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COVER NOTE

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Subject:	REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Mid-term review of the Zero Pollution Action Plan 'Delivering clean air, ocean, freshwaters and soil'

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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Mid-term review of the Zero Pollution Action Plan 'Delivering clean air, ocean, freshwaters and soil'

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1 INTRODUCTION

The report 'Europe's Environment 2025'[1] contains scientific evidence that climate change and environmental degradation continue to affect Europe's competitiveness, economy and resilience. It is urgent to step up the implementation of policies and long-term sustainability-enabling actions already agreed to under the European Green Deal. Such actions are in line with the European Commission's Competitiveness Compass and Clean Industrial Deal priorities in terms of innovation, decarbonisation and security.

A clean environment is a prerequisite for a competitive and sustainable economy that works for both people and the planet. Clean air is proven to reduce the number of sick days people take off work. It also reduces health-care costs[2]. Clean ocean and freshwater are needed for many economic activities, such as agriculture, fisheries and aquaculture, food processing or industrial production. Access to safe drinking water and sanitation is also essential for public health and well-being. Clean and healthy soils are essential for sustainable agriculture, have a positive impact on yields and ensure food security and safety. Regulating the use of hazardous chemicals in products reduces risk to human health and the environment, encourages waste management practices in line with the waste hierarchy and is conducive to a competitive and circular economy by enabling innovative clean solutions. The World Economic Forum identified pollution among the top 10 global risks in 2025[3].

Europe has set a trajectory for making the environment cleaner. The 2021 Zero Pollution Action Plan[4] sets out the long-term ambition for a toxic-free environment[5] and is a key pillar of the EU's clean and circular competitiveness agenda. The ambition for 2050 has also been enshrined in recent laws[6] to help guide the green transition. Key milestones are the 2030 targets used to measure progress in implementing the Zero Pollution Action Plan[7]. Together with the Chemicals Strategy for Sustainability[8], the Action Plan announced concrete actions to put the EU on a path towards achieving zero pollution as a complement to its climate and nature restoration goals, thereby addressing the triple planetary crisis. Staying the course to reach the environmental ambitious goals is Europe's strategic autonomy agenda in times of geopolitical unrest.

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1 EEA (2025), Europe's environment and climate

2 OECD (2025): Want stronger growth in Europe? Start with the air we breathe, "The impact of air pollution on labour productivity: Large-scale micro evidence from Europe"

3 World Economic Forum: "Global Risks 2025: The point of no return"

4 COM(2021) 400

5 '*A Healthy Planet for All: Air, water and soil pollution is reduced to levels no longer considered harmful to health and natural ecosystems and that respect the boundaries our planet can cope with, thus creating a toxic-free environment.*'

6 Article 1.1 of the revised Ambient Air Quality Directive (EU) 2024/2881 and Article 1.1 of the Soil Monitoring Law (EU) 2025/2360

7 Zero pollution targets

8 COM(2020) 667

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Transformative actions have been undertaken and will continue over the coming years[9]. The Commission has made it clear that zero pollution objectives are firmly anchored in the priorities for a competitive and resilient Europe. The focus will be on implementing the agreed legislation, with particular attention paid to make it easier for Member States and companies to abide by it[10]. This will be a pre-requisite for moving towards zero pollution. Under the 2024 – 2029 Political Guidelines, several headline policies such as the Clean Industrial Deal, the Competitiveness Compass, the Water Resilience Strategy, the European Ocean Pact, the Vision for Agriculture and Food and the Chemicals Industry Action Plan as well as the Bioeconomy Strategy[11] have announced further actions to help achieve zero pollution. Major strategic initiatives such as the upcoming Circular Economy Act, the revision of the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), and actions linked to the One Health agenda, such as preventive health, will also be crucial for addressing some of the identified shortcomings.

Strengthening the untapped potential of innovation for zero pollution is needed. The EU's environmental economy[12] continued to grow more strongly in 2022 than the overall economy in terms of employment and added value[13]. By supporting green industries, reskilling workforces, redefining business models, and reducing the administrative burden especially for small- and medium-sized enterprises (SMEs) and micro-enterprises, societies can achieve sustainable prosperity and competitiveness. Over the past few years, Horizon Europe and LIFE funding have helped to develop breakthrough solutions. This has led to many success stories, including selected examples mentioned in this document. EU eco-innovation is highly developed. It must be further harnessed in the EU in commercial applications to support high-tech competitiveness of the EU's green economy.

Stricter environmental regulations also push businesses to innovate. EU environmental legislation can support the deployment of green and clean innovative solutions. Green and clean innovation can drive productivity and create new markets[14]. The OECD has pointed out that green sectors are creating new value chains and new solutions that make for greater efficiency and provide cost savings. The World Economic Forum believes that countries leading in green tech can dominate emerging markets. It has also pointed out that 80% of global companies now integrate sustainability into innovation strategies[15]. Recently the OECD confirmed that even modest improvements in air quality can boost productivity[16].

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9 See Zero Pollution action tracker and Chemicals Strategy implementation

10 COM(2025) 980

11 COM (2025) 30, COM(2025) 85, COM(2025) 280, COM(2025) 281, COM(2025) 75, COM(2025) 530, COM(2025) 960

12 Many of these sectors contribute directly or indirectly to zero pollution (see EUROSTAT).

13 ESTAT (2025): Environmental economy – statistics on employment and growth

14 OECD: Economic and environmental outcomes of innovation

15 The OECD reports that environmental goods and services (EGS) markets grew by 4.5% annually between 2010 and 2020, outpacing GDP growth.

16 OECD (2025), same as footnote 2.

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Investment is essential for unlocking innovation potential. Currently, the potential investment gap for implementing EU environment legislation is EUR 58 billion per year (0.4% of EU GDP)[17]. The new Multiannual Financial Framework offers new opportunities to secure initial public financing. Private investments are also needed, and public-private initiatives can help to unlock them. The returns on investment from tackling pollution are much higher than the costs. In the case of tackling air pollution, they are estimated at 700% thanks to lower healthcare expenditure, fewer crop yield losses due to ozone, fewer absences from work due to illness, and higher productivity at work[18].

More and more businesses, cities and regions are taking the lead. They are showing that the green transition, including zero pollution transition, is possible and brings tangible advantages with it. This report aims to non-exhaustively showcase some of the frontrunners.

Now it is time to take stock of progress and map out the next steps. This report presents the mid-term review of the Action Plan announced in 2021[19]. It builds on the findings of the latest European Environment Agency (EEA) Report "Europe's Environment 2025"[20] which has been informed by the second Zero Pollution Monitoring and Outlook 2025[21].

2 PROGRESS TOWARDS A CLEAN ENVIRONMENT (SINCE 2021)

Progress on reaching the zero pollution targets is encouraging, though mixed. The latest assessment found that air pollution[22], the use of pesticides and risk, antimicrobial sales and plastic pollution at sea (monitored through beach litter)[23] had been significantly reduced. For noise[24] and nutrient pollution of waters, as well as waste, the trends are stable, whereas microplastics pollution has been estimated to have increased in recent years. Limited progress or lack of it, in some areas can be partly explained by the lag time between implementing new measures and seeing their effects[25], and by data limitations.

The legal framework for zero pollution is largely in place. Over the past six years, EU rules have been revised to raise the level of ambition to achieve the 2050 vision and reach the 2030 targets. In some areas, the scope of EU legislation has

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17 COM(2025) 420

18 SWD(2022) 345

19 '*As many work strands are ongoing or only starting to deliver results, by 2025 the Commission will take stock of the degree of implementation of this action plan, building on the second Zero Pollution Monitoring and Outlook Report. It will identify whether further action is needed to address emerging concerns and review the targets, flagships and actions identified so far, so that this decade sets the EU on the pathway to zero pollution…*'.

20 EEA (2025): Europe's Environment 2025 which, on pollution, builds on the 2nd Zero Pollution Monitoring and Outlook

21 EEA & JRC (2025): Zero Pollution Monitoring and Outlook 2025 as well as corresponding thematic assessments (e.g. Fourth Clean Air Outlook (COM/2025/64) or the 2025 Environmental Noise in Europe report)

22 See also EEA report 1/2025 Air Quality Status Report 2025

23 The results for pesticide use and antimicrobial sales must be used with caution as they do not adequately consider the risks they can cause to human health and the environment.

24 See also EEA report 5/2025 Environmental Noise in Europe

25 COM(2025) 420

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been extended to cover more polluting activities. Nature restoration measures have also been agreed on. Efforts are required by the Commission and the Member States to monitor operating permits and grant updated ones (for air, water and industrial emissions for example) so that encouraging results can be obtained on the ground[26]. Once the resulting measures are implemented, they will prevent or reduce pollution.

Supporting and preparatory actions have laid the groundwork for the future[27]. For example, the evaluation of the Marine Strategy Framework Directive has led to the announcement of its upcoming revision[28], as a key component of the deployment of the Ocean Pact. Other evaluations, of, for example, bathing water, air emissions, and sewage sludge , have identified areas where better implementation is needed[29]. The supporting document on indoor air quality identifies several EU norms that can help Member States make tailor-made improvements[30]. The nine flagships in the Action Plan have also managed, to a greater or lesser degree, to integrate zero pollution into other policy areas[31].

Some zero pollution actions have yet to be implemented. Major legal proposals, such as those on water pollutants[32], healthy soils[33] and 'One Substance, One Assessment'[34], have just entered or are about to enter into force after long negotiations. A few evaluations, in particular the Fitness Check of the Polluter Pays Principle or the evaluation of the Environment Liability Directive, have yet to be completed. Other ongoing evaluations are on single-use plastics and on nitrates. The actions aimed at helping farmers to adopt less polluting nutrients management practices[35], have been delayed due to the postponement of the Integrated Nutrient Management Action Plan. In the meantime, some relevant actions have been included in the European Water Resilience Strategy[36]. The proposal for a Regulation on the sustainable use of plant protection products has been withdrawn by the Commission, as political support from the co-legislators was lacking.

The EU has taken its zero pollution vision to the next level. The development of the Zero Pollution Monitoring and Outlook and the presentation of two assessment reports[37] has in the meantime provided an integrated, comprehensive and forward-looking overview of all types of pollution and their effect on human health and biodiversity. This work is underpinned by considerable thematic work, such as the

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26 With additional proposals to speed up environmental assessments (COM(2025) 984)

27 Zero Pollution action tracker

28 See COM(2025) 280 and COM(2025) 281

29 SWD(2025) 52, SWD(2023) 157 and SWD(2025) 394 & 395

30 SWD(2024) 147

31 See updated information on flagships in the action tracker

32 COM(2022) 540

33 Directive (EU) 2025/2360

34 Regulation (EU) 2025/2455, Regulation (EU) 2025/2457, Directive (EU) 2025/2456

35 COM(2021) 400: Actions 22. "*Build capacity and improve knowledge on less polluting practices with national advisory services for farmers*" and 23. "*Compile and make accessible in a digital format all main obligations on nutrient management stemming from EU law to limit the environmental footprint of farming activities*".

36 COM(2025) 280: "*Launch an Assistance Toolbox for Member States to support actions to reduce nutrients pollution, including through enhanced modelling, interactive maps and exchanges of best practices.*"

37 2025 report and 2022 report, see for overview: Zero pollution targets

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modelling for the Clean Air Outlook[38] which assesses the implications of air pollutant emission reductions in terms of their impacts and their costs to and benefits for society, or the new EU indicator framework for chemicals[39] which looks at the causes and impacts of chemical pollution.

Knowledge and data gaps persist. Some of the indicators for monitoring progress in reaching zero pollution targets are inadequate in terms of indicating pollution reduction in water or soil (in terms of the use of pesticides and antimicrobials for example) or they lack regular dataflows to assess them (on nutrient losses and microplastics for example). Data are sometimes late or incomplete or lacking in quality. Other gaps are the availability of data concerning the presence of substances of concern in both products and waste streams. Better use of digitalisation and newer monitoring techniques, including satellite earth observation and real-time (online) monitoring using appropriate sensors, can help overcome these challenges. A particular knowledge gap exists regarding the impacts of certain pollutants on health and biodiversity, namely microplastics, anthropogenic noise and light pollution. Furthermore, there is a lack of understanding about the health effects of human exposure to various pollutants, including the 'cocktail effect' that happens when individuals are exposed to multiple chemicals simultaneously. The EU Water Resilience as well as the EU Ocean Research & Innovation Strategies will assess remaining knowledge gaps in water resilience and ocean protection, identifying relevant priorities also for achieving zero pollution.

The Commission will
- **continue to share best practices and promote innovative solutions,**
- **establish an early warning and action system (EWAS) (by properly implementing 'One Substance, One Assessment' legislation),**
- **prepared Research & Innovation Strategies on water resilience and ocean protection and**
- **further invest in improving the evidence base for better data, indicators, assessments and modelling.**

3 OUTLOOK FOR A CLEAN ENVIRONMENT BY 2030 AND BEYOND

The progress made towards reaching the 2030 targets will largely depend on national implementation efforts. Even if the outlook has indicated that fully reaching all targets by 2030 is unlikely, significant progress can still be made if national, regional and local actors implement the agreed legislation and policies swiftly and with a high level of ambition. For example, in case of transport noise (target to reduce by 30% by 2030 the proportion of people chronically disturbed by transport), a positive scenario with additional measures could result in a reduction of up to 23%. Similarly, for the air deposition of nitrogen (25% reduction target for 2030), a 19% reduction is predicted if Member States fulfil their current emission reduction commitments in a timely manner. If Member States take some further technical measures, this reduction could be increased to 31%[40]. Projections up to

[38] Clean Air Outlook, Fourth Report COM(2025) 64

[39] EEA / European Chemicals Agency (ECHA) Report (2024): "EU Agencies: more work needed to make chemicals safe and sustainable" and online dashboard EU indicator framework for chemicals

[40] COM(2025) 64

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2030 with the Consumption Footprint also show that the EU has the potential to reduce impacts across several environmental dimensions[41]. These examples demonstrate that similar progress can be made in case of other targets.

Many cities and regions are taking the plunge. The EU's green urban and regional initiatives attract an increasing number of local and regional citizens and decision-makers. By 2030, 112 cities in the EU and 8 neighbouring countries want to become carbon neutral in the EU Mission for Smart and Climate-Neutral Cities. The EU Mission label has been awarded to 103 cities. These cities have submitted their climate-city contracts, outlining concrete objectives to reduce air, water and noise pollution, with significant co-benefits for pollution reduction. Under the Green City Accord, 123 cities have committed themselves to reducing their pollution footprint by 2030, by taking action on air quality, noise and water quality together with waste management-circular economy and urban greening efforts. Since 2010, the European Commission has acknowledged the best performing and committed cities with the European Green Capital and Green Leaf awards.

Green cities and regions across the EU moving towards zero pollution
*The **Zero Pollution Dashboard** shows that most regions have been able to reduce pollution over the past few years. In the **Green City Accord**, many cities have implemented comprehensive strategies to mitigate pollution and improving overall urban living conditions for residents. A good example is the **Limp.AR** programme of **Guimarães** (a signatory of the Green City Accord and European Green Capital in 2026). Limp.AR focuses on improving air and noise quality in urban centres by promoting the integration of vegetation, active mobility solutions and raising environmental awareness. Another good example is the city of **Lahti** (European Green Capital in 2021). The city has implemented numerous small and large-scale environmental actions, including the cleaning up the badly polluted lake (**Lake Vesijärvi** project). Lahti emerged as one of Europe's most progressive environmentally friendly cities. Many cities are also frontrunners in urban greening and restoration. For example, **Madrid, Bologna** and **Milan** are implementing the **LIFE VEG GAP** project which looks at how vegetation ecosystems can contribute, both as a source and as a sink, to air pollution and affect air temperature. The **Green Going Local: best practices** database of the Committee of the Regions provides more good examples.*

Some pollution challenges require additional EU action. The European Water Resilience Strategy[42] and the Vision for Agriculture and Food[43] have identified **nutrient pollution**, as a continuous priority challenge and several actions have been announced to address the matter. The evaluation of the National Emission-reductions Commitments Directive[44] and the ongoing evaluation of the Nitrates Directive analyse whether these key nutrient pollution reduction instruments are still 'fit for purpose'. The implementation of the CAP national strategic plans will also continue to support the reduction of nutrient and other pollution. In terms of **aquaculture**, the reduction of nutrient (and other) pollution is being promoted through the Strategic Guidelines on EU Aquaculture[45]. In terms of emissions from **livestock**, the Commission is working on a comprehensive strategy that will address all aspects of

41 See Chapter 3.5 on Pollution from Consumption in Zero Pollution Monitoring and Outlook 2025, also available in Consumption Footprint and Domestic Footprint Outlook Report 2025
42 COM(2025) 280
43 COM(2025) 75
44 SWD(2025) 394
45 COM (2021) 236

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livestock farming, including the environmental and climate sustainability of the sector. The Commission will present its report in accordance with Article 73 by 31 December 2026. Finally, the Commission will continue to support farmers and other beneficiaries in environmental and climate priority areas. Furthermore, the Commission will prepare an Assistance Toolbox for Member States to support actions to reduce nutrient pollution including support for farmers for the extensification of livestock systems or for diversification to other agricultural activities[46]. The removal of **pesticides** and their **metabolites** from groundwater and drinking water is becoming more and more challenging, in particular in rural environments due to agricultural activities near catchment areas. Besides ensuring compliance with the recently revised groundwater, surface water and drinking water quality standards, the implementation of the recast Drinking Water Directive requires Member States to ensure that a risk assessment of the catchment areas for abstraction points is carried out and appropriate risk management is put in place by July 2027 at the latest.

Clean rivers and lakes - zero water pollution[47]
*The research cluster Zero Pollution for Water (**ZP4Water**) looks at pollution throughout the water cycle. 32 case studies are looking into solutions for zero-pollution drinking and groundwater and providing policy recommendations (**MAR2PROTECT**, **NINFA**, **UPWATER**, **H2OforAll**, **intoDBP**, **SafeCREW**, **ToDrinQWATERPROTECT**, **NIAGARA**, **D4RUNOFF**, **LIFE ELEKTRA**, **LIFE PRISTINE**, **LIFE CASCADE**).*

A specific, cross-cutting focus will address ocean pollution. Air, freshwater and soil pollution ends up in the ocean, as the pervasive problem of marine litter shows. Building on the source-to-sea approach[48] set out in the European Water Resilience Strategy and the European Ocean Pact, the revision of the Marine Strategy Framework Directive together with the proposal for an Ocean Act will review the legal framework to make it more effective and simplify it in order to better achieve, among other things, a clean and healthy marine environment. The 2030 zero pollution targets, and the overarching 2050 vision, complementary to the climate-neutrality and biodiversity goals, will guide this revision process. Member States need to do more to monitor and ensure the quality of areas where fishing and shellfish farming takes place, since water pollution leads to significant losses for this sector.

Clean ocean - zero marine pollution
*Ocean are polluted, and **litter** is one of the most visible problems. But regulation is starting to make a difference. The **JRC's EU Coastline Macro Litter Trend** report showed that the amount of marine macro litter on the EU coastline had dropped by 29% as a result of EU legislation. Several projects play an important part in helping to clean up the European sea regions such the North-East Atlantic (**Free LitterAT**), the Baltic (**Circular Ocean**), and the Mediterranean (**Marine Litter MED PLUS**). **Aquaculture** needs clean water or helps to clean water, but it can also be a source of pollution. Innovative technologies can create business opportunities whilst reducing the environmental impact of aquaculture and helping to contribute to bioremediation (**Baltic MUPPETS**, **OLAMUR**, **ASTRAL**, **REMEDIA LIFE**). **Earth observation** is playing an increasing role in preventing pollution.*

46 See Art. 4.1 in proposal for the new Common Agriculture Policy, COM(2025) 560
47 Water - Research and innovation
48 EEA (2023): 'From source to sea — The untold story of marine litter'

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*Copernicus data are being used to optimise ship routes, thereby reducing fuel consumption and pollution and preventing accidental pollution incidents increasing efficiency and safety for ship owners and port authorities, including insurance companies (**OHB LuxSpace, SeaCras, EOMAP**). In the field of **civil protection** ongoing projects address long-term risk analysis for oil and hazardous substances pollution from shipping accidents to the marine environment in the Baltic Sea (**BRISK II**) and impacts and response options regarding low sulphur marine fuel oil spills (**IMAROS II**).*

In terms of **plastics and waste pollution**, several revised pieces of EU law on waste will contribute to zero pollution (for example the new Ecodesign for Sustainable Products Regulation, the revised Waste Framework Directive, the new Waste Shipment Regulation, the Single-use Plastics Directive, the new Packaging and Packaging Waste Regulation and the new Plastic Pellet Regulation). To complement these actions, the Commission has published the Bioeconomy Strategy[49] and is working on the Circular Economy Act that will support the key pillars of the Competitiveness Compass.

In terms of **noise pollution**, actions are underway[50] to improve the road worthiness of the EU vehicle fleet with the aim of also addressing noise from those modes of transport. As for railways, the introduction of quiet freight wagons to operate exclusively on "quieter routes"[51] has been a major step towards reducing noise in the sector. Future amendments to this Regulation are expected by 2029. The Commission will also assess the feasibility of introducing EU noise-reduction targets and limits in the Environmental Noise Directive in line with the European Court of Auditors' recommendations[52].

Environment and health policies are closely intertwined – applying One Health in practice. The environmental and climate dimension in the One Health approach are critical due to their role in mediating health outcomes and influencing the emergence and spread of diseases in animals and humans. The Commission will continue to focus on preventive health building on the successful example of the Beating Cancer Action Plan and new EU Cardiovascular Health Plan. The Commission is also increasing efforts to introduce a One Health governance[53] and ensure that environmental considerations are incorporated into EU initiatives aimed at preventing non-communicable diseases[54].

Healthier environment – zero air and noise pollution
*Clean air and quiet areas are a major factor in healthy living. Many projects have demonstrated how regional air quality can be improved (**LIFE Małopolska, LIFE Prepair, LIFE Sirius**) and that clean urban environments are beneficial to well-being, including cardiovascular, respiratory and mental health. (**eMOTIONAL Cities, EXPANSE, LongITools**)and. They also show how extreme heat can exacerbate air pollution (**EXHAUSTION**) and how urban greening reduces these effects whilst creating a business case for planting new trees (**100KTREES, LIFE AIRFRESH**).*

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49 COM(12025) 960

50 See updated rules for safer roads, less air pollution and digital vehicle documents

51 In accordance with the amendment to Regulation (EU) 1304/2014 (TSI Noise) or recently the agreement on CountEmissionsEU

52 ECA special report 02/2025: Urban pollution in the EU–Cities have cleaner air but are still too noisy

53 Scientific Advice Mechanism: "One Health governance in the EU"

54 Council Recommendation 2023/C 220/01

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Mixtures of pollutants including emerging ones, such as endocrine disruptors and pharmaceuticals, are becoming an increasing concern. Human biomonitoring is showing examples of effects of multiple chemicals on human health[55] and some reports show that the effects of exposure to certain chemicals can have significant health costs[56]. At the same time, these data show that effective regulation reduces the exposure and can lead to measurable improvements within short time frames. Certain hazardous chemicals are also affecting biodiversity wildlife[57]. Since 2019, the Strategic Approach for Pharmaceuticals in the Environment[58] introduced a more holistic approach to deal with the presence of pharmaceuticals in the environment. Measures to prevent emissions of hazardous chemicals upstream can reduce remediation costs, e.g. for water treatment.

Cleaner environment - zero pollution from pharmaceuticals
*More innovative approaches are emerging to minimizing environmental footprint by using cutting-edge technologies to detoxify pharmaceutical wastewater by more than 80% using an economically viable and cost-effective method (**LIFE PHARMA-DETOX**). Also, the* **RECOPHARMA** *project, has developed advanced water treatment solutions that are versatile, fast, efficient and low-cost.*

Legacy and persistent pollution, the underestimated problem. Despite growing awareness of the risks and high environmental concentrations of 'forever' chemicals[59], the full magnitude and the serious consequences of widespread pollution from per-and polyfluoroalkyl substances (PFAS) and other persistent chemicals are only beginning to be understood. In particular, the widespread appearance of trifluoroacetate (TFA)[60], a common degradation product of some PFAS, has not yet been adequately addressed by the Zero Pollution Monitoring and Outlook. However, recent decisions on water pollutants[61], the restriction of PFAS in firefighting foams[62] and upcoming work under chemicals (including the work on the 'PFAS universal restriction')[63] and other, recently agreed legislation will shed more light on the scale and extent of the problem across the EU. Regarding PFAS in drinking water, the Commission has signed an agreement with the World Health Organisation (WHO)[64] to assess the most recent scientific evidence on the potential health effects of relevant PFAS, including TFA, in drinking water. At the same

55 EEA (2025): Risks of chemical mixtures for human health in Europe

56 E.g. HEAL (2025): Chemical pollution driving men's health crisis; "The health and economic burden is significant: the related costs are estimated to exceed €15 billion annually."

57 EEA (2025): Mixtures of chemicals in Europe's rivers and lakes and Saskia Finckh et al. (2022): "Endocrine disrupting chemicals entering European rivers: Occurrence and adverse mixture effects in treated wastewater" (as well as Pistocchi, A. et al. (2022): "European scale assessment of the potential of ozonation and activated carbon treatment to reduce micropollutant emissions with wastewater"

58 COM(2019) 128, for more information: https://environment.ec.europa.eu/topics/water/surface-water_en

59 See Zero pollution monitoring and outlook 2025; and EEA Signals: (1) Treatment of drinking water to remove PFAS, (2) PFAS contamination and soil remediation and (3) Leachate pollution from landfills

60 A proposal was submitted to ECHA in April 2025 for harmonised classification of TFA as Reprotox 1B and persistent, mobile and toxic or very persistent and very mobile (PMT/vPvM).

61 Water pollution: Council and Parliament reach provisional deal to update priority substances in surface and ground waters

62 Commission restricts the use of 'forever chemicals' in firefighting foams

63 ECHA (2025): Per- and polyfluoroalkyl substances (PFAS)

64 WHO/ENV contribution agreement "Assessing health effects of PFAS in drinking water"

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time, a study[65] is ongoing to analyse treatment techniques and their related costs for PFAS (including TFA) removal from drinking water. A study on PFAS in waste streams is also ongoing taking account the ban on PFAS in packaging and packaging waste[66]. Based on this, the Commission will consider the best course of action. Moreover, actions on PFAS mitigation, remediation and support for alternatives announced in the Chemicals Industry Action Plan[67] and the European Water Resilience Strategy[68] will tackle the issue holistically in partnership with all those concerned.

Cleaning up the environment - zero pollution through remediation
*Preventing pollution must be the priority but it is not always possible to do so. Innovative and cost effective ways of detecting and remediating persistent and mobile pollutants such as PFAS are increasingly available on the market (**SCENARIOS**, **ZeroPM**, **LIFE SOuRCE**, **CHROMOFORA** and **PROMISCES**). Nature-based solutions can also help reduce nutrient pollution or remove historical metal pollution in river sediment and soils (**LIFE NARMENA**, **LIFE BELINI**, **LIFE POPWAT**). Nature-based solutions for soil remediation are increasingly innovative reducing pollution but also cutting the costs of decontamination (**POSIDON**, **ARAGON**, **EDAPHOS**).*

The European Environment Agency and the Joint Research Centre will continue to update the **Zero Pollution Monitoring and Outlook**[69] every two years. Future editions will increasingly benefit from the recently agreed 'One Substance, One Assessment' legislative framework. It will help improve data collection, integrated analysis and early warning of chemical pollution as well as setting up a permanent EU-wide human biomonitoring exercise to provide a valuable dataset. The monitoring and outlook assessment will maintain its focus to track progress reaching 2030 targets, but upcoming editions will project progress up to 2040 and 2050 and review the existing targets from a scientific perspective to determine whether more stringent or additional targets are needed for 2040. The Zero Pollution Monitoring and Outlook work will also be more closely aligned with ongoing or planned national monitoring. Integrating data and assessments, such as those from Copernicus, can also help **simplification** by using digital tools and artificial intelligence to harvest publicly available data rather than exclusively requiring Member States to report.

Through the zero pollution policy agenda, the Commission will seek potential for the **reduction of administrative and regulatory burden.** This will not only guide the legislative revisions, such as the revision of the REACH Regulation or the revision of the Marine Strategy Framework Directive, but also the work on delegated and implementing acts. The Chemicals and Environment Omnibus[70] proposals have also identified some simplification measures linked to zero-pollution work. The Commission will continue to stress-test the EU law also from a zero-

65 Contract "Analysis of treatment techniques: removal of specific pollutants and feasibility assessment of an EPR system for PFAS"
66 Regulation (EU) 2025/40
67 COM(2025) 530
68 COM(2025) 280
69 Implemented in close coordination with the EU indicator framework for chemicals
70 COM(2025) 526 & 531 and COM(2025) 980, 981, 982, 983, 984, 985 & 986

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pollution perspective, through, for example, a few upcoming evaluations and dialogues.

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The Commission will

- **continue supporting cities and regions in their zero pollution actions,**
- **revise the REACH Regulation to simplify and update it, while ensuring protection of the environment and human health,**
- **evaluate the Nitrates Directive and the Single-use Plastics Directive,**
- **present a holistic livestock strategy and publish a report on industrial emissions in accordance with Article 73 of the IED [by 2026]**
- **assess the feasibility of introducing EU noise-reduction targets and noise limits in the Environmental Noise Directive [by 2029]**
- **implement the pollution-related actions in the Water Resilience Strategy and Ocean Pact,**
- **implement the PFAS-related actions announced in the Chemicals Industry Action Plan,**
- **help implement the EU Cardiovascular Health Plan and the Beating Cancer Action Plan through zero pollution action,**
- **publish a staff working document on the environmental performance of EU aquaculture [by 2026] and on promoting aquaculture's environmental benefits [by 2027], give related training to Member States and the aquaculture industry.**

4 SUPPORTING THE ZERO POLLUTION TRANSITION

The Commission will continue to help Member States with their implementation efforts, focusing on key enablers: integration, investments and innovation. The Commission will also continue to promote international cooperation on pollution prevention and reduction, engaging in both multilateral and bilateral international cooperation efforts.

4.1 Implementation, investments and integration to boost change

Implementation must be the priority. The latest Environmental Implementation Review (EIR)[71] - a periodic report on the state of implementation of EU environmental law and policies - identifies the policy areas with key challenges of implementing EU environmental legislation namely: the circular economy and waste; zero pollution including chemicals; nature and biodiversity; and climate action. It identifies good practices and challenges in the Member States. It recommends improvements and solutions as well as "priority actions"[72]. The 2025 EIR identifies five key factors that make the difference between good implementation and poor implementation. These are: (1) the **integration of environmental objectives** into public policies, through political dialogue and on the sharing the implementation cost among stakeholders; (2) **financing**; (3) **administrative capacity**, especially to ensure proper planning and coordination; (4) **digital data**; and (5) the **role of public participation** in environmental decision-making alongside better **access to justice and means of redress**.

[71] COM(2025) 420, more information: Environmental Implementation Review

[72] Out of the 96 priority actions recommended to the Member States, 36 concern pollution-related legislation (see Annex 1 of COM(2025) 420)

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All stakeholders – from the Commission to Member States, including regional and local authorities, the private sector, and civil society and households – have a role to play in environmental implementation. To support better implementation and enforcement, the Commission will carry out **implementation dialogues**[73] based on the country-specific assessments and priority action recommendations in the EIR and in policy-specific assessments[74]. The **Zero Pollution Stakeholder Platform** will also play an important role as it is co-chaired with the Committee of the Regions discusses in particular regional and local level implementation challenges[75]. Furthermore, the dialogues with stakeholders including businesses and civil society will continue and revolve around **'reality checks'** of whether EU legislation can be applied effectively in practice. The Commission will also continue to support the Member States by providing technical capacity and funding[76], as well as simplifying regulatory frameworks complemented, where appropriate, by enforcement actions. The **LIFE programme**, the EU funding instrument for environment, climate action and clean energy transition, has **helped close the implementation gap**, by providing targeted co-financing and technical assistance to support specific measures (for example on wastewater, industrial and agricultural emissions, and the management of chemicals), strengthening administrative capacity and digital tools, and catalysing multi□level governance.

A key enabler for implementation is financing. The 2025 EIR presents a detailed analysis of investment needs for, and gaps in, the implementation of EU environmental law amounting to EUR 122 billion per year in the EU, i.e. 0.8% of the EU GDP[77]. A recent study[78] shows that the cost of inaction far outweighs the cost of investment, with an estimated implementation gap of EUR 180 billion per year, much more than the cost of closing the implementation gap. The estimated investment gaps for pollution prevention and control as well as water protection (largely linked to water and wastewater infrastructure) is EUR 58 billion per year (or 48% of the total gap). **EU funding** plays an important role in helping to close implementation gaps. For example, in the recent **mid-term review of cohesion policy**[79], the Commission proposed additional measures to encourage Members States and regions to invest in water resilience. The agreed Regulation[80] includes an additional 10% of EU financing and a maximum of 20% of prefinancing for water resilience investments, including investments to help reduce water pollution.

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73 In particular the structured dialogues announced in the context of the Water Resilience Strategy.

74 COM(2025) 2, COM(2025) 3 and related SWDs

75 Zero Pollution Going Local | European Committee of the Regions

76 E.g. through the TAIEX EIR Peer-to-Peer support, the Technical Support Instrument in the context of the European Semester or the EIB Water Programme and Sustainable Water Advisory Facility announced in the European Water Resilience Strategy.

77 COM(2025) 420 and EIR dashboard: https://environment.ec.europa.eu/app/eir-dashboard-on-environmental-investment-needs-and-gaps

78 Update of the costs of not implementing EU environmental law

79 A modernised Cohesion policy: The mid-term review

80 Regulation (EU) 2025/1914

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Cleaner environment – zero pollution financing
EU investments have contributed directly or indirectly to actions linked to achieving the clean air objective[81]. EU funding has been made available to and successfully used by Member States by directly supporting clean air projects or incorporating clean air objectives in other investments (such as infrastructure). Since 2007, the EU has invested EUR 84 per person in large water infrastructure. The investments in central and eastern European regions have been much higher, ranging from EUR 100 to over EUR 300 per person. This has led to significant pollution reductions and thereby improvements in water quality. The dashboard 'Towards zero pollution in regions' gives an overview of these improvements.

EU funding for a cleaner environment will also be available in the future. Under the proposals for the **new Multi-annual Financial Framework**[82], zero pollution-related investments are part of the 35% target for climate and environment spending. This offers the potential for continued and even stronger synergies between spending on climate neutrality and/or biodiversity protection and on zero pollution. The proposed **European Competitiveness Fund** and the proposed **European Fund for Economic, Social and Territorial Cohesion, Agriculture, and Rural, Fisheries, and Maritime Prosperity and Security** under which Member States should prepare **National and Regional Partnership Plans** will contribute to protecting, restoring and improving the quality of the environment, including freshwater, the coast, the ocean and soil, to reducing pollution, to halting and reversing biodiversity loss and tackling the degradation of terrestrial and marine ecosystems, while increasing climate and water resilience. **Horizon Europe** proposals for the period 2028-2034 pointed out that the integration of environmental science into activities is necessary to prevent damage to the environment, to keep it clean and to restore healthy ecosystems. It also identified 'Towards zero pollution of water in the EU' as one of the possible moonshot areas. Also, the **Common Agricultural Policy,** the **Common Fisheries Policy and the European Maritime, Fisheries and Aquaculture Fund** and the **Regional Development and Cohesion Funds** will continue to contribute to achieving zero pollution.

As EU funding is not enough, substantial national funding is also needed. In this context, Member States should make better use of **taxes, extended producer responsibility schemes,** and other mechanisms to better implement the **polluter-pays principle**. The Member States currently do not make much use of environmental taxation[83]. The 2025 EIR and the 2024 European Semester package[84] recommend reforming environmentally harmful subsidies (EHS). Member States may also consider how to guide businesses' and consumers' choices while bringing in tax revenue that could be used to address the investment gap. The **Fitness Check of the Polluter Pays Principle** provides some valuable insights into what has worked and finds that making the polluter pay is a highly effective way of providing price signals that make environmental policy more efficient provided the just

81 clean-air tracking
82 EU budget 2028-2034 for a stronger Europe (COM(2025) 555, 565, 543, 560, 559 & 552)
83 E.g. see "2025 Annual Report on Taxation"
84 2024 European Semester: Spring package

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transition, competitiveness, food security and overhead costs are properly factored into its design.

Unlocking private investments will be essential to scale up the clean transition. The Commission is cooperating with the **European Investment Bank (EIB) Group** to step up public and private investments in the environment (for example under the Water Resilience Strategy) both in the EU and globally. Cooperation with financial institutions can leverage more private financing through blended finance approaches and innovative models such as structured ecosystems for green and blue bonds. The simplified **EU sustainable finance framework** and the rolling out of the **Savings and Investment Union** also aim to increase funding opportunities for EU businesses. Figures show that the **EU taxonomy** for sustainable finance is being taken up by an increasing number of investors in some sectors[85]. The **Clean Industrial Deal** will further mobilise clean investment by strengthening the **Innovation Fund** and proposing an **industrial decarbonisation bank**. The **Omnibus II Regulation** will amend the **InvestEU** Regulation to increase the amount of financial guarantees that InvestEU can provide to support investments for the deployment of clean tech, clean mobility, waste prevention, reduction and recycling. These efforts will inevitably create co-benefits for zero pollution. As part of the Water Resilience Strategy, the Commission will also establish a Water Resilience Investment Accelerator and launch a Green and Blue corridors initiative to support the restoration. This will support investment in cleaner waters.

Integration must go faster and further. Implementation experience shows that it is crucial to ensure sufficient integration of environmental policy into the development and execution of public policies, upstream and in a systematic and cross-cutting way. It is also crucial to account for the implications of the environment for public policies, the budget and the economy. This is why a more integrated, holistic approach – for example, bringing together authorities in different policy areas or regions – tends to produce better results in the long term and to be more inclusive, consistent, effective and efficient. This is why the 2021 Zero Pollution Action Plan set out the flagship 'Enforcing zero pollution together'[86], with initial work undertaken in cooperation with the EU Network for the Implementation and Enforcement of Environmental Law (IMPEL). This will continue in 2026. The structured dialogues envisaged for the implementation of water legislation will seek to involve all relevant parts of the national (and regional) governments.

Cleaner transport – zero pollution mobility
*Decarbonising transport also brings benefits in terms of air quality and noise. Market-ready prototypes for detecting noisy and polluting vehicles and helping reduce pollution through multifunctional barrier and specialized pavements (**NEMO**). Better urban planning and organisation of last mile logistics also helps reduce CO_2, air pollution and noise (**SENATOR**, **LIFE ASPIRE**). Innovative emission reduction techniques and fuels in inland waterway transport help reduce air pollution and greenhouse gas emissions in real-life conditions (**LIFE CLINSH**).*

85 The EU Taxonomy's uptake on the ground

86 "*bring together environmental and other enforcement authorities (e.g. those in charge of EU transport, energy, agriculture or consumer protection legislation) to kick off the exchange of best practices and encourage Member States to devise cross-sectorial compliance actions towards zero tolerance for pollution at national level and transboundary level.*"

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Cleaner agriculture – zero pollution farming
Changing agricultural practices can significantly reduce pollution. ***Air pollution from intensive*** *meat (pig & poultry) and dairy* ***farming*** *can be reduced with innovative technologies and management practices such as separating waste streams and using robots, reducing emissions and transforming stored manure into a commercial fertiliser making it possible to close a farm's nitrogen cycle (**LIFE CMCD**, **LIFE Green Ammonia**, **LIFE Clean Air Farming**, **Econutri**, **SOLACE**). Moreover, the Commission is also preparing an Action plan for fertilisers, which will amongst others look into the efficient use of fertilisers and recycled nutrients which will in turn benefit efforts to reduce pollution from fertiliser use. Innovative transition pathways towards more sustainable plant protection can reduce crop protection costs, while reducing* ***pesticide pollution*** *of air, water and soil and producing healthier foods (**SPRINT**). By working with farmers and organisations to identify sustainable practices to manage* ***micro- and nano-plastics****, it has been possible to simultaneously improve the environment and agricultural productivity (**PAPILLONS**, **MINAGRIS**).*
Cleaner living – zero pollution building
*Urban development with a clean and circular infrastructure can reduce greenhouses gases, minimise waste and promote sustainable consumption while lowering pollution. By using a sorted 'three pipes' sewage system, it enables water and waste recycling and the retrieval of energy and nutrients (**RecoLab**). Using natural materials and developing a digital twin of buildings, equipped with sensors to monitor vital parameters such as moisture content, will enable predictive maintenance and give an indication of the effects of technical alterations on the building's performance (**Build-in-Wood**).*

The Commission will
- **address country-specific pollution challenges in the structured dialogues with all Member States announced in the Water Resilience Strategy,**
- **together with IMPEL, continue the exchange of best practices and encourage cross-sectorial compliance actions.**

4.2 Innovation and skills to strengthen competitiveness

Innovation is driving the clean transition. In the current economic crisis, it will be important to provide targeted support to industry to stay cost-competitive and keep critical production in the EU. Simplifying the regulatory framework will be crucial to keep the EU attractive for companies. However, as mentioned in the Competitiveness Compass, the root cause for the current crisis is a lack of innovation during the past two decades. Carefully designed measures to promote the transition to a clean and circular economy model can not only contribute to protecting human health and the environment, but also create the necessary business opportunities for innovative and future oriented technology to strengthen the EU's long-term global competitiveness. The Clean Industrial Deal are supporting this innovation drive through financing (through the Innovation Fund and InvestEU) or specific initiatives such as the EU Startup and Scaleup Strategy[87]. In terms of pollution, the new Innovation Centre on Industrial Transformation and Emissions (INCITE)[88] will identify and evaluate the maturity level of innovative techniques to

[87] COM(2025) 270
[88] Established in the context of the revised Industrial Emissions Directive (EU) 2024/1785, see European Innovation Centre for Industrial Transformation and Emissions | INCITE

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showcase their potential and promote their uptake on a larger scale. INCITE will also analyse the decarbonisation, resource efficiency, including energy, raw materials and water, less and safer use of hazardous chemicals and circular economy potential of innovative technologies in a 360° environmental assessment. Inspired by INCITE, the Commission will also create 'EU Innovation and Substitution Hub(s)'[89] to overcome innovation barriers and accelerate the development of safer and more sustainable solutions with specific attention to the needs of SMEs. It will also explore collaborative approaches to the substitution of targeted chemicals. The 'Safe and Sustainable by Design' (SSbD) chemicals framework[90] will be embedded in the innovation hubs, providing technical guidance on the early stages of innovation.

Cleaner products and processes - zero pollution innovations
Bioeconomy innovations *such as biodegradable plastic packaging, absorbent hygiene products or bio-based alternatives for food trays as well as new networking models along the whole plastic value-chain in the agri-food sector significantly reduce plastic waste and thereby land filling and pollution (**Circpack**, **EMBRACED**, **FRESH**, **LIFE CLOOVER2**). An **innovative textile practice** turns old cotton textiles into sustainable, high-quality fibre using less-polluting chemicals (**TeKiDe**). Innovation practices in recycling hazardous waste **electrical and electronic equipment** (WEEE) make it possible to safely recover clean polymers, bromine, and antimony trioxide from plastics, supporting a closed-loop recycling system thereby helping to reduce EU's dependence on imported antimony (**PLAST2bCLEANED**). Innovative technologies recover **resources from wastewater** (such as biofertilisers, cellulose, bioplastics, biomethane and a variety of food and drink additives) significantly reducing the operating costs and environmental impact of wastewater treatment facilities and in turn create new business opportunities and jobs (**AFTERLIFE**, **INCOVER**, **SMART-Plant**, **LIFE ENRICH**, **24Water**). **Innovative generators** in construction and urban green care reduce emissions while providing smaller, lighter, and more powerful, portable power supplies that attract significant amounts of funding from private investors (**LIFE CLEANAIRMM**). **Innovative propulsion systems** offer cleaner, more circular satellite launching technologies (**HyImpulse**, **Pangea**).*

EU research and innovation has been underpinning this transition for many years and will continue to do so. Traditionally, environmental research and demonstration projects on pollution prevention, control and remediation have been priorities of EU research and LIFE programmes.

Over the course of the current Multi-annual Financial Framework, the **EU has increased its support** through Horizon Europe and LIFE funding programmes. For research and innovation, a specific destination 'Clean environment and zero pollution' with the dedicated instruments such as the EU missions[91] and partnerships[92], are particularly impactful, as well as the destination 'Living and working in a health promoting environment' which addresses the impacts of environmental exposures on human health. Research and innovation tackling pollution is also incorporated into the whole programme.

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89 COM(2025) 530

90 Safe and Sustainable by Design for Chemicals and Materials. Revised Framework (2025). JRC143022 (in press).

91 'A Soil Deal for Europe', 'Restore our Ocean and Waters', and 'Climate-Neutral and Smart Cities'

92 Partnership for the Assessment of Risks from Chemicals (PARC) or Water4All–Water Security for the Planet

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Many **Horizon 2020 and Horizon Europe projects have and continue to support the zero pollution efforts**[93], particularly disease prevention and health promotion, water use and management, air, freshwater and soil quality, protection of the marine environment, the development of safe and sustainable by design chemicals and materials, circularity, agriculture, food systems (including through the Food 2030 initiative and the zero pollution food systems pathway), industrial innovation, the bioeconomy, transport, energy, environmental monitoring and observation. The environmental co-benefits of research and innovation in climate action often result in pollution prevention and reduction, thereby protecting biodiversity and natural ecosystems. An example is a dedicated 2024 call under the EU mission 'Climate-Neutral and Smart Cities' focusing on creating zero pollution cities, which attracted over 100 proposals[94].

The **LIFE programme** continue to be drivers of the demonstration, deployment and policy uptake of clean solutions across Member States. LIFE complements Horizon Europe by de□risking near□to□market solutions and supporting their uptake by authorities, utilities and SMEs. Through pilots and large□scale demonstrations, the improvement of governance, capacity□building, and targeted policy support, LIFE helps turn green innovation into replicable, investable zero□pollution practices across the EU and its neighbourhood. Since 2014, more than 170 LIFE projects with EUR 400 million of EU financing have tackled air, water and soil, pollution delivering measurable results on the ground and feeding into EU legislation and standards[95]. Also, in the future, EU financing will play an important role as all key LIFE features are included in the European Competitiveness Fund proposal.

A key future innovation topic will be the remediation of historic and legacy pollution. Water and soil monitoring show the high number of pollution hotspots across the EU[96]. The implementation of the new Soil Monitoring Law and the Nature Restoration Regulation will go some way towards addressing this. In this context, nature-based solutions and bioremediation have the potential to provide cost-effective solutions. The public-private initiative to achieve a technological breakthrough in feasible and affordable methods for the detection and remediation of PFAS and other persistent chemicals will aim to promote the development of such solutions[97].

Digital solutions for zero pollution exist[98] but barriers to their deployment need to be overcome. The European Network of Living Labs (ENoLL) has issued some recommendations[99] on living labs for zero pollution which can help increase the uptake of digital solutions. New opportunities arise from combining data, for example from earth observation, with artificial intelligence and modelling. New Copernicus Sentinel satellites will provide more accurate and timely data, on air

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93 Horizon projects supporting the Zero Pollution Action Plan

94 Although it was only able to fund four selected projects with a total of EUR 20 million

95 LIFE Project Portfolio - Overview (2014 onwards)

96 Zero pollution monitoring and outlook 2025

97 The initiative will be supported by research projects, e.g. the EU Mission "A Soil Deal for Europe" (2025 call, of dedicated living labs for soil remediation).

98 SWD(2021) 140

99 2023 ENoLL Recommendations

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quality and emissions for example. **Destination Earth**[100] and , in close synergy with the upcoming Ocean Observation Initiative and Ocean Act, the **Digital Twin of the Ocean** aim to support such cutting-edge tools to, among other things, address pollution related matters. The European Commission's Joint Research Centre (JRC) is also contributing to work in this area, with marine pollution models used in the Zero Pollution Outlook.

Cleaner environment - zero pollution through earth observation and digital twins
Copernicus, the earth observation component of the EU's space programme, has enabled the development of several business solutions for zero pollution. Leveraging earth observation, artificial intelligence, and machine learning can significantly improve environmental monitoring of air, ocean and freshwater and soil quality, of land degradation and deforestation and of supply chain impacts (Orbify). It also enabled the development of a Pollution Crisis Management Platform which monitors rivers, reservoirs, and urban zones, helping local authorities track pollution and respond quickly to pollution events (Azulfy). Other digital platforms mobilize citizens to identify and report illegal waste sites in their communities in real-time helping to raise awareness and support rapid local action (WasteNoTime). These tools also help economic operators to move towards zero pollution. ***Smart farming*** *applications can reduce pollution and save costs by helping farmers to match agricultural inputs (fertilisers, pesticides, water) with what crops actually needs (SQAT, DINOSAR, TerraMetallum). Optimising the operation of* ***airports and flight paths*** *helps to reduce noise, fuel consumption, and air and greenhouse gas emissions (EDGAR, VITOLMINS). Services for better geotechnical and environmental monitoring of* ***mining activities*** *throughout the lifecycle from exploration to closure help improve operational safety and efficiency, while enabling mining operators to limit pollution and waste and brining about a more circular use of materials (MOSMIN, TerraEye).*

Digitalisation relies on the availability and useability of high-quality data. Several projects promote environmental data-based services, with an emphasis on the importance of zero pollution for speeding up implementation[101]. Numerous smart community pilots have also been launched in a bid to collect data on zero pollution in cities[102]. A key instrument for improving the availability of data on pollution is the new '**One Substance, One Assessment**' legal framework which establishes, among other things, a common data platform[103] and a 'one-stop shop' for accessing data on chemicals. The Commission is also preparing an 'Action Plan for the Digitalisation of the Water sector' to raise awareness of such developments and support them in a more systematic way. **Digital tools can also help consumers and citizens to make environmentally friendly choices** that support the zero pollution objectives**.** Citizens increasingly want to know how clean the air they breathe is, or whether certain products contain hazardous chemicals.

Clean products – making zero pollution choices
A number of user-friendly consumer apps make it possible to identify products that avoid the use of chemicals with hazardous properties (Yuka, ToxFox, KEMILUPPEN, CheckED yourself, SIN List). Some apps focus on a range of everyday products such as food

[100] Destination Earth (DestinE) - digital model of the earth and European Digital Twin of the Ocean (European DTO)
[101] 'Data Space for a Sustainable Green Europe' (SAGE project) or the previous Green Deal Data Space GREAT Project
[102] European Data Space for Smart Communities, see StiD, IPPCP and Geo4Water pilots.
[103] Regulation (EU) 2025/2455

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products, cosmetics, personal care products toys, furniture, carpets, sports shoes, textiles and electronic devices. Others look at hazardous properties including endocrine disrupting chemicals and propose substitution possibilities or make personalised recommendations for the home environment, lifestyle, and everyday habits. These apps help innovation and raise consumers' (and consequently businesses') awareness of undesirable chemicals.

The shortage of skills and training is holding back the clean transition. There is a widespread shortage of green skills, especially in SMEs and in key sectors such as construction, transport, waste management, energy and engineering. The digital and green transition, driving employment trends until 2035, requires people of all ages and across different disciplines to develop new skills[104]. The lack of green skills in the workforce is a growing concern. Training and retraining are still not managing to keep up with demand[105]. In addition to general actions to support green skills though the Pact for Skills[106] (e.g. the regional partnership led by the European Chemical Regions Network under the Pact for Skills)[107], the Commission is launching dedicated initiatives in the context of the European Water Resilience Strategy (such as the Water Smart Industrial Alliance, and the European Water Academy) which will include the skills required for achieving zero pollution.

Capacities in environmental administrations in the Member States are already low, and this situation will worsen unless action is taken. The public sector is facing an ageing workforce and a skills gap, particularly in technical areas such as pollution control and water treatment and management and in terms of digital skills. The EIR has highlighted that this will be crucial for implementing EU legislation on the ground[108].

The Commission will
- **finance priority projects in the 2026 and 2027 work programmes of Horizon Europe and LIFE,**
- **accelerate and scale up chemical innovation using voluntary EU chemicals innovation hubs (as set out in the Chemicals Industry Action Plan),**
- **prepare a 'Digitalisation Action Plan for the water sector' [by 2026] as announced in the European Water Resilience Strategy.**

4.3 International cooperation - promoting worldwide change for zero pollution

International multilateral efforts to move to a pollution-free world have made significant and steady, albeit sometimes slow, progress. A historic decision is the establishment of the **Intergovernmental Science-policy Panel on Chemicals, Waste and Pollution** (ISPCWP) in July 2025. This, together with recent agreements such as the **Global Framework for Chemicals and multilateral**

[104] CEDEFOP (2023) "Skills in Transition – the way to 2035" and OECD (2023) "Assessing and Anticipating Skills for the Green Transition: Unlocking Talent for a Sustainable Future, Getting Skills Right"

[105] Employment and Social Developments in Europe (ESDE) 2024

[106] Such as the Council recommendation on Learning for the green transition and sustainable development

[107] Under the Pact for Skills a regional partnership led by the European Chemical Regions Network, has as primary commitment to assist regions in navigating the challenges posed by the industry's transition to green and digital practices.

[108] COM(2025) 420

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environmental agreements (MEAs), further raises the bar in addressing pollution, putting addressing it on a par with efforts to address climate change and biodiversity loss. **Global Plastics Treaty** negotiations will continue and the EU will aim for an ambitious agreement that goes beyond waste management to address the full life cycle of plastics. Existing global and/or UNECE instruments such as the **Minamata, Basel, Rotterdam and Stockholm Conventions** as well as the **Gothenburg Protocol** are being steadily implemented, to create a level playing field for an increasing number of chemicals and pollution sources.

The **Global Biodiversity Framework** sets the target of reducing pollution to levels that are not harmful to biodiversity[109]. EU national targets communicated to the Convention on Biological Diversity in 2024 to implement the global biodiversity framework build on the Zero Pollution Action Plan. The progress made in reaching these targets and measures taken to do so will be reported on by the contracting parties to the Convention in 2026.

On air pollution, the **Global Methane Pledge**[110] brings 159 participating countries and the European Commission together in pursuit of a goal to get methane emissions to 30% below 2020 levels by 2030.

Cleaner planet – zero pollution through cooperation
*The **Minamata Convention** has been very successful in eliminating mercury pollution worldwide. In 2023, the Conference of the Parties agreed to ban five mercury-containing lamp categories as well as batteries, switches, relays and cosmetics. In 2025, it was possible to agree on a global ban on mercury in dental amalgam. These global decisions further support the protection of public health and the environment from the harmful effects of mercury.*

The Commission will continue to work with the Member States so that these multilateral agreements are implemented successfully. In particular for the setting up of the ISPCWP, it will be important to make it operational and agree on a work programme that matches its ambition and complements the work of the Intergovernmental Panels for Climate Change and Biodiversity and Ecosystem Services. A global pollution outlook would be the ideal starting point for identifying the scale of and priority areas for global action. The EU will also continue to work closely with the neighbours with whom it shares a marine region[111] or transboundary rivers. In this context, it is crucial to highlight the EU's support[112] to **Western Balkans and other enlargement countries**, as many of these economies have highly polluting industries and under-performing water and waste management infrastructures. These challenges also result in transboundary pollution, directly affecting the ability of neighbouring EU Member States to achieve their targets[113].

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109 Target 7

110 https://www.ccacoalition.org/news/factsheet-2024-global-methane-pledge-ministerial using the Copernicus Methane Hotspot Explorer

111 See for example Pact for the Mediterranean (JOIN(2025) 26)

112 COM(2024) 146

113 See Scenario analysis of $PM_{2.5}$ and ozone impacts on health, crops and climate with TM5-FASST: A case study in the Western Balkans and JRC study which shows that aligning the Western Balkans with the Zero Pollution Action Plan's goals would result in a high benefit–cost ratio, highlighting the need to reduce air pollution.

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The Commission will also continue to work on pollution prevention and control in bilateral discussions with its partners around the world. In this context, the **clean trade and investment partnerships** offer an opportunity to create synergies between climate and pollution policies.

The Commission will
- **continue to work on the implementation of multilateral environmental agreements (MEAs) that the EU signed up to and**
- **lead the way in implementing the new Intergovernmental Science-policy Panel on Chemicals, Waste and Pollution.**

5 Conclusions and next steps

In May 2021, the EU embarked on a pioneering journey towards zero pollution which contributes to Europe's long-term sustainable competitiveness and resilience. This mid-term review highlights the progress made towards reaching the 2030 targets, with significant reductions in air pollution, the use of pesticides, and plastic pollution at sea. However, challenges persist, particularly in waste management, microplastics, noise and nutrient pollution.

The transition to a zero-pollution economy is both feasible over the long term and economically beneficial – if guided by inclusive and forward-looking policies and supported by sufficient funding from a range of sources.

As part of the political agenda for 2024-2029, the **Commission will contribute to implementing the policies underpinning the green and digital transition** in which decarbonisation, climate adaptation, circularity, biodiversity protection, water resilience and zero pollution go hand in hand with the One Health approach supported by a competitive, resilient and inclusive circular economy.

As next steps, the Commission will focus on the implementation of agreed legislation and policies including the **Water Resilience Strategy, the Ocean Pact** and the **Chemicals Industry Action Plan**.

The new **EU Cardiovascular Health Plan** promotes preventive action in line with One Health, thereby contributing to better health outcomes for people and ecosystems. The **EU Bioeconomy Strategy** and the **planned Circular Economy Act** are part of wider efforts to better integrate circularity principles into public policies, to ensure a cost-competitive, resource-efficient and fair transition.

As regards the implementation of the **Clean Industrial Deal** and **Competitiveness Compass**, the Commission will closely link climate objectives to the co-benefits of reducing pollution, ensuring a toxicity-free environment, promoting sustainable economic growth and creating a single market for secondary raw materials and waste.

The Commission will take stock of progress with regular updates of the Zero Pollution Monitoring and Outlooks (currently planned for 2026 and 2028) and will analyse the possible trajectories for taking the clean transition forward towards 2040 by complementing the 2040 climate targets with realistically ambitious pollution targets, in strong support of its legislative implementation agenda.

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Moving forward on zero pollution is a vital step towards a healthier, more sustainable and resilient future. By prioritising a clean and circular competitiveness and promoting eco-friendly practices, it is possible to ensure a resilient and prosperous Europe for generations to come.

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