding objective of carbon neutrality no later than 2050, together with an energy supply that is 100% renewable by that same year. An objective of reaching a 60% reduction in emissions by 2030 compared to 2005 levels. Consideration of consumption patterns through consumption-based inventories of emissions and mandatory labelling schemes applicable to construction-related materials and industrial products in relation to their greenhouse gas emissions based on life-cycle analyses.

Agriculture and livestock contribute 11% of total GHG emissions according to the Catalan Office for Climate Change. Of these emissions, 47.5% are generated in manure management and 15.8% are caused by enteric fermentation. 70% of the latter are generated by the cattle sector. If animal feed production is taken into account, emissions from the meat sector rise even more due to the use of soy crops that can cause deforestation in the countries where they are grown.

The state of the art of companies in the Catalan agricultural and livestock sector on how to manage the challenges of global warming or the so-called carbon footprint in business terms is uneven. Agribusinesses with products closer to the markets are starting to calculate their carbon footprints by applying standards such as ISO 14064 for the calculation of organisational footprint. Companies located in the more early-stage and middle-stage links of the value chain will be pressed by their customers to report and also reduce their organisational footprint.

Faced with this challenge, there is a need for an integrated project that creates a link between livestock farming, agriculture, value chains in other sectors and climate change, thereby helping the sector be able to calculate its carbon footprint so that it may subsequently apply reduction measures.

The project proposed here will provide the animal compound feed production sector with a new IT tool that provides information in a simple, automated, and reproducible way on the carbon footprint derived from its production processes. They will be able to have baseline data that will allow them to establish the most optimal strategy for significantly reducing their carbon footprint. Likewise, they will be able to apply measures to modify their production processes more efficiently so as to ensure more environmentally friendly practices. That way, they will contribute to fulfilling the GHG emission reductions objectives established in the climate emergency declaration and the Catalan Climate Change Act.

Objectives

The **main objective** of the CARBOPETJA project is **to develop an IT tool that allows for digitisation and integration in corporate ERPs in the animal food compounds production sector with the goal of being able to perform an entity-wide calculation of the resulting carbon footprint left by all the stages that make up the production process.**

To achieve this general objective, the CARBOPETJA project will target the following specific technical objectives:

1. Offer a calculation of the carbon footprint of the company, cooperative or other organisation that allows it to be certified with the ISO 14064 standard and in accordance with the climate change law in Catalonia.
2. Design and implement a digital iterative carbon footprint calculation platform for feed companies using the business activity of ESPORC as a case study that can be replicable for all other ASFAC (Catalan Association of Compound Feed Producers) member companies. Design this platform and integration so that in the future it can also incorporate water footprint calculations and other environmental indicators that may be requested by the European Commission.
3. Carry out a bilateral integration of this new carbon footprint calculation and communication platform with the ERPs of feed production companies and the èdit® environmental indicator calculation engine offered by the circular and sustainable solutions company inèdit.
4. Acquire the knowledge to later be able to integrate it into the ERPs of the companies in the meat sector value chain on the platform.
5. Reduce the operational and economic costs of companies that will have to manage global warming by making it easier for them to calculate their carbon footprint.
6. Use random checks to validate the calculations the platform makes automatically.

Description of Activities Planned for the Project

The CARBOPETJA project is set out with an implementation plan of four activities:

ACTIVITY 1. Design of data inventories according to ISO 14064 to be collected in order to calculate the carbon footprint of feeds.

An initial review of the data to be collected from the entire feed value chain will be carried out. The types of users and companies that need to be registered will be identified and incorporated into the carbon footprint calculation platform so that they proceed to incorporate their data. These data shall go beyond those that may already be included in the ERPs of feed manufacturing company. In order to rigorously carry out this activity, all the data quality requirements indicated in the carbon footprint ISO standards 14064 and 14067, as well as the product category rules set out in the EPD International platform, will be considered: *"PCR 2016:03 Preparations used in animal feeding for food animals"*. The product category rules are a methodological document that details the recommendations for quantity and quality of data to be

incorporated if the goal is to create a carbon footprint that is comparable and contrastable with others in the category of products for animal feed.

ACTIVITY 2. Design and implementation of the platform for the collection of inventory data and visualisation of carbon footprint results.

First, the data inventory obtained in Activity 1 will be digitised.

Next, the necessary measures will be implemented to ensure that different users throughout the value chain (from the field to feed processing) can share operational data to complement any of those that are not in the feed companies' ERPs. This will involve integration with different ERPs and will make it necessary to consider alternative data collection methods for multiple types of companies that may be related to the primary sector or be companies that supply materials or services to them.

It will then be necessary to integrate the platform that has been implemented in the ERPs of the different companies in the feed value chain or automated systems to access the necessary data, with the relevant access rights authorisations, in order to complement the data required by the inventory designed in Activity 1. The integration of the carbon footprint calculation platform in the operational data capture part of the companies' ERPs will not start from scratch. Rather, it will use pre-existing technology related to data capture for the preparation of feed formulation that partially covers some of the information needed for the carbon footprint calculation, but it will have to be supplemented with detailed information regarding the production of the crops involved, logistics, packaging, product losses, waste, emissions, etc.

The next stage will consist of organising the feed value chain operational data extracted from the ERPs or automatically shared by the companies in a database in the capture platform. All the data stored in this database must consider the legal requirements and all levels of confidentiality decided by the companies themselves.

The next task will be the carbon footprint calculation. To carry out this function, the platform will need a second integration with a calculation engine. This is where the platform will be integrated with the *inèdit* company's *èdit* carbon footprint calculation tool. The company's fiscal data will not be stored by *èdit*. Its operational data, however, will be processed to calculate the carbon footprint and return the aggregated and partial footprint results to the newly designed platform created as part of this project.

Finally, the design of the platform's interface will be such that it allows the visualisation of the carbon footprint data in a pleasing and user-friendly way. It will generate comparisons between years, production centres and users in the different links of the value chain.

ACTIVITY 3. Validation of Esporc's carbon footprint results to integrate them into other ASFAC member companies

Task 3.1. Validating the results.

Random validations will be performed on operational data inventories to ensure that the data captured by the platform are correct. For this purpose, a sample of data inventories will be scored manually to contrast the data capture with the pre-existing data in Esporc's ERPs.

To validate the second integration -between the platform and *èdit*- carbon footprint calculations will be performed manually, and these will be contrasted with the results generated by the platform.

The work of validating the carbon footprint will also be carried out following the methodological standards mentioned in Activity 1. Specifically, those are ISO 14064 and ISO 14067 and PCR 2016:03 *Preparations used in animal feeding for food animals*, making sure that any divergences in results obtained are not due to the methodological approach and any errors due to errors in the IT integration of the software.

Task 3.2. Solving potential integration problems between computer software.

Appropriate solutions for integration between computer software will be found so that the errors detected in the automatic calculation can be resolved. While capturing operational data, there may be errors in decimals, units, or other errors, which will be corrected and resolved definitively.

Task 3.3. Outlook for software integration at ASFAC member companies.

The technical and IT requirements of the different ERPs of all ASFAC companies will be analysed in order to identify what degree of complexity would be required to integrate the carbon footprint platform with their ERPs.

Companies will be classified by their level of complexity. Despite the high diversity of ERPs, the expected result is that the levels of complexity to carry out mass integration will be low due to the synergy with partial integrations already carried out in the formulation of feed.

ACTIVITY 4. Transfer of results and dissemination actions.

ASFAC member companies and members of the feed production sector will be informed of the actions carried out and the results obtained in the project. The scientific dissemination of the project results will also be carried out.

The following activities for the dissemination and transfer of the results are planned:

- Information sessions for feed producers and other related sectors in the agri-food industry.
- Informational video on how the IT platform works and its application in the feed production sector.
- Publications in trade journals and scientific journals specialised in sustainability and climate change.
- Distribution on ASFAC and UAB digital channels.

Expected Results and Practical Recommendations

Once the different activities of the project are completed, the expected results are the following:

- Obtain a list of data, mutually agreed upon between project participants, that is in line with the data quantity and quality requirements set out by the methodological standards and that allows the digitisation and automation of the information necessary to calculate animal feed carbon footprints.
- Achieve a proper integration between the operational data capture and carbon footprint platform with the edit calculation engine that allows the data to flow and be processed and visualised in an automated and error-free manner.
- The capture via digitisation of data required for processing and then estimate feed companies' carbon footprints.
- Calculation of the carbon footprint of the feed companies and its proper display on the carbon footprint platform.
- Validation of the functioning of the platform, as realised via the tests carried out at ESPORC.
- The resolution of any problems that may have arisen in the functioning of the application regarding the integration of the software and in the automated calculation operations.
- Obtain low levels of complexity with respect to carrying out mass integration as a result of the synergy with partial integrations already carried out in feed formulation.
- Achieve the maximum dissemination and transfer of the results obtained in the project.

Having a digital platform for automated carbon footprint calculation is an important step in reducing the annual costs of calculating and diagnosing climate change in companies and is the first step toward implementing reduction actions. The carbon footprint platform proposed in this project is an innovation for companies in support of the digitisation and automation of climate change management, as it will allow as many iterations of the calculation as are necessary to be carried out autonomously and greatly reduce the need for external technical support at the companies where it is implemented. The integration of this platform with a single pre-existing calculation engine and, at the same time, with company ERPs will make it possible to overcome an IT barrier that always involves complications, that of integrating different computer programs with company ERPs. This integration will allow the ERPs to automatically export the information required for calculating the carbon footprint. The calculation engine will therefore transform the business activity information into the carbon footprint indicator expressed in tonnes of CO₂ equivalent, and the management platform will make it possible to represent the partial and total results obtained in a user-friendly way for the different users of the different parts of the value chain of the feed production sector.

The economic and time savings generated is another incentive for companies to invest in plans, actions and tangible projects that help reduce their carbon footprints via reduction targets that should be aligned with the Catalan Climate Change Act.

Operational Group Leader

ENTITY: CATALAN ASSOCIATION OF COMPOUND FOOD MANUFACTURERS (ASFAC)

Operational Group Coordinator

ENTITY: CATALAN ASSOCIATION OF COMPOUND FOOD MANUFACTURERS (ASFAC)

Other members of the operational group (grant recipients)

ENTITY: ESPORC, S.A.

Other members of the operational group (non-grant recipients)ENTITY: AUTONOMOUS UNIVERSITY OF BARCELONA (SUSTENIPRA)
INEDIT INOVACIÓN, S.L.**Subject Area(s) of Application**

- Agricultural production system
- Agricultural practice
- Agricultural equipment and machinery
- Livestock and animal welfare
- Plant production and horticulture
- Landscape / Territory management
- Pest and disease control
- Fertilisation and nutrient management
- Soil management
- Genetic resources
- Forestry
- Water management
- Climate and climate change
- Energy management
- Waste and by-product management
- Biodiversity and natural environment management
- Food quality / processing and nutrition
- Supply chain, marketing and consumption
- Agricultural and forestry competitiveness and diversification
- General

Territorial Scope

PROVINCE(S)	COUNTY(IES)
BARCELONA	OSONA BARCELONA VALLÈS OCCIDENTAL

Communication about project (publications, workshops, multimedia, etc.)

Propagation of knowledge from the CARBOPETJA project will be carried out through the following actions, done in the following areas:

RELATED AGRI-FOOD SECTORS

- Presentation of the developments and results of the project at conventions, sectoral fairs and/or seminars specific to the compound feed production and livestock sectors.
- Use of the media available at each of the companies (personalised e-mails to customers, internet, social media, marketing initiatives, catalogues, marketing documents, newsletters, etc.).

In addition, the project's dissemination plan specifies different actions that will be coordinated through ASFAC:

- Project presentation day (first year).
- Project results transfer day (second year).
- Creating an informational video. In order to facilitate and promote the use of the tool among ASFAC member companies, a presentation video and guide on how to use the digital platform will be produced.

TECHNOLOGY AND RESEARCH CENTRES AND SCIENTIFIC SECTOR

- Publication of project results in specialised scientific journals.
- Sharing the results through the centres and scientific and technological platforms where the SOSTENIPRA group at the UAB participates.
- Presentation at national and international scientific meetings and conferences.

Project Website

<https://www.asfac.org/>

Additional Project Information

PROJECT DETAILS	TOTAL BUDGET
Start Date: July 2021	Total Budget: €133,346.30
	DACC funding: € 61,666.37
Current Status: In Progress	EU funding: €46,520.25
	Own Funding: € 61,666.37

Financed by:

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Order ARP/113/2021, of 20 May, approving the regulatory bases for innovation cooperation grants by fostering the creation of operational groups of the European Agricultural Innovation Partnership in the field of agricultural productivity

and sustainability and the implementation of innovative pilot projects by these groups, and Resolution ACC/1660/2021, of 27 May, making the call for the aforementioned grant.



Generalitat de Catalunya
**Departament d'Acció Climàtica,
Alimentació i Agenda Rural**



**Fons Europeu Agrícola
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