

# Sustainable Prosperity and the European Green Deal

Green Deal Projects Support Office



## Sustainable Prosperity and the European Green Deal

European Commission  
Directorate-General for Research and Innovation  
Directorate B — Healthy Planet Unit B.1 — Green Transitions

Contact Sophie De Vinck  
Email RTD-GREEN-DEAL-CALL-COORDINATION@ec.europa.eu  
Sophie.De-Vinck@ec.europa.eu  
support@greendealprojects.eu

RTD-PUBLICATIONS@ec.europa.eu

European Commission  
B-1049 Brussels

Manuscript completed in July 2025  
First edition

The contents of this publication do not necessarily reflect the position or opinion of the European Commission.

---

PDF ISBN 978-92-68-41037-0 doi:10.2777/7929998 KI-01-26-105-EN-N

---

Luxembourg: Publications Office of the European Union, 2026

© European Union, 2026



The Commission's reuse policy is implemented under Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39, ELI: <http://data.europa.eu/eli/dec/2011/833/oj>).

Unless otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed, provided appropriate credit is given and any changes are indicated.

For any use or reproduction of elements that are not owned by the European Union, permission may need to be sought directly from the respective rightholders. The European Union does not own the copyright in relation to the following elements:

Cover: © Raiko Goldenbaum #2076597709. Source: stock.adobe.com, all rights reserved.

Page 3: © MicroOne #305386384. Source: stock.adobe.com, all rights reserved.

# Sustainable Prosperity and the European Green Deal

Green Deal Projects Support Office

José Salcedo Jimenez

## CONTENTS

|                                                                                                           |    |
|-----------------------------------------------------------------------------------------------------------|----|
| ABOUT THE GREEN DEAL PROJECTS SUPPORT OFFICE .....                                                        | 3  |
| 1 INTRODUCTION .....                                                                                      | 4  |
| 1.1 INTRODUCTION .....                                                                                    | 4  |
| 1.2 DEFINITIONS .....                                                                                     | 4  |
| 1.3 STRUCTURE OF THE REPORT .....                                                                         | 5  |
| 2 POLICY BACKGROUND .....                                                                                 | 6  |
| 3 PROMISING AREAS FOR ACCELERATING THE GREEN TRANSITION<br>WHILE BOOSTING EU COMPETITIVENESS IN R&I ..... | 8  |
| 3.1 CIRCULAR ECONOMY .....                                                                                | 8  |
| 3.2 ENERGY .....                                                                                          | 9  |
| 3.3 CLEAN MOBILITY .....                                                                                  | 11 |
| 3.4 WATER TECHNOLOGIES .....                                                                              | 12 |
| 3.5 NATURE RESTORATION .....                                                                              | 13 |
| 4 EXAMPLES OF IMPACTFUL GREEN DEAL CALL PROJECTS .....                                                    | 15 |
| 4.1 NETZEROCITIES .....                                                                                   | 15 |
| 4.2 RESTORE .....                                                                                         | 16 |
| 4.3 TREEADS .....                                                                                         | 16 |
| 5 CONCLUSIONS .....                                                                                       | 18 |
| 6 DISCLAIMER .....                                                                                        | 19 |

# ABOUT THE GREEN DEAL PROJECTS SUPPORT OFFICE

**The Green Deal Projects Support Office** has been developed to facilitate coordination between projects funded under the Horizon 2020 Green Deal Call and maximise their positive impact in the longer term. The Green Deal Projects Support Office will operate until November 2026, and its key activities include supporting Green Deal projects in effective collaboration, providing networking and knowledge exchange opportunities to develop synergies, and helping projects boost the communication efforts of their results. The Green Deal Projects Support Office support networking, knowledge exchange and common capacity building activities through five working groups:



For more information on the Green Deal Projects Support Office, please contact:  
[support@greendealprojects.eu](mailto:support@greendealprojects.eu)

# 1 INTRODUCTION

## 1.1 INTRODUCTION

This report emphasises the most promising areas where research and innovation (R&I) can accelerate the transition to a greener and more competitive economy, discussing three example projects in these areas.

## 1.2 DEFINITIONS

To understand the relationship between R&I, competitiveness, and the Green Deal's objectives, some definitions are necessary.

The **European Green Deal** aims to make the EU the first climate-neutral continent by 2050, with goals including no net greenhouse gas emissions, decoupling economic growth from resource use, and ensuring no one is left behind. It encompasses policies across sectors like energy, transport, industry, and agriculture to promote sustainability and environmental protection, aiming to enhance the quality of life for EU citizens by fostering a modern, resource-efficient, and competitive economy.<sup>1</sup>

**Competitiveness** is a multifaceted concept with several definitions. At a broader level, it is the ability of a country, region, or company to produce goods and services that meet international quality standards while maintaining or increasing real incomes.<sup>2</sup> Economist Paul Krugman equates competitiveness with productivity,<sup>3</sup> a view echoed in the Draghi report, which states that raising productivity growth is the core focus of a competitiveness agenda.<sup>4</sup> This is seen as the most important driver of long-term growth, leading to rising living standards. According to the EU glossary, a competitive economy is one whose sustained productivity drives growth, income, and welfare.<sup>5</sup> Therefore, for this discussion, rising competitiveness correlates with economic growth.

R&I, competitiveness, and the Green Deal's objectives are closely related and not mutually exclusive:

- **A strong R&I environment is crucial for future competitiveness** as it strengthens the knowledge base and builds capacities in areas such as green technologies, circular economy or adaptation to climate change. This ranges from policies focused on productivity to those aimed at creating lead markets and first-mover advantages by exporting key technologies

1 European Commission. 2019. *Communication on the European Green Deal*. COM(2019) 640 final. Brussels: European Commission. [https://commission.europa.eu/publications/communication-european-green-deal\\_en](https://commission.europa.eu/publications/communication-european-green-deal_en)

2 Draghi, Mario. 2024. *The Future of European Competitiveness: A Competitiveness Strategy for Europe*. Luxembourg: Publications Office of the European Union. [https://commission.europa.eu/topics/eu-competitiveness/draghi-report\\_en](https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en)

3 Krugman, Paul. 1994. Competitiveness: A Dangerous Obsession, *Foreign Affairs*, 73(2), 28-44

4 Draghi, Mario. 2024. *The Future of European Competitiveness: A Competitiveness Strategy for Europe*. Luxembourg: Publications Office of the European Union. [https://commission.europa.eu/topics/eu-competitiveness/draghi-report\\_en](https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en)

5 European Commission. n.d. "Competitiveness." EUR-Lex. Accessed April 29, 2025. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:competitiveness>

where the EU is at the forefront. The relationship between innovation and economic growth is often captured using Total Factor Productivity (TFP), a parameter that explains most of the variation in economic growth between countries, reflecting how efficiently resources are used to raise the welfare of an economy.

- **R&I is also one of the vectors to achieve the objectives of the Green Deal.** A technological approach to tackling climate change often centres on the ambition to decouple economic growth from resource use. While this concept remains largely theoretical and has yet to be sustained over long periods historically, it continues to shape the strategic direction of innovation policy. The EU is making efforts in this area, and other countries, such as China, have begun to show signs of decoupling growth from emissions. Notably, almost a third of the required CO<sub>2</sub> reductions by 2050 rely on technologies currently at the demonstration or prototype phase.<sup>6</sup> Therefore, support for R&I is fundamental to bringing these technologies to market and achieving the Green Deal's objectives.
- **Competitiveness and the objectives of the Green Deal are compatible.** The Green Deal can be seen as an attempt to build a domestic market for more sustainable products through demand-driven innovation, creating a production chain that can be exported to other countries. An example is the eco-design regulation, which aims to position the EU as a first mover in climate technologies.<sup>7</sup> Although the EU has shown considerable strength in these technologies, it is currently lagging behind China and the US in patent activities.<sup>8</sup>

### 1.3 STRUCTURE OF THE REPORT

The remainder of the report is structured as follows: the policy background section discusses the EU's strategic frameworks, including the updated Industrial Strategy, Green Deal Industrial Plan, Circular Economy Action Plan, and Strategic Energy Technology Plan. The core of the report identifies promising areas for R&I that can drive both green growth and competitiveness: circular economy, energy, clean mobility, water technologies, and nature restoration. Each area is analysed for its contribution to Green Deal objectives and impact on competitiveness. Then, the contributions of three Horizon 2020 Green Deal Call projects (NetZero Cities, RESTORE and TREEADS) are examined more closely as examples of how to balance sustainability and competitiveness. The report ends with conclusions.

<sup>6</sup> European Commission. 2024. *Why Europe Needs a Systemic R&I Policy: Redefining Competitiveness for Long-Term Sustainability*. Luxembourg: Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/3717b938-2a01-11ef-9290-01aa75ed71a1/language-en>

<sup>7</sup> European Parliament and Council. 2024. *Regulation (EU) 2024/1781 of 13 June 2024 Establishing a Framework for the Setting of Ecodesign Requirements for Sustainable Products, Amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542, and Repealing Directive 2009/125/EC*. Official Journal of the European Union L 2024/1781, 28 June 2024. <https://eur-lex.europa.eu/eli/reg/2024/1781/oj>

<sup>8</sup> European Commission. 2024. *Why Europe Needs a Systemic R&I Policy: Redefining Competitiveness for Long-Term Sustainability* (op. cit.)

## 2 POLICY BACKGROUND

The EU is at a critical juncture where the urgent need to decarbonise is intertwined with the imperative to maintain economic competitiveness. The **European Green Deal** remains the guiding framework to achieve climate neutrality by 2050. However, the current agenda emphasises certain aspects more prominently to align with the new economic priorities in a contested international environment.

Since the updated **Industrial Strategy** in 2020, clean industries have been central to the EU's pursuit of economic growth and green ambitions. This strategy places R&I at the core of Europe's efforts to enhance resilience, sustainability, and technological sovereignty. R&I is not merely supportive but essential to shaping the future of EU industry.<sup>9</sup>

R&I also drives the EU's **Green Deal Industrial Plan**, fuelling the development of green technologies, reducing strategic dependencies, and ensuring Europe remains competitive in the race for a climate-neutral industry.<sup>10</sup> The commitments outlined in these communications have paved the way for the **Net Zero Industrial Act (NZIA)**. The NZIA establishes an enabling framework to develop technologies deemed strategic for climate neutrality, amidst a global race to deploy them at scale.<sup>11</sup>

Complementing the industrial agenda is the **Circular Economy Action Plan**, which aims to reduce pressure on natural resources. This plan acknowledges the necessity of R&I to invent, test, and scale up new technologies and systems that will define a regenerative, low-waste European economy.<sup>12</sup>

The **Strategic Energy Technology (SET) Plan** is another crucial element in the EU's policy framework. Launched in 2007, the SET Plan aims to accelerate the development and deployment of low-carbon technologies to achieve the EU's energy and climate goals.<sup>13</sup> The recent **revision of the SET Plan** harmonises its objectives with the European Green Deal and the Green Deal Industrial Plan, ensuring a unified approach towards achieving the EU's decarbonisation goals.<sup>14</sup>

Under the new Commission, competitiveness is a key goal and R&I is put at its centre. One of the first communications of 2025, the **Competitiveness Compass**, underscored the importance of sufficient public and private investment to boost productivity growth and achieve the EU's goals on

9 European Commission. 2021. *Updating the 2020 New Industrial Strategy: Building a Stronger Single Market for Europe's Recovery*. COM(2021) 350 final. Brussels: European Commission. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_21\\_1884](https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1884)

10 European Commission. 2023. *A Green Deal Industrial Plan for the Net-Zero Age*. COM(2023) 62 final. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0062>

11 European Parliament and Council. 2024. *Regulation (EU) 2024/1735 of 13 June 2024 Establishing a Framework of Measures for Strengthening Europe's Net-Zero Technology Manufacturing Ecosystem and Amending Regulation (EU) 2018/1724*. Official Journal of the European Union L 1735, 28 June 2024. <https://eur-lex.europa.eu/eli/reg/2024/1735/oj>

12 European Commission. 2020. *A New Circular Economy Action Plan: For a Cleaner and More Competitive Europe*. COM(2020) 98 final. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0098>

13 European Commission. 2007. *A European Strategic Energy Technology Plan (SET-Plan): Towards a Low Carbon Future*. COM(2007) 723 final. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52007DC0723>

14 European Commission. 2023. *Communication on the Revision of the Strategic Energy Technology (SET) Plan*. COM(2023) 634 final. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023DC0634>

innovation and climate neutrality.<sup>15</sup> Alongside the Competitiveness Compass, the **Clean Industrial Deal** highlights the crucial role of R&I in accelerating the development and deployment of clean technologies that are not yet available at scale in the market. These technologies are vital for driving industrial decarbonisation and include breakthroughs in areas such as green hydrogen, carbon capture and storage (CCUS), electrification of industrial processes, and sustainable materials like low-carbon steel and green cement. To support these initiatives, the proposal for an Industrial Decarbonisation Bank, with €100 billion in funding, aims to back innovative projects across various sectors.<sup>16</sup>

Complementing these flagship initiatives, the Commission has just adopted the **European Water Resilience Strategy**<sup>17</sup> and the **European Ocean Pact**, which launches a dedicated Water & Oceans R&I agenda, including a **Water-Smart Industrial Alliance**, a **European Water Academy** and an **Ocean R&I Strategy**, all due in 2026. These frameworks will be backed by a **Water Resilience Investment Accelerator** and a €15 billion EIB facility to scale breakthrough solutions.<sup>18</sup> In parallel, the Commission is finalising the update of the 2018 **Bioeconomy Strategy**, scheduled for late 2025, to embed sustainable bio-based innovations across EU value-chains, and on 2 July 2025, it presented the “**Choose Europe for Life Sciences**” strategy to reinforce Europe’s leadership in health, agri-food and industrial biotechnology.<sup>19</sup> Finally, a high-level strategic dialogue on circularity is paving the way for a comprehensive **Circular Economy Act**, expected in 2026, which will double the share of recycled materials in the EU economy and digitalise cross-border waste shipments.

15 European Commission. 2025. *A Competitiveness Compass for the EU*. COM(2025) 30 final. Brussels: European Commission. [https://commission.europa.eu/topics/eu-competitiveness/competitiveness-compass\\_en](https://commission.europa.eu/topics/eu-competitiveness/competitiveness-compass_en)

16 European Commission. 2025. *Clean Industrial Deal: Driving the EU's Green Industrial Transformation*. Brussels: European Commission. [https://commission.europa.eu/topics/eu-competitiveness/clean-industrial-deal\\_en](https://commission.europa.eu/topics/eu-competitiveness/clean-industrial-deal_en)

17 European Commission. 2025. *European Water Resilience Strategy*. COM(2025) 280 final. Brussels: European Commission. <https://circabc.europa.eu/ui/group/1c566741-ee2f-41e7-a915-7bd88bae7c03/library/b560bc22-6a61-4b63-b62b-a7fe890ea177/details>

18 European Commission. 2025. *European Ocean Pact*. COM(2025) 281 final. Brussels: European Commission. [https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=comnat:COM\\_2025\\_0281\\_FIN](https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=comnat:COM_2025_0281_FIN)

19 European Commission. 2025. *Choose Europe for life sciences. A strategy to position the EU as the world's most attractive place for life sciences by 2030*. COM(2025) 525 final. Brussels: European Commission. [https://research-and-innovation.ec.europa.eu/document/download/411698e8-6062-41af-96e5-af54474d70f5\\_en](https://research-and-innovation.ec.europa.eu/document/download/411698e8-6062-41af-96e5-af54474d70f5_en)

## 3 PROMISING AREAS FOR ACCELERATING THE GREEN TRANSITION WHILE BOOSTING EU COMPETITIVENESS IN R&I

To streamline efforts and maximise impact, the number of priority areas is restricted. This targeted approach allows for more effective allocation of resources and fosters collaboration among stakeholders. To select these priority areas, a thorough examination of relevant documents and contributions, including the Draghi report, the Competitiveness Compass, and expert reports, was performed.

The selected priority areas are chosen based on their proven contribution to both competitiveness and sustainability goals. For instance, while artificial intelligence (AI) is recognised as a crucial factor for competitiveness, it does not necessarily align with sustainability goals, as its resource-intensive nature necessitates focused research on reducing energy and water usage. Therefore, the selected fields not only enhance economic performance but also align with environmental objectives.

The Draghi report recognises that a concentrated effort on a smaller number of commonly agreed priorities is necessary to achieve impactful results.<sup>20</sup> By concentrating on a few key areas, the EU can drive innovation and achieve its ambitious goals for a competitive and climate-neutral future.

### 3.1 CIRCULAR ECONOMY

#### 3.1.1 Rationale for inclusion

The circular economy is a pivotal area for R&I within the EU, offering a strategic pathway to maximise growth while respecting the planet's resource boundaries. Given the EU's limited endowment of rare earths and other critical materials, focusing on circular economy principles is essential. This approach is embedded in key EU strategies, including the Green Deal, Clean Industrial Deal, and Competitiveness Compass. Prioritising R&I in the circular economy contributes to reducing the EU environmental footprint, reducing resource dependencies and creating leading markets, enhancing competitiveness while contributing to the objectives of the Green Deal.

#### 3.1.2 Circular economy and the Green Deal objectives

The circular economy is integral to the EU's growth strategy expressed in the Green Deal, which aims to decouple economic growth from resource use. By prioritising circular economy principles,

<sup>20</sup> Draghi, Mario. 2024 (*op. cit.*)

the EU can address the pressing need to reduce its material footprint. Despite efforts over the past two decades, the annual material footprint per capita in the EU has only slightly decreased.<sup>21</sup> Therefore, the circular economy presents a viable solution to significantly reduce resource consumption and environmental impact.

Applying circular economy principles to key sectors such as cement, steel, plastic, and aluminium production could reduce emissions by 40% by 2050.<sup>22</sup> This substantial reduction underscores the potential of the circular economy to drive environmental sustainability. Moreover, innovation in this field can have significant spillover effects globally. As other countries adopt technologies developed in the EU, the material footprint can be reduced worldwide, reinforcing the international dimension of the Green Deal.

### 3.1.3 Circular economy and competitiveness

Focusing R&I on the circular economy can bolster the EU's competitive edge. The EU has a comparative advantage in developing energy and resource-efficient products and services, which is crucial given its resource constraints. Currently, the EU's resource productivity (GDP per kg of domestic material consumption) is higher than that of the US, but growth in this area has lagged behind China over the past 20 years.<sup>23</sup> Enhanced research in the circular economy can help the EU maintain its competitive edge, especially as global resources become increasingly limited.

Efficient use of materials is also a security imperative, reducing dependence on external sources. The Draghi report emphasises that security is a precondition for sustainable growth.<sup>24</sup> Furthermore, R&I in the circular economy can enable the EU to achieve first-mover advantages in exporting technologies for processing used materials. Although the EU leads in patents related to the circular economy, the successful commercialisation of these patents has been challenged by the rise of China. Strengthening R&I can help the EU capitalise on its leadership in innovation.

The EU can also leverage its relatively consolidated internal market for recycling, with leading enterprises such as Veolia and Suez. This established market infrastructure provides a solid foundation for advancing circular economy initiatives and driving industrial decarbonisation.<sup>25</sup>

## 3.2 ENERGY

### 3.2.1 Rationale for inclusion

R&I in the energy sector is crucial for achieving both the competitiveness and sustainability objectives of the European Green Deal. Supplying clean, affordable, and secure energy is a fundamental measure for achieving climate neutrality, as the production and use of energy across

21 European Commission. 2024. *Why Europe Needs a Systemic R&I Policy: Redefining Competitiveness for Long-Term Sustainability* (op. cit.)

22 Ellen MacArthur Foundation. 2019. *Completing the Picture: How the Circular Economy Tackles Climate Change*. Cowes, UK: Ellen MacArthur Foundation. <https://ellenmacarthurfoundation.org/completing-the-picture>

23 European Commission. 2024. *Why Europe Needs a Systemic R&I Policy: Redefining Competitiveness for Long-Term Sustainability* (op. cit.)

24 Draghi, Mario. 2024 (op. cit.)

25 European Commission. 2024. *Why Europe Needs a Systemic R&I Policy: Redefining Competitiveness for Long-Term Sustainability* (op. cit.)

economic sectors account for more than 75% of the EU's greenhouse gas emissions.<sup>26</sup> This focus is reflected in all major strategies for competitiveness, including the Draghi and Letta reports, which emphasise the necessary shift to renewables due to the high cost of fossil fuels and its implications for competitiveness. The Strategic Energy Technology (SET) Plan is central to the EU's R&I strategies, aiming to accelerate the development and deployment of low-carbon technologies. R&I in energy is essential for reducing greenhouse gas emissions, reducing energy costs, and contributing to a competitive domestic industry, especially in energy-intensive sectors.

### 3.2.2 Energy and the Green Deal objectives

The European Green Deal positions renewables at its core, with numerous initiatives developed to support this transition. For the EU to become climate-neutral by 2050, innovation is essential in fields such as batteries and storage. While technologies like solar and wind are well developed, R&I is needed to advance other critical technologies, including energy storage, hydrogen, and carbon capture and storage (CCUS). Developing industries connected to these ecosystems is urgent, given the need for robust value chains.

Energy storage is key to increasing the share of renewable energy without compromising supply stability, as many renewables have intermittent production and cannot produce baseload power. Innovation in smart grids is another critical aspect for reaching the Green Deal objectives. Smart grids, which are more suitable for integrating renewables compared to traditional centralised models, are highlighted under the Net Zero Industrial Act as a strategic technology for achieving climate neutrality goals.<sup>27</sup>

### 3.2.3 Energy and competitiveness

R&I in energy can significantly enhance the EU's competitiveness. Currently, the price of electricity for companies in the EU is around 2–3 times higher than in the US, and the price of gas is 4–5 times higher. The development of renewable energies has been possible due to substantial investments in R&I, both public and private, and these energies are now strategic for lowering electricity prices, given their marginal cost of production is close to zero. R&I helps reduce the overall cost of energy production, as demonstrated by offshore wind, where production costs have dropped by over 70% in the past decade, boosting deployment and giving EU firms a first-mover export advantage.<sup>28</sup>

Hydrogen, a focus of Horizon Europe, is vital for energy-intensive industries where electrification is challenging due to the high temperatures required. Reducing the cost of electrolyzers, necessary for hydrogen production, is crucial and can only be achieved through R&I. Becoming competitive in electrolyzers could also provide the EU with a first-mover advantage, as hydrogen technology can be easily traded. The EU currently holds the highest share of patents for electrolyzers, reflecting its competitive advantage.<sup>29</sup>

<sup>26</sup> COM(2019) 640 final

<sup>27</sup> Regulation (EU) 2024/1735

<sup>28</sup> International Energy Agency. 2023. *Renewable Energy Market Update - June 2023*. Paris: IEA. <https://www.iea.org/reports/renewable-energy-market-update-june-2023>

<sup>29</sup> European Commission. 2023. *Water Electrolysis and Hydrogen in the European Union: Status Report on Technology Development, Trends, Value Chains and Markets*. Luxembourg: Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/46e16a85-9d7f-11ef-85f0-01aa75ed71a1/language-en>

### 3.3 CLEAN MOBILITY

#### 3.3.1 Rationale for inclusion

Mobility is a cornerstone of the European industry and service sector, contributing approximately 5% to the EU's Gross Domestic Product (GDP) and 3.1% of total EU employment. In manufacturing, it accounts for about 7% of total EU employment. Maintaining this industry within Europe is crucial for competitiveness and achieving the targets of the European Green Deal. However, the highly competitive environment in the field of electric vehicles (EVs) necessitates significant R&I to catch up with global leaders.<sup>30</sup>

The transport sector is R&D intensive, with the automotive industry alone spending around 15% of its gross value added on R&D. Despite this investment, the sector struggles to match the rapid advancements seen in China and the US. R&I in clean mobility is essential for both competitiveness and climate neutrality, as these goals are deeply interconnected. R&I must address existing competitive gaps in cost and technology in EVs, decarbonisation of fuel-intensive modes of transport and innovative ways to organise clean mobility.<sup>31</sup>

#### 3.3.2 Clean mobility and the Green Deal objectives

Accelerating the shift to sustainable and smart mobility is a key measure of the European Green Deal, which recognises that transport accounts for a significant portion of the EU's greenhouse gas emissions. Currently, transport emissions represent about one-third of the EU's total emissions and are expected to rise to 44% by 2030, given the slow pace of decarbonisation in this sector. Road transport is a priority, accounting for 73% of all transport-related greenhouse gas emissions.<sup>32</sup>

R&I efforts to reduce these emissions extend beyond the development of EVs. A comprehensive environment where access to clean energy is readily available is crucial. Modern and smart grids are necessary to expand charging capacity and replace the widespread availability of fossil fuels. In maritime transport, where electrification is more challenging, developing hydrogen solutions is a promising innovation that has yet to be scaled. Given the importance of maritime transport in freight, clean mobility solutions are fundamental.

Additionally, the development of Mobility as a Service (MaaS) models is key for decarbonisation. These models integrate public transport modes and commercial transport services, such as ride-sourcing, bike- and car-sharing, and taxis, into a comprehensive, digitally-enabled mobility offer. This integration reduces private vehicle use and, consequently, lowers emissions.<sup>33</sup>

#### 3.3.3 Clean mobility and competitiveness

Creating competitive EV batteries at scale within the EU has proven challenging, as evidenced by the recent bankruptcy of Northvolt (March 2025). Therefore, R&I is needed across the entire value

<sup>30</sup> European Commission. 2020. *Sustainable and Smart Mobility Strategy – Putting European Transport on Track for the Future*. Brussels: European Commission. [https://transport.ec.europa.eu/transport-themes/mobility-strategy\\_en](https://transport.ec.europa.eu/transport-themes/mobility-strategy_en)

<sup>31</sup> European Commission. 2024. *Addressing European Research and Innovation Challenges for System Transitions in Energy and Mobility*. Luxembourg: Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/46e16a85-9d7f-11ef-85f0-01aa75ed71a1/language-en>

<sup>32</sup> European Environment Agency. 2024. "Road Transport." European Environment Agency. Last modified October 11, 2024. <https://www.eea.europa.eu/en/topics/in-depth/road-transport>

<sup>33</sup> European Platform on Sustainable Urban Mobility Plans. 2023. *Mobility as a service (MaaS) and Sustainable Urban Mobility Planning*. [https://urban-mobility-observatory.transport.ec.europa.eu/system/files/2023-11/maas\\_and\\_sustainable\\_urban\\_mobility\\_planning.pdf](https://urban-mobility-observatory.transport.ec.europa.eu/system/files/2023-11/maas_and_sustainable_urban_mobility_planning.pdf)

chain to lower upfront investment costs and use resources more efficiently. This effort is closely linked to the circular economy, as end-of-life vehicle, battery, and material recycling are crucial areas of technology development for EVs. These vehicles drive significant increases in material demand, and recycling has the potential to reduce the need for raw materials. In a context where few critical raw materials are produced within the EU, R&I should focus on reducing dependencies and building a more resilient value chain.

The external dimension is also important, given China's recent first-mover advantage in the EV field. R&I in European technology should enable the EU to regain its competitive edge, especially as the combustion engine becomes less viable. Exporting IT technologies that enable MaaS solutions is another area deserving further research.

## 3.4 WATER TECHNOLOGIES

### 3.4.1 Rationale for inclusion

Although often overlooked, R&I in water technologies can significantly contribute to the competitiveness of the EU and the objectives of the European Green Deal. Innovation in water technologies is a key area covered by Horizon Europe Cluster 6, which focuses on food, bioeconomy, natural resources, agriculture, and environment. The recently published European Water-Resilience Strategy calls for new technologies to monitor, save, and substitute water supplies, highlighting the need for strong R&I in developing these technologies.<sup>34</sup> R&I is crucial for preventing groundwater contamination, creating decentralised approaches for water and wastewater management, securing drinking water quality with improved monitoring and treatment, and preventing droughts, among others.

### 3.4.2 Water technologies and the Green Deal objectives

Reducing water pollution is essential to preserve and restore biodiversity in lakes, rivers, wetlands, and estuaries, and it also improves human health as water pollution directly impacts agriculture and consumers. Currently, only about one-third of EU surface waters are in “good” condition.<sup>35</sup> Advanced, lower-cost treatment technologies are essential to curb nutrient and chemical loads from agriculture and industry. The elimination of pollutants such as PFAS and microplastics requires R&I, as these substances are difficult to remove from water at a competitive cost. Therefore, developing affordable and effective technologies is necessary.

Digitalisation of water management is another sector where the EU has a strong R&I track record. Innovations in this field include low-cost sensors, big data analytics, applications for consumers, and novel approaches to identify leaks, reduce water loss, and improve forecasting of water demand.<sup>36</sup> These advancements help reduce pressure on natural resources and contribute to the objectives of the European Green Deal.

<sup>34</sup> European Commission. 2025. European Water Resilience Strategy (*op. cit.*)

<sup>35</sup> European Environment Agency. 2024. *Europe's State of Water 2024: The Need for Improved Water Resilience*. EEA Report No. 07/2024. Luxembourg: Publications Office of the European Union. <https://www.eea.europa.eu/en/analysis/publications/europes-state-of-water-2024>

<sup>36</sup> European Commission. 2021. *ICT4Water Cluster: Digitalising the Water Sector*. Luxembourg: Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/3ff7b5db-91c7-11eb-b85c-01aa75ed71a1>

### 3.4.3 Water technologies and competitiveness

Water is currently available at a relatively low cost, but this may not always be the case in the future, as water availability is expected to decrease. More optimal resource use can enhance competitiveness in such an environment. Up to 25% of drinking water is lost through leakage, and digital twins, satellite leak detection, and AI-driven asset management are emerging fields that require further research.<sup>37</sup>

Furthermore, ensuring technologies for recycling and reusing water from industrial processes can contribute to a more efficient European industry. Smart-water technologies can cut operating costs for chemicals, food, and semiconductor plants, improving their price competitiveness and lowering supply-chain risks.

Improving water efficiency can also make water available for new industries, such as the hydrogen industry, which will require significant water availability to scale up. Efficient water-electrolysis and ultra-pure water systems underpin Europe's hydrogen strategy.

Leadership in these niches supports domestic equipment manufacturing and exports. The technologies for water management that are tested in Europe can be exported to new markets, especially in areas where water scarcity is a significant problem, such as Asia and Africa.

## 3.5 NATURE RESTORATION

### 3.5.1 Rationale for inclusion

Nature restoration is often viewed in isolation as a purely environmental policy, overlooking its significant implications for competitiveness. The European Green Deal announced the Nature Restoration Law, which was approved in 2024. This law aims to restore at least 20% of the EU's land and sea areas by 2030 and ultimately all ecosystems in need of restoration by 2050.<sup>38</sup> Restoring these areas will benefit competitiveness by providing essential services such as carbon capture and biodiversity protection. Additionally, restored natural areas act as safeguards against future disasters, offering more returns on investment. R&I in the field could be steered towards IT solutions enabling restoration of large areas at a competitive price or strategies and tools for preventing natural disasters.

### 3.5.2 Nature restoration and the Green Deal objectives

The contribution of nature restoration to the Green Deal objectives is clear. Achieving climate neutrality involves capturing CO<sub>2</sub> from the atmosphere, and natural areas are best suited for this purpose. Regulation alone is insufficient; new technologies and governance models are needed to achieve climate neutrality through nature restoration. For example, AI-driven platforms use pattern recognition, remote sensing, and data analysis to track animal populations and monitor biodiversity in real-time, providing crucial insights into ecosystem health. Some companies are employing drone technology to plant trees and restore ecosystems at scale.<sup>39</sup>

<sup>37</sup> European Commission. 2024. "Poorly Managed Water." *Environment*. Accessed April 30, 2025. [https://environment.ec.europa.eu/topics/water/water-wise-eu/poorly-managed-water\\_en](https://environment.ec.europa.eu/topics/water/water-wise-eu/poorly-managed-water_en)

<sup>38</sup> European Parliament and Council. 2024. *Regulation (EU) 2024/1991 of 24 June 2024 on Nature Restoration and Amending Regulation (EU) 2022/869*. Official Journal of the European Union L 2024/1991, 24 June 2024. <https://eur-lex.europa.eu/eli/reg/2024/1991/oj>

<sup>39</sup> Dendra Systems. 2025. "Home." Accessed April 30, 2025. <https://www.dendra.io/>

The synergies between regulation and innovation are strong in this field. Four flagship projects on ecosystem restoration, funded under the EU's European Green Deal—SUPERB, MERLIN, WaterLANDS, and REST-COAST—have a direct relevance for the 2030 EU Biodiversity Strategy and the new Nature Restoration Law. These projects exemplify how R&I can drive progress in nature restoration, contributing to the Green Deal's goals.<sup>40</sup>

Restoring natural habitats also plays a crucial role in mitigating the impacts of climate change. Wetlands, forests, and grasslands act as natural buffers against extreme weather events, reducing the risk of floods, droughts, and soil erosion. By enhancing the resilience of these ecosystems, the EU can better adapt to the changing climate and protect its citizens and infrastructure from environmental disasters.

### 3.5.3 Nature restoration and competitiveness

Nature restoration can be seen as a security guarantee to protect future investments. Environmental disasters are costly, and protecting coastal wetlands, for example, could save the insurance industry around €50 billion annually by mitigating flood damage losses.<sup>41</sup> Key economic sectors such as construction, agriculture, and food and drink are heavily dependent on nature, with over 50% of the world's GDP moderately or highly reliant on natural ecosystems.<sup>42</sup>

R&I for soil restoration is particularly imperative, given that soil loss is projected to increase by 13 to 22.5% in the EU by 2050. According to the impact assessment of the Nature Restoration Law, the monetary benefits of restoring the EU's priority habitats are estimated to reach around €1,860 billion, with costs estimated at around €154 billion.<sup>43</sup> Restoration projects also allow rural communities to benefit from R&I, fostering local development and resilience.

The restoration of natural habitats also supports the EU's strategic autonomy by reducing dependence on imported resources. Healthy ecosystems provide essential services such as clean water, fertile soil, and pollination, which are vital for food production and other industries. By safeguarding these resources, the EU can enhance its resilience and reduce vulnerability to external shocks.

40 European Research Executive Agency. 2024. "REA Projects Helping Restore Europe's Forests, Freshwater Sources, Coasts and Wetlands." *European Commission*. Last modified July 10, 2024. [https://rea.ec.europa.eu/news/rea-projects-helping-restore-europes-forests-freshwater-sources-coasts-and-wetlands-2024-07-10\\_en](https://rea.ec.europa.eu/news/rea-projects-helping-restore-europes-forests-freshwater-sources-coasts-and-wetlands-2024-07-10_en)

41 European Commission. 2025. *EU Biodiversity Strategy for 2030: Bringing Nature Back into Our Lives*. COM(2020) 380 final. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX%3A52020DC0380>

42 World Economic Forum & PwC. 2020. *The New Nature Economy Report – Press release "Half of World's GDP Moderately or Highly Dependent on Nature"*. 19 Jan 2020. Accessed July 11, 2025. <https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/>

43 European Commission. 2022. *Impact Assessment Accompanying the Proposal for a Regulation on Nature Restoration*. SWD(2022) 167 final. Brussels: European Commission. [https://environment.ec.europa.eu/publications/nature-restoration-law\\_en](https://environment.ec.europa.eu/publications/nature-restoration-law_en)

## 4 EXAMPLES OF IMPACTFUL GREEN DEAL CALL PROJECTS

The Horizon 2020 Green Deal Call has funded several projects in the areas identified above, contributing to the Green Deal objectives while enhancing the competitiveness of the EU. While most of them are in the final phase and their long-term impacts are still unclear, below is a selection of three promising projects. These projects have been selected by the GD-SO based on the information gathered supporting them and their public webpages. In doing so, the GD-SO has aimed at achieving a balanced composition of topics covered by the projects.

### 4.1 NETZEROCITIES<sup>44</sup>

#### 4.1.1 Project description

NetZeroCities is a Horizon 2020 project supporting European cities in drastically cutting greenhouse gas emissions to achieve climate neutrality by 2030. Part of the EU's Mission "100 Climate-Neutral and Smart Cities by 2030", the project aims to make these cities innovation hubs for broader European transformation. It offers tailored services and expertise through a one-stop-shop platform, helping cities overcome institutional and cultural barriers. Pilot projects and a Twinning Learning Programme foster experimentation and peer-learning.

#### 4.1.2 Contribution to the Green Deal objectives

NetZeroCities directly supports the Green Deal's climate neutrality goal by targeting urban areas, responsible for over 70% of CO<sub>2</sub> emissions. It promotes energy efficiency through retrofitting, smart grids, and district heating optimisation, with projected energy savings of up to 30% in pilot cities. The project also drives innovation and scalable solutions for urban sustainability, aligning with the Green Deal's emphasis on R&I.

Its focus on sustainable planning helps cities use resources efficiently and reduce their footprint, supporting the decoupling of growth from resource use. Social inclusion is central, ensuring no person or place is left behind. NetZeroCities also enhances climate resilience by encouraging adaptive infrastructure and urban preparedness.

#### 4.1.3 Contribution to competitiveness

NetZeroCities enhances the EU's leadership in sustainable urban development and smart city technologies, opening export opportunities for EU firms. It stimulates job creation in renewable energy, construction, and digital services, while helping cities lower operating costs and attract investment. Local energy and resource solutions reduce reliance on imports, supporting EU strategic autonomy and economic resilience.

<sup>44</sup> NetZeroCities. 2025. "NetZeroCities.". Accessed April 30, 2025. <https://netzerocities.eu/>

## 4.2 RESTORE<sup>45</sup>

### 4.2.1 Project description

RESTORE (Renewable Energy based seasonal Storage Technology in Order to Raise Economic and environmental sustainability of DHC) develops solutions to integrate renewables into District Heating and Cooling (DHC) systems. The project combines Thermo-Chemical Energy Storage (TCES) for long-term, loss-free storage and reversible Organic Rankine Cycle (ORC) to adapt inputs from varied renewable sources. Coordinated by Fundación CENER, the project involves 12 partners across 7 countries.

### 4.2.2 Contribution to the Green Deal objectives

RESTORE advances decarbonisation in the heating and cooling sector, which accounts for 40% of residential energy use. It enables the full integration of renewable energy, including solar and waste heat, into DHC systems, significantly reducing emissions and fossil fuel reliance. The use of seasonal storage improves efficiency by enabling summer-collected energy to serve winter needs.

The project aligns with the Green Deal's goals of resource efficiency and climate neutrality. The technologies developed are expected to cut energy consumption in DHC systems by up to 30%, supporting cost-effective emissions reduction and sustainable energy use.

### 4.2.3 Contribution to competitiveness

RESTORE strengthens the EU's competitive edge in renewable DHC technologies through its innovative TCES and ORC integration. Its scalable solutions support replication across diverse urban environments, creating new market opportunities for EU energy and storage tech firms. The project reduces energy costs for cities and industries, supports job creation, and opens export markets for EU clean-tech solutions.

## 4.3 TREEADS<sup>46</sup>

### 4.3.1 Project description

TREEADS is a Horizon 2020 initiative creating a comprehensive fire management ecosystem to address rising wildfire risks in Europe. Involving 48 partners from 13 countries and Taiwan, the project covers three phases: prevention, response, and restoration.

Prevention uses real-time risk detection through neural networks, drones, and AI platforms. Detection and response employ VR training, UAVs, and smart wearables for emergency responders. Restoration efforts focus on post-fire recovery using agroforestry, drone seeding, and AI to assess regrowth potential and risk.

45 RESTORE Project. 2025. "RESTORE." Accessed April 30, 2025. <https://www.restore-dhc.eu/>

46 TREEADS Project. 2025. "TREEADS." Accessed April 30, 2025. <https://treeads-project.eu/>

### 4.3.2 Contribution to the Green Deal objectives

TREEADS supports Green Deal targets by addressing climate change impacts and improving land resilience. Wildfire prevention and control reduce emissions from fires, contributing to climate neutrality goals. Initial data show a 30% reduction in incidents in pilot areas.

Sustainable forest management and restoration techniques support biodiversity and ecosystem recovery, aiming to restore over 10,000 hectares. The project strengthens preparedness through community engagement and smart technologies, building resilience to climate-related disasters.

### 4.3.3 Contribution to competitiveness

TREEADS enhances EU competitiveness by positioning it as a leader in wildfire management technology. AI, drones, and internet of things (IoT) solutions tested in 10 pilot projects offer scalable tools for global export. By reducing wildfire-related damage, the project may save up to €500 million annually.

It also supports market creation for environmental monitoring tools and services, offering EU firms a leading role in disaster resilience markets. Efficient fire management reduces resource loss and enhances long-term sustainability of European forests and rural economies.

## 5 CONCLUSIONS

The European Green Deal and competitiveness are not only compatible but mutually reinforcing. The Green Deal serves as a growth strategy that aims to enhance the EU's competitiveness while achieving climate neutrality. R&I policies play a crucial role in this context by ensuring that innovation is directed towards green growth. This involves developing new clean technologies that can create markets both within the EU and globally, thereby fostering long-term economic sustainability.

This report identifies at least five key areas where the EU is well-positioned to leverage its strengths. Innovation in these sectors is essential for reducing the costs of technologies necessary for a climate-neutral EU. The EU's strategic position in circular economy, energy, water technologies, clean mobility and nature restoration presents a strong case for first-mover advantages. These technologies can be easily exported, contributing to the international dimension of the Green Deal while simultaneously sustaining and creating new industries within the EU.

Based on the analysis presented above, some preliminary lessons can be drawn:

- **Prioritisation of sectors:** While it is important to maintain a comprehensive approach to research and innovation, ensuring strategic focus within Horizon Europe can help maximise impact. The Draghi report has raised concerns about the programme's broad scope and the potential dilution of resources across too many priorities.<sup>47</sup> A more targeted allocation, guided by societal needs as well as economic potential, could enhance effectiveness. This does not mean reducing ambition or scope but rather ensuring that investments are aligned with areas that can most effectively advance the Green Deal's twin goals of sustainable growth and improved quality of life.
- **Market narrative for climate neutrality projects:** Projects aimed at contributing to climate neutrality must have a compelling market narrative to align with the new global context. Although the EU is a global leader in innovation, it has often struggled to translate this innovation into successful businesses. Many technologies identified in this report have the potential to be scaled up and become market-ready.
- **Risk and leadership in R&I investments:** Not all promising technologies today will remain relevant in the future. R&I investments inherently carry risks, and the experience shows that picking winners at early stages of innovation is challenging. Nevertheless, strong leadership is required to align research efforts with the EU's long-term priorities, ensuring that the EU remains competitive while achieving climate neutrality.

<sup>47</sup> Draghi, Mario. 2024 (*op. cit.*)

## 6 DISCLAIMER

*Under the Horizon 2020 Green Deal Call, the European Union funds 73 research and innovation projects to accelerate a just and sustainable transition to a climate-neutral Europe by 2050. The Green Deal Projects Support Office was established under a contract with the European Union to support the projects funded under the Green Deal Call and to help facilitate collaboration, share best practices and increase their impact.*

*The projects mentioned in this report have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements No 101036519, 101036766, and 101036926.*

*The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in the report. Neither the Commission nor any person acting on the Commission's behalf may be held responsible for the use which may be made of the information contained therein.*

## GETTING IN TOUCH WITH THE EU

### In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online ([european-union.europa.eu/contact-eu/meet-us\\_en](https://european-union.europa.eu/contact-eu/meet-us_en)).

### On the phone or in writing

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: **00 800 6 7 8 9 10 11** (certain operators may charge for these calls),
- at the following standard number: **+32 22999696**,
- via the following form: [european-union.europa.eu/contact-eu/write-us\\_en](https://european-union.europa.eu/contact-eu/write-us_en).

## FINDING INFORMATION ABOUT THE EU

### Online

Information about the European Union in all the official languages of the EU is available on the Europa website ([europa.eu](https://europa.eu)).

### EU Publications

You can view or order EU publications at [op.europa.eu/en/publications](https://op.europa.eu/en/publications). Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre ([european-union.europa.eu/contact-eu/meet-us\\_en](https://european-union.europa.eu/contact-eu/meet-us_en)).

### EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex ([eur-lex.europa.eu](https://eur-lex.europa.eu)).

### EU open data

The portal [data.europa.eu](https://data.europa.eu) provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

Can Europe stay competitive while building a climate-neutral future?

This report examines how research and innovation are helping to answer that question.

Featuring Green Deal-funded projects including NetZeroCities, RESTORE and TREEADS, it highlights the technologies, ideas and approaches shaping Europe's response to major challenges, from decarbonising cities and restoring nature to strengthening energy security and water resilience.

*Studies and reports*



**Publications Office  
of the European Union**

Law | Data | Publications