

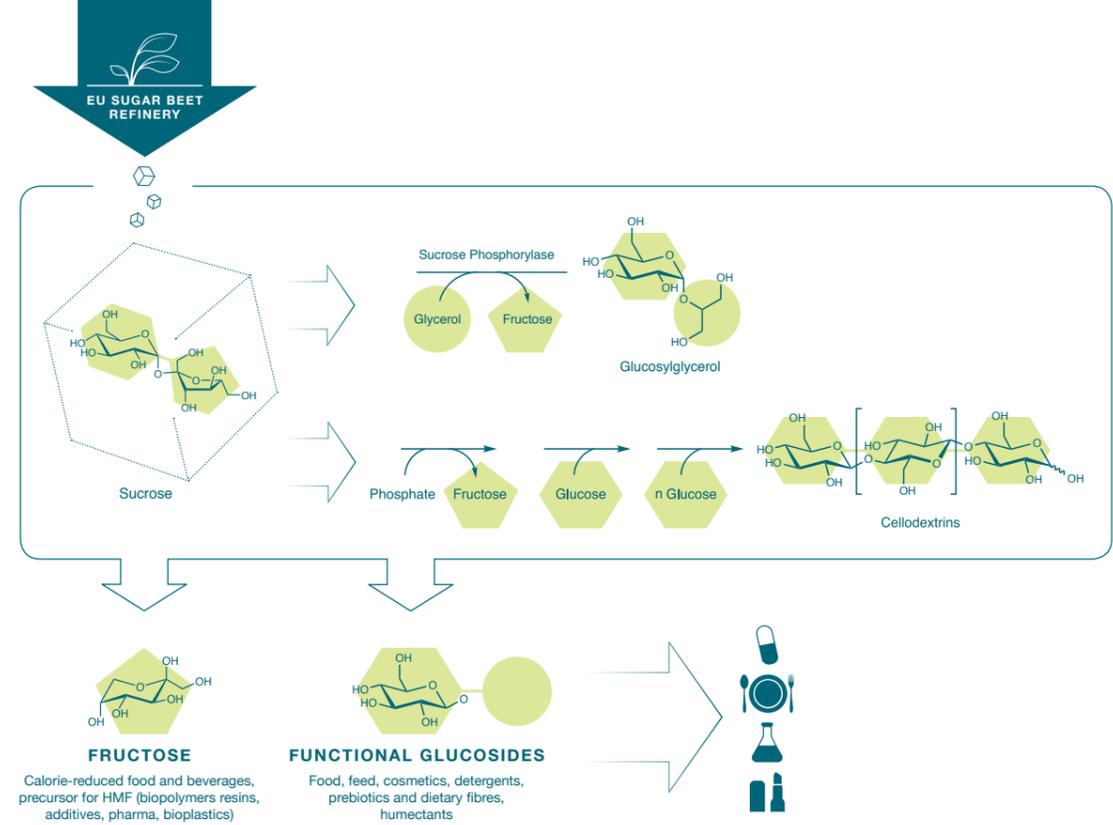


WORLD CAFÉ DISCUSSIONS
AT EFIB PRE-CONFERENCE WORKSHOP
5TH OCTOBER 2021

**The future of CARBAFIN's
glycosylation technology in
industrial production processes**



CARBAFIN has developed a platform glycosylation technology for the production of high value added compounds from sugar beet biomass.



QUESTION 1

What do you think is the potential for replication of this technology? What are the chances, what are the risks of creating such new value chains?

The two discussion tables talked about future glycoside products, new chances and identified the most common risks that might come along with novel products and processes. **Pharma industry, agriculture and cement industry** have been mentioned as **relevant sectors for glycoside applications**, and also the **synthesis of biosurfactants** (like alkyl polyglucosides, APG) was identified as a concrete example. Participants remarked that the replication potential strongly depends on the similarity to already existing technologies: the more knowledge available and the more characterizations done, the better the chance for replication. Or vice versa: **the higher the variability of new value chains** (eg usage of different substrates, with certain chemical properties, new enzyme cata-

lysts, using another host organism...) the more unknown factors are arising and the lower the replication potential. On the other hand, some participants suggested to focus rather on the synthesis of new products instead of replacing existing production routes (which are hard to compete in most cases). Furthermore, the replication potential of such a technology is highly impacted by market dynamics, considering competitors, availability and prize of substrates, stability of supply chains, long-term demands of customers etc. Especially, application of glucosides synthesized with the CARBAFIN technology to the food & feed market might be challenging. Ingredients have to be natural and non-GMO, and also clean labelling was mentioned. To overcome this barrier a common regulation/guideline for GMO free products would be required. Furthermore, a benchmark is needed to be able to compare biocatalytic production processes and validate them in terms of greener production.

According to the participants, the biotechnological process development is considered quite time consuming and costly compared to chemistry-based processes. However, this could be compensated by improved sustainability and environmental friendliness on the long term.



QUESTION 2

Which life-cycle assessment approaches are relevant for the implementation of new technologies for a circular bioeconomy? What should be considered, what are the “must-haves”?

In order to assess the potential of a novel technology, development processes should always be accompanied by a comprehensive life-cycle assessment (LCA). For most companies, LCA is already part of their daily business. The main **motivation driver for such assessments** is the customer, who requires greener processes (mainly in cosmetics), safety of products and sustainability. Performing better in sustainability issues creates unique selling points and improves marketability. The **CO₂ footprint** (cradle to gate) is one of the high-priority parameters in LCA, followed by **energy efficiency and water efficiency**. However, it was stated that a full LCA might be difficult to achieve. A central point in LCA calculation is the data availability

and quality – a situation that might improve with the increasing number of LCAs performed in future. In addition, LCA should be always combined with economic assessment. Even if a “cultural change” among the younger generation towards the value of sustainability is visible, the willingness of customers to pay more for improved sustainability is rather low. Product properties have to be communicated differently to younger people. **Waste reduction during production should also be of interest for the consumers** since waste has a high impact on the product price. A cradle to grave thinking and combining industries in circular economy was seen as a value perspective. One aspect that was also discussed on both discussion tables was the **necessity of clear regulations and standardized metrics** in order to be able to compare different processes properly. While on the one side, critically seen, additional regulatory demand for evaluation was seen as restriction of possibilities most participants regarded an extra push from regulatory and also financing institutions as necessary. In this LCA context, also the EU Product Environmental Footprint (PEF) Pilots were mentioned, though not well known by the participants .

https://ec.europa.eu/environment/eussd/smgp/ef_pilots.htm

QUESTION 3

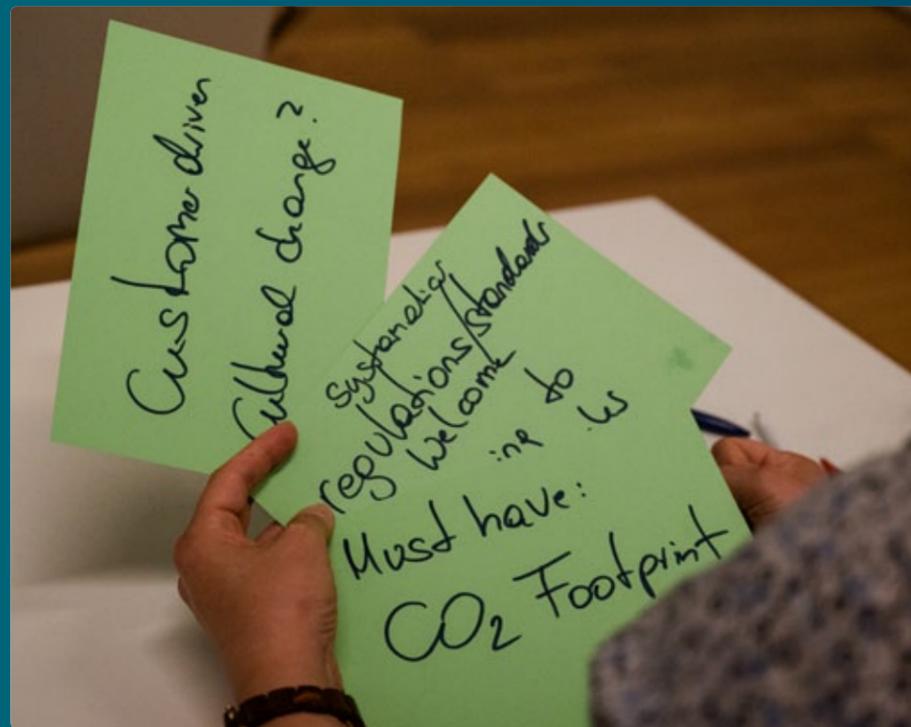
What do you expect when you participate in EU projects like CARBAFIN? What is in for industry? What is required to take up project results and adapt current processes according to project outcomes?

From industrial perspective, the participation in EU projects provides a **financial benefit** and enables the development of early-phase or risky projects that the company would not pursue independently. The up-scaling of **results** from lab to pilot scale is always very challenging, but the participation in an EU project can accelerate this process and offers a faster way to implementation. However, it has to be considered that for an uptake of results after project lifetime the **dynamic development of the regulatory landscape** (e.g., **safety regulations**) could be a barrier and has to be taken into account as early in the project as

possible. One problem that was mentioned on both discussion tables: **the majority of results is not competitive enough to outcompete current processes and would require more validations in short time**. The timing in EU-funded projects is often too limited for the industrial collaborators to effectively incorporate new ideas in production processes. In this regard, it is typically more efficient to develop bilateral collaborations. Apart from that, at a certain level several industrial participants within the project might compete for the project results. Therefore, EU calls at a lower TRL/maturity level would be clearly favoured by industry (current product-driven calls under the Horizon Europe program are less attractive for them).

Both discussion tables further pointed out that participation in EU projects offers an **excellent networking opportunity** for future collaborations. Consortium members benefit from opening the mind and sharing opinions. Industrial collaborators gain insights into current developments in academia, and academic participants learn about “hot topics” in industry. This exchange often creates the basis for novel ideas, outstanding results and the development of unexpected products and collaborations. Overall, the accumulation of knowledge creates the basis for future developments.







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