

Business plans for the Shikifactory100 project

The novel biobased product industry is growing, but small and largely under development. There are barriers to their uptake, from feedstock sourcing concerns, consumer preferences, regulatory issues and competition with traditional products as well as other novel products. As such, robust business plans are key to making a business succeed in the long-run.

A business plan is a detailed document, essentially describing the business opportunity and the method for achieving it.

Business Model

A good starting point before considering producing a business plan is to produce a business model, outlining some of the key aspects at a more strategic high-level. Essentially, a business model is the blueprint and describes how a business creates, delivers and captures value. The business model canvas designed by Osterwalder is an example outline (Figure 1).

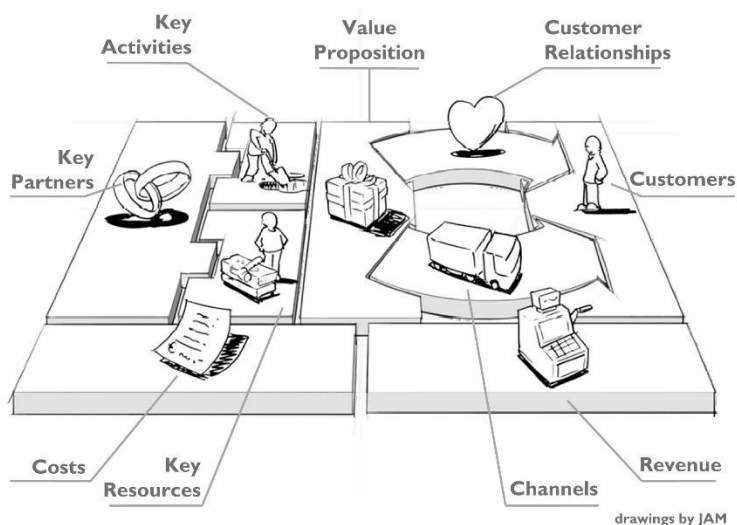
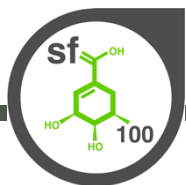


Figure 1 Business Model Canvas¹

Understanding the value proposition is the first step to build a business model. Understanding and optimising a product or service is important, but can be futile if it's not matched by an understanding of the customer wants and needs. The customer must be able to expect a benefit from the product or service. A key question to ask is 'what is the offering to the customer, and does the customer want it?' This is then followed by brainstorming other key elements of the business model.

¹ Osterwalder and Yves Pigneur. Business Model Generation. Wiley. 2010. ISBN: 978-0470-87641-1





The activities of the business and the resources required should be considered, which helps to give an outline of the key partners. Then, costs to the business and revenue channels in order to determine if the business is economically viable.

Once the business model has been created and understood, this is the primary outline for the business and a more in-depth business plan can be generated.

Business Plan

A business plan can come in many different formats, shapes and sizes, but the main concepts that should be included are the goals of a business and how to achieve those goals. Some things to consider including are:

- **The Company.** This contains the summary of the value proposition, detailing the product and business opportunity and where the company sits in the value chain.
- **Market & Competitive Analysis.** Understanding the target market and how much of it can be captured is key, as well as assumed industrial, societal, economic and market influences on the business and both direct and indirect competition.
- **Process Design.** The technology and production efforts should be detailed here, as well as any sustainability efforts. It also helps to calculate production costs and investment required.
- **Marketing & Promotion.** It's important to communicate the value proposition and unique selling point to the customer.
- **Financial Plan.** Estimated income and costs is needed, and there may be cash requirements for start-up costs. Projection of expected revenue, costs and risks is important information for investors.
- **Personnel, Management and Organisation.** Employees and governance should be described.
- **Intellectual Property.** Making sure you have freedom to operate is an important consideration.

A business plan should also contain a SWOT (strengths, weakness, opportunities and threats) analysis. Similarly, potential risks should be identified and mitigation strategies given. In addition, a project plan should be included, showing what needs to be done and when will it be done. This could be such as a timeline for transitioning from a pilot plant to commercial plant, or if any further research needs to be done.

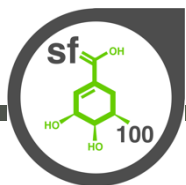
Lastly, an executive summary is written, which usually goes at the beginning of the business plan.

Business plan for a biobased business

For businesses operating within the bioeconomy there will likely be comparable opportunities and threats.

For many biobased products, there is a price premium for the consumer as a result of the smaller industry and developing technology. In general, there is a 'greening' of society and a trend towards a growing consumer preference for perceived green products but consumers need to be able to see an additional benefit in order to justify the higher price often associated with biobased products. Effective marketing is an important tool to help consumers choose biobased products. This can also take the form of obtaining appropriate labels and certificates to demonstrate sustainability. In general, there is a regulatory push in support of increased biobased content in products and materials.





Technology-readiness can be a hinderance. In addition, price competitiveness with fossil-based feedstocks is a challenge, and can be impacted by factors such as increases and decreases in oil prices.

Security of biomass feedstock supply and quality must be demonstrated. Increased research and development will help to build up biobased supply chains and technology offerings.

Shikifactory100 Project

The development of economically feasible and sustainable biotechnological processes as alternatives to oil-based chemistry is one of the major goals of the biobased economy. Synthetic biology and biobased processes are expected to become the preferred approach to produce chemicals from renewable feedstocks using cell factories. ShikiFactory100 is a Horizon2020 funded project with the aim of boosting synthetic biology competitiveness in Europe.

The project aims to produce more than 100 high-added value compounds from the shikimate pathway. The project will develop and consolidate an integrated Synthetic Biology platform for engineering tailored strains, based on simplified and optimized genomes for the efficient, cost-effective bio-based production of chemicals around the shikimate hub.

It has a consortium of 11 project partners, including NNFFC. One of NNFFC's roles is to create business plans for the exploitation of the key results of the project.

ShikiFactory exploitation

NNFFC's task is to create business models for each key exploitable result, using the business canvas model approach to ensure all key aspects are considered. The development of these business models will draw on the key findings of the conclusions of the sustainability appraisal – a task, also carried out by NNFFC, which analyses all 100 compounds from an economic, environmental and social perspective to discover the most exploitable results.

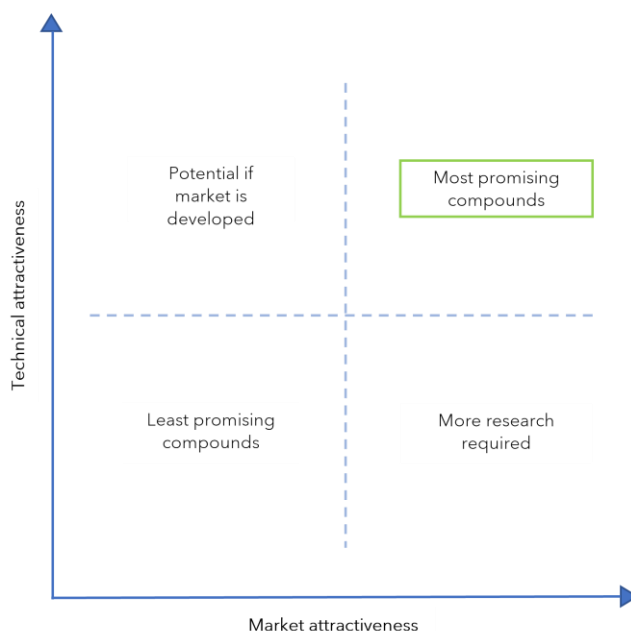
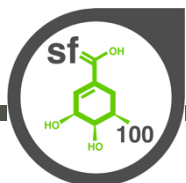


Figure 2 Four-quadrant diagram to assess the market and technical attractiveness of the 100 compounds.





NNFCC will assess the market attractiveness of each of the 100 compounds, and the technical attractiveness will be evaluated by the contributions of the other project partners. This will allow a comprehensive appraisal of each compound, with the key exploitable results being the most promising in both aspects, as shown in the diagram above (Figure 2).

After the business models have been produced, a two step process will be used to validate them. Firstly, appropriate stakeholders will be identified. These stakeholders will capture the breadth of the whole value chain, with an emphasis on the potential to become early innovation adopters. The value proposition will be introduced and feedback will be requested. This will be through interviews, questionnaires, and if relevant, visits to the experimental demonstration sites. If necessary, the value proposition will be updated and the revenue and costings in the business models reviewed.

The business models are to be detailed within a business plan, an integral part of the wider exploitation plan. An exploitation plan is essential to developing routes to commercialisation. The exploitation plan is a working document, constantly updated throughout the project and highlighting for each possible result the business opportunity, the business model, associated intellectual property management, barriers and issues, key stakeholders and stakeholder roles, risks and risk mitigation and an exploitation roadmap. At the end of the project the detailed exploitation plan will be finalised.

You can find out more about the Shikifactory100 project at <https://www.shikifactory100.eu/>

