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# Revolutionising Carbon Accounting in Biotechnology

Case study

IBioIC

**The Industrial Biotechnology Innovation Centre**

## The Challenge

**The Industrial Biotechnology Innovation Centre (IBioIC) recognised that the biotechnology industry faces a difficult challenge:**

How to quantify and reduce carbon emissions generated by complex biotech processes. To encourage wider adoption of eco-friendly biotech processes, it was crucial to provide industries with a tool that could reliably predict and showcase the environmental benefits of biotechnology-based manufacturing methods.

The challenge was clear: For IBioIC to develop a robust carbon accounting tool that could quantitatively demonstrate the superior environmental performance offered by biotechnology processes, facilitating their integration into various sectors.

## The Background

In response to this industry-wide challenge, Firefinch joined forces with IBioIC and key stakeholders to lead the development of a ground-breaking solution – C-SUM. This bespoke carbon accounting tool was envisioned to revolutionise the landscape of biotechnology-based research, development, and manufacturing, as well as bridging the gap between biotechnology and environmental sustainability.

Dr. Ian Archer, the Technical Director at IBioIC, led the exploration of C-SUM's development, functionality, and benefits, ensuring a comprehensive tool that could accurately calculate the carbon emissions associated with biotech processes.

# The Solution

- Developed a user-friendly and accessible tool that bridges the gap by offering a more intuitive interface, for a wider range of users.
- Devised a tool capable of leveraging process modelling to calculate carbon footprints, innovatively enhancing the accuracy and flexibility of carbon accounting in biotech processes.
- Seamlessly integrated C-SUM with existing data sets, aiding comprehensive analysis of carbon emissions across various stages of biotechnology processes.
- Enhanced C-SUM's technological capabilities by rebuilding the tool, using a more advanced tech stack, for better performance and scalability.
- Enabled users to compare different variants of a biotech process, empowering them to choose the most environmentally sustainable options, tailored to their specific needs.

# Results

**The efforts of Firefinch and its collaborative partners resulted in the creation of C-SUM, a game-changing carbon accounting tool that is set to reshape the biotechnology landscape.**

As a result of C-SUM, the biotech industry gains the ability to predict and demonstrate the overall emissions generated by specific production processes across a diverse range of sectors.

This newfound transparency empowers decision-makers to make informed choices, encouraging the uptake of biotechnology processes that offer significantly reduced greenhouse gas emissions.

C-SUM stands as a testament to Firefinch's commitment to technological innovation, sustainability and passion for forging a more eco-conscious future.

"An effective, flexible and easily accessible carbon accounting tool is essential for demonstrating the power of biotechnology to improve environmental performance and support industrial decarbonisation. The Industrial Biotechnology Innovation Centre (IBioIC) is engaged in an ongoing collaboration with Firefinch Software to develop C-SUM - a cutting edge carbon accounting tool for biotechnology processes.The team at Firefinch have been outstanding partners on this project. Their ability to engage with a diverse mix of industrial, academic and technical stakeholders, coupled with their unparalleled grasp of key software solutions has been critical to the development of C-SUM. We look forward to embarking on the next stage of the project with them."

Kim Cameron, Bioeconomy Cluster Business Engagement Manager,
Industrial Biotechnology Innovation Centre (IBioIC)