

## EU Research & Innovation Framework Programme

### Missions propelling innovation

The Lamy High Level Group (HLG) report<sup>1</sup> defines: *Missions should be open to all actors in the research and innovation cycle, easy to communicate and capture public imagination and involvement, thus allowing for better communication of the benefits of the future programme. Missions should mobilise many actors and investors, including at national level, and induce action across disciplines, sectors and institutional silos.*

Mission inspiring innovation should contribute to benefitting Europe. The innovation cycle included in the Lamy HLG report<sup>1</sup> needs to be complemented by an appropriate **value chain approach**. Innovation needs to be stimulated at various stages of the value chains; including upstream process industries.

Professor Mariana Mazzucato in her recent report<sup>2</sup> stresses the need for Research & Innovation (R&I) missions to be bold. *Missions provide a massive opportunity to increase the impact of European research and innovation, grasp the public imagination and make real progress on complex challenges.* The report also provides five key criteria for selecting missions and a model for movement between broad global challenges and R&I Missions.

In line with the Lamy HLG report<sup>1</sup> and Mazzucato's report<sup>2</sup> Cefic supports the recommendation to align Research & Innovation Framework Programme Missions with the **Sustainable Development Goals (SDGs)**<sup>3</sup> defined by the United Nations. **ChemistryCAN**<sup>4</sup> demonstrates how the European chemical industry facilitates the transition to a more sustainable society and make the UN SDGs a reality. A recent publication from the International Council of Chemical Associations (ICCA)<sup>5</sup>, illustrates current contributions of the global chemical industry to the SDGs.

Europe is a hub for leading chemical companies<sup>6</sup>, and a front-runner in chemistry research and innovation. Across industry sectors and value chains – from health, hygiene, construction and transport to agriculture and energy & raw materials supply – chemical industry products are an essential element, vital to a competitive business landscape, and a crucial part<sup>7</sup> of the transition to a sustainable society<sup>7</sup>.

Cefic identifies **three essential missions**. In addition, we will contribute to and support missions proposed by others linked to relevant products and value chains such as health, transportation and urbanisation.

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<sup>1</sup> LAB – FAB – APP: *Investing in the European future we want*, Pascal Lamy High Level Group report, July 2017

<sup>2</sup> *Mission-Oriented Research & Innovation; A problem-solving approach to fuel innovation-led growth*, Mariana Mazzucato, February 2018

<sup>3</sup> *17 Goals to Transform our World*, United Nations Sustainable Development Goals, September 2015

<sup>4</sup> <https://chemistrycan.com/>

<sup>5</sup> *Global Chemical Industry Contributions to the Sustainable Development Goals*, ICCA, January 2017

<sup>6</sup> The EU chemical industry employs 1.2 million workers and contributes €519 billion to the EU economy

<sup>7</sup> *Accelerating Europe towards a sustainable future*, CEFIC sustainability report, October 2017

## Low carbon industries

Addressing climate change and EU resource objectives

Inspired by



Industry is the backbone of the European economy. It accounts for 80% of Europe's exports and private innovations, and provides high-skilled jobs for citizens. Europe has a global competitive advantage on high value-added products and services, and ambitious goals to address **climate change** by moving towards an economy that will minimise the emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs). Building this low-carbon emitting economy requires orchestration and breakthrough in terms of social behaviour, economic approach, technology development and environmental assessment while safeguarding the economic backbone.

The European chemical industry supplies virtually all sectors of the economy, providing innovative and sustainable solutions to today's economic and environmental challenges. Driven by the European ambition to become Carbon-Neutral, the EU chemical industry fulfils the key prerequisites to play a leading role in the societal transformation into a **carbon neutral economy**. This transition entails a reduction of carbon footprint (negative impact factors) and an increase of carbon handprint (positive impact factors).

The chemical industry **CAN:**

- Increase the downstream handprint through novel products, materials and solutions finding their way through value chains to reduce energy and resources consumption and enable re-use/recycle.
- Further reduce its carbon *footprint* by development of innovative, sustainable and efficient production processes, and development of synergies/symbiosis between industrial actors and urban infrastructures.
- Develop processes for renewable alternative feedstock to complement fossil-based feedstock.

## Materials driving safe & circular use

*Addressing health and environment  
Retaining functionality and durability  
Enabling value creation and circularity*

Inspired by



The European chemical industry supplies virtually all sectors with (advanced) materials. Sustainable use and re-use of these materials require **collaborative approaches** within value chains and across networks of value chains to develop and promote the uptake of safe materials, substances and solutions as well as address potential harm to humans and the environment throughout the entire material-product life cycle.

Take plastics, a valuable and ubiquitous group of materials. The unique functionalities<sup>8</sup> of plastics address a number of societal challenges unmatched by any other material. The reuse and recycling of many materials is low, causing wasting end-of-life products and finite resources. Turning waste into a resource is one key element in the **circular economy**.

The objectives and targets set in European legislation are key drivers to improve waste management, stimulate innovation in recycling, and suppress the use of landfill. Making the best use of resources requires a change in consumer behaviour, re-manufacturing and re-design (in terms of durability) of products, different business models, recycling of products into products, materials or feedstock, and a change in mind-set. Circular thinking and product eco-design, biodegradable products, renewable feedstock considerations, using less material for more results, and removing the term "waste" (as it simply will no longer exist) provide a unique mission for innovation.

Product solutions from the chemical industry are designed with the objective to keep (end) products and materials at the highest utility and value<sup>9</sup>; re-using resources in an efficient and sustainable manner.

The chemical industry **CAN**:

- Enhance eco-design; develop materials enabling product- or material sorting by design and/or (digital) markers, re-use and recycling (closed and open loop).
- Develop chemical recycling technologies for end-of-life plastics upcycling (producing new materials).
- Exploit the use of renewable resources (circular streams, bio-based) to complement fossil-based feedstock.

<sup>8</sup> Plastics are light, easily shaped, strong and inexpensive

<sup>9</sup> *Taking the European Chemical Industry into the Circular Economy*, Accenture/CEFIC study, March 2017

## Affordable and abundant low carbon energy for all

*Powering clean energy production and enabling storage and use*

Inspired by



A modern society depends on a range of energy sources for its very existence. A long-term and structural change towards **low carbon energy** production and related energy systems (storage, distribution, and use) will drive fundamental changes and paradigm shifts in terms of economic activities, social economic behaviour, and energy availability & use. Large-scale use of renewable energy sources<sup>10</sup> like wind, hydropower, solar, geothermal, and ocean power require breakthrough innovation in terms of technology, **materials** and business models to resolve variability and to match supply and demand (e.g. storage solutions).

The scale and nature of production processes in the chemical industry make these processes energy intensive. The energy transition from fossil-based to renewable, and an increase in the use of renewable (electrical) energy provide opportunity.

The chemical industry **CAN:**

- Develop **advanced materials** for insulation of buildings, storage of electrical energy (batteries), energy efficiency in transportation (lightweight), transition to electric vehicles, and storage of thermal energy.
- Develop **advanced materials** for the generation of renewable energy, e.g. photovoltaics and windblades
- Develop **advanced processes** for the storage of renewable energy under chemical form.
- Incorporate further the use of renewable (electrical) energy<sup>11</sup> for the production of chemicals. Power-to-X technologies for manufacture of chemical products.

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#### About Cefic

Cefic, the European Chemical Industry Council, founded in 1972, is the voice of the large, medium and small chemical companies in Europe, which provide 1.1 million jobs and account for 15% of world chemicals production.

<sup>10</sup> EU's Renewable energy directive sets a binding target of 20% final energy consumption from renewable sources by 2020

<sup>11</sup> *Low carbon energy and feedstock for the European chemical industry*, Dechema Technology Study, June 2017