

Service ID S00329

Location Remote, Sweden



Life cycle assessment (LCA) of agrifood products with and without AI, Robotics, and Digitalisation (AIRDIG)

Provider service

Research Institutes of Sweden (RISE)

Link to content

<https://www.agrifoodtef.eu/services/life-cycle-assessment-lca-agrifood-products-and-without-ai-robotic-digitalisation-airdig>

Type of Sector

Arable farming, Food processing, Greenhouse, Horticulture, Livestock farming, Tree Crops, Viticulture

Accepted type of products

Data

Type of service

LCA assessment

Description

LCA of agrifood products provides a clear comparison of the environmental impacts associated with food production using advanced technologies like AI, robotics, and digital tools versus traditional methods. By examining every stage of the production process—from resource extraction to processing, packaging, and distribution—this assessment highlights how these innovative technologies can lead to significant reductions in energy consumption, waste generation, and overall environmental footprints. For example, AI can optimise crop management, while robotics can streamline harvesting, both contributing to more efficient resource use. This information empowers businesses to understand the tangible benefits of adopting AIRDIG services, enabling them to make informed decisions that not only enhance environmental sustainability but also improve operational efficiency and reduce costs. Ultimately, the LCA serves as a valuable tool for stakeholders looking to implement greener practices in their agrifood operations.

How can the service help you

This service addresses the customer's need to understand the environmental impacts of their production processes, both with and without the integration of AI, robotics, and digital tools. Before the service, customers may struggle with uncertainty about how their practices impact and may lack data on the efficiency of their current systems. After the service, they receive detailed insights into the environmental footprint of their operations, enabling them to identify key areas for improvement, such as reducing energy consumption or waste. For instance, a customer using automated harvesting might learn that this technology significantly lowers greenhouse gas emissions compared to manual methods. This actionable information empowers businesses to make informed decisions, enhance their sustainability strategies, and ultimately improve their competitiveness in a market increasingly focused on environmental responsibility.

How the service will be delivered

Examples of agrifood processes that can be assessed include crop production with AI-driven irrigation systems, robotic harvesting, or digitalised supply chain management. Customisation options allow the LCA to focus on specific environmental impacts, such as carbon emissions, water use, or waste reduction, depending on the customer's goals. Limitations may arise if complete data on energy use, system lifecycle, or supply chain specifics are unavailable, which can affect the precision of the assessment. Additionally, highly complex systems or those with multiple layers of digital tools may require more detailed analysis and longer assessment times. Customers should ensure they have accurate and comprehensive data to provide for the most reliable results and actionable insights.

Service customisation

The LCA service for agrifood products with and without AIRDIG services takes 6-10 weeks and can be repeated annually or after significant operational changes. It can be delivered year-round, independent of the vegetation period, and is conducted remotely, with no specific location requirements as long as the customer is able to communicate in English and provides relevant data (e.g., operational details, energy use, system specs). The customer receives a detailed report comparing the environmental impacts of their processes with and without AI, robotics, and digitalisation, along with recommendations for sustainability improvements. Required inputs include data on production processes, technology usage, and supply chain details.