



## Abstract:

Title: Having the End in Mind – Commercialization of Bio-Based Products in a Translational Core

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The Novo Nordisk Foundation (NNF) Center for Biosustainability (CfB) develops engineering workflows - enabling the rapid, inexpensive construction of cell factories for a broad range of chemical and pharmaceutical products. While a cell factory alone has limited commercial value, combining the cell factory with a validated prototyped bioprocess creates a strong commercial value proposition, increasing the technology value by 3- to 10-fold by reducing the time and risk to market. Bio manufacturing plays a significant role in Danish industries and its economy by representing about 40% of the manufacturing output of the country. Thus, adding bioprocess development capabilities to the CfB is notably enhancing its translational potential and socio-economic impact. The CfB has integrated strain design and engineering, fermentation screening and scale-up, bioprocessing, analytics and business development capabilities into one translational core. Scientists, engineers and technicians staff the facilities, capable of developing two bioprocesses simultaneously, and operate under industrial mindset and criteria.

In order to productively invest resources in accordance with CfB's mission (to promote a more sustainable bio based chemical industry), it is essential to rigorously evaluate technologies prior to any further progressing. Filter out those that are not commercially viable and/or are inconsistent with CFB's mission, give constructive guidance to those with commercial potential but not technically ready for pre-piloting. Prioritize those that are clearly ready for acceleration and piloting and have the most commercial potential and the greatest potential to fulfill CFB's mission. To characterize key process scale parameters the Core has to operate at near, or at, planned operational system level to demonstrate at a small processing scale, apply state-of-the art technologies, high-throughput, automation and computational sciences. Testing of industrial feeds, prototyping of product separation strategies, examination of impurities in the purified product, estimation of large-scale capital and operating costs, generation of kilogram quantity product samples is required to produce technology information packages for productive, fully valued technology transfer into desired commercialization tracks (e.g. spinouts or licenses). CfB's facilities further provide process demonstrations, training, and troubleshooting support for internal and external stakeholders.