



01 THE CHALLENGE

An industrial technology roadmap is a flexible planning technique to support strategic and long-range planning, by matching short-term and long-term goals with specific technology solutions. It is a plan that applies to a new product or process and may include using technology forecasting/technology scouting to identify suitable emerging technologies. Developing an industrial roadmap has three major uses. It helps reach a consensus about a set of needs and the technologies required to satisfy those needs, it provides a mechanism to help forecast technology developments, and it provides a framework to help plan and coordinate technology developments. It may also be used as an analysis tool to map the development and emergence of new industries.



02 HOW COORDINATION AND SUPPORT ACTIONS (CSAs) ADDRESS THE CHALLENGE

RoadToBio developed a roadmap for the chemical industry where the aspiration is to increase the share of bio-based or renewable feedstock to 25% of total volume of organic chemicals raw materials/feedstock used by the chemical industry in 2030. The **strategy document** provides in-depth background information on the drive for bio-based market growth, as well as the opportunities, barriers and recommended actions to increase the share of bio-based chemicals. The roadmap includes product-specific barriers for nine product groups¹ as well as general barriers that may hinder the development of Europe's bioeconomy and recommended actions how to overcome them.

BIO-TIC undertook a comprehensive, multi-step stakeholder consultation process to assess innovation hurdles in industrial biotechnology (IB) and to define potential solutions. The **BIO-TIC R&D roadmap** revolves around the setting of R&D priorities and identifying needs for research, pilot and demonstration plant activities. The analysis focused on the identification of R&D bottlenecks and required breakthroughs across a broad range of technological domains.



Beyond Coordination and Support Actions (CSAs)

Many industrial and sector-wise roadmaps are developed beyond the CSAs. Some are funded through trade associations, whereas others are funded by the European Commission. To mention just a few examples:

- The Confederation of European Paper Industries (CEPI) unfolded the future when launching "Unfold the future: The Forest Fibre Industry 2050 Roadmap to a low-carbon bio-economy", their 2050 Roadmap to a low-carbon bio-economy. The roadmap attempts to lay out the future of the forest fibre industry and its potential to meet future consumer demands, stay competitive and deliver a CO₂ emission reduction.
- "A journey into the Future of Europe with the European Chemical Industry" is a CEFIC initiative to describe a plausible path toward a prosperous, more sustainable Europe in 2050.
- The Blue Bioeconomy Forum (BBF) Roadmap identified 14 challenges that fall within four main themes: Policy, environment and regulation; Finance and business development; Consumers and supply chains; Science, technology and innovation. With the help of the BBF community, solutions were formulated to tackle these challenges.

¹ Agrochemicals, Adhesives, Cosmetics, Lubricants, Man-Made Fibres, Paints and Coatings, Plastics, Solvents, and Surfactants.





03 MAIN OUTCOMES FROM THE COORDINATION AND SUPPORT ACTIONS (CSAs)

Technology roadmaps identifying opportunities, needs and barriers, setting priorities, and recommending actions for increasing bio-based production.



04 GAPS TO BE ADDRESSED

- Industrial roadmaps in the bioeconomy domain are complex due to the wide variety of potential products, technological evolutions and continuously emerging opportunities and even hurdles.
- Poor engagement of stakeholders (industry including SMEs, policy makers and other public entities, consumer associations) in the design of shared industrial roadmaps leading to low acceptance and deployment.
- Difficulties in setting up a joint industrial roadmap due to the lack of interest of industrial actors to share data and information due to IPR issues.
- Poor collaboration between academia and industry, which may lead to mismatch with industrial interest and needs as well as poor roadmap exploitation.

05 RECOMMENDATIONS

- To maximise the opportunities emerging from the bio-based sector, the **development of industrial roadmaps** that are able to address properly the complexity and wide variety of challenges (related to feedstocks, technologies, value chains etc.) should be encouraged.
- Formulate (per stakeholder group) concrete and targeted actions and associated timeframes, and define indicators for the **assessment of the implementation and impact** of the industrial roadmap.
- Ensure **early and continuous engagement** of all stakeholders in roadmap development and refinement to ensure ownership, acceptance and commitment in the deployment
- **Monitor** technology developments, **identify** sectors for which it is more urgent to develop roadmaps, and **ensure supportive measures** for the design of these roadmaps.
- Design industrial roadmaps **valorising local resources** (feedstock, infrastructures, skills, industrial fabric, strategies/funding) to maximise opportunities at regional level.

06 COORDINATION AND SUPPORT ACTIONS (CSAs) IN A NUTSHELL

Acronym/logo	Programme	Duration	Website
	BBI JU	Sept 2016 – Aug 2019	www.roadtobio.eu/
	FP7	Aug 2012 - July 2015	industrialbiotech-europe.eu

07 RESOURCES

Roadmap for the chemical industry in Europe towards a Bioeconomy. Strategy Document (2019) **RoadToBio project**
https://www.roadtobio.eu/uploads/publications/roadmap/RoadToBio_strategy_document.pdf

Overcoming hurdles for innovation in industrial biotechnology. Research and Development Roadmap (2015) **BIO-TIC project**
<http://www.industrialbiotech-europe.eu/wp-content/uploads/2015/10/RD-Roadmap-BIO-TIC.pdf>

Unfold the future: The forest Fibre Industry 2050 Roadmap to a low carbon bio-economy. **Confederation of European Paper Industries (CEPI)**
<http://www.aspapel.es/sites/default/files/publicaciones/Doc%20177.pdf>

A journey into the Future of Europe with the European Chemical Industry. **CEFIC initiative**.
https://cefic.org/app/uploads/2019/06/Cefic_Mid-Century-Vision-Molecule-Managers-Brochure.pdf

Blue Bioeconomy Forum. Roadmap for the blue bioeconomy (December 2019).
<https://www.technopolis-group.com/wp-content/uploads/2020/01/BBForum-Report-PDF.pdf>

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