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The Zero Pollution Action Plan as a chance for a crossregulatory approach to pollution prevention and reduction

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# The Zero Pollution Action Plan as a chance for a cross-regulatory approach to pollution prevention and reduction

by

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On behalf of the German Environment Agency

#### WHAT TO EXPECT

In May 2021, the European Commission published the European Union Action Plan 'Towards Zero Pollution for Air, Water and Soil'<sup>1</sup>. With this Action Plan and its embedment in the European Green Deal, measures against pollution are on the same political level as the protection of climate and biodiversity. The Action Plan delivers on the needed integration of many relevant topics and is thus a very important contribution in order to reach the vision of 'a healthy planet for all'.

The main take-aways of this paper can be found in the Executive Summary (p. 5).

#### **Chapter 1 Integrating the Zero Pollution Ambition across sectors and initiatives (p. 7)**

The Zero Pollution Ambition highlights the need for action towards sustainable development and planetary health. Chapter 1 illustrates why this new, systematic approach is necessary and how it could be designed to confront the complexity of today's forms of pollution – and that it can be challenging for institutions.

#### Chapter 2 Improving the regulatory framework (p. 11)

There are already many EU regulations in place aiming at the protection of air, water and soil. The Action Plan lists numerous evaluations and currently ongoing revisions of existing regulations, which is an important contribution to the above-mentioned vision. Where the Action Plan does not provide details of the evaluations and revisions, we describe further required actions in chapters 2, 3 and 4.

#### Chapter 3 Proposal for a cross-regulatory approach: The Zero Pollution Ambition Cycle (p. 12)

The Action Plan fails to propose a cross-regulatory approach addressing pollution not only across existing regulations but also along the pollutants' entire life-cycle, considering all relevant emission sources. The Zero Pollution Ambition Cycle, proposed in chapter 3, is seen as a blueprint for a cross-regulatory approach.

The Action Plan indicates actions where such an approach can be implemented. These are, for example, flagship 5 "Enforcing zero pollution together", Action 24 "Contribution to European Green Deal Dataspace to improve data availability"; Action 31 "Zero Pollution Monitoring and Outlook Reports" and Flagship 9 "Consolidate EU's Knowledge Centres for Zero Pollution". Also, the European Partnership for Chemicals Risk Assessment under Horizon Europe (PARC) will address cross-regulatory aspects.

#### Chapter 4 Improving existing regulations and applying the Zero Pollution Ambition Cycle (p. 19)

The existing EU regulations for air, water and soil protection are very different from each other and so are their needs for improvement. See Chapter 4 for suggestions on how to improve regulation for environmental media.

#### Chapter 5 Outlook (p. 26)

The Zero Pollution Ambition is a long-term project that will be challenging for generations of policy makers and scientists to come. Chapter 5 points to some examples.

<sup>&</sup>lt;sup>1</sup> European Commission (2021): Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Pathway to a Healthy Planet for All. EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'. COM(2021) 400. Final. <u>https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0400&from=EN</u> (26.07.2021).

#### **Executive Summary**

Being the last one of the horizontal and integrated strategies within the European Green Deal, the EU Action Plan 'Towards Zero Pollution for Air, Water and Soil' was published by the European Commission in May 2021. The German Environment Agency (UBA) welcomes the Zero Pollution Action Plan particularly because it positions prevention and reduction of pollution on the same political level as the protection of climate and biodiversity. Also, it delivers a comprehensive compilation of on-going and planned initiatives of relevant topics towards zero pollution from an integrated perspective.

The 'Zero Pollution Vision for 2050: a Healthy Planet for All' as stated in the Action Plan has a broad and comprehensive scope: "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". The Zero Pollution Ambition therefore aims for contributing significantly towards sustainable development and planetary health. To this end, pollution needs to be prevented and reduced systematically, overcoming solely sectoral approaches and improvement of singular environmental policies by, amongst others, seeking innovative new approaches of governance and regulations. Furthermore, regulatory action should be directed specifically at environmental media and mainstreamed in all relevant initiatives and sectors at all levels.

Despite its overarching analysis, the Action Plan lacks a cross-regulatory approach that not only aims at an improvement of existing regulations, but focuses on the entire life-cycle including major sources or entry paths of a given pollution. For this purpose, UBA proposes the routine use of the 'Zero Pollution Ambition Cycle':

- The identification of main pressures for health and the environment and the corresponding need for action through monitoring, knowledge of pollutant properties and information on uses and sources;
- (2) A rapid, targeted, and precautionary response supported by a fact-based problem analysis, prioritisation and optimised information transfer;
- (3) Selection of appropriate measures and legal schemes considering the problem, sources of the pollutant, possible measures, etc;
- (4) Implementation of measures based on a practicable and enforceable design that includes tools for compliance and reporting;
- (5) Control of success including the assessment of policy effectiveness through monitoring and the examination of trends of pollution;
- (6) Data management and digitalisation as an overarching field of action requiring an "open data" approach, improved processing, standardisation and linking of data from chemical legislation and monitoring.

This approach can be applied to protect air, water and soil from pollution by improving existing legislation, closing gaps and better linking different legal provisions. For instance, monitoring requirements in regulation of air quality standards should be expanded to more pollutants such as ammonia, methane and bio-aerosols. One example for strengthening the interface between substance-specific regulations and water-related legislation could be introducing the properties for substances of very high concern as stipulated in the REACH-Regulation ((EC) 1907/2006) into the key legislative framework for water protection (Water Framework Directive 2000/60/EC) and for industrial emissions (Industrial Emission Directive 2010/75 EU and EU PRTR Regulation No. 166/2006). By this means, the respective legislations may complement and

strengthen each other. Also, in the field of water policy the benefits of chemical non-target analyses should be made use of. In the case of soil protection, an EU-wide strategy for soil protection is required, including monitoring requirements and thresholds for chemicals of concern. Investigation and assessments of contaminated soils needs to be extended and remediation measures should be taken.

The Zero Pollution Ambition's goal of reducing the negative impact of human activities on the environment as well as human health and well-being towards zero will remain a moving target. Continuous development of technologies, products, services and chemical applications will constantly bring new challenges, generate new pollutants and thus require innovative regulatory, technological and societal reactions by the economy, the society and by policy makers. The scope and goals of actions will thus have to be re-adjusted continuously. This is why the Zero Pollution Ambition is best perceived as long-term programme. Nevertheless, the EU needs to step up its efforts now to reach the current Ambition's goals.

## 1 Integrating the Zero Pollution Ambition across sectors and initiatives

#### 1.1 Sustainable development and planetary health

The 20<sup>th</sup> century has brought economic and societal change at a pace humankind has not seen before. However, many innovations that aimed at improving everyday lives and generating prosperity, e.g. cars, air conditioning, or industrialized agriculture, had (and still have) unintended side-effects such as serious levels of pollution of air, water and soil, noise, but also climate change and biodiversity loss. Inevitably, these effects have a significant impact on human health and well-being: Environmental pollution is associated to various health effects, such as respiratory diseases and diabetes. In the EU, one in eight deaths per year is caused by pollution<sup>2</sup>. Also in Europe, these consequences are often not equally distributed within populations as for example, socially deprived groups are often more affected by environmental health issues<sup>3</sup>.

Today, we much better understand the consequences of our way of life for both environment and health. However, the 20<sup>th</sup> century approach of regulating causes of pollution one-by-one is not sufficient to guarantee sustainable development<sup>4</sup>, fulfil the goal of living within the earth's planetary boundaries<sup>5</sup> and safeguard planetary health<sup>6</sup>. A comprehensive social and ecological transformation of our society and economy is necessary<sup>7</sup>, which includes addressing pollution systematically across traditional regulatory frameworks.

The European Green Deal (EGD) is one major step into this direction. Its strategies for climate action, circular economy, or sustainable food systems, among others, aim to improve the integration of policies. Nevertheless, implementation of the EGD is ongoing and policy coordination remains a tremendous challenge. This is especially true for the regulations ensuring clean air, water and soil, as well as noise, as the recently published Zero Pollution Action Plan proposes<sup>8</sup>.

<sup>&</sup>lt;sup>2</sup> European Environment Agency (2020): Healthy environment, healthy lives: how the environment influences health and well-being in Europe. EEA Report No 21/2019.

https://www.eea.europa.eu/publications/healthy-environment-healthy-lives (26.07.2021). <sup>3</sup> World Health Organization Regional Office for Europe (2019): Environmental health inequalities in Europe. Second assessment report.

https://www.euro.who.int/en/publications/abstracts/environmental-health-inequalities-in-europe.-second-assessment-report-2019 (26.07.2021).

<sup>&</sup>lt;sup>4</sup> United Nations (2021): Make the SDGS a reality. <u>https://sdgs.un.org/</u> (26.07.2021).

<sup>&</sup>lt;sup>5</sup> Rockström, Johan et al. (2009): Planetary Boundaries: Exploring the Safe Operating Space for Humanity. In: Ecology and Society, 14 (2): 32, doi:10.5751/ES-03180-140232.

<sup>&</sup>lt;sup>6</sup> "Planetary health is the health of human civilisation and the state of the natural systems on which it depends." from Whitmee, Sarah et al. (2015): Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. In: The Lancet, 386 (10007): 1973-2028, doi:10.1016/S0140-6736(15)60901-1.

Halonen, Jaana I et al. (2020): The Helsinki Declaration 2020: Europe that protects. In: The Lancet Planetary Health, 4 (11): e503 - e505, doi:10.1016/S2542-5196(20)30242-4.

Halonen, Jaana I et al. (2020): A call for urgent action to safeguard our planet and our health in line with the helsinki declaration. In: Environmental Research 193 (2021): 110600, doi:10.1016/j.envres.2020.110600.

 <sup>&</sup>lt;sup>7</sup> Sachs, Jeffrey. D. et al. (2019): Six transformations to achieve the Sustainable Development Goals. In: Nature Sustainability 2 (9): 805-814, doi:10.1038/s41893-019-0352-9.

<sup>&</sup>lt;sup>8</sup> European Commission (2021): Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Pathway to a Healthy Planet for All. EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'. COM(2021) 400.

## **1.2** Preventing and reducing pollution systematically – towards a Zero Pollution Ambition

In the European environment — state and outlook (SOER) 2020<sup>9</sup>, the European Environment Agency (EEA) urgently calls for a fundamental sustainability transition in all aspects of our daily life. According to EEA, progress on improving the state of the environment is not sufficient and is moreover not always happening fast enough in all areas, e.g. the reduction of greenhouse gas emissions or nutrient inputs to soils. Simply continuing the incremental improvement of environmental policies is not enough for achieving this sustainability transition in time. Along these lines, the EEA states that improving established policy tools has to go hand in hand with innovative approaches to governance. "We do not only have to do more; we also have to do things differently." (p.7) is one of the most important take home messages of the SOER 2020.

Since further sectoral implementation of existing policies is not sufficient for achieving EU's environmental goals up to 2030, it is necessary to address gaps and weaknesses in policy frameworks, too – here, the Zero Pollution Ambition may play a key role.

The German Environment Agency (UBA) considers the Zero Pollution Ambition as a holistic approach to reduce human-made negative physical, chemical and biological impact of substances, mixtures as well as physical stressors to a level that does not harm, threat or raise concern for the environment, human health and well-being. Rather than a specific goal, this ambition aims at a moving target that adjusts with new technological developments and scientific findings regarding types and impacts of pollution. This means that a zero-pollution economy and society may not be within reach any time soon. However, pursuing this ambition is vital for successively reducing the negative impacts of human activities as far as possible, will produce cleaner air, water and soil, curtail biodiversity loss, and improve human health and well-being, and could thus contribute to quality of life for everyone in Europe.

A systematic approach in order to gain significant progress towards this ambition includes regulatory action aimed specifically at protection of environmental media (see the following chapters), but also **mainstreaming the Zero Pollution Ambition in all relevant initiatives and sectors** at all levels, e.g. transport or agriculture, in view of a sustainable development and planetary health (Figure 1). Likewise, other important environmental policy goals and strategies interact with the Zero Pollution Ambition, e.g. energy efficiency policy that may incentivize the use of undesired chemicals in products.

Final. <u>https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0400&from=EN</u> (26.07.2021).

<sup>&</sup>lt;sup>9</sup> European Environment Agency (2019): The European environment - state and outlook 2020. Knowledge for transition to a sustainable Europe. <u>https://www.eea.europa.eu/publications/soer-2020</u> (26.07.2021).

#### Figure 1: Mainstreaming of the Zero Pollution Ambition in relevant policy fields

Left: key drivers of pollution; Right: key political initiatives; Policy fields are exemplary.



Source: own illustration, Umweltbundesamt

The box below presents two examples of a more holistic consideration of environmental pollution. They can be seen as starting points for Zero Pollution Ambition mainstreaming.

#### Two examples towards mainstreaming the Zero Pollution Ambition

#### **Example 1: Transport policy**

Historically, cars and trucks have been a major source of air pollution and noise in urban areas. National and EU legislation in the past decades have both addressed per-vehicle emissions as well as strategic approaches to reduce immissions in specific areas. However, some of the improvements in air quality and noise has been diminished by the increasing number of cars and longer distances each vehicle covers per trip. Mainstreaming of the Zero Pollution Ambition in transport policy would thus go beyond these measures and promote sustainable mobility, e.g. walking, cycling and public transportation, and discourage the use of cars, e.g. by removing counteracting subsidies and implementation of integrated planning.

#### **Example 2: New European Bauhaus**

The European Commission recently launched the "New European Bauhaus" initiative as a platform for dialog towards a more sustainable, aesthetic, and inclusive way of living together. This initiative sets an excellent example for the holistic approach to problem solving outlined in this scientific opinion paper and provides opportunities to reduce a number of key pollution sources, especially in the urban environment. By integrated planning of sustainable infrastructures, housing as well as design, pollution from indoor- and outdoor air pollutants, noise, as well as pollution and emissions from buildings during their entire life-cycle can be reduced significantly<sup>10</sup>.

<sup>10</sup> Commission for Sustainable Building at the German Environment Agency (Editor) (2016): Contaminant Input to the local Environment from Buildings and Building Products. Position of the commission for Mainstreaming the Zero Pollution Ambition should thus serve as an important guideline for projects evolving from the New European Bauhaus initiative.

#### **1.3** Institutional challenges posed by the Zero Pollution Ambition

The cross-sectoral nature of the Zero Pollution Ambition – and systemic approaches to policymaking in general – can be challenging for organisations and authorities, usually organised hierarchically along environmental media and existing regulations. Environmental agencies, or similar governmental bodies, are confronted by this in particular, as they allocate detailed expert knowledge on specific regulations, either by implementation, research activities, or both. While public policy, administrative science, and organisation theory (and practice) provide some examples<sup>11</sup>, the box below describes the approach UBA has taken.

#### UBA approach towards the Zero Pollution Ambition

Acknowledging the interdisciplinary and cross-sectional character of the Zero Pollution Ambition, the UBA established a Zero Pollution Ambition Working Group in 2020 with members from different departments.

The main goal of this working group consisting of 10 experts with different perspectives is to gather and contribute with UBA's knowledge and experience relevant for the EU's Zero Pollution Ambition. The working group thus seeks to support the work of the German Environment Ministry, the European Commission and the European Parliament in this field.

As UBA combines responsibility for all environmental media, human health, plant safety in various industrial sectors, chemicals, products etc. in one authority, results – like this paper – and experiences from this working group may inspire cross-sectional and interdisciplinary approaches to the Zero Pollution Ambition also in other institutions.

sustainable building at the german environment agency.

https://www.umweltbundesamt.de/publikationen/contaminant-input-to-the-local-environment-from (26.07.2021).

Schubert, Susanne et al. (2021): Innenentwicklung in städtischen Quartieren: Die Bedeutung von Umweltqualität, Gesundheit und Sozialverträglichkeit.

Rother, Stefan et al. (2020): 13 Thesen für einen klimaneutralen Gebäudebestand. Drängende Herausforderungen der Wärmewende. <u>https://www.umweltbundesamt.de/publikationen/13-thesen-treibhausgasneutrale-gebaeude</u> (26.07.2021).

https://www.umweltbundesamt.de/publikationen/innenentwicklung-in-staedtischen-quartieren-die (26.07.2021).

Pelgrims, Ingrid et al. (2021): Association between urban environment and mental health in Brussels, Belgium. In: BMC Public Health, 21 (635), doi:10.1186/s12889-021-10557-7.

<sup>&</sup>lt;sup>11</sup> Scott, Ian et al. (2021): Coordinating government silos: challenges and opportunities. In: Global Public Policy and Governance, 1: 20–38, doi:10.1007/s43508-021-00004-z.

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#### 2 Improving the regulatory framework

There are various EU regulations designed to protect air, water and soil. Nevertheless, these regulations alone are not sufficient, as recent reports<sup>12</sup> still indicate significant environmental impacts. Additional efforts are therefore needed to reduce the stress on the environment and, consequently, human health. Currently, the identification of problems and the regulatory response to them usually entail a considerable delay. As a result, measures often take effect only when significant damage has already occurred, which increases the removal efforts and duration of environmental pollution. This is especially true for persistent pollutants, as a reduction of the load will only be achieved over long periods of time.

In recent years, the EU Commission has carried out a large number of evaluations of relevant regulations. In addition to individual evaluations, there was also a cross-sectional evaluation of the chemicals regulations<sup>13</sup>. From this, and from the experiences of UBA, the following fields of action within a Zero Pollution Ambition are identified:

- Closing regulatory gaps
- Optimising existing regulations
- ► Remedying implementation deficits
- > Dissolving inconsistencies and unnecessary double regulation
- Improving the interaction of regulations and the organisation of information flows and transfer points between them
- ▶ Raising the level of ambition to achieve the global SDGs

In addition to further optimising individual regulations and improving the interfaces of individual regulations, the entire flow of substances, the most important input sources or use pattern and, where applicable, the life cycle of the substance or the group of substances must also be considered to prevent the entry of substances into the environment.

 <sup>12</sup> e.g. European Environment Agency (2021): EEA Signals 2020: Towards zero pollution in Europe. <u>https://www.eea.europa.eu/signals/signals-2020-towards-zero-pollution</u> (26.07.2021).
European Environment Agency (2019): The European environment - state and outlook 2020. Knowledge for transition to a sustainable Europe. <u>https://www.eea.europa.eu/publications/soer-2020</u> (26.07.2021).
<sup>13</sup> European Commission (2019): Fitness Check of the most relevant chemicals legislation (excluding REACH), as well as related aspects of legislation applied to downstream industries. SWD (2019) 199 final/2, <u>https://ec.europa.eu/info/sites/default/files/swd 2019 0199 en.pdf</u> (26.07.2021).

#### 3 Proposal for a cross-regulatory approach: The Zero Pollution Ambition Cycle

UBA has developed the following steps to examine the relevance and need for action of a given pollutant or pollution across boundaries of various regulatory areas – the so-called Zero Pollution Ambition Cycle (Figure 2). It builds upon well-established approaches and steps in the EU law making process <sup>14</sup> as well as in other regulatory areas, but advocates their cross-cutting application beyond the limits of the specific areas. This systematic view beyond regulatory boundaries is especially important for identifying synergies and conflicts of goals towards a Zero Pollution Ambition.

In the context of such analyses, structural weaknesses of regulations or their interactions may also be identified. Therefore, cross-regulatory evaluations can help to optimise the overall regulatory framework.

Clearly, measures from the Zero Pollution Ambition Cycle should be complementary to the general pollution minimisation requirements as foreseen in the different regulations.

<sup>&</sup>lt;sup>14</sup> E.g. the EU policy cycle, see: European Commission (2017): Better Regulation Guidelines. SWD (2017) 350, <u>https://ec.europa.eu/info/sites/default/files/better-regulation-guidelines-better-regulation-commission.pdf</u> (26.07.2021).

Figure 2: The Zero Pollution Ambition Cycle – a cross regulatory approach for improving the regulatory framework for the systemic protection of air, water, soil and human health



Source: own illustration, Umweltbundesamt

## **3.1** Analysis, prioritisation and observation – Monitoring of environmental status and impact of pollution

The first step of the Zero Pollution Ambition Cycle (Figure 2) consists of continuous monitoring of pollutants in all environmental media as well as in selected organisms, including humans, in a comprehensive way so that relevant data for a wide set of pollutants are covered. This may include, among others, targeted environmental and human biomonitoring as well as non-target screening. Non-Target Screening could help to broaden the scope of monitoring and allow for a faster response<sup>15</sup>. The data obtained through monitoring needs to be analysed and evaluated regarding its compliance with the protection goals, e.g. stipulated in existing national and European regulations or objectives of the European Green Deal, in particular the Zero Pollution Ambition. In addition to monitoring of the quality of environmental media (e.g. air, water, soil), data collected according to substance or environmental legislation should also be analysed regarding critical properties and/or use patterns rendering them likely to reveal unwanted

<sup>&</sup>lt;sup>15</sup> Hollaender, Juliane et al. (2019): High resolution mass spectrometry-based non-target screening can support regulatory environmental monitoring and chemicals management. In: Environmental Sciences Europe, 31 (42), doi:10.1186/s12302-019-0225-x.

release or effects. This step allows identifying and prioritising substances and relevant areas of application for further investigation.

Relevant monitoring should be institutionalised and linked with appropriate mechanisms to control effectiveness of policies or measures. To that end, the responsibilities of the Member States and the EU must be defined and (methodological) conditions for producing comparable monitoring data across the EU need to be established. Among other factors, this needs to cover the availability of analytical standards, development of analytical methods as well as data management (see chapter 3.6 Data management – Digitalisation). To ensure continuous evaluation and use of gathered information, sufficient resources must be allocated at EU and national level.

These monitoring activities could ultimately serve as an early warning system. The existing approaches (e.g. similar to the NORMAN network<sup>16</sup>, HBM4EU<sup>17</sup> or activities in the Netherlands<sup>18</sup>) can be developed further and transformed into a formal structure (involving Member States and EU institutions located at an EU agency or within the framework of the Network of Leaders of the European Environment Agencies<sup>19</sup>). Also, the future work of the European Partnership for Chemicals Risk Assessment under Horizon Europe (PARC) could be of relevance.

The identified need for action should then be addressed in the individual regulatory frameworks in an integrated approach that ensures consistency of legislation and provides a better linkage between source-oriented provisions (e.g. substances, products, processes) and environmental quality-oriented objectives.<sup>20</sup>

## 3.2 Recognising the need for action – Ensure a rapid, targeted and precautionary response

Currently, the time between recognising a concern which requires regulatory actions and the implementation of appropriate measures is still too long. In the context of the Zero Pollution Action Plan measures that allow for a quicker and more precautionary response need to be developed.

To allow for a faster response, it is vital to optimise the transfer of digital information between the actors or working structures of the various regulations. This applies both to the identification of problems (see section before) and the measures to be taken. Within the framework of the One Substance – One Assessment approach, the Chemicals Strategy for

<sup>&</sup>lt;sup>16</sup>NORMAN network (2021): Welcome to the NORMAN network, <u>www.norman-network.net</u> (26.07.2021). <sup>17</sup>Ganzleben, Catherine et al. (2017): Human biomonitoring as a tool to support chemicals regulation in the European Union. In: International Journal of Hygiene and Environmental Health, 220(2 Pt A): 94-97. doi:10.1016/j.ijheh.2017.01.007.

HBM4EU (2021): Coordinating and advancing human biomonitoring in Europe to provide evidence for chemical policy making. www.hbm4eu.eu (26.07.2021).

<sup>&</sup>lt;sup>18</sup> Soeteman-Hernández Lya G. (2018): An approach to identify, prioritise and provide regulatory followup actions for new or emerging risks of chemicals for workers, consumers and the environment. In: International Journal of Risk Assessment and Management, 21 (3): 248-269.

Bakker, Joost (2014): Progress report on New or Emerging Risks of Chemicals (NERCs). RIVM Letter report 2014-004. <u>https://www.rivm.nl/publicaties/progress-report-on-new-or-emerging-risks-of-chemicals-nercs</u> (26.07.2021).

<sup>&</sup>lt;sup>19</sup>EPA Network (2021): Network of the Heads of Environmental Protection Agencies. epanet.eea.europa.eu (26.07.2021).

<sup>&</sup>lt;sup>20</sup>E.g. addressing substances according to WFD (river basin specific pollutants, priority substances and watchlist), CLP (harmonised classification) and REACH (substance registration, SVHC identification, authorisation, restriction).

Sustainability (CSS) proposes the establishment of coordination instruments. In principle, the proposals are useful and should also be reflected in the implementation of the Zero Pollution Action Plan. The key challenge, however, is to avoid creating new regulatory hurdles that complicate and/or delay necessary regulatory measures.

The experience gained from the implementation of the previous EU Regulation on the evaluation and control of the risks of existing substances (Regulation (EEC) No 793/93, repealed)<sup>21</sup> shows that an excessively comprehensive risk assessment approach can ultimately paralyse the system. Likewise, the objective of regulating groups of substances and, where appropriate, critical alternatives together is sensible and necessary. But it must not result in a regulation that is too complex and thus not implemented. What is needed are lean and well-functioning instruments of coordination and exchange between regulatory areas that allow more targeted measures. At the same time, immediate coordinated action, which allows for equally rapid follow-ups when new findings are available, is crucial. The approaches discussed within the CSS to increasingly consider "generic risk"<sup>22</sup> approaches as well as "essential use" can enable simplification. The precautionary principle and the polluter pays principle must be strengthened in the management of pollution prevention and control.

#### 3.3 Selection of appropriate regulatory measures

To select the most appropriate and effective measures, information on the below listed aspects is crucial. However, data should only be collected and considered as far as absolutely necessary for decision-making. In general, broader approaches addressing the entire problem should be given priority. For example, where a group of substances poses a similar concern, the whole group of substances (such as Per- and Polyfluoroalkyl Substances, PFAS) should be addressed together and not each substance individually one after the other. Decisions on the regulation of pollutants must also be taken in case of uncertainties in line with the precautionary principle.

The crucial aspects are:

- Problem description
- Sources of the pollutant or entry pathways and, if applicable, analysis of the material flow or the entire life-cycle
- Identification of possible measures, their possible administrative or legislative implementation including advantages and disadvantages. These include e.g. approaches for restricting the production or use (e.g. restriction of user categories or specific applications) of a substance, organisational or technical measures to prevent or reduce release (waste water treatment, exhaust air treatment, waste treatment, etc.)
- Necessity of use with regards to sustainable development
- Alternatives including their properties, availability, and possible constraints

<sup>&</sup>lt;sup>21</sup>Commission of the European Communities (1998): Report on the implementation of directive 67/548/EEC, directive 88/379/EEC, regulation (EEC) 793/93 and directive 761769/EEC. SEC (1998) 1986 final.

<sup>&</sup>lt;sup>22</sup>For certain critical groups of substances, it should be assumed that, in principle, use under non-strictly controlled conditions poses a risk. So far, in the context of the REACH Regulation, this has only been accepted for CMR substances in consumer uses. An extension is now under discussion.

- Critical substitutes with possible (other) undesirable effects (regrettable substitution)
- ▶ Efficiency, effectiveness, and time horizon of possible measures
- Socio-economic considerations (also regarding environmental and health costs of the business-as usual case)
- Consideration of the polluter pays principle

#### 3.4 Implementation of measures

Some of the problems with pollution continue to exist not due to a lack of regulation, but caused by shortcomings in implementation<sup>23</sup>. Accordingly, analyses of possible reasons for persisting pollution that includes an evaluation of the effectiveness of implementation and corrective measures where necessary are advisable. A clear understanding of responsibilities, actors and tools that support or hinder compliance is a pre-requisite for proposing possible further measures. Additional regulations are not automatically the appropriate solution, but sometimes additional legal requirements can eliminate misincentives and encourage higher compliance. Reporting on enforcement measures to a proportionate extent should become an integral part of regulations whenever possible, so that implementation and enforcement deficits can be better distinguished within the overall policy effectiveness.

#### 3.5 Control of success

Once measures have been implemented, it is necessary to monitor whether the desired objectives are achieved. This does not only include observations on the trends of pollution and whether the burdens are decreasing. It is also necessary to check whether the alternatives used may involve (new) risks for protected goods. To this end, existing reporting obligations from the regulations must be better utilised and fast-track mechanisms should be developed in order to quickly include new substances or substance groups in monitoring. For example, regarding industrial emissions, the revision of the European Pollutant Release and Transfer Register (E-PRTR)<sup>24</sup> points in a promising direction aspiring to make available more useable information for policy makers (trends of pollution, effectiveness of policy) and the public (pollution in the neighborhood) concerning the release of polluting substances from (agro-)industrial plants. The PRTR review team also assesses options on how to improve the linkage with other regulations (such as the POPs Regulation, WFD, IED, etc.).

Measuring substance concentrations in environmental media, biota and humans (human biomonitoring, HBM) is an important component and first step of success control. For example, detecting pollutants in certain media including biota or tracking the temporal pollution trends is a pre-requisite that delivers evidence when assessing the success or failure of certain measures. These monitoring results have then to be evaluated using a set of suitable criteria or indicators to understand the effectiveness of policies and the attribution of measures to the trend observed. A differentiated interpretation of monitoring results in the sense of success control is

<sup>&</sup>lt;sup>23</sup>See, for example, the quality deficiency in REACH registration dossiers, deficiency rates in safety data sheets or unacceptable material burdens on too many imported products.

<sup>&</sup>lt;sup>24</sup> European Commission (2021): Evaluation and Revision under European Pollutant Release and Transfer Register (E-PRTR), <u>https://ec.europa.eu/environment/industry/stationary/e-prtr/evaluation.htm</u> (26.07.2021).

usually only possible on the basis of specific criteria and assessment values, such as e.g. in the case of the pollution level in humans, reference or HBM guidance values as derived in HBM4EU<sup>25</sup>. In addition to success control, the consideration of use patterns and quantities should be included, possibly with a focus on selected areas. The development and application of indicators for control of success partially is still ongoing. For the evaluation of the effectiveness of policies it is also important to consider overall exposures with pollutants across regulations. The overall aim must be the good environmental status of all environmental compartments.

#### 3.6 Data management – Digitalisation

Existing legislation and initiatives related to the Zero Pollution Action Plan create huge amounts of data. This information combined with data from science, public authorities (e.g. European Environment Information and Observation Network (Eionet)<sup>26</sup>), and companies can be the basis for a better environmental policy. This requires an "open data" approach which, in accordance with the objectives of the Aarhus Convention and the Open Data Directive (Directive (EU) 2019/1024), makes this data publicly available and digitally accessible. The use of data depends on standardized data formats and a context-oriented, digital processing thereof. At the same time, raw data must be largely available for science. To handle this huge amount of data, methods like artificial intelligence and big-data analysis should be used but also expert knowledge is needed.

Currently, data from monitoring of environmental media, human biomonitoring, legislation, and other relevant fields is often only interpreted by the institutions who collect them. This leads to very heterogeneous data inaccessible for others, hampering a more holistic data analysis. This calls for obligations and standards on data quality, collection, and sharing thereof with institutions responsible for the systematic evaluation and derivation of measures. We suggest the EEA (through its Eionet) and European Chemicals Agency (ECHA) as suitable institutions at EU level. These should create a virtual focal point of contact for the participation with other institutions and stakeholders. It is necessary to create the required resources to systematically evaluate the collected data and to derive the need for action to protect the environment. In this context, the origin of data and their validity, reliability and relevance need to be considered, specified and made traceable.

The foreseen coordination groups in context of the 'Chemical Strategy for Sustainability' could be responsible for the overall process of using respective data on EU-Level. The working groups responsible for the different pieces of legislation should also use the data and contribute to this integrative work.

Furthermore, new approaches are needed to link data from chemical legislation with data from monitoring environmental media, and vice versa.

In the areas of monitoring, effectiveness control and early warning systems and cross-regulatory solutions should also be promoted in the future. Therefore, intensified use as well as further expansion of digital solutions offers, for example, the following opportunities:

<sup>25</sup>Apel, Petra et al. (2020): Human biomonitoring initiative (HBM4EU) - Strategy to derive human biomonitoring guidance values (HBM-GVs) for health risk assessment. In: International Journal of Hygiene and Environmental Health, 230 (113622), doi: 10.1016/j.ijheh.2020.113622.
<sup>26</sup> EIONET (2021): European Environment Information and Observation Network. <u>www.eionet.europa.eu</u> (26.07.2021).

- Assembling already existing data in databases
- ► Harmonize and annotate heterogenous data sets
- Collecting and assembling new data
- Cross-agency access to data (possibly considering other actors)
- The evaluation of the data by means of artificial intelligence

#### 4 Improving existing regulations and applying the Zero Pollution Ambition Cycle

This paper promotes a holistic view that widens the scope of analysis across relevant regulations and environmental media for the protection of the environment and human health (see section 3). This view, however, may also unveil still neglected aspects as well as structural weaknesses of media-oriented environmental regulations and their interactions. This is particularly important, as the EU Action Plan currently relates its vision towards zero pollution of the environmental media air, water and soil. In the following, we therefore propose concrete improvements regarding the policies for protection of air, water and soil. Moreover, we indicate how the specific policies could benefit from the cross-regulatory perspective of the promoted Zero Pollution Ambition Cycle.

#### 4.1 Air pollution – improvements are needed on different regulatory levels

Although air quality in the EU has been improved during the last decades, air pollution still has significant negative impacts on human health and ecosystems<sup>27</sup>. Emissions of the main air pollutants, with the exception of ammonia, are decreasing although improvements slowed down after 2010. Concentrations of pollutants in the ambient air have also been reduced. However, there are still European regions with poor air quality, the reasons being both insufficient implementation of existing regulations as well as the regulations themselves, which are partially not ambitious enough to trigger the necessary improvements.

Currently, air quality management in the EU is based on three pillars:

- ▶ Regulation of sector-specific emissions (e. g. Directive 2010/75/EU on Industrial Emissions)
- ▶ National emission ceilings (Directive 2016/2284/EU)
- ► Air quality standards (Ambient Air Quality Directives 2008/50/EC and 2004/107/EC)

Each of these pillars contains elements of the Zero Pollution Ambition Cycle, such as standards to monitor air pollutants or rules to implement measures. Nevertheless, regulatory gaps in each of these pillars remain and should be closed to further improve air quality.

With respect to **monitoring requirements**, established standards for regulated pollutants, both for monitoring of emissions as well as ambient air concentrations, exist. However, current regulations of air quality standards only demand for measurements of ambient concentrations of air pollutants with existing target or limit values. Thus, important air pollutants such as ultrafine particles or black carbon are neglected, creating a lack of data of ambient concentrations of these pollutants, and, consequently, their health impacts are still poorly understood. These knowledge gaps make it impossible to set up target or limit values, which in turn prevents the requirement to measure these pollutants as part of the compliance assessment of target or limit values. This will also improve monitoring in a qualitative way by identifying main air pollutants putting pressure on human health.

<sup>&</sup>lt;sup>27</sup> European Environment Agency (2020): Air quality in Europe — 2020 report. EEA Report No 09/2020www.eea.europa.eu/publications/air-quality-in-europe-2020-report (26.07.2021).

In recent years, a significant improvement was achieved in the field of **sector-specific emissions** by implementing regulations for real-driving emissions for diesel passenger cars (see box below). Not taking real-driving emissions into account was a prominent example for missing coherence between the three pillars, namely between emission regulations for diesel passenger cars and limit values for ambient concentrations of nitrogen dioxide. But still there are further improvements possible, e.g. by creating and implementing regulations for all relevant pollutants emitted by medium combustion plants (and not only the three regulated: SO<sub>2</sub>, NO<sub>x</sub> and dust), or regulations for abrasion from tires emitted by road vehicles.

The upcoming revision of the **Ambient Air Quality Directives** gives the opportunity to bring the air quality standards closer to recommendations of the World Health Organization, namely for particulate matter. A suitable implementation of more ambitious standards is still challenging since even the existing standards can currently not be met by every Member State. Additionally, new pollutants like ammonia should be included in the Ambient Air Quality Directives to strengthen the protection of ecosystems.

Emissions of **ammonia** are also a major challenge with respect to national emission ceilings, since the national air pollution control programmes demanded by Directive 2016/2284/EU are insufficient to reach the emission reduction commitments in many Member States by 2030. Here, the implementation of measures should be strengthened, not only by setting up stricter regulations but also by providing appropriate incentives. A further development of the national emission ceilings could also include emission reduction commitments for **methane**. Apart from its greenhouse potential, methane is an important precursor of airborne ozone formation and hence there might be additional benefits by regulating methane not only as a greenhouse gas but also as an air pollutant on an international level. The exploration of a possible inclusion of methane into the Directive 2016/2284/EU will be part of the review of the directive according to the EU strategy to reduce methane emissions<sup>28</sup>.

**Bioaerosols** are a further category of pollutants which are not yet included in air quality regulations on an EU level. Possible regulations could include standards for emissions of bioaerosols from animal housings and regulations to reduce emissions of Legionella from evaporative cooling systems.

#### **Regulating noise emissions from vehicles**

Emissions of air pollutants by vehicles are regulated by European emission standards, including most vehicle types like cars, light- and heavy-duty vehicles and two-wheeled motor vehicles. But vehicles not only emit air pollutants, they are also an important source of noise.

The key regulatory instrument in road traffic noise abatement is the type approval framework for vehicles with respect to sound. Beginning in the 1970s, the harmonised approval test has been progressively refined and the corresponding limit values were successively lowered across Europe. As a result, today new vehicles are much quieter than their predecessors decades ago. Unfortunately, this positive trend cannot be observed in all segments of the vehicle fleet. An

<sup>28</sup> European Commission (2020): Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU strategy to reduce methane emissions. COM(2020) 663 final, <u>https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1603122077630&uri=CELEX:52020DC0663</u> (26.07.2021).

increasing number of cars and motorcycles today are designed and marketed in what is often termed the "business model noise". By means of acoustic flaps in the exhaust tract and sound generators, these vehicles manage the balancing act of meeting the sound limits of the type approval test while at the same time providing the driver with excessive sound on the road. A recent study by UBA documents this deficiency of the current type approval test<sup>29</sup>. The results of the study suggest that the type approval test was actually designed to accommodate the "business model noise".

As the noise pollution of the "business model noise" is pollution by design, shutting down the "business model noise" can be achieved at virtually no cost simply by tightening the type approval test. Effective measures should include a ban of acoustic flaps in the exhaust tract, a ban of sound generators and the implementation of a general not-to-exceed limit value for all operating conditions. The level of the not-to-exceed limit should be derived from the best-in-class vehicles and thus reflect the state of the art.

### 4.2 Water – a strategy is needed to combine the assessment criteria of sector specific regulations

During the past two decades, water quality in Europe has improved. Drinking and bathing water quality continues to improve, while emissions and concentrations of certain well-known hazardous pollutants have also been reduced (e.g. priority substances). However, a good chemical status of water bodies as defined in the Water Framework Directive (2000/60/EC) has yet to be achieved. In addition to that the chemicals included in the definition of the good chemical status only represent a minority of the chemicals known to be part of the chemical pollution of water bodies. Hence, for a Zero Pollution Ambition, strategies are needed to consider the complete picture of water pollution and to minimise chemical pollution in water.

Emissions into water need to be minimised primarily at their sources. Especially substances which are not degradable in a natural environment by biotic and abiotic processes might persist in water bodies and contribute to chemical pollution. Hence, production and use of persistent substances must be limited, and emissions into water need to be excluded to a high degree. This should also apply to substances with endocrine disrupter properties. In addition, **waste water management and treatment** must be adapted to better account for the elimination of chemicals and minimise emissions into surface water. Measures for a better waste water treatment should be financed utilising the polluter pays principle by introducing a common financing mechanism in the EU, e.g. a fonds. This might be introduced in the course of the revision of the Urban Waste Water Treatment Directive (91/271/EEC).

Since **monitoring and risk management of chemicals in water** is addressed primarily by the Water Framework Directive (WFD) and by Directive 2013/39/EU amending the list of priority substances (Annex X to the WFD), the use of the framework might be optimised by specifying the obligation of Art. 16 (8) of the WFD with regard to phasing out certain hazardous substances or substance groups – like PFAS. In addition, the indicative list of the main pollutants in Annex VIII Water Framework Directive needs to be expanded to better include certain substance

www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte 161-2020\_ueberpruefung\_der\_geraeuschemissionen\_von\_motorraedern\_im\_realen\_verkehr.pdf (26.07.2021).

<sup>&</sup>lt;sup>29</sup> Huth, Christine et al. (2020): Überprüfung der Geräuschemissionen von Motorrädern im realen Verkehr. Abschlussbericht. UBA TEXTE 161/2020.

properties, e.g. as defined in REACH (Regulation (EC) No 1907/2006) Art. 57 for substances of very high concern (SVHC)<sup>30</sup> with high environmental relevance.

In addition, the procedures and criteria to **identify and prioritise substances of concern** relevant for water contamination of the substance specific regulations, water regulations, emissions regulations, and product specific regulations need to be aligned and strengthened by harmonising the properties defining high environmental concern. Properties relevant for prioritisation should include persistence, accumulation, mobility, and potential for high environmental distribution and should be aligned across all aforementioned regulations. Along these lines, the definition of environmental quality standards also needs to be revised. Another example is the Guidance document n° 27: Technical Guidance for Deriving Environmental Quality Standards<sup>31</sup> which is still focusing on toxicity as the main criteria and urgently needs to be adapted to the definitions introduced for substances of very high concern under REACH.

An important target towards zero pollution is to **strengthen the interfaces between substance-specific regulations and water legislation**. A first and important step is to achieve a prioritisation mechanism which is valuable for all regulatory approaches relevant for water pollution. Hence, the following activities need to be considered:

- 1. **Continuous chemical monitoring** of surface water including especially non-degradable chemicals, beginning with substances with persistent properties and that are identified as relevant for surface water. After a substance is found in surface water, their entry pathways into water bodies must be investigated and clarified. The detection of critical substances in water bodies should therefore be followed by a closer monitoring of possible sources, e.g. effluents of municipal and eligible industrial wastewater treatment plants or diffuse entries.
- 2. **Introduce chemical non-target analysis** in the monitoring strategies combined with an open database to share information on substances already identified by other monitoring stations in Europe and worldwide. The primary goal of the non-target analysis is the identification of unknown substances of concern in water bodies. Once substances of concern are detected, an evaluation process for establishing the relevance of these findings and, if necessary, a transfer process to our proposal under item 1 above and item 7 below should be developed.
- 3. Introduce the appropriate combination of substance properties of very high concern for the environment, e.g. as defined in REACH Art. 57, into the other legislation addressing the possible presence of chemicals, especially the Water Framework Directive and the Industrial Emissions Directive IED (2010/75/EU). Concerning the IED, a recently finalised project 'Hazardous Industrial Chemicals in the IED BREFs (HAZBREF)'<sup>32</sup> analyses in detail the interfaces, possible synergies and gaps

<sup>31</sup> Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) (2017): Scientific Advice on Guidance Document n°27: Technical Guidance for Deriving Environmental Quality Standards. <u>https://ec.europa.eu/health/sites/default/files/scientific\_committees/scheer/docs/scheer\_o\_012.pdf</u> (26.07.2021).

<sup>&</sup>lt;sup>30</sup> The additions to Article 57 REACH announced in the CSS should also be reflected.

<sup>&</sup>lt;sup>32</sup> HAZBREF (2020): Analysis of the interfaces, possible synergies or gaps between Industrial Emission Directive, REACH Regulation, Water Framework Directive, Marine Strategy Framework Directive and the

between the IED, the REACH Regulation and the Water Framework Directive (WFD) and proposes measures to better use available data generated in the context of these respective legal frameworks. The report includes also proposals for better cooperation between the respective expert-communities and concerning a better linkage between these regulations.

- 4. **Adapt the criteria** to include substances in the Water Framework Directive-monitoring that promote moving from the "measured Environmental Quality Norm (EQN)" to substance-specific criteria, e.g. as defined in REACH Annex XIII.
- 5. Strengthen the interface between monitoring data of chemicals detected in water bodies and substance information like provided in ECHA's database<sup>33</sup> or the OECD EChem Portal<sup>34</sup>. This might be an opportunity to assess pollutants immediately when first detected.
- 6. **Combine the prioritisation processes** used to identify priority substances of the Water Framework Directive and candidates for the watchlist and the activities to prioritise substances of concern for further assessment and regulation as chemicals, biocides, pesticides or pharmaceuticals, e.g. the integrated regulatory strategy under REACH aiming at identifying and addressing substances of concern<sup>35</sup>.
- 7. **Develop an effective mechanism** introducing substances highly relevant for surface water (groundwater, soil) into the watch lists of the respective framework (Water Framework Directive, Drinking Water Directive, (EU) 2020/2184).

**Chemical non-target analysis** offers the opportunity to include a broad substance spectrum in monitoring and to monitor the emissions of more pharmaceuticals and pesticides in water. The results of these findings might be used directly for the respective specific legislations, e.g. by introducing restrictions of certain uses to prevent additional pollution by the active ingredients of these products. The detection of these emerging contaminants may also provide arguments to strengthen the producer responsibility (based on the polluter pays principle).

Much of the monitoring capacities of the European Member States are consumed to measure persistent organic pollutants and legacy pesticides which are no longer in use or which uses have been minimized. To **optimise the limited monitoring resources**, it is proposed to concentrate more on strategies for substances still in use and emerging pollutants and to lower the measuring frequencies for legacy pollutants with clearly declining trends.

POP Regulation concerning hazardous substances. <u>www.syke.fi/en-</u>

<sup>&</sup>lt;u>US/Research</u> <u>Development/Research</u> and <u>development</u> <u>projects/Projects/Hazardous</u> industrial chemic <u>als in the IED BREFs HAZBREF/Publications (26.07.2021).</u>

Another HAZBREF report (see same link) presents proposals how relevant information on chemicals can be more systematically addressed at the right time during reviews of **B**est Available Techniques **Ref**erence Documents (BREFs).

<sup>&</sup>lt;sup>33</sup> European Chemicals Agency (2021): Search for chemicals. <u>https://echa.europa.eu/</u> (26.07.2021).

<sup>&</sup>lt;sup>34</sup> OECD (2021): eChemPortal. The Global Portal to Information on Chemical Substances. <u>https://www.echemportal.org/echemportal/</u> (26.07.2021).

<sup>&</sup>lt;sup>35</sup> European Chemicals Agency (2021): Addressing substance of concern.

www.echa.europa.eu/web/guest/substances-of-potential-concern (26.07.2021).

## 4.3 Soil – closing the sustainability gap by including an effective soil protection strategy

Soil is a non-renewable resource and its regeneration – if possible at all – takes longer than a human lifetime. As a **key component of Europe's natural capital**, it contributes to basic human needs like food provision and water purification<sup>36</sup>, while acting as a major store for organic carbon and a habitat for diverse biological communities. 'Soil formation and protection' is one of the ecosystem services known to be declining in Europe, according to the recent assessment by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)<sup>37</sup>. Soils are threatened by increasing competition for land, unsustainable management practices and inputs of pollutants, causing their degradation in various forms. Chemicals, products like mineral fertilizers and plant protection products, industrial emissions, use of sewage as soil fertilizer, and other emissions contribute as soil-relevant pollutants to the degradation of soils.

**Soil pollution** occurs via various sources and is differentiated into specific, local pollution and widespread pollution. Handling losses, leakages, accidents, malfunctions, improper operation, or abandoned waste disposal sites and abandoned industrial sites are common causes for local or hot spot pollution. Widespread pollution however covers mostly larger areas with lower concentrations, whereas the sources can be more complex. Intake scenarios can include air deposition, intensive farming, or soil management with contaminated materials. Once chemicals are enriched in soils it is difficult and, in many cases, **impossible or disproportionately expensive to rehabilitate soils**.

#### Examples for sources of soil pollution

- Releases (losses, leakages, accidents) from industrial installations, their sites, waste disposal sites and historically contaminated sites.
- Application and introduction of materials onto or into soil (i.e. waste and building materials, sewage sludge, manure).
- Releases of hazardous substances inherent to soil matrix through natural or biological processes.
- Wet and dry depositions of airborne pollutants.
- Use of contaminated water for irrigation.
- Intensive agriculture and farming.

Pollutants in soil are often **transferred to water or air**. Depending on their properties, pollutants can be transferred into groundwater or taken-up by plants. Pollutants in soil can also be taken up directly by humans, especially via dermal resorption or by ingesting small soil particles by young children.

<sup>&</sup>lt;sup>36</sup> European Environment Agency (2021): Soil: the living treasure under our feet. <u>https://www.eea.europa.eu/themes/soil</u> (26.07.2021).

<sup>&</sup>lt;sup>37</sup> Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2018): The IPBES assessment report on land degradation and restoration. Bonn, Germany, doi:10.5281/zenodo.3237392.

Pollutants in soil can furthermore **affect soil functions** as well as soil organisms and may have a drastic effect on biodiversity. Considering the fact that 95% of human food is produced on soil and drinking water is either based on ground or surface water, soil pollution is linked to human health, too and deserves to be addressed explicitly by the Zero Pollution Ambition.

In terms of the Zero Pollution Ambition it is therefore necessary to prevent further pollution of soils and to restore polluted soils. Emissions into soil need to be minimized primarily at the sources. Substances of concern such as pharmaceuticals and biocides may be present in wastewater effluents and sewage sludge. Agricultural use of sewage sludge is a source of persistent chemicals if applied to soil which may be further transferred into food and groundwater. To identify pollutants with a high relevance for soil contamination, the different emission pathways need to be considered and EU-wide thresholds for chemicals of concern for soil are necessary. Furthermore, it is vital to expand soil monitoring to improve the data situation on pollutants relevant to soil and to better identify areas with local and widespread contamination. These issues need to be integrated into the announced EU-wide strategy for soil protection<sup>38</sup> with harmonised regulations and monitoring obligations for all Member States. More than 2.8 million potentially contaminated sites exist in the EU, but only 24 % of the sites are investigated and assessed yet<sup>39</sup>. The objective of the new soil strategy therefore must be to register all contaminated sites and to push for remediation of those areas. The thus cleanedup sites can be re-used in a more sensible way and might reduce the pressure on natural soils and land.

<sup>38</sup> European Commission (2021): Healthy soils – new EU soil strategy.

<sup>39</sup> European Environment Agency (2021): Contamination from local sources.

www.eea.europa.eu/themes/soil/soil-threats/soil-contamination-from-local-sources (26.07.2021).

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12634-Gesunde-Boden-eineneue-Bodenstrategie-der-EU\_de (26.07.2021).

SCIENTIFIC OPINION PAPER The Zero Pollution Action Plan as a chance for a cross-regulatory approach to pollution prevention and reduction

#### 5 Outlook

The Zero Pollution Ambition is a new strategic approach in environmental policy that aims at a moving target: Reducing the negative impact of human activities on the environment, human health, and well-being towards zero or down to levels no longer considered harmful to health and natural ecosystems. Even if we achieve all measurable goals that we set in legislation today, new challenges will inevitably arise. Already today, non-target screening and human biomonitoring are tools that can improve the detection and monitoring of new and emerging pollutants significantly. In a broader sense, innovation and increased knowledge may also widen the scope of what we consider to be part of the Zero Pollution Ambition, e.g. in terms of space by considering the near-earth orbit as a part of "our environment", or in terms of types and impacts of pollutants still unknown today by learning more about existing – or discovering new – stressors that have negative impacts on human health, well-being, and the environment. We learned from our past that innovation in technology and society can present new opportunities to find and remedy pollution while at the same time they can also introduce new challenges and risks to human health and the environment.

For the future, pursuing the Zero Pollution Ambition also has a strong potential to further improve environmental equity and justice, as already mentioned in the EU Action Plan. This is because exposure to pollution and health risks are often linked to the socio-economic position and other social aspects. Moreover, developing action towards a non-toxic environment should consistently consider social factors in order to ensure fairness and acceptance throughout society. Against this background, the Zero Pollution Ambition is likely to benefit not only from a consistent integration of environmental and health data but also from linkage to quantitative and qualitative information on social aspects.

Furthermore, also the global dimension of the Zero Pollution Ambition has to be considered. Pollution is not limited to boarders or continents. Often origins and entry pathways of pollutants are located outside the EU but migrate through trade, environmental media and over time to Europe. Many products and intermediates manufactured in non-EU countries reach or end up in consumer products, the European environment or the EU waste management system. Vice versa, Europe's export of hazardous materials and wastes may cause multiple pollution in other parts of the world. Even though this paper is focusing on the EU-level also the global perspective needs to be taken in to account, as foreseen in the EU Action Plan and within the Strategic Approach to International Chemicals Management (SAICM) and the sound management of chemicals and waste (SMCW) beyond 2020<sup>40</sup>.

The improvement of the legal framework for the protection of air, water and soil as outlined in this paper is an important contribution to reduce pollution, but a toxic-free environment is clearly not only achieved on the basis of further incremental improvements of legislation for air, water, and soil. The Zero Pollution Ambition rather calls for a profound transformation of human behaviour and our society in general. This transformation of human behaviour in turn has the potential to reduce pollution of environmental media significantly and thus needs to be pushed forward by all actors. In this view, moving towards a more circular economy would bring the EU a long way forward in reaching a non-toxic environment as circularity demands for a

<sup>&</sup>lt;sup>40</sup> SAICM (2021) Strategic Approach and sound management of chemicals and waste beyond 2020 - The Intersessional Process. <u>www.saicm.org/Beyond2020/IntersessionalProcess/tabid/5500/language/en-US/Default.aspx</u> (26.07.2021).

change of consumption patterns, product-design, and waste management, to only name a few aspects.

In conclusion, the UBA concurs with the European Commission in its view that the Zero Pollution Ambition describes a pathway, provides a compass and steers the long-term vision of a non-toxic environment. At the same time, this ambition demands to speed up pollution reduction now and to do things differently. Consequently, taking this ambition seriously is a long-term programme that will occupy many researchers, policy experts and the broader public for years to come.