European Commission

European Research on

Environment & Health

Projects funded by
Horizon Europe and **Euratom**
from Calls for proposals 2021-2022

Research and Innovation

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European Commission
Directorate-General for Research and Innovation
Directorate D — People
Unit D.2 — Health Innovations & Ecosystems

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EUROPEAN COMMISSION

European Research on Environment & Health

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Directorate-General for Research and Innovation

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INTRODUCTION

Facing increasing environmental challenges and needing to protect public health, the European Union has established in recent decades an extensive framework of thematic programmes and regulatory actions related to environment and health. They need constant updating and must rely on solid scientific evidence to be credible. The EU has also responded since 1998 by providing increasing financial support for the necessary underpinning research to consolidate the scientific knowledge base through its framework programmes of research and innovation. This has resulted in the funding of over 700 multi-national, multi-partner research projects with an estimated EU contribution of almost € 3 billion since 2000. Details on these projects are available.

This project catalogue provides a snapshot of a collection of environment and health-related projects funded from all the several thematic clusters and programmes in Horizon Europe and Euratom, covering the projects issued from the first two years of calls for proposals (2021-2022). As far as environment and health is concerned, this new Framework of research and Innovation, running from 2021-2027, got to a good start: At the time of publication, already 84 projects have been funded, with an overall EU contribution of around € 587 million. The project ensemble includes significant initiatives such as The European Partnership for The Assessment of Risks from Chemicals (PARC), the largest ever initiative funded by the environment and health research portfolio by the EU, and a number of clusters working together on a common theme (European Cluster on Indoor Air Quality and Health [IDEAL], European Cluster on Climate Change and Health, European Research Cluster on EMF and Health [CLUE-H], Methods for Assessing Health-Related Costs of Environmental Stressors Cluster [METEOR]).

The new projects and initiatives are described below, classified thematically. For each project, their potential to contribute to various policy actions and programmes is indicated. At this time, the main policy drivers have been the initiatives launched under the European Green Deal, mainly the Chemicals Strategy for Sustainability Towards a Toxic-Free Environment and the Zero Pollution Action Plan for Water, Air and Soil. Once more calls for proposals will be launched and new projects selected, this catalogue will be updated accordingly.

HORIZON EUROPE AND EURATOM PROJECTS IN DIFFERENT ENVIRONMENT AND HEALTH DOMAINS

1. Horizon Europe projects addressing chemical safety and human health

Nine projects have been allocated funding from various parts of Horizon Europe (Table 1) in the first two years of Horizon Europe (€226 million commitment). 94% of the budget for this area was provided by Cluster 1: Health, in which is embedded the core environment and health activity under Horizon Europe, referred to as 'Destination 2. Living and working in a health-promoting environment'.

It should be noted that many other projects addressing chemicals exposures are included in other chapters of this publication (e.g., those focused on mitigation of pollution, the exposome etc). This

further attests to the importance of this research area, with the potential to underpin numerous chemical policies, as described in the last column of Table 1, not the least the European Green Deal-related EU Chemical Strategy for Sustainability and the Zero Pollution Action Plan for water, air and soil.

The most significant initiative launched in the first two years of Horizon Europe:

- **European Partnership for the Assessment of Risks from Chemicals - PARC**: The largest investment ever in environment and health research by a European Union research framework programme. This co-funded European partnership, coordinated by the French Agency for Environmental and Occupational Health Safety (ANSES), has an overall budget of €400 million for 7 years. The aim of the partnership is to establish an EU-wide research and innovation programme supporting the EU and national chemical risk assessment/management authorities and processes with new data, knowledge, methods and skills to address current, emerging and novel chemical safety challenges. In line with the European Green Deal's zero-pollution ambition for a toxic free environment, and the Chemical Strategy for Sustainability, the partnership will facilitate the transition to the next generation of risk assessment to better protect human health and the environment. Part of the activities of HBM4EU, the European Human Biomonitoring Initiative, which run from 2017 until 2022, continue under PARC. At this moment, PARC involves close to 200 institutions working in the areas of the environment or public health from 28 countries and three EU authorities, including the European Chemical Agency (ECHA), the European Food Safety Authority (EFSA) and the European Environment Agency (EEA).

Table 1. Horizon Europe projects on chemical safety and human health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101043848 **ARCHIMEDES** *A holistic data platform to accelerate the development of better and safer drugs and chemicals* 60 months (2022-2027) European Research Council (ERC) consolidator grant; € 2 000 000 Principal investigator: Dr Dario Greco, University of Tampere, FI Additional information in CORDIS	Toxicogenomics; mechanism of action (MOA) of chemicals; Adverse Outcome Pathways (AOP); big data science; artificial intelligence (AI); Toxicology Knowledge Graph (TKG), an innovative data platform; associations between exposures and diseases	Chemicals strategy for sustainability towards a toxic-free environment European Partnership for the Assessment of Risks from Chemicals (PARC)

101061889 **AQUADRUGS** *Uncovering the effects of pharmaceuticals in the wild, beyond individuals to animal communities* 24 months (2023-2024) MSCA Postdoctoral Fellowships 2021, €222 727 Fellow: Dr Marcus Michelangeli, Swedish University of Agricultural Sciences, Uppsala, SE	Pharmaceutical pollutants in waterways; mixtures; behavioural changes in animals leading to high-order ecological effects; fish; ecotoxicology	European Union Strategic Approach to Pharmaceuticals in the Environment Pharmaceutical Strategy for Europe EU Mission 'Restore our Ocean and Waters'
101057844 **ENVIROMED** *Next generation toolbox for greener pharmaceuticals design & manufacturing towards reduced environmental impact* 36 months (2022-2025) Cluster 1: Health, €7 518 062 Research and innovation action Coordinator: Dr Stephanos Camarinopoulos, Risa Sicherheitsanalysen GMBH, DE Additional information in CORDIS	Pharmaceuticals; metabolites; emerging environmental toxicants; persistence; environmental occurrence and fate; toxicity (*in-vitro, in-vivo* models); *in-silico* methods; Lifecycle Assessment (LCA); green-by-design in-silico drug development	European Union Strategic Approach to Pharmaceuticals in the Environment Pharmaceutical Strategy for Europe
101057668 **ETERNAL** *Boosting the reduction of the environmental impact of pharmaceutical products throughout their entire life cycle* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 5 922 396 Coordinator: Dr Jesus Latorre Zacares, AIMPLAS, ES Additional information in CORDIS	Environmental risks of active pharmaceutical ingredients (API) and residues/metabolites, other chemicals and by-products of the production process green manufacturing; case studies; pollution; waste; ecotoxicity and environmental fate of pharmaceuticals	European Union Strategic Approach to Pharmaceuticals in the Environment Pharmaceutical Strategy for Europe EU Zero Pollution Action Plan
101099775 **IDEFIX** *Multiorgan toxicity and efficacy test platform* 36 months (2022-2025) Innovation action European Innovation Council transition project; €2 496 073 Coordinator: Dr Jeremy Cramer, Cherry Biotech, Montreuil, FR Additional information in CORDIS	Animal testing; prediction of drug effects (toxicity and efficacy) in humans; organ-on-chip/MPS solution based on microfluidic technology; reconstruction of complex tissues (vascularisation, immune system, circulating metastasis, multiorgan interconnection)	Directive on the protection of animals used for scientific purposes REACH regulation

 101057014 **PARC** *European Partnership for the Assessment of Risks from Chemicals* 84 months (2022-2029) Programme Co-fund Action Cluster 1: Health, € 200 000 000 Coordinator: Dr Pascal Sanders, Agency for Environmental and Occupational Health Safety (ANSES), Maisons Alfort, FR Additional information in CORDIS	Chemical risk assessment and risk management; data, knowledge, methods, networks and skills; current, emerging and novel chemical safety challenges; transition to next generation risk assessment; EU-wide sustainable cross-disciplinary network; joint EU research and innovation activities; strengthening existing capacities and building new trans-disciplinary platforms to support chemical risk assessment	Chemicals strategy for sustainability towards a toxic-free environment EU Zero Pollution Action Plan REACH regulation European Union framework on endocrine disruptors EU strategic framework on health and safety at work 2021-2027
101058697 **PFAS-ITOX** *Developmental immunotoxicity of perfluoroalkyl substances (PFASs) in a population of highly-exposed children* 24 months (2022-2024) MSCA Postdoctoral Fellowships 2021, € 222 727 Fellow: Dr Christel Nielsen, Lund University, SE Additional information in CORDIS	Perfluoroalkyl substances (PFAS); immunotoxicity; cohort of children with a range of PFAS exposures; effect of prenatal and childhood PFAS exposures on health outcomes, including COVID-19 incidence	Chemicals strategy for sustainability towards a toxic-free environment EU Zero Pollution Action Plan
QTOX DOCTORAL NETWORK 101072531 **QTOX** *Quantitative extrapolation in ecotoxicology* 48 months (2023-2027) MSCA doctoral network; €2 727 057 Coordinator: Prof. Ronny Blust, University of Antwerp, BE Additional information in CORDIS	Chemical risk assessment; development of mechanistic knowledge and data-efficient modelling tools to bridge the gap between standard toxicity data and ecologically relevant end points arising from chronic, time variable exposures to chemical mixtures; intersectoral research and training programme with 10 doctoral candidates	Chemicals strategy for sustainability towards a toxic-free environment REACH regulation EU Water Framework Directive

101092164 **ZEROF** *Development of verified safe and sustainable PFAS-free coatings for food packaging and upholstery textile applications* 36 months (2023-2025) Research and innovation action Cluster 4: Digital, Industry and Space, € 4 998 888 Coordinator: Dr Miika Nikinmaa, VTT Technology Centre, FI Additional information in CORDIS	Safe-and-sustainable-by-design (SSbD) coating alternatives to replace PFAS compounds in food packaging and upholstery textiles; environmental impacts; toxicology (e.g. hazard and law, green toxicology principles); toxicology modelling; reduce in-vitro testing	Chemicals strategy for sustainability towards a toxic-free environment EU Zero Pollution Action Plan Directive on the protection of animals used for scientific purposes

2. Horizon 2020 projects on nanosafety and health

Nanosafety research emerged as an important sub-area in environment and health in the Seventh Framework of Research and Innovation (FP7), partially due to public concerns and thanks to policy initiatives such as the European strategy for nanotechnology and the nanotechnology Action Plan, adopted in 2004. Many of the projects funded have participated or are participating in the European NanoSafety Cluster, a platform for coordinating nanosafety research in Europe. It provides strategic direction for the EU and member states, enhances synergies between running and newly starting projects, preserves the outputs and data from ended projects and promotes FAIR data.

Five Horizon Europe projects address the environmental and human health impacts of nanomaterials (Table 2), with an EU commitment of around €14.7 million. All five projects emerged from a dedicated call '*Advanced characterisation methodologies to assess and predict the health and environmental risks of nanomaterials'*, launched under the Cluster 4: Digital, Industry and Space of Horizon Europe.

Table 2. Projects on nanosafety and health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101092796 **ACCORDS** *Green Deal inspired correlative imaging-based characterization for safety profiling of 2D materials* 48 months (2023-2026) Coordination and support action Cluster 4: Digital, Industry and	Graphene family materials (GFMs); 2D nanomaterials; assessment and prediction of nanomaterials health and environmental	Chemicals strategy for sustainability towards a toxic-free environment REACH regulation Directive 2010/63/EU on the protection of animals used for scientific

Space, € 1 669 149 Coordinator: Prof. Damjana Drobne, University of Ljubljana, SI Additional information in CORDIS	risks; ACCORDs framework; safe and sustainable by design; user guidance; reference in vitro tests; new reference 2D nanomaterials	purposes
 10109 2971 **ICARE** *Integrated assessment and advanced characterisation of neuro-nanotoxicity* 48 months (2023-2026) Research and innovation action Cluster 4: Digital, Industry and Space, € 2 744 654 Coordinator: Dr Ernesto Alfaro, International Iberian Nanotechnology Laboratory, Braga, PT Additional information in CORDIS	Imaging technologies to quantify physical-chemistry properties in complex matrices; impact of nanomaterials on brain health to prevent the toxicity nanomaterials; toxicology testing protocols; vitro and in vivo testing	Chemicals strategy for sustainability towards a toxic-free environment REACH regulation Directive 2010/63/EU on the protection of animals used for scientific purposes
 101092686 **MACRAME** *Advanced characterisation methodologies to assess and predict the health and environmental risks of advanced materials* 36 months (2022-2025) Research and innovation action Cluster 4: Digital, Industry and Space, € 4 201 652 Coordinator: Dr Steffi Friedrichs, Acumenist, Brussels, BE Additional information in CORDIS	Detection, characterisation and quantification of advanced materials (AdMas) during their processing and product-life-cycle; (eco)toxicology; impact on (human) health and the environment; standardisation and harmonisation of the developed test- and characterisation methods	Chemicals strategy for sustainability towards a toxic-free environment REACH regulation Directive 2010/63/EU on the protection of animals used for scientific purposes
101092741 **NANOPASS** *Bridging the gaps in nanosafety for animal-free prediction of adverse outcomes* 36 months (2023-2026) Research and innovation action Cluster 4: Digital, Industry and Space, € 3 073 736 Coordinator: Prof. Iktok Urbancic, Jožef Stefan Institute, Ljubljana, SI Additional information in CORDIS	Cost-efficient high-throughput screening; focus of nanosafety testing on early key events (KEs) leading to adverse outcomes (AOs); intravital in vivo microscopy; quantitative time-lapse in vitro microscopy; single-cell omics; computational	Chemicals strategy for sustainability towards a toxic-free environment REACH regulation Directive 2010/63/EU on the protection of animals used for scientific purposes

	modelling of structure-function relationships; new in vitro systems; quantitative in silico models to predict AOs; validation of AO predictions	
POTENTIAL 101092901 **POTENTIAL** *Platform optimisation to enable nanomaterial safety assessment for rapid commercialisation* 36 months (2023-2026) Research and innovation action Cluster 4: Digital, Industry and Space, € 2 999 787 Coordinator: Dr Luisa Diomede, Mario Negri Institute of Pharmacological Research, Milano, IT Additional information in CORDIS	Advanced Nanomaterials (Ad-NMs); harmonised protocols for characterisation, testing, grouping and read-across of Ad-NMs; advanced imaging protocols; methodologies for accelerated testing; in vitro multi-cellular models; in vivo (invertebrate) models; ecotoxicological models for assessing the environmental and health hazard of Ad-NMs	Chemicals strategy for sustainability towards a toxic-free environment REACH regulation Directive 2010/63/EU on the protection of animals used for scientific purposes

3. Horizon Europe projects on air quality and health

It is widely agreed that air pollution is the major environmental stressor human populations are exposed to in Europe. This environmental challenge is addressed by 12 projects (Table 3), with an EU commitment of around €60 million. This area of research received a considerable boost as the Health cluster launched a call '*Indoor air quality and health*' in 2021 under 'Destination 2. Living and working in a health-promoting environment'. This topic that received increasing attention as the Covid pandemic started, due to evident links of viral transmission to indoor air quality issues.

Noteworthy initiative:

- **European Cluster on Indoor Air Quality** and Health (IDEAL): As the call for proposal stated that 'All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate', the seven projects selected for funding have formed a cluster, to optimize synergies, avoid overlaps and increase the impact of the projects at the level of dissemination and outreach to policy-makers and other stakeholders. The cluster formed working groups on issues of common interest (Working groups - IDEAL CLUSTER) and will organise workshops and training activities, among other things.

Table 3. Projects on air quality and health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101095457 **EASVOLEE** *Effects on air quality of semi-volatile engine emissions* 48 months (2023-2027) Cluster 5: Climate, Energy and Mobility: € 2 999 051 Research and innovation action Coordinator: Prof. Spyros Pandis, Foundation for Research and Technology – Hellas, Heraklion, EL Additional information in CORDIS	Secondary aerosol formation from transport engines and air quality; health-related metrics and mechanisms, mitigation strategies and policies to improve air quality; emissions of transport engines under real driving conditions, formation of secondary particulate matter (PM); toxicity of both the fresh and aged PM	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World European Green Deal
101057497 **EDIAQI** *Evidence driven indoor air quality improvement* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 7 876 015 Coordinator: Dr Francesco Mureddu, Lisbon Council for Economic Competitiveness, BE Additional information in CORDIS Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)	Indoor air pollution; characterization of sources and routes of exposure and dispersion of chemical, biological, and emerging indoor air pollution in multiple cities in EU; small-scale and long-term, large-scale monitoring of target indoor air pollutants	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101066362 **FACEINQ** *Innovative dynamic façade systems for indoor environmental quality* 15 months (2023-2024) MSCA Postdoctoral Fellowships 2021, € 127 165 Fellow: Dr Marcel Loomans, Eindhoven University of technology, NL	Energy efficiency of buildings; computational models validated with measured data and feedback from building occupants; impact of indoor environment on building occupants and the impact of occupants' behaviour on the operation of façade systems	Energy efficient buildings

101056883 **INCHILDHEALTH** *Identifying determinants for indoor air quality and their health impact in environments for children: measures to improve indoor air quality and reduce disease burdens* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 7 368 144 Coordinator: Prof. Heidi Salonen, Aalto University, FI Additional information in CORDIS Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)	Determinants for and impact of indoor air quality; school children; chemicals, particle concentrations, microorganisms and physical parameters in schools, homes, sports halls and transport; epidemiology; interventions in three European cities; respiratory infections, allergies, and neurological and cognitional symptoms; cytotoxicity testing	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101057499 **INQUIRE** *Identification of chemical and biological determinants, their sources, and strategies to promote healthier homes in Europe* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 7 830 787 Coordinator: Dr Pernilla Bohlin Nizzetto, Norwegian Institute for Air Research (NILU), Oslo, NO Additional information in CORDIS Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)	Determinants of indoor air quality (IAQ) in homes; exposure to hazardous chemical and biological determinants; infants and young children; low-cost, non-invasive sampling strategies (sensors, indoor/outdoor passive sampling, urine biomonitoring); data analysis techniques (e.g., machine learning, exposure modelling, geospatial analysis)	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101057693 **K-HEALTHINAIR** *Knowledge for improving indoor air quality and health* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 7 984 484 Coordinator: Dr Jose Fermoso Domínguez, CARTIF Technology Centre, Boecillo (Valladolid), ES Additional information in CORDIS	Indoor air quality (IAQ) at home and in workplaces; effects on health; monitoring of chemical and biological indoor air pollutants; in vivo/vitro assays; clinical trials; equipment and tools	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World

Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)		
101057510 **LEARN** *Development of novel assessments for indoor air quality monitoring and impact on children's health* 48 months (2022-2026) Research and innovation action Cluster 1: Health, €7 550 974 Coordinator: Dr Ernesto Alfaro-Moreno, International Iberian Nanotechnology Laboratory, Braga, PT Additional information in CORDIS Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)	Air quality; schools; impact on cognition of children; development and deployment of novel sensors to detect the presence of air pollutants; characterisation of indoor and outdoor air pollutants; biomarkers of exposure and effect; *C. elegans*; human-based *in vitro* models of lung and skin	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101096133 **PAREMPI** *Particle emission prevention and impact: from real-world emissions of traffic to secondary PM of urban air* 36 months (2023-2025) Research and innovation action Cluster 5: Climate, Energy and Mobility: € 2 996 544 Coordinator: Dr Päivi Aakko-Saksa, VTT Technology Centre, FI Additional information in CORDIS	Transport sector; air pollution; particulate matter (PM2.5) emissions; contribution of secondary aerosols from transport sources to ambient PM2.5 levels; toxicity and health impact assessments	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101064284 **SENSEWELLBEING** *The well-being of the sensitive: indoor environment and well-being of people with autism* 24 months (2022-2024) MSCA Postdoctoral Fellowships 2021, € 230 774 Fellow: Prof Jørn Toftum, Technical University of Denmark	Autism; indoor comfort and well-being; environmental stimuli; environmental parameters; behavioural monitoring; subjective questionnaire surveys; adaptive strategies	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World

101057271 **SYNAIR-G** *Disrupting noxious synergies of indoor air pollutants and their impact in childhood health and wellbeing, using advanced intelligent multisensing and green interventions* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 6 662 223 Coordinator: Dr Nikos Papadopoulos, National and Kapodistrian University of Athens, EL Additional information in CORDIS Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)	Identify and quantify synergistic interactions between different air pollutants affecting health; mechanisms; schools; multipollutant monitoring system; interventions; sensors of chemical and biological (allergens, microbes) pollutants; health outcome data from children using a gamified app and prospective monitoring; cell and mouse models	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101057779 **TWINAIR** *Digital twins enabled indoor air quality management for healthy living* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 6 925 582 Coordinator: Dr Stelios Karatzas, University of Patras, EL Additional information in CORDIS Belongs to the European Cluster on Indoor Air Quality and Health (IDEAL)	Indoor air quality; innovative tools for identifying and tracing pollutants and pathogens; impact on health; demonstration in residential and public buildings, hospitals, vehicles and schools; six pilot sites in Europe; chemical and environmental sensors; smart buildings; behaviour	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World
101060170 **WEBASOOP** *Research reinforcing in the Western Balkans in offline and online monitoring and source identification of atmospheric particles* 36 months (2022-2025) Coordination and support action Widening Participation and Spreading Excellence, Twinning, € 1 492 000 Coordinator: Prof. Milena Jovasevic-Stojanovic, University of Belgrad, RS Additional information in CORDIS	Atmospheric particles; particulate matter (PM); monitoring; physical, chemical and biological properties of PM determining toxicity and bioavailability; research hub of knowledge and skills related to PM monitoring and assessment; oxidative potential as proxy for health effects	EU Zero Pollution Action Plan EU Global Health Strategy: Better Health for All in a Changing World

4. Horizon Europe projects on urban health

According to WHO, urbanization is one of the leading global trends of the 21st century that has a significant impact on health. Over 55% of the world's population live in urban areas, a proportion that is expected to increase to 68% by 2050. While cities can bring many challenges, they can also provide opportunities for better health, cleaner environment and climate action. Health aspects will also be covered by the EU Climate-neutral and Smart Cities mission launched in 2021. EU missions are a novelty in Horizon Europe and are a new way to bring concrete solutions to some of our greatest challenges. They have ambitious goals and will deliver tangible results by 2030.

Table 4 lists the four projects, with an EU commitment of around €12.7 million, addressing various aspects of urban health, funded outside the calls launched by the Mission.

Table 4. Projects on urban health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101082551 **100KTREES** *Decision toolbox for cities to improve air quality, biodiversity, human wellbeing and reduce climate risks by planting more trees in our cities* 36 months (2022-2025) Innovation action Cluster 4: Digital, Industry and Space, € 1 891 300 Coordinator: Dr Brigitte Holt Andersen, DHI A/S, Hørsholm, DK Additional information in CORDIS	Green areas; urban; planting trees; mapping and modelling toolbox to optimise the planting of trees; pollution absorption; cooling effect; noise abatement; flood risk reduction; life quality; mental health impacts	EU Mission: Climate-Neutral and Smart Cities Urban agenda for the EU
101073437 **GREENEXUS** *Green-health-safety nexus for new urban spaces* 48 months (2023-2026) MSCA doctoral network; € 2 633 666 Coordinator: Dr. Cesare Sangiorgi, University of Bologna, IT Additional information in CORDIS	Characteristics of urban green contexts and people's health and safety; air pollution and urban climate; reduced contact with nature; limited access to quality green spaces; urban fabrics and infrastructure; mental and physical	EU Mission: Climate-Neutral and Smart Cities Urban agenda for the EU

	well-being; Training-through-Research programme	
OneAquaHealth 101086521 **ONEAQUAHEALTH** *Protecting urban aquatic ecosystems to promote One Health* 48 months (2023-2026) Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 4 939 558 Research and innovation action Coordinator: Dr Maria J Feio, University of Coimbra, PT Additional information in CORDIS	Aquatic urban ecosystems; degradation; people, animals and plants; health and environmental observations; health and wellbeing impacts in wildlife and humans; environmental monitoring of early warning indicators; AI-based Environmental Surveillance System	EU Mission: Climate-Neutral and Smart Cities Urban agenda for the EU Global Earth Observation System of Systems (GEOSS)
101095423 **YOPAAPE** *A youth-centred preventive action approach towards co-created implementation of socially and physically activating environmental interventions* 60 months (2023-2027) Research and innovation action Cluster 1: Health, € 3 281 100 Coordinator: Prof. Mai Chin A Paw, VU University Medical Center Amsterdam, NL Additional information in CORDIS	Healthy movement behaviours; risks for non-communicable diseases (NCDs); implementation of lifestyle interventions focused on teenagers; social and physical environmental interventions; urban environments; co-creation	EU Global Health Strategy: Better Health for All in a Changing World

5. Horizon Europe projects on climate change and health

According to WHO, between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year in the world from malnutrition, malaria, diarrhoea and heat stress. The direct damage costs to health (i.e. excluding costs in health-determining sectors such as agriculture and water and sanitation), is estimated to be between USD 2-4 billion/year by 2030. According to the Lancet Countdown report (2021), global excess mortality attributable to heat exposure in people over 65 is estimated to have increased by more than 50% during the period 2000-2018. Climate change affects many of the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.

In recent years, the European Union has responded to this challenge by adopting initiatives such as the new EU strategy on adaptation to climate change in 2021,

European Climate and Health Observatory

which acknowledges that climate change impacts the health and well-being of Europeans, who increasingly suffer from heat waves. Furthermore, it calls for the need of a deeper understanding of the climate-related risks for health. Within this context, a new European Climate and Health Observatory has been established under Climate-ADAPT. On the research front, Horizon Europe supports the EU Mission: Adaptation to Climate Change since 2021. Addressing health-related issues is one of the components of this new Mission.

Outside the Mission, funding for climate change and health research received a significant boost in the first two years of Horizon Europe. 10 projects have been funded, with an EU commitment of around €59 million (Table 5).

Noteworthy initiative:

- **European Cluster on Climate Change and Health**: This cluster of six projects resulted from a call launched by the Health cluster of Horizon Europe. Taken together, the project addresses the dual call requirement, namely research on the relationships between changes in environmental hazards caused by climate change, the impacts on interrelated ecosystems and their influence on human health, and climate induced emergence and transmission of pathogens and spread of zoonotic pathogens using Eco-health and One-Health approaches. As the call for proposal stated that 'All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate', the seven projects selected for funding have formed a cluster, to optimize synergies, avoid overlaps and increase the impact of the projects at the level of dissemination and outreach to policy-makers and other stakeholders. The cluster formed working groups on issues of common interest and will organise workshops and training activities, among other things.

Table 5. Projects on climate change and health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101065960 **ARCEPH** *Tracking impacts of climate change in the Arctic marine ecosystems through cephalopod diversity and life histories* 24 months (2022-2024) MSCA Postdoctoral Fellowships 2021, €173 847 Fellow: Dr Henk-Jan Hoving, GEOMAR Helmholtz Centre for Ocean Research, Kiel, DE Additional information in CORDIS	Climate change impact; predictions; ecosystems; Arctic; Cephalopoda (Phylum Mollusca); marine food webs; modelling; biodiversity; populations shifts	EU Strategy for Managing the Arctic
BlueAdapt 101057764 **BLUEADAPT** *Reducing climate based health risks in blue environments: Adapting to the climate change impacts on coastal pathogens* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 6 678 353 Coordinator: Prof. Marc Neumann, BC3 Basque Centre for Climate Change, ES Additional information in CORDIS climate-health Belongs to the European Cluster on Climate Change and Health	Investigation and quantification of the future health risks associated with selected coastal pathogens; tools to assess the impacts of policy responses and communicate the results; One Health and Ecological Public Health; simulations of how changes in climate variables, interacting with other environmental change, may influence the state of selected microbial pathogens of public health concern in coastal waters	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World

101057131 **CATALYSE** *Climate action to advance healthy societies in Europe* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 8 377 188 Coordinator: Prof. Cathryn Tonne, Barcelona Institute for Global Health - ISGlobal, ES Additional information in CORDIS Belongs to the European Cluster on Climate Change and Health	Environmental hazards caused by climate change, ecosystems and human health; health evidence in decision making; integrated indicator framework and repository to track the status of health-relevant outcomes of climate actions; health co-benefits and social and environmental costs and benefits resulting from mitigation measures outside of the health sector; surveillance and forecasting tools; interventions; evidence and training on the most effective strategies for climate change adaptation and mitigation for health systems	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World
101057690 **CLIMOS** *Climate monitoring and decision support framework for sand fly-borne diseases detection and mitigation with cost-benefit and climate-policy measures* 36 months (2022-2025) Research and innovation action Cluster 1: Health, € 9 038 530 Coordinator: Dr Carla Maia, Nova University of Lisbon, PT Additional information in CORDIS Belongs to the European Cluster on Climate Change and Health	Mitigation of climate- and climate change-induced emergence, transmission and spread of vector-borne and zoonotic pathogens; Eco-health and One Health; climate and environmental-related drivers of sandfly vector populations and the sand fly-borne diseases; Early Warning System (EWS) and decision support frameworks for climate and health modelling; big data time series (on vectors, disease, micro- and macroclimate, environment and health, infection risk)	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World
101062347 **FASCIOCLIME** *Impact of climate change on zoonotic vector-borne diseases and their potential transmission increase and introduction risk: An innovative approach with a selected disease*	Vector-borne diseases (VBDs); snails; climate change; response of zoonotic VBDs to climate change; fascioliasis as a model; integrative	HERA European Climate and Health Observatory

model 24 months (2022-2024) MSCA Postdoctoral Fellowships 2021, €181 152 Fellow: Prof. Santiago Mas-Coma, University of Valencia, ES	modelling framework for fascioliasis transmission	
101056783 **FOCI** *Non-CO2 forcers and their climate, weather, air quality and health impacts* 48 months (2022-2026) Research and innovation action Cluster 5: Climate, Energy and Mobility: € 6 470 974 Coordinator: Dr Tomáš Halenka, Charles University, CZ Additional information in CORDIS	Individual and cumulative contribution of short- and long-lived radiative forcers, including GHGs, their precursors, aerosols, refrigerants and other climate forcers, to climate change; impact on atmospheric and ocean circulation; air pollution; application in relevant sectors (transport, industry, agriculture and health) with a view to better understand co-benefits and trade-offs of mitigation policies with other societal benefits, including human health	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World
101057843 **HIGH HORIZONS** *Heat indicators for global health (High Horizons): monitoring, early warning systems and health facility interventions for pregnant and postpartum women, infants and young children and health workers* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 8 759 066 Coordinator: Prof. Stanley Luchters, University of Ghent, BE Additional information in CORDIS Belongs to the European Cluster on Climate Change and Health	Climate change; health and well-being impact on pregnant and postpartum women, infants, health workers; health impacts of extreme heat; personalised Early Warning System (EWS); adaptation-mitigation actions in health facilities; data from Europe and Africa; cost/benefit analyses	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World

101057554 **IDALERT** *Infectious disease decision-support tools and alert systems to build climate resilience to emerging health threats* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 9 188 294 Coordinator: Prof. Joacim Rocklöv, Umeå University, SE Additional information in CORDIS Belongs to the European Cluster on Climate Change and Health	Climate change; zoonotic infectious diseases; pan-European indicators tracking past, present, and future climate-induced disease risk across hazard, exposure, and vulnerability domains at the animal, human and environment interface; cost-benefits of climate change adaptation and mitigation measures across sectors and scales; surveillance, early warning and response systems; health system resilience	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World
101057739 **TRIGGER** *Solutions for mitigating climate-induced health treaths* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 9 996 777 Coordinator: Prof. Silvana Di Sabatino, University of Bologna, IT Additional information in CORDIS Belongs to the European Cluster on Climate Change and Health	Understanding of linkage between climate, health and ecosystems; tools to monitor, predict and mitigate risks for human health connected to climate change; Climate-Health Connection Labs in Europe; increased heat waves, air pollution, droughts, UV exposure; cardio-vascular and respiratory diseases	European Climate Law EU Adaptation Strategy HERA The Lancet Countdown: Health and Climate Change in Europe European Climate and Health Observatory WHO's work on climate change and health EU Global Health Strategy: Better Health for All in a Changing World
101064940 **TRUEHEAT** *Best-estimate projections of future compound extreme heat, its impacts and driving mechanisms* 36 months (2022-2025) MSCA Postdoctoral Fellowships 2021, €308 746 Fellow: Prof. Robert Vautard, National Centre for Scientific Research (CNRS), FR	Extreme heat; can current climate models sufficiently capture the risk and intensity of extremes under present and future climate conditions	European Climate Law EU Adaptation Strategy Actions of Health Emergency Preparedness and Response Authority (HERA) European Climate and Health Observatory

6. Horizon Europe projects on biological safety

Biological hazards include bacteria, viruses, parasites, biotoxins etc. Some of these hazards can pose serious risks to public health and can be influenced by environmental factors and conditions. The increasing importance of this area has become more evident due to the recent Covid pandemic and changing transmission patterns of pathogens due to climate change.

Six projects have been funded from calls launched during the first two years, with an EU commitment of around €22 million (Table 6).

Table 6. Projects on biological safety and health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101052876 **APROSUS** *Microbiome-derived asthma and allergy protective substances for prevention* 60 months (2023-2027) European Research Council (ERC) advanced grants; €2 500 000 Principal investigator: Prof. Erika Von Mutius, Helmholtz Environmental Health Centre, Munich, DE Additional information in CORDIS	Asthma and allergies; exposures to the environmental microbiome; risk and protection from onset of illness; in depth characterization of microbe-derived metabolite complexes to better understand their associated asthma- and allergy protective properties; population-based farm studies	EU Global Health Strategy: Better Health for All in a Changing World
BCOMING 101059483 **BCOMING** *Biodiversity conservation to mitigate the risks of emerging infectious diseases* 48 months (2022-2026) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, €4 949 614 Coordinator: Dr Julien Cappelle, International Centre of Cooperation in Agronomic Research for Development (CIRAD), Marcy l'Etoile, FR Additional information in CORDIS	Biodiversity loss and hotspots; disease surveillance; Europe and three tropical biodiversity hotspots in Southeast Asia, West Africa and the Caribbean; mechanisms underlying the impact of biodiversity on the risk of infectious disease emergence; tools to facilitate the design of context-adapted biodiversity conservation and restoration strategies	EU Biodiversity Strategy for 2030 European Health Union EU Adaptation Strategy

	that reduce zoonotic risk	
 101060568 **BEPREP** *Identification of best practices for biodiversity recovery and public health interventions to prevent future epidemics and pandemics* 60 months (2022-2027) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 5 424 904 Coordinator: Prof. Frauke Ecke, University of Helsinki, FI Additional information in CORDIS	Nature restoration targeting biodiversity recovery; public health interventions; mitigation of disease risk; case studies in Europe and the tropics; causal mechanisms of infection dynamics and drivers; epidemics and pandemics	EU Biodiversity Strategy for 2030 EU Global Health Strategy: Better Health for All in a Changing World
 101057036 **DESIGN OH AMR** *Designing the European partnership on one health AMR* 24 months (2022-2024) Coordination and support action Cluster 1: Health, € 990 432 Coordinator: Dr Laura Plant, Swedish Research Council, SE Additional information in CORDIS	Antimicrobial resistance (AMR); one health approach; threat to human, animal, plant and environmental health; preparatory groundwork of the candidate European co-funded One Health antimicrobial resistance (OH AMR)	Farm to Fork strategy One Health Antimicrobial Resistance partnership European One Health Action Plan against AMR WHO Global Action Plan on AMR EU Global Health Strategy: Better Health for All in a Changing World
 101086640 **E4WARNING** *Eco-epidemiological intelligence for early warning and response to mosquito-borne disease risk in endemic and emergence settings* 48 months (2023-2026) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 4 082 528 Coordinator: Dr Frederic Bartumeus, Spanish National Research Council (CSIC), Blanes, ES Additional information in CORDIS	Mosquito-borne diseases; anticipating and identifying eco-epidemiological risks leading to epidemics and emergence in previously unaffected areas; understanding of factors that drive disease circulation, emergence and spread; changing environment; One Health; zoonotic pathogens	EU Global Health Strategy: Better Health for All in a Changing World WHO work on One health

 101073982 **MOBILISE** *MOBILISE: A novel and green mobile One Health laboratory for (re-) emerging infectious disease outbreaks* 36 months (2022-2025) Innovation action Cluster 3 - Civil security for society: € 3 999 891 Coordinator: Dr Florian Gehre, Bernhard Nocht Institute for Tropical Medicine, Hamburg, DE Additional information in CORDIS	Climate change; emergence of arboviruses; mosquitoes and ticks (arthropod vectors); mobile One Health laboratory; pathogen discovery and epidemiological analysis; rapid diagnostic tests for BSL-3/4 pathogens	EU Civil Protection and Health policy framework EU Global Health Strategy: Better Health for All in a Changing World WHO work on One health

7. Projects on non-ionizing and ionizing radiation and health

Non-ionizing radiation: While the adoption of digital technologies presents new opportunities, e.g., distance monitoring of air and water pollution and health outcomes, it also presents potential health risks. There has been an exponential increase in the use of wireless personal communication devices (mobile phones, Wi-Fi or Bluetooth-enabled devices etc.) by almost all citizens in private and professional settings and in the supporting infrastructures. The number of other applications using electromagnetic fields (EMF) has also increased such as security scanners, smart meters and medical equipment. This has resulted in an increase in man-made electromagnetic radiation (non-ionizing) in our surroundings. Therefore, as there is some concern over the possible impact on health and safety from potentially higher exposure to EMF, e.g., arising from the deployment of 5G technology, a dedicated call for proposals was launched in 2021 to provide forward-looking information on potential hazards and risks of existing and emerging EMF exposures through innovative monitoring techniques, experimental evidence and modelling.

Ionizing radiation: This type of radiation is capable of stripping electrons from atoms and breaking chemical bonds, creating highly reactive ions. Radioactive materials occur naturally and emit ionising radiation in a process known as radioactive decay. Man-made devices such as x-ray machines produce ionising radiation. It is acknowledged that this type of physical environmental stressor has the capacity to produce adverse health effects.

Four projects were funded from calls launched during the first two years on non-ionizing radiation, with an EU commitment of around €29 million (Table 7). In addition, one Programme Co-fund Action was funded by the Euratom research and training programme on health impacts of ionizing radiation.

A noteworthy initiative:

- European Research Cluster on EMF and Health (CLUE-H): This cluster of four projects resulted from a call launched by the Health cluster of Horizon Europe. This represents a significant investment in this area of research that received little funding from

the previous Framework Programme Horizon 2020. As the call for proposal stated that 'All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate', the four projects selected for funding have formed a cluster, to optimize synergies, avoid overlaps and increase the impact of the projects at the level of dissemination and outreach to policy-makers and other stakeholders. The cluster formed working groups on issues of common interest (Working Groups | EMF Health Cluster (emf-health-cluster.eu)) and will organise workshops and training activities, among other things.

Table 7. Projects on ionizing and non-ionizing radiation and health

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
ETAIN 101057216 **ETAIN** *Exposure to electromagnetic fields and planetary health* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 6 635 053 Coordinator: Dr Anke Huss, Utrecht University, NL Additional information in CORDIS CLUE-H EUROPEAN CLUSTER EMF AND HEALTH Belongs to the European Research Cluster on EMF and Health (CLUE-H)	5G; electromagnetic fields (EMF); planetary health; insect biodiversity and fitness; insect pollinators; personal absorbed radiofrequency (RF)-EMF; mechanisms of biological effects in humans and the environment; skin and eyes	Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) Directive on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) SCHEER opinions on EMF and health The International EMF Project ICNIRP guidance
GOLiAT 101057262 **GOLIAT** *5G exposure, causal effects, and risk perception through citizen engagement* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 7 036 677 Coordinator: Dr Mònica Guxens, Barcelona Institute for Global Health - ISGlobal, ES Additional information in CORDIS CLUE-H EUROPEAN CLUSTER EMF AND HEALTH	5G; radiofrequency (RF) electromagnetic radiation (EMF); child and occupational health; neuropsychological effects; brain function; thermoregulation; radical stress; health impact assessment; risk perception and communication; citizen engagement	Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) Directive on the minimum health and safety requirements regarding the exposure of workers to the risks arising from

Belongs to the European Research Cluster on EMF and Health (CLUE-H)		physical agents (electromagnetic fields) SCHEER opinions on EMF and health The International EMF Project ICNIRP guidance
NextGEM 101057527 **NEXTGEM** *Next generation integrated sensing and analytical system for monitoring and assessing radiofrequency electromagnetic field exposure and health* 48 months (2022-2026) Research and innovation action Cluster 1: Health, € 7 559 039 Coordinator: Dr Nikolaos Petroulakis, Fundation for Research and Technology – Hellas (FORTH), Heraklion, EL Additional information in CORDIS CLUE-H EUROPEAN CLUSTER EMF AND HEALTH Belongs to the European Research Cluster on EMF and Health (CLUE-H)	EMF-based telecommunication technologies; EMF exposure in residential, public and occupational settings; knowledge and data on new scenarios of exposure to EMF in multiple frequency bands; NextGEM Innovation and Knowledge Hub (NIKH); health effects and mechanisms; causal links; human and experimental studies; real-life case studies	Council Recommendation on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) Directive on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) SCHEER opinions on EMF and health The International EMF Project ICNIRP guidance
PIANOFORTE EUROPEAN PARTNERSHIP FOR RADIATION PROTECTION RESEARCH 101061037 **PIANOFORTE** *The European Partnership for Radiation Protection Research* 60 months (2022-2027) Programme Co-fund Action Euratom; € 29 414 410 Coordinator: Dr Jean-Christophe Gariel, French Institute for Radiation Protection and Nuclear Safety (IRSN), Fontenay Aux Roses, FR Additional information in CORDIS	Radiation protection in relation to the use of ionizing radiation in the medical field; variability of individual response to exposure to ionizing radiation; mechanisms involved in chronic exposure to low doses of ionizing radiation; improvement of anticipation capacities and resilience in nuclear or radiological crisis situations and post-accident management; sustainable capacity of expertise in radiation protection in Europe	Europe's Beating Cancer Plan Sendai Framework for Disaster Risk Reduction
SEAWave 101057622 **SEAWAVE** *Scientific-based*	Monitoring of electromagnetic fields (EMF); 5G networks;	Council Recommendation on the limitation of

exposure and risk assessment of radiofrequency and mm-wave systems from children to elderly (5G and beyond) 36 months (2022-2025) Research and innovation action Cluster 1: Health, € 7 317 777 Coordinator: Dr Theodoros Samaras, Aristotle University of Thessaloniki, EL Additional information in CORDIS Belongs to the European Research Cluster on EMF and Health (CLUE-H)	millimetre waves; base stations; wireless devices; standardisation; children and elderly; skin cancer; epigenetics; risk assessment and communication; *in vitro* and *in vivo*	exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) Directive on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) SCHEER opinions on EMF and health The International EMF Project ICNIRP guidance

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8. Horizon Europe projects focused on environment and health policy-making

Table 8 represents a collection of four projects (EU contribution: €18.7 million) that have in common the fact that they support general environment and health policy-making (not focusing on specific types of environmental exposures or a narrow policy sector). Thus, the list includes a cluster that will underpin regular use of integrated economic and health modelling in impact assessments and socio-economic analysis by public authorities and improve the estimation of health impacts and socio-economic costs and/or benefits of environmental stressors.

Noteworthy initiative:

- **Methods for Assessing Health-Related Costs of Environmental Stressors Cluster (METEOR):** This cluster of five projects, receiving €17.5 million for the next four years, represents the first significant investment ever in supporting research through the Framework Programme on advancing the methodologies and approaches to estimate health impacts and costs and/or benefits of environmental stressors. The cluster is the result of a dedicated call for proposals on '*Methods for assessing health-related costs of environmental stressors*'. It is known that policy-makers face challenges when devising pollution mitigation measures and having to assess the health costs emerging from life-long exposures to environmental stressors or the benefits from clean environments. Deaths and disabilities resulting from pollution carry a quantifiable economic cost to society, but there are significant uncertainties in the cost estimates methodologies. There is also paucity of data to evaluate the economic benefits of clean environments.

  The call for proposal encouraged the funded projects to participate in networking and joint activities to optimize synergies, avoid overlaps and increase the impact of the projects at the level of dissemination and outreach to policy-makers and other stakeholders. The cluster is planning to form working groups on issues of common

interest, organise workshops and training activities, among other things. A common website is under construction.

Table 8. Projects focused on environment and health policy-making

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101095408 **BEST-COST** *Burden of disease based methods for estimating the socio-economic cost of environmental stressors* 48 months (2023-2026) Research and innovation action Cluster 1: Health, € 4 185 218 Coordinator: Dr Brecht Devleesschauwer, Sciensano, BE Additional information in CORDIS Belongs to the Methods for Assessing Health-Related Costs of Environmental Stressors Cluster (METEOR)	Improved and consensual burden of disease (BoD) framework for estimating the health impact of environmental stressors, with a focus on air pollution and noise; improved and consensual methodology for monetization of BoD estimates of environmental stressors; coherent methodological framework for assessing social inequalities in the socio-economic cost of environmental stressors	EU Zero Pollution Action Plan
101095430 **MARCHES** *Methodologies for assessing the real costs to health of environmental stressors* 48 months (2023-2026) Research and innovation action Cluster 1: Health, € 3 999 281 Coordinator: Prof. Mikael Skou Andersen, University of Aarhus, DK Additional information in CORDIS Belongs to the Methods for Assessing Health-Related Costs of Environmental Stressors Cluster (METEOR)	Integrated economic and health modelling in impact assessments and socio-economic analysis; advancing methodological rigor and consistency in accounting for the welfare economic health costs of air pollution and drinking water nitrate; systematic reviews; consensus on approaches on premature mortality with disability-adjustment of the associated morbidity burdens	EU Zero Pollution Action Plan

101095119 **MISTRAL** *A toolkit for dynamic health impact analysis to predict disability-related costs in the aging population based on three case studies of steel-industry exposed areas in Europe* 48 months (2023-2026) Research and innovation action Cluster 1: Health, € 3 619 635 Coordinator: Dr Mauro Grigioni, Istituto Superiore di Sanità, Rome, IT Additional information in CORDIS Belongs to the Methods for Assessing Health-Related Costs of Environmental Stressors Cluster (METEOR)	Socio-environmental risk factors and sub-clinical conditions and the consequent increase of primary non-communicable diseases; Health Impact Assessment (HIA); artificial Intelligence algorithms; prediction of health impact of health-related features, forecasting the trajectories of disability and quality of life reduction; Model validation on three different exposures in steel plants in Italy, Belgium and Poland.	EU Zero Pollution Action Plan
101059534 **PFASTWIN** *Twinning to address the PFAS challenge in Serbia* 36 months (2022-2025) Coordination and support action Widening Participation and Spreading Excellence, Twinning, € 1 182 431 Coordinator: Dr. Vladimir Beškoski, University of Belgrade, RS Additional information in CORDIS	Per- and polyfluoroalkyl substances (PFAS); networking activities between University of Belgrade and institutions in the EU with expertise in PFAS analysis and innovative (bio)remediation of emerging pollutants; scientific strategy for dealing with PFAS; knowledge transfer in the field of analysis and (bio)remediation of emerging pollutants; capacity building	Chemicals strategy for sustainability towards a toxic-free environment EU Zero Pollution Action Plan
101094639 **UBDPOLICY** *The urban burden of disease estimation for policy making* 48 months (2023-2026) Research and innovation action Cluster 1: Health, € 2 765 718 Coordinator: Dr Mark Nieuwenhuijsen, Barcelona Institute for Global Health - ISGlobal, ES Additional information in CORDIS Belongs to the Methods for Assessing Health-Related Costs of Environmental Stressors Cluster (METEOR)	Improve estimation of health impacts and socio-economic costs and/or benefits of environmental stressors (air pollution, noise, temperature/heat and lack of green space); advance methodological approaches; 1000 cities; physical activity; gender and inequality	EU Zero Pollution Action Plan

101095611 **VALESOR** *Valuation of environmental stressors* 36 months (2023-2025) Research and innovation action Cluster 1: Health, € 2 913 886 Coordinator: Prof. Gildas Appéré, University of Angers, FR Additional information in CORDIS Belongs to the Methods for Assessing Health-Related Costs of Environmental Stressors Cluster (METEOR)	Economic values of environmental stressors in policy making; chemical stressors and air pollutants transmitted via air, water, and soil vectors; website tool for stakeholders to assess health and economic consequences of planned variations in chemical stressors; economic welfare assessments of chemical and air pollution	Chemicals strategy for sustainability towards a toxic-free environment EU Zero Pollution Action Plan

9. Horizon Europe projects on the exposome: environmental risk factors of health and disease

Table 9 presents 11 projects with an EU commitment of around €67 million. A significant portion of the funding went to projects dealing with mental health issues and cancer, funded by the Cluster 1 (Health) of Horizon Europe. The increase in funding of research focused on environmental causes of cancer is a reflection of the significance of cancer as a policy and scientific issue at the EU level, as manifested by the adoption in 2021 of the Europe's Beating Cancer Plan and the EU Mission in Cancer.

Table 9. Projects addressing environmental determinants and risk factors of health and disease; the exposome

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
101096888 **DISCERN** *Discovering the causes of three poorly understood cancers in Europe* Research and innovation action 60 months (2023-2027) Cluster 1: Health, € 8 857 813 Coordinator: Dr Marc Gunter, International Agency for Research on Cancer (IARC), Lyon, FR Additional information in CORDIS	Causes of three poorly understood cancers in Europe (renal, pancreatic and colorectal cancer); large-scale European biorepositories comprising population-based cohorts and tumour case-series; novel exposomics and proteomics scans, geospatial and environmental exposure	Europe's Beating Cancer Plan EU mission on cancer

Belongs to the 'Understanding' cluster to work on Objective 1 of the Cancer Mission programme	information from 16 large-scale epidemiological cohorts including almost 900,000 individuals; biological mechanisms	
ELMUMY 101097094 **ELMUMY** *Elucidation of risk factors and health determinants associated with progression of monoclonal gammopathies to multiple myeloma* 48 months (2023-2026) Research and innovation action Cluster 1: Health, € 9 951 078 Coordinator: Dr Ieronymos Zoidakis, National and Kapodistrian University of Athens Additional information in CORDIS Belongs to the 'Understanding' cluster to work on Objective 1 of the Cancer Mission programme	Multiple myeloma; omics and bioinformatics; biological pathways and molecules responsible for the onset, progression and resistance to therapy; health determinants and risk factors associated with progression; demographic, lifestyle and exposure datasets	Europe's Beating Cancer Plan EU mission on cancer
environ MENTAL 101057429 **ENVIRONMENTAL** *Reducing the impact of major environmental challenges on mental health* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 9 045 288 Coordinator: Prof. Gunter Schumann, Charité Medical Center, Berlin, DE Additional information in CORDIS	Global environmental challenges; climate change; urbanisation; psychosocial stress caused by the COVID-19-pandemic; mental health over the lifespan; deep phenotyping; environmental adversity; molecular characterisation; virtual reality; biomarkers; prevention	EU (mental) health policies EU Global Health Strategy: Better Health for All in a Changing World
101043321 **EXPOMET** *Deciphering the exposome by metabolomic technology in breast cancer* 60 months (2022-2027) European Research Council (ERC) consolidator grant; €2 937 489 Principal investigator: Dr Benedikt Warth, University of Vienna, AT	Mass spectrometry-based platform for omic-scale assessment of chemical exposures; environmental contaminants and breast cancer; comprehensive sequencing of the exposome and aetiology of breast cancer; exposome-wide association (ExWAS) study	Europe's Beating Cancer Plan EU mission on cancer

101096312 **GENIAL** *Understanding gene environment interaction in alcohol-related hepatocellular carcinoma* 60 months (2023-2027) Research and innovation action Cluster 1: Health, € 11 996 753 Coordinator: Prof. Eric Trepo, Free University of Brussels, BE Additional information in CORDIS Belongs to the 'Understanding' cluster to work on Objective 1 of the Cancer Mission programme	Alcohol-related hepatocellular carcinoma; characterisation of environmental factors (e.g. diet, lifestyle; genetic and environmental determinants promoting ALD-HCC; assess how these determinants modulate the ALD-HCC risk in prospective cohorts of patients included in HCC surveillance programmes	Europe's Beating Cancer Plan EU mission on cancer
101096473 **LUCIA** *Understanding lung cancer related risk factors and their impact* 48 months (2023-2026) Cluster 1: Health, 13 516 869 Research and innovation action Coordinator: Prof. Hossam Haick, Technion - Israel Institute Of Technology, Haifa, Israel Additional information in CORDIS Belongs to the 'Understanding' cluster to work on Objective 1 of the Cancer Mission programme	Lung cancer; toolbox for discovering and understanding new risk factors; personal exposure to chemical pollutants and behavioural and lifestyle factors; external risk factors, such as urban, built and transport environments, social aspects and climate; biological responses to the personal and external risk factors, retrospective and prospective cohorts	Europe's Beating Cancer Plan EU mission on cancer
101096667 **MELCAYA** *Novel health care strategies for melanoma in children, adolescents and young adults* 48 months (2022-2026) Research and innovation action Cluster 1: Health, 8 013 218 Coordinator: Dr Susana Puig, Clínic Foundation for Biomedical Research, Barcelona, ES Additional information in CORDIS Belongs to the 'Understanding' cluster to work on Objective 1 of the Cancer Mission programme	Risk factors and determinants of melanoma in childhood, adolescence and young adults; European cohorts and registries; genetic and environmental risk factors and progression of melanoma; omics; machine learning tools; non-invasive disruptive tools based on artificial intelligence and volatilomics detection from exhaled breath and skin for earlier detection; public health	Europe's Beating Cancer Plan EU mission on cancer

101086247 **PSYCHOMED** *Psychiatric disorders and comorbidities caused by pollution in the Mediterranean area* 48 months (2023-2026) MSCA Staff Exchanges 2021, €1 159 200 Coordinator: Prof. Marc Landry, University of Bordeaux, FR Additional information in CORDIS	Staff exchange programme; role of anthropogenic pollutants in the Mediterranean area as a risk factor of neuro-psychiatric disorders and associated pathologies; neuroinflammatory responses; psychiatric patients; *in vitro* and in *in vivo* preclinical models	EU (mental) health policies EU Global Health Strategy: Better Health for All in a Changing World EU Zero Pollution Action Plan
101044387 **PREDICTCOPD** *Understanding the host-environmental interactions across the lifespan determining lung function trajectories and COPD* 60 months (2022-2027) European Research Council (ERC) consolidator grant; €1 998 319 Principal investigator: Dr Maria Rosa Faner, University of Barcelona, ES	Chronic Obstructive Pulmonary Disease (COPD); gene and environment interactions occurring early in life; alteration of the normal lung developmental programme; trajectome	EU Global Health Strategy: Better Health for All in a Changing World
101041087 **SOCIALCRAVING** *Towards a social neuroscience of health-related decision-making* 60 months (2023-2027) European Research Council (ERC) starting grant, € 1 491 166 Principal investigator: Dr. Leonie Koban, National Centre for Scientific Research (CNRS), Lyon, FR Additional information in CORDIS	Psychosocial risk factors; social determinants of health; brain signature of social craving; mental and physical health	EU (mental) health policies EU Global Health Strategy: Better Health for All in a Changing World
101057182 **YOUTH-GEMS** *Gene environment interactions in mental health trajectories of youth* 60 months (2022-2027) Research and innovation action Cluster 1: Health, € 8 107 980 Coordinator: Dr Sinan Gülöksüz, Maastricht University, NL Additional information in CORDIS	Youth mental health; gene environment interactions; epigenetics; development; child and adolescent psychiatry; complex genetics; machine learning; brain; biomarker discovery; predictive models; cohorts	EU (mental) health policies EU Global Health Strategy: Better Health for All in a Changing World

10. Horizon Europe projects focused on pollution monitoring and mitigation

Table 10 represents a collection of small-scale projects focused on developing technological means to detect environmental pollution in different media and finding ways for remediation and mitigation, the final aim being to protect environmental and human health.

17 projects were funded, with a commitment of 48 million euros from Horizon Europe. Most of the projects are funded not by Cluster 1 (Health), but by Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment.

Table 10. Projects addressing monitoring and mitigation of pollution

Project ID nb, acronym, title, duration, funding area, EU contribution, project type, coordinator, logo	Key words	Potential contribution to EU and/or global policy and actions
BIOSYSMO 101060211 **BIOSYSMO** *Bioremediation systems exploiting synergies for improved removal of mixed pollutants* 48 months (2022-2026) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 4 873 331 Coordinator: Dr. Lila Otero-Gonzalez, Idener, Sevilla, ESAdditional information in CORDIS	Computationally-assisted framework; synergistic biosystems; degradation and sequestration of pollutant mixtures; bacteria, fungi and plants (poplar tree); engineering bacteria for improved degradation and bioaugmentation	EU Zero Pollution Action Plan
D4RUNOFF 101060638 **D4RUNOFF** *Data driven implementation of hybrid nature based solutions for preventing and managing diffuse pollution from urban water runoff* 48 months (2022-2026) Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 3 332 948 Research and innovation action Coordinator: Mr. Uffe Linneberg Gangelhof, Vandcenter Syd AS, DK Additional information in CORDIS	Urban runoff pollution sources and the impacts; high-resolution suspect and screening & non-target screening NTS methods for Contaminants of Emerging Concern (CECs) detection and identification; online sensors for targeted CECs, metals and microplastics	EU Zero Pollution Action Plan

101054300 **EMBODIED ECOLOGIES** *Embodied Ecologies: A collaborative inquiry into how people sense, know, and act to reduce chemical exposures in everyday urban life* 60 months (2022-2027) European Research Council (ERC) advanced grants; 2 499 117 Principal investigator: Dr Anita Hardon, Wageningen University, NL Additional information in CORDIS	Chemical exposures; harm reduction strategies; two Western European and two Southeast Asian cities having adopted green policies but differing starkly in their regulatory environments; multi-modal ethnography; multi-layered cartography to study the accumulation of toxic chemicals in human bodies; impact of political, economic, social, and regulatory forces shaping uneven exposure	Chemicals strategy for sustainability towards a toxic-free environment
101039270 **ERA-ARE** *A new ERA for Environmental Risk Assessment: Chirality as a tool towards environmentally safe pharmaceuticals* 60 months (2023-2028) European Research Council (ERC) starting grant, € 1 499 950 Principal investigator: Dr Ana Ribeiro, University of Porto, PT Additional information in CORDIS	Pharmaceuticals, metabolites and transformation products; emerging contamination of aquatic environments; prevention; exploitation of the chirality of fluoro-quinolones as a piloting tool to reduce antibiotic resistance and create innovative guidelines for developing safer drugs; avoidance of ecotoxicological effects and bioaccumulation	European Union Strategic Approach to Pharmaceuticals in the Environment Pharmaceutical Strategy for Europe EU Zero Pollution Action Plan
101091980 **GREENER** *Single photon source and detector based on novel materials for the detection of endocrine disruptors* 36 months (2023-2025) Cluster 4: Digital, Industry and Space, € 3 759 104 Research and innovation action Coordinator: Dr Martin Moebius, Technical University of Chemnitz, DE Additional information in CORDIS	Water safety; drinking water contaminants; endocrine disruptors; spectrometer capable of measuring extremely low concentrations; biosensor	EU Water Framework Directive Drinking water directive

 101081963 **H2OFORALL** *Innovative integrated tools and technologies to protect and treat drinking water from disinfection byproducts (DBPs)* 36 months (2022-2025) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 3 452 700 Coordinator: Dr. Luisa Durães, University of Coimbra, PT Additional information in CORDIS	Safe water; water purification and disinfection; disinfection by-products (DBPs); sensor monitoring devices; modelling of spread through drinking water distribution systems; toxicity and environmental impact; water treatments to remove DBPs	EU Water Framework Directive
101041255 **HELIOS** *The new generation of scalable urban heat island mitigation by means of adaptive photoluminescent radiative cooling skins* 60 months (2022-2027) European Research Council (ERC) starting grant, € 1 498 125 Principal investigator: Dr Anna Laura Pisello, University of Perugia, IT Additional information in CORDIS	Urban heat island; resilient urban skin of the future; radiative cooling structures; into temperature responsive performance for indoor-outdoor human comfort and energy-efficiency	European Climate Law
101090291 **IMPACTAS** *Improving micropollutants analysis and controlling of terrestrial and aquatic systems* 30 months (2022-2025) ERA fellowship Widening participation and spreading excellence; €226 441 Coordinator: Prof. Jose Juan Santana Rodriguez, University of Las Palmas de Gran Canaria, ES	Microplastics; contaminants; analytical methodologies and strategies for the determination of organic pollutants adsorbed to MPs; monitoring in different environmental compartments; risks for natural ecosystems	EU Strategy for Plastics in a Circular Economy Blue Growth strategy of the European Union
 101081728 **INTODBP** *Innovative tools to control organic matter and disinfection byproducts in drinking water* 48 months (2022-2026) Innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 3 994 707 Coordinator: Dr Maria José Farré, Catalan Institute for Water Research, Girona, ES	Water quality management for safe human use and a healthy environment; drinking water treatment and real-time monitoring; pollution and risks related to disinfection by-products (DBPs); sensors and analytical methods; human exposure	EU Water Framework Directive

Additional information in CORDIS		
101072559 **MODELAIR** *Groundbreaking tools and models to reduce air pollution in urban areas* 48 months (2023-2026) MSCA Postdoctoral Fellowships 2021, € 2 688 624 Fellow: Dr Soledad Le Clainche Martinez, Technical university of Madrid, ES	Artificial Intelligence (AI) - based tool; control air pollution in urban areas; Bristol, Brussels and Madrid; flow and dispersion of air pollution; sensor network to provide a high-quality air pollution monitoring service; influence of the pollutant emission source	EU Mission: Climate-neutral and smart cities
101056777 LENS *L-vehicles emissions and noise mitigation solutions* 36 months (2022-2025) Research and innovation action Cluster 5: Climate, Energy and Mobility, € 4 995 098 Coordinator: Prof. Leonidas Ntziachristos, Environmental and Energy Studies and Software Development,Thessaloniki, EL Additional information in CORDIS	Noise and air pollution from motorcycles and mopeds (L-category vehicles - LVs); techniques to monitor LVs' noise and emissions; emissions and noise performance under real driving conditions; detailed pollutant and noise characterization of more than 150 vehicles in the lab and on the road; portable sensor-based and mini-analyser measurement systems; nanoparticles	Environmental noise directive
101079455 **NET4AIR** *Networking center for excellence in nanoelectronic devices for air monitoring* 36 months (2023-2025) Coordination and support action Widening Participation and Spreading Excellence, Twinning, € 1 423 825 Coordinator: Dr Carmen Moldovan, National Institute for Research and Development in Microtechnologies, RO Additional information in CORDIS	Collaborative programme; air quality monitoring; engagement of Romanian citizens in a participatory approach to air quality science; health and wellbeing; Networking Centre for Excellence in environmental monitoring and remediation; low-cost wearable/portable nanoelectronic-based	EU Zero Pollution Action Plan European Green Deal

	platform for air monitoring	
101081865 **NINFA** *Taking action to prevent and mitigate pollution of groundwater bodies* 48 months (2022-2026) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, €3 996 824 Coordinator: Dr Amro Satti, LEITAT Technological Centre, Terrassa, ES Additional information in CORDIS	Groundwater pollution; pesticides, nutrients, pharmaceuticals, antibiotic resistance genes, hydrocarbons, heavy metals, microplastics; monitoring and protection; synergistic effects and risks of multiple stressors and pollutants, early-warning decision support system	EU Water Framework Directive
101072777 **PLASTICUNDERGROUND** *Integrated cross-sectoral solutions to micro- and nanoplastic pollution in soil and groundwater ecosystems* 48 months (2022-2026) MSCA doctoral network; €2 489 724 Coordinator: Dr Laurent Simon, University Claude Bernard of Lyon, FR Additional information in CORDIS	Environmental and public health risks of micro- and nanoplastics (MnP) in soils and groundwater; Doctoral Network; fate, transport and impacts of MnPs; multidisciplinarity	EU Strategy for Plastics in a Circular Economy
101063386 **REMIPLASWAS** *Removal of microplastics from the environment using autochthonous wastewater-derived microbial consortia* 24 months (2023-2025) MSCA Postdoctoral Fellowships 2021, € 181 152 Fellow: Prof. Elisabet Aranda Ballesteros, Univeristy of Granada, ES Additional information in CORDIS	Microplastics (MPs) pollution; cost-effective biobased MPs (Polyethylene terephthalate-PET) removal strategies; eco-friendly remediation techniques; wastewater; microbial communities; toxicity of the resulting effluent after MPs process	EU Zero Pollution Action Plan EU Strategy for Plastics in a Circular Economy
101086109 **SYLVA** *A System for real-time observation of aeroallergens* 48 months (2023-2026) Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, € 2 998 677 Innovation action	Bioaerosols (mainly pollen and fungal spores, but also bacteria and viruses); allergens; improved monitoring and temporal resolution, timeliness, coverage and availability of	Global Earth Observation System of Systems (GEOSS)

Coordinator: Prof. Mikhail Sofiev, Finnish Meteorological Institute, Helsinki, FI Additional information in CORDIS	information about aeroallergens and other bioaerosols; bioaerosol monitoring ICT infrastructure; demonstrating SYLVA innovations including health	
 101081807 **UPWATER** *Understanding groundwater pollution to protect and enhance water quality* 48 months (2022-2026) Research and innovation action Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment, €3 993 637 Coordinator: Dr Enric Vazquez, Spanish National Research Council (CSIC), ES Additional information in CORDIS	Groundwater chemical and microbial pollution; identification, occurrence and fate of pollutants; cost-efficient sampling methods; identify and quantify the pollution sources; bio-based engineered natural treatment systems designed as mitigation solutions	EU Water Framework Directive

CONCLUSIONS

Total EU funding

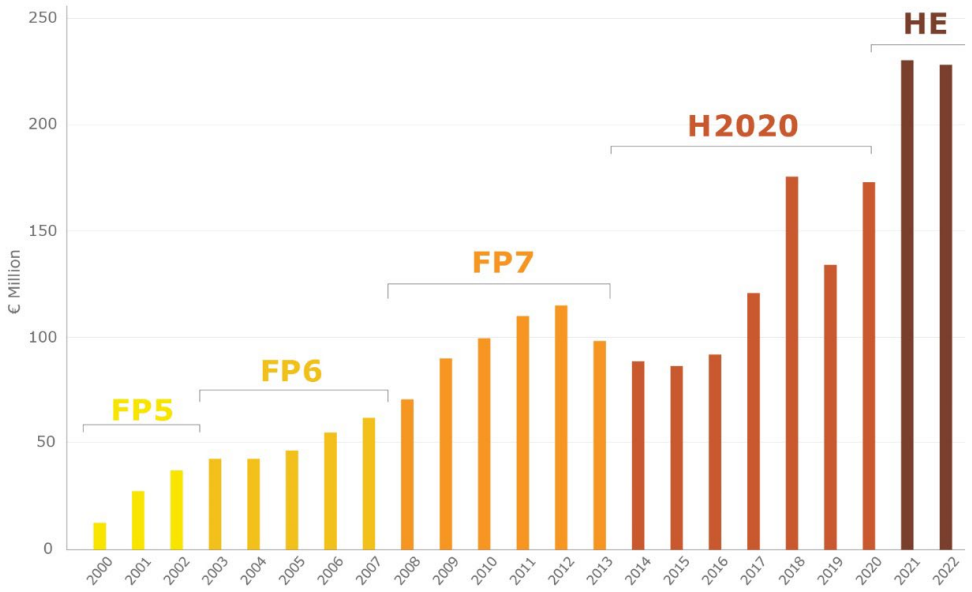
Taken together, the first two years of Horizon Europe have seen a substantial increase in the EU allocation to support environment and health projects on an annual basis (Fig.1a). The increase is especially related to the launch of the large-scale PARC initiative (without taking into account PARC, the funding level is about the same as in Horizon 2020, €194 million per annum). Overall, the funding levels have seen a sustained increase since the beginning of FP5, resulting from numerous policy initiatives such as the European Environment and Health Strategy or the European Green Deal.

Fig.1a: EU allocation to EU environment and health projects in various Framework Programmes[1]

Framework	Nb projects	EU contribution (€M)	Funding per annum (€M)
Fifth Framework of Research (FP5, 1998-2002)	90	160	40
Sixth Framework of Research (FP6, 2003-2006)	66	283	71
Seventh Framework of Research (FP7, 2007-2012)	147	550	79
Horizon 2020 (2013-2020)	351	1381	197
Horizon Europe (2021-2022)	85	597	299

[1] From 2014-2022 (First two calls of Horizon Europe)

Fig.1b: EU allocation to EU environment and health research projects



Funding from various Horizon 2020 programmes

Environment and health research has a very wide scope and is of multidisciplinary nature, which therefore spans across several thematic areas, programmes and Directorates in DG Research and Innovation, the entity in the European Commission in charge of the research and innovation framework programmes. As seen from Table 11, a large majority of funding for the first two years has come from the Health cluster (72%), followed by other cluster and the Euratom programme. The health cluster being in the lead is logical as this Theme had a dedicated environment and health research area (referred to as Destination 2. Living and working in a health-promoting environment').

Themes 5 and 6 are a significant funding source for projects with focus on environmental aspects (with relevance to health), be it research and innovation or innovation actions on remediating pollution problems or providing support for healthier urban environments. The Theme 4 has supported research on nanosafety. The Excellent Science pillar of Horizon Europe covers European Research Council (ERC) actions, and Marie Skłodowska-Curie (MSCA) actions, which support both research teams and individual fellows.

Table 11. Origin of environment and health research funding

	Nb projects	EU contribution (€ M)
CLUSTERS OF HORIZON EUROPE		
Cluster 1: Health	34	438
Cluster 3 - Civil security for society	1	4,0
Cluster 4: Digital, Industry and Space	8	25,3
Cluster 5: Climate, Energy and Mobility	4	17,5
Cluster 6: Food, Bioeconomy, Natural Resources, Agriculture and Environment	11	46,1
WIDENING PARTICIPATION AND SPREADING EXCELLENCE		
Twinning	3	4,1
ENHANCED EUROPEAN INNOVATION COUNCIL (EIC) PILOT		
European Innovation Council transition project	1	2,5
SCIENTIFIC EXCELLENCE		
European Research Council (ERC) actions	8	16,4
Marie Skłodowska-Curie actions	14	13,5
EURATOM		
Nuclear Fission, Safety and Radiation Protection	1	29,4
TOTAL	85	597

Thematic coverage

As regards thematic coverage of the projects, the projects can roughly be divided into 10 main groups, although there are numerous overlaps between some of the categories. For example, many of the projects on air quality also address climate change-related issues; the urban health projects can also include climate change, chemical and air quality aspects; and chemical pollution is a small or large part in many of the groups.

Fig.2 shows that the largest allocation of funds during the first two years of Horizon Europe were to projects dealing with issues related to understanding exposure to as well as biological and health impacts of chemicals (39% of funding; €226 million), followed by those investigating environmental determinants (including the exposome) of human health and well-being (11% of EU funding; €77 million) and three other categories with very similar levels of funding: Air quality (10%; €59,9 million), climate change (10%; 59.2 million) and radiation (10%; €58 million).

As shown in Fig. 3, the main differences, as compared to Horizon 2020, are the emergence of several areas: Research on the impact of chemicals on health (related to the funding of PARC); climate and other environmental changes on health; and non-ionizing and ionizing radiation and health. The latter two are the result of funding of clusters in these areas. In parallel, exposome research, urban health and nanosafety saw getting a smaller share of the cake.

Fig.2. Number of projects funded (A) and EU contribution (B) in different areas of environment and health research

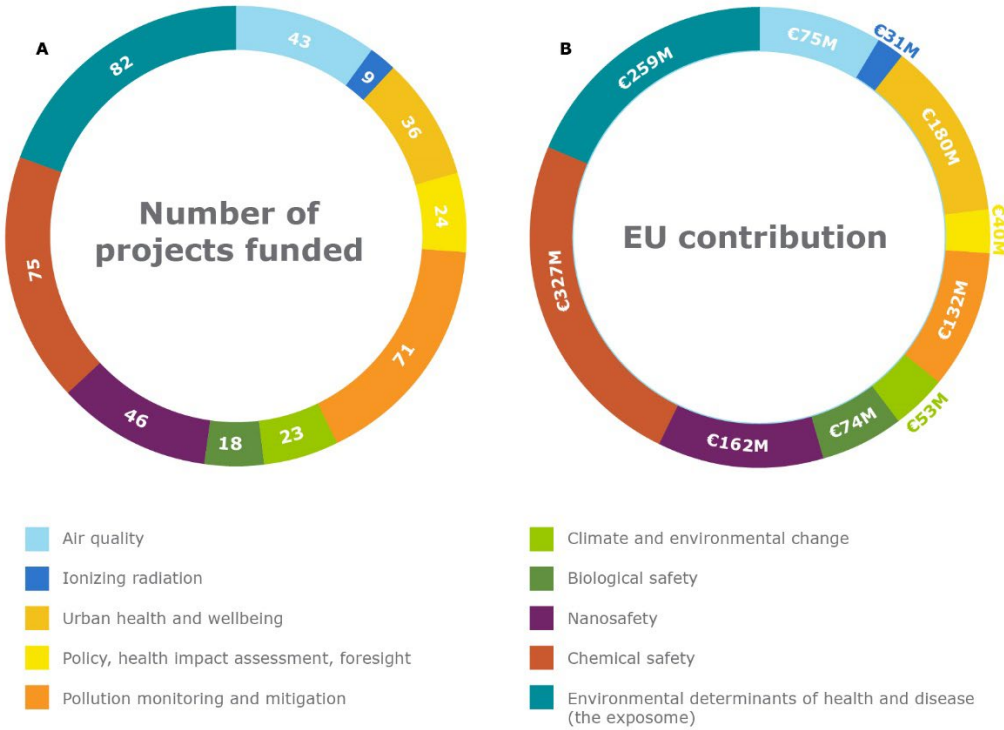


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Fig. 3. Funding of environment and health research per thematic sub-areas

Main area of E&H (% of total in HE vs H2020)	Horizon Europe 2021-2022		Horizon 2020	
	Nb projects	EU funding (€ M)	Nb projects	EU funding (€ M)
Chemical safety (39% vs 25%)	9	226	66	327
Risk factors for health (11% vs 19%)	10	67	71	259
Air quality (10% vs 6%)	12	60	31	75
Climate change (10% vs 4%)	10	59	13	53
Radiation (10% vs 2%)	5	58	4	31
Pollution monitoring (8% vs 10%)	17	48	54	132
Biosafety (4% vs 6%)	6	22	12	74
Policy-making (3% vs 3%)	6	19	18	40
Nanosafety (3% vs 12%)	5	15	41	162
Urban health (2% vs 13%)	4	13	32	180

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The first two years of Horizon Europe, the ongoing EU Framework of Research and Innovation running from 2021-2027, have seen a substantial increase in the EU allocation to support environment and health projects on an annual basis. At the time of publication, already 84 projects have been funded, with an overall EU contribution of around € 587 million. The increase is especially related to the launch of the large-scale PARC initiative (The European Partnership for the Assessment of Risks from Chemicals). The sustained support for this area is the result of numerous policy initiatives emanating from the European Green Deal. The impact will be increased by the establishment of a number of clusters working together on a common theme: the European Cluster on Indoor Air Quality and Health [IDEAL], the European Cluster on Climate Change and Health, the European Research Cluster on EMF and Health [CLUE-H], and the Methods for Assessing Health-Related Costs of Environmental Stressors Cluster [METEOR].

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