



## 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 groups<sup>1</sup> 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 CO<sub>2</sub> 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.

<sup>1</sup> 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 | <a href="http://www.roadtobio.eu/">www.roadtobio.eu/</a>                     |
|  | FP7       | Aug 2012 - July 2015 | <a href="http://industrialbiotech-europe.eu">industrialbiotech-europe.eu</a> |

## 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](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](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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