



# Circular Economy Action Plan

For a cleaner and  
more competitive  
Europe

**CLIMATE  
PACT AND CLIMATE  
LAW**

**PROMOTING  
CLEAN  
ENERGY**

**INVESTING IN MORE  
SUSTAINABLE,  
SMARTER MOBILITY**

**PROTECTING  
NATURE**

**MOBILISING INDUSTRY  
FOR A CLEAN AND  
CIRCULAR ECONOMY**

# The European Green Deal

**FROM FARM  
TO FORK**

**ELIMINATING  
POLLUTION**

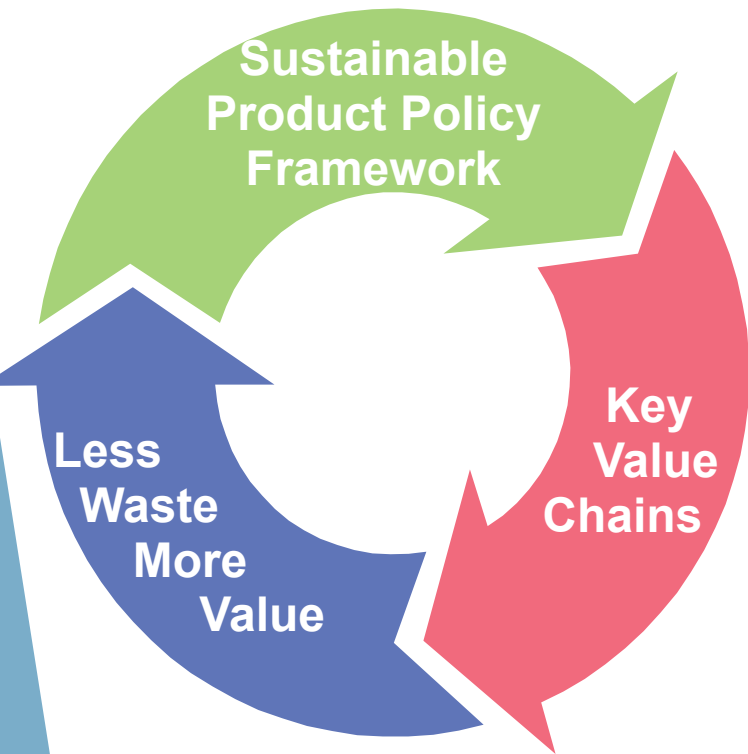
**LEADING THE  
GREEN CHANGE  
GLOBALLY**

**ENSURING  
A JUST  
TRANSITION  
FOR ALL**

**MAKING  
HOMES ENERGY  
EFFICIENT**

**FINANCING  
GREEN  
PROJECTS**

# Changing the way Europe consumes and produces



35 actions

Make sustainable products the norm in the EU  
Empower consumers and public buyers  
Sustainable production processes

Electronics and ICT  
Batteries and vehicles  
Packaging  
Plastics  
Textiles  
Construction and buildings  
Food, water and nutrients

Reduce Waste  
Reduce Waste Exports  
Boost market for high quality and safe secondary raw materials

Making circular economy work for people, regions and cities

Circular economy as a requisite for climate neutrality

Getting the Economics Right

Financial Markets

Investments and R&I

Global Level Playing Field

Monitoring

# Circular Economy – policy context

## Green Deal Industry Plan

- Enhance the competitiveness of Europe's net-zero industry and accelerate the transition to climate neutrality.

## Net-Zero Industrial Act

## Critical Raw Materials Act

## Long-Term Competitiveness Strategy



# *Circular Economy & the Zero Pollution Action Plan*

**Flagship 4.  
Facilitating zero  
pollution choices**



**Towards zero pollution from  
production and consumption**

# The EU Ecolabel

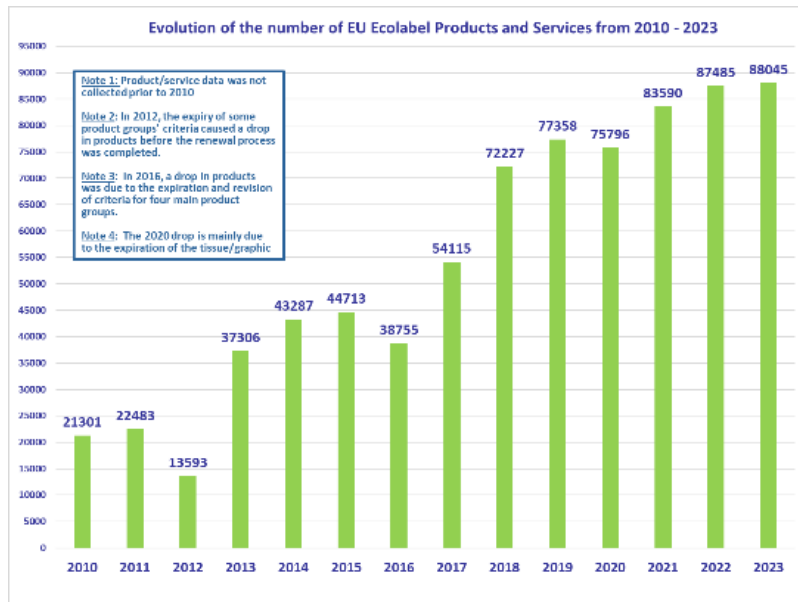


- Since 1992 the **official** European Union **voluntary label** for **environmental excellence**
- The only **EU-wide ISO 14024 Type 1 Ecolabel** (reliable; multi-criteria; third party verified; criteria set with a life-cycle approach through an open-transparent-multi-stakeholder process)
- Strict environmental criteria address **10-20% best products on the market in terms of environmental performance**; they also guarantee **high quality products**. **Social aspects** addressed where appropriate.
- It can be awarded to **24** categories of **EU & non-EU products** placed on the EU market (e.g. detergents, paper products, textiles, tourist accommodation, etc.)
- EU Ecolabel connects the market actors to the political priorities of **climate neutrality, circular economy** and **zero pollution**.

# EU Ecolabel in practice

By joining or increasing the visibility of the EU Ecolabel, stakeholders can pledge under existing Commission initiatives e.g. the **Sustainable Consumption Pledge**

**EU Ecolabel uptake continues growing** (March 2023 data)



88 045 products

2 367 licences

most licences are awarded in Italy (17%), Germany (16%), Spain (15%) and France (14%).

Most successful product groups (N licences):  
: Tourist accommodation services (22%), Hard surface cleaning products (15%) and Tissue paper and tissue products (9%).

**EC action:** increasing synergies with EU initiatives, establishing partnerships with retailers, promoting ecolabels through GPP, communication.

**Green Claims Directive** expected to boost EU Ecolabel

# Why set requirements on environmental claims?

**Protect** consumers and companies from **greenwashing**

**Enable** consumers to make informed purchasing decisions based on **credible environmental claims & labels**

**Boost** the **competitiveness** of economic operators that make efforts to increase their **environmental sustainability**

**Improve** legal certainty & **level the playing field** on the **Single Market**

**Accelerate the green transition towards a circular, clean & climate neutral economy**





# Main Elements

## Substantiation

- ▶ Backed by scientific evidence
- ▶ Reveals significant impacts from a life-cycle perspective
- ▶ Transparency on offsets

## Communication

- ▶ Clear, unambiguous & transparent claims
- ▶ Information to be made available to consumers

## Labelling schemes

- ▶ Based on certification schemes with robust governance
- ▶ Ban their proliferation

## Verification

- ▶ Ex-ante verification by independent & accredited verifiers
- ▶ Certificate of conformity recognised in the EU

## Enforcement & Monitoring

- ▶ Empowering competent authorities to enforce (i.e. penalties)
- ▶ Annual monitoring will define further priorities

# *Ecodesign for Sustainable Products Regulation*

- Widen the scope of the Ecodesign Directive
- Set ecodesign requirements to deliver on product circularity
- Enable product value chains where chemicals, materials and products are as safe and sustainable as possible by design and during their lifecycle
- OPC to decide priority product categories to be addressed first by **ESPR**

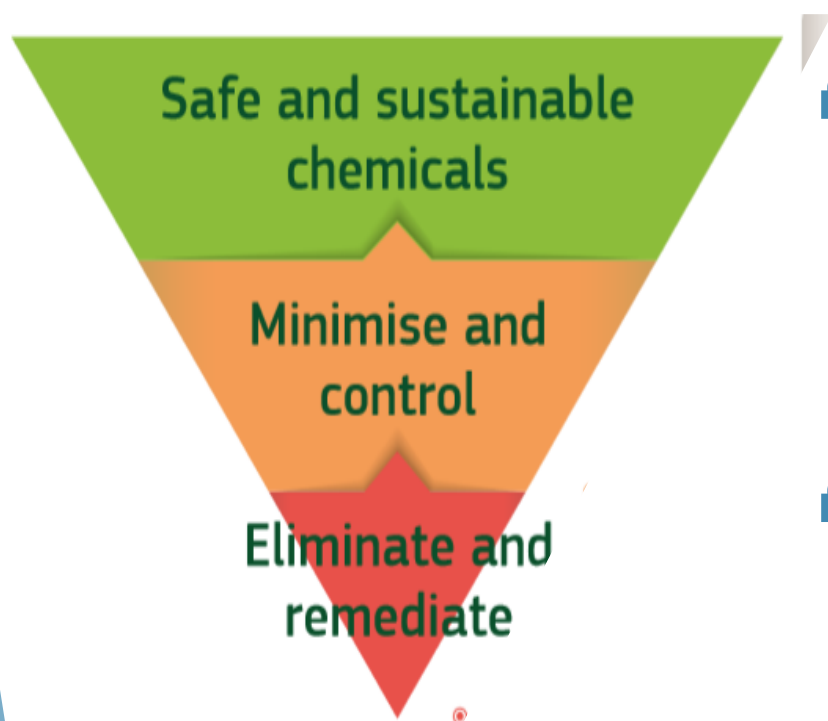
**FEEDBACK: OPEN**



**Feedback period**

31 January 2023 - 12 May 2023 (midnight Brussels time)






# Chemicals strategy for sustainability: towards a toxic-free environment



-  Chemicals are produced/used in a way that maximises their benefits to society while **avoiding harm to planet & people**
-  Production and use of *safe and sustainable chemicals* becomes the EU market norm and a global standard

# Strengthening legislation



-  **All chemicals** on the market to be used safely and sustainably.
-  Substitute and minimise as far as possible **substances of concern**
-  Avoid the **most harmful chemicals** in consumer products esp. for vulnerable groups

Endocrine  
disruptors

PFAS

Mixtures

Environmental  
impact

New hazard classes

Concept of 'essential uses'



# *Boosting innovation*

## Promote the transition to safe and sustainable chemicals, materials and products

- **EU safe and sustainable-by-design criteria**
- An approach to design, development and use of substances, materials or products focusing on providing a function while preventing harmful impacts on health or environment throughout the life cycle
- Strengthening EU's open **strategic autonomy** for critical chemicals

# *Safe and Sustainable by Design chemicals - Recommendation*

- Proposes a European framework for ‘safe and sustainable by design’ chemicals and materials for R&I activities on a voluntary basis
- Addressed to Member States, industry, academia and research and technology organisations



- **Test the assessment framework** for feedback to improve relevance, reliability and operability
- Results obtained from applying the framework will help **define ‘safe and sustainable by design’ criteria**

# *Safe and sustainable by design chemicals Expected application and impact*

Steering innovation towards the green industrial transition

- **Substitute (as far as possible) or minimise the production and use of substances of concern, in line with and beyond regulatory obligations (existing and upcoming)**
- **Minimising the impact on health, climate and the environment (air, water, soil) during sourcing, production, use and end-of-life of chemicals and materials**

 **Enabling change through R&I**



# Stakeholder engagement

#CEstakeholderEU

## European Circular Economy Stakeholder Platform

A joint initiative by the European Commission and the European Economic and Social Committee

- **Advancing the circular economy concept on the ground**
- **Strengthening cooperation among stakeholders' networks**

*representatives of networks of businesses, civil society and local, regional and national public authorities*



**Submit your own good practices, knowledge, strategies and voluntary commitments!**

Link to website: <http://circulareconomy.europa.eu/platform/>



European  
Commission



# Learn more & Keep in touch



[Circular economy action plan \(europa.eu\)](https://europa.eu)



[@EU\\_ENV](https://twitter.com/EU_ENV)



[@EUEnvironment](https://www.facebook.com/EUEnvironment)



[EU Environment and Climate](https://www.linkedin.com/company/eu-environment-and-climate)



[ourplanet\\_eu](https://www.instagram.com/ourplanet_eu)



European  
Commission

# Thank you



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## **4th Zero Pollution Stakeholder Platform Meeting**

**Digital Solutions at the service of citizens' needs**

**Concrete contributions to the Zero Pollution Action Plan**

*20 April 2023*

# The European Green Deal

#EUGreenDeal

SHAPING  
EUROPE'S DIGITAL FUTURE

#VDL.COMMISSION

Smart and Sustainable Cities and Communities should use digital technologies to become more sustainable and improve their citizens' quality of life

European Commission  
Commission européenne

# Digital contribution to SDGs, including zero pollution goals

## Digital product passport:

Data for circular business models, Sustainable, integrated Single Market

**Smart mobility:** reduction of transport emissions up to 37%; **smart buildings** with emissions reduction by 17%;

**Digital contribution:** reduction by up to 15%-20% of total emissions with deployment of today's technology.

**Also:** AI, smart energy networks; Precision farming, Blockchain for emissions accounting, smart cities solutions; AI for climate; smart manufacturing, etc,



**Destination Earth / digital twins:** High Performance Computing, AI for better anticipation of extreme events prediction, climate modelling.

# Sustainable Digital Technologies

**Climate Neutral and highly energy efficient datacentres by 2030:** review JRC's CoC, the Energy Efficiency Directive and the Taxonomy Regulation



**Greener electronic communications by 2030:**

- Ø Transparency measures
- Ø Administrative incentives for green deployment



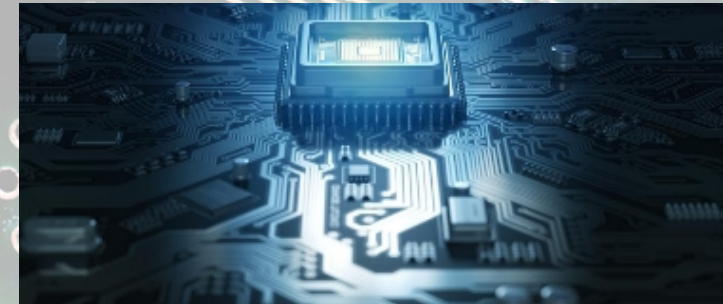
**Circular Electronics Initiative:**

Better durability, reparability, refurbishment, recycling for consumer and industrial electronics & IoT

“Right to repair” for consumers.



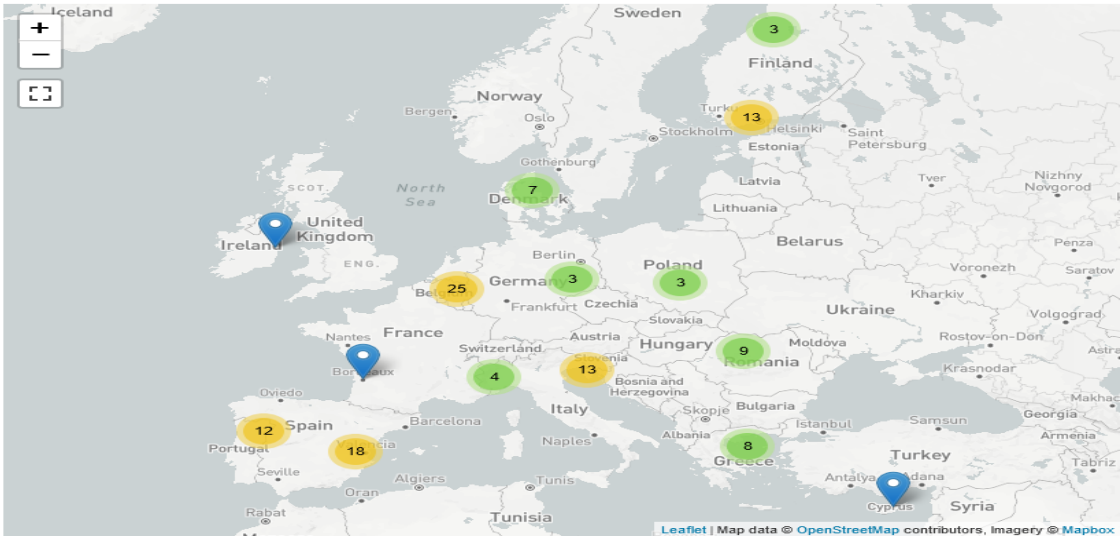
**Low power processors, software and AI:** investing in new ultra-low-power



# LIVING-IN.EU

The European way of digital transformation  
in cities and communities

*Over 131 signatures so far...  
From Mayors, Regional and National Ministers  
+ over 134 supporters  
Covering over 41 Mo of EU citizens*



**JOIN,  
BOOST,  
SUSTAIN**



## ENOLL – EC WG on Digital Sustainability, including Zero Pollution

- Living-in.eu founding member supporting the twin transition
- Multidisciplinary research structures in local territories (full cycle)
- Engagement methodology
  - Identification of LL and DIH / core group creation
  - Workshops (co-creation and consultation – low hanging fruits)
  - Recommendations (first draft Dec 22 and second draft April 23)

**European  
Network of  
Living Labs**



# Recommendations: key observations

- Recognise the role of digital solutions to address ZP priorities
- Highlight the role of data to sense, understand, monitor and manage pollution at the local level
- Demonstrate the need to work with experts at local level to identify suitable tools and provide training and support to local actors
- Highlight the role of citizens but also other stakeholders to engage in ZP actions
- Proposed targeted examples and tested solutions.

# Giving to the floor to

# The European Environment and Health Atlas

# Environment and Health Atlas: Concept and link with Zero Pollution

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- Focus on environmental pressures on health and benefits of nature
- Public-facing communication tool building on EEA data and other trustworthy sources
- Dedicated web platform with an interactive online map viewer
- ATLAS presenting disaggregated spatial data
- Gateway to EEA information and assessments
- Deliverable under the ZPAP, action #32; details of its progress to date have been documented via the Stakeholder Platform's Action tracker

# CLEAR NARRATIVE FOR THE CITIZEN: THE ENVIRONMENT AFFECTS YOUR HEALTH

## Maps

### Explore maps by theme

Please select an environmental category from the list, we have compiled maps and information on its health impacts and benefits. Maps represent different geographical levels and are based on the most recent information that is available for each category.



Air pollution



Urban green spaces



Noise



Water



Climate



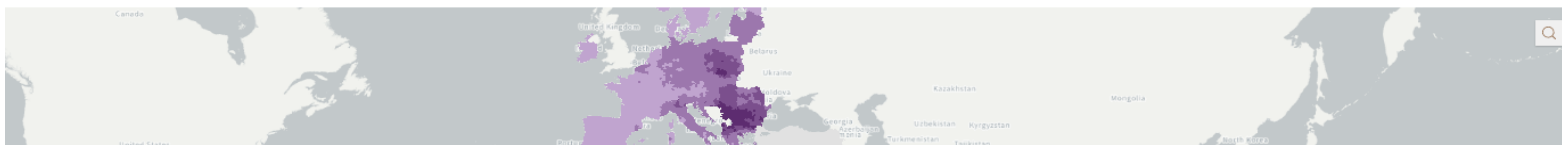
Combined risks & inequalities

## Featured maps

Mortality attributable to PM2.5

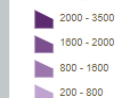
Heatwave days

Urban green spaces



Years of life lost (rate) due to PM<sub>2.5</sub>

YLL average 2018-2020

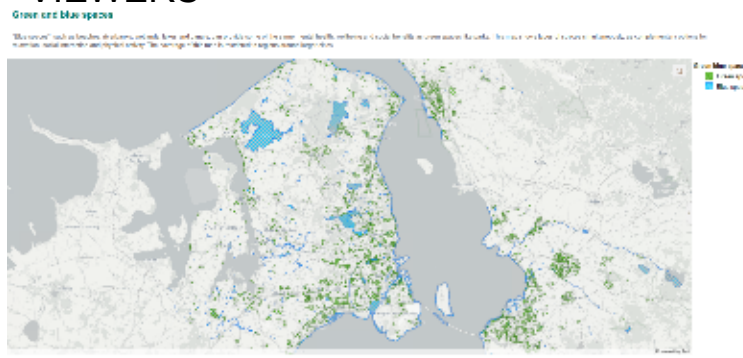


# KEY ELEMENTS AND RATIONALE

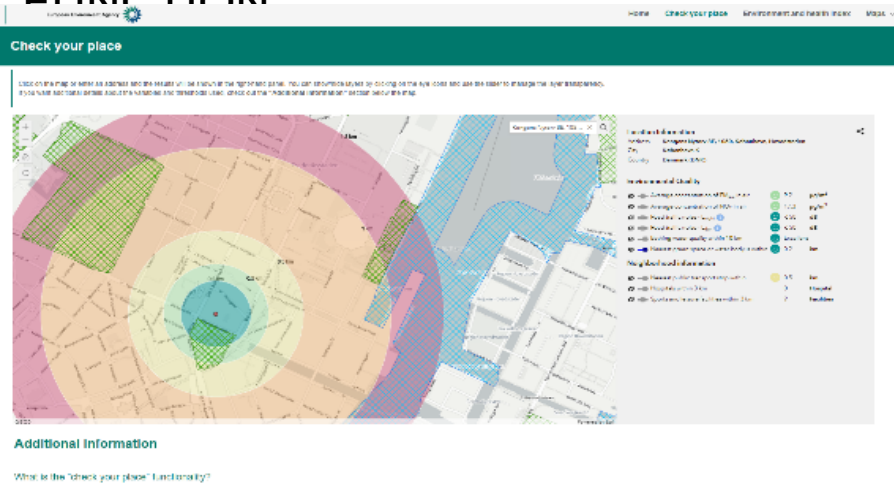
## LANDING WEBSITE



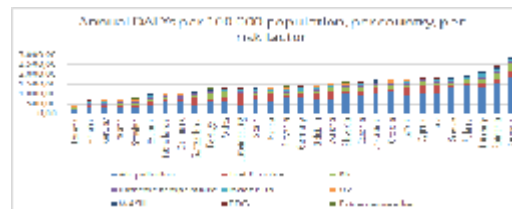
## MAPS: THEMATIC + INTERACTIVE VIEWERS



## CHECK YOUR PLACE EMISSIONS



## ENV HEALTH INDEX (Upcoming)



## More info, data, videos

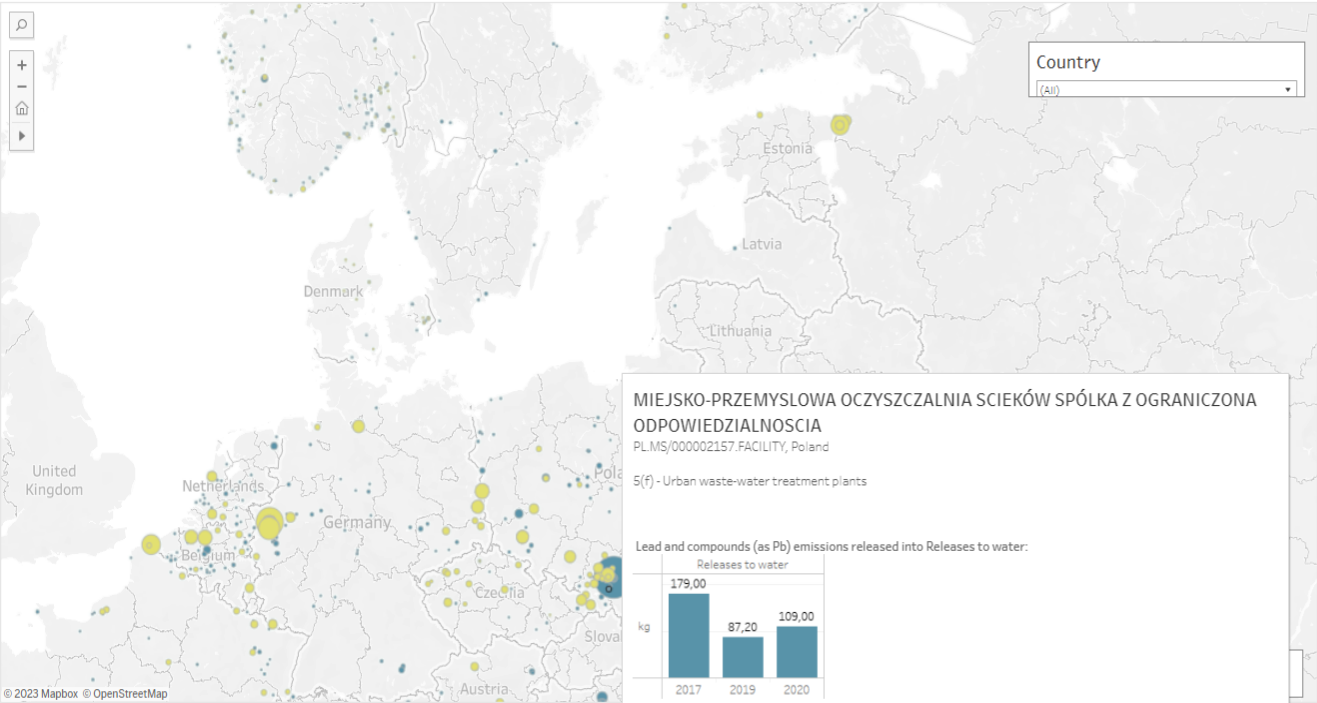


# AGILE PRODUCT: USING (MOSTLY) EU DATA, OFF-THE-SHELF TECHNOLOGIES



## Emissions from facilities

### Lead and compounds (as Pb)



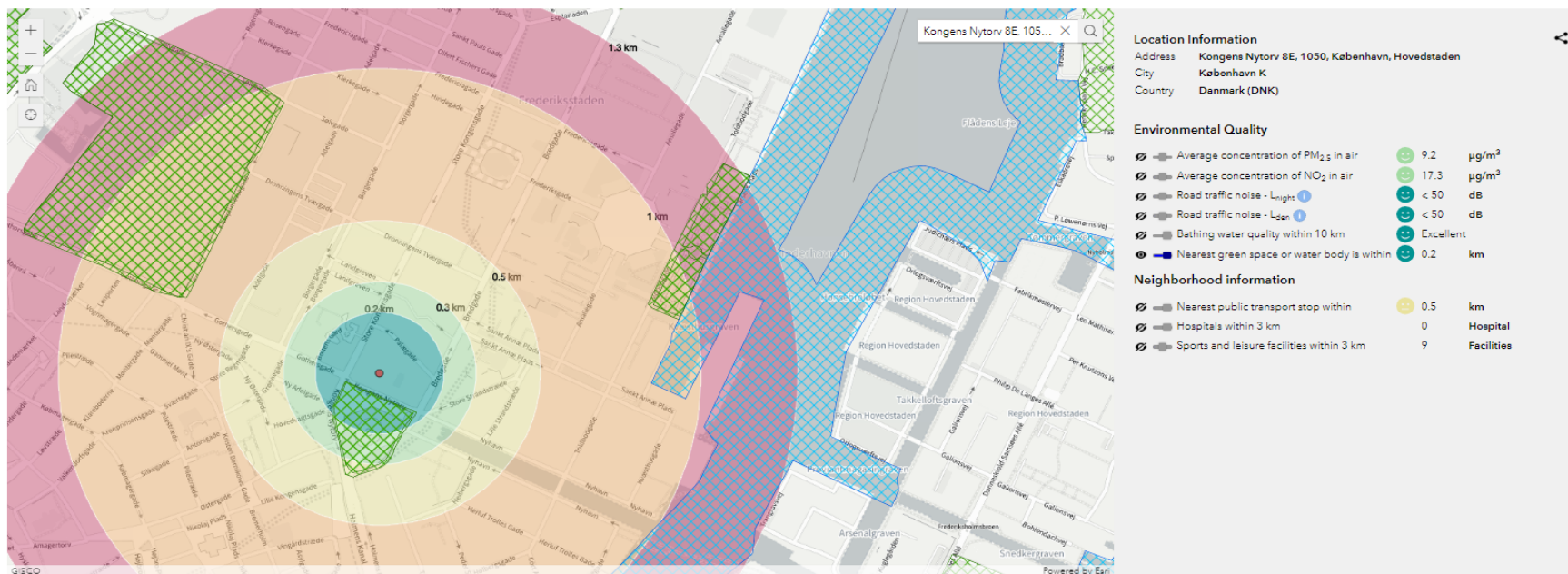
- Pollutant on map
- Arsenic and compounds (as As)
  - Cadmium and compounds (as Cd)
  - Chromium and compounds (as Cr)
  - Lead and compounds (as Pb)
  - Mercury and compounds (as Hg)
  - Nitrogen oxides (NOX)
  - Particulate matter (PM10)
  - Sulphur oxides (SOX)

latest available data  
Click facility on map for more information

# MAKING IT PERSONAL: THE “CHECK YOUR PLACE” WIDGET

## Check your place

Click on the map or enter an address and the results will be shown in the right-hand panel. You can show/hide layers by clicking on the eye icons and use the slider to manage the layer transparency. If you want additional details about the variables and thresholds used, check out the “Additional information” section below the map.



## Additional information

What is the “check your place” functionality?

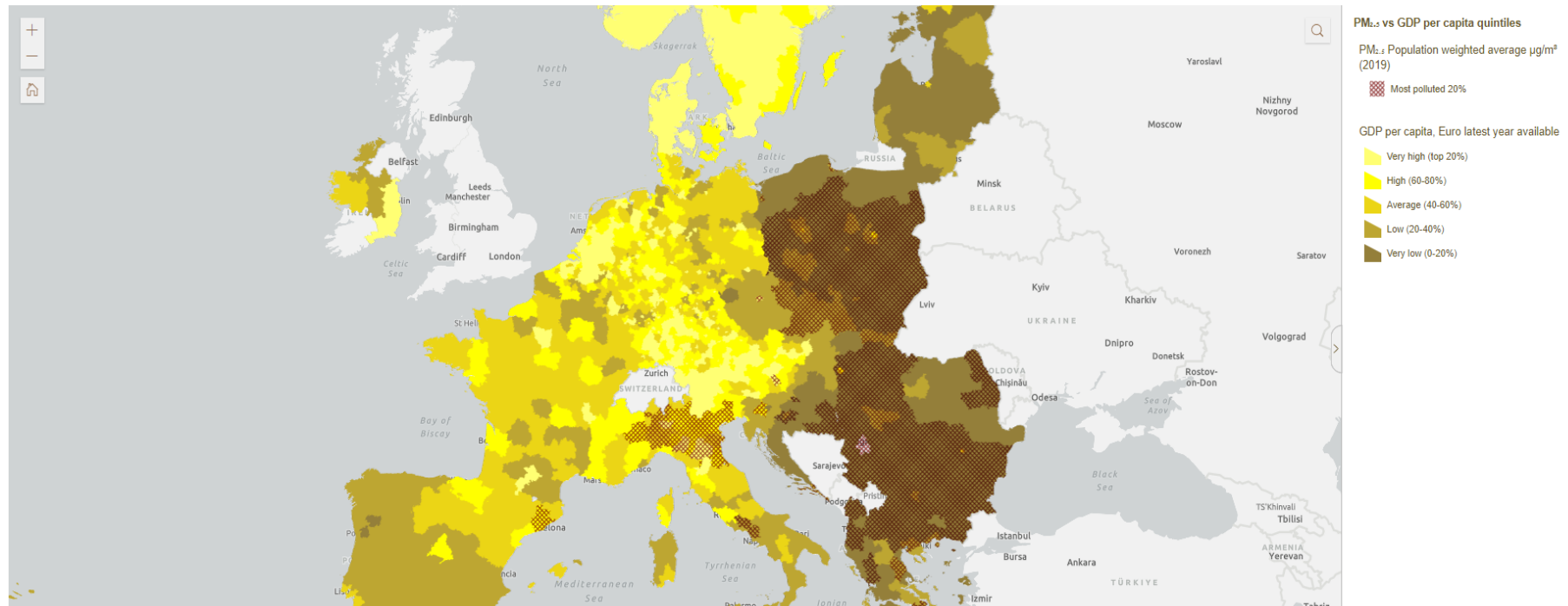


# VISUALIZING EU-WIDE CORRELATIONS



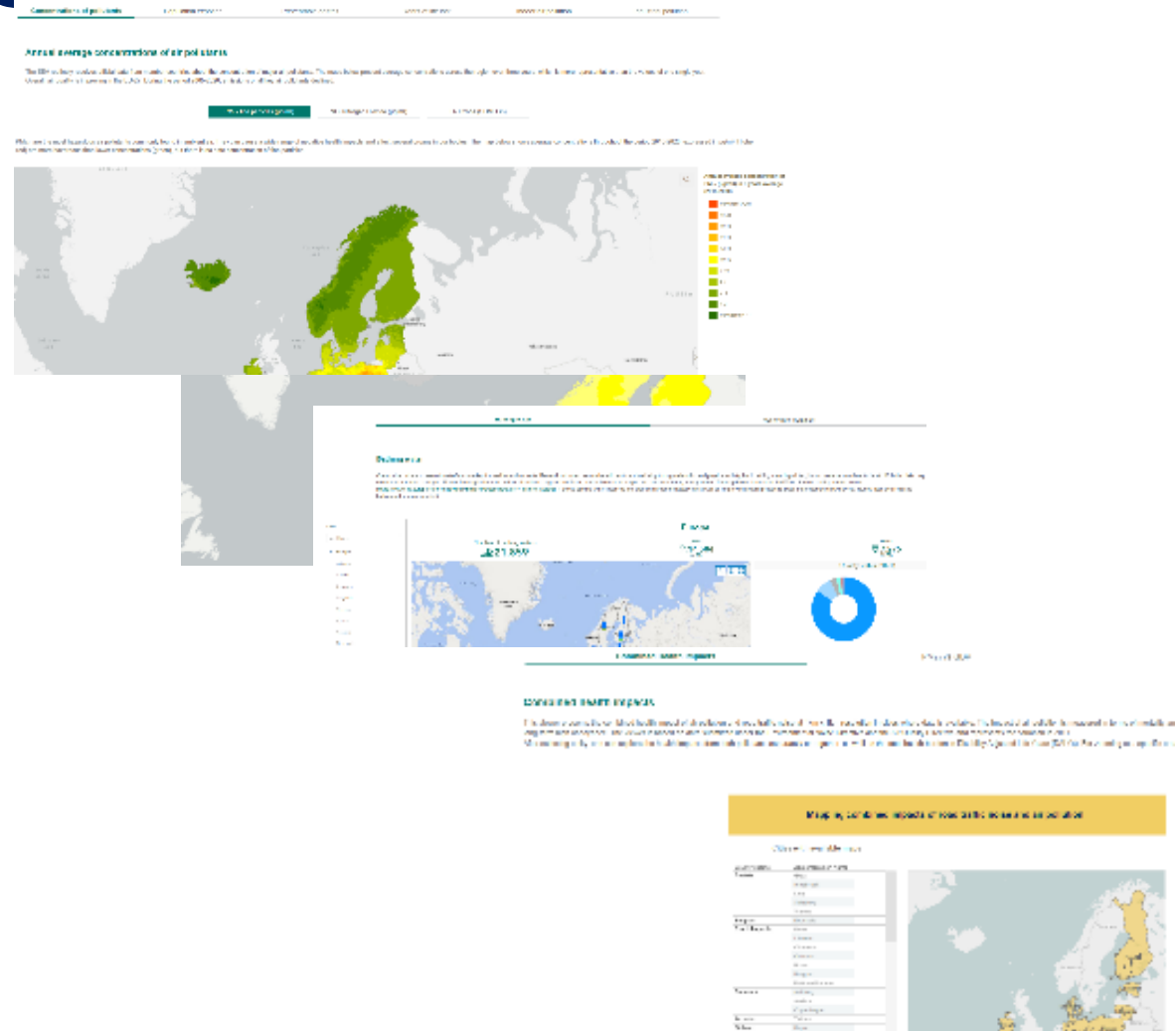
## PM<sub>2.5</sub> vs GDP per capita

Particulate matter pollution is not uniformly distributed across Europe. The map below shows the income levels of all regions (in terms of GDP per capita), on which the 20% most polluted (from particles in air) regions is overlaid. The poorest regions largely coincide with the most polluted in terms of PM<sub>2.5</sub>. To a large extent, poorer and more polluted regions are found in southern and eastern Europe.



# A LOT (but not all) OF THE CONTENT FOCUSED ON POLLUTION

- Air pollutants: PM2.5, NOx, O3, industrial (air/water)
- Environmental noise
- Water (waste, bathing)
- Inequalities in exposure, combined impacts



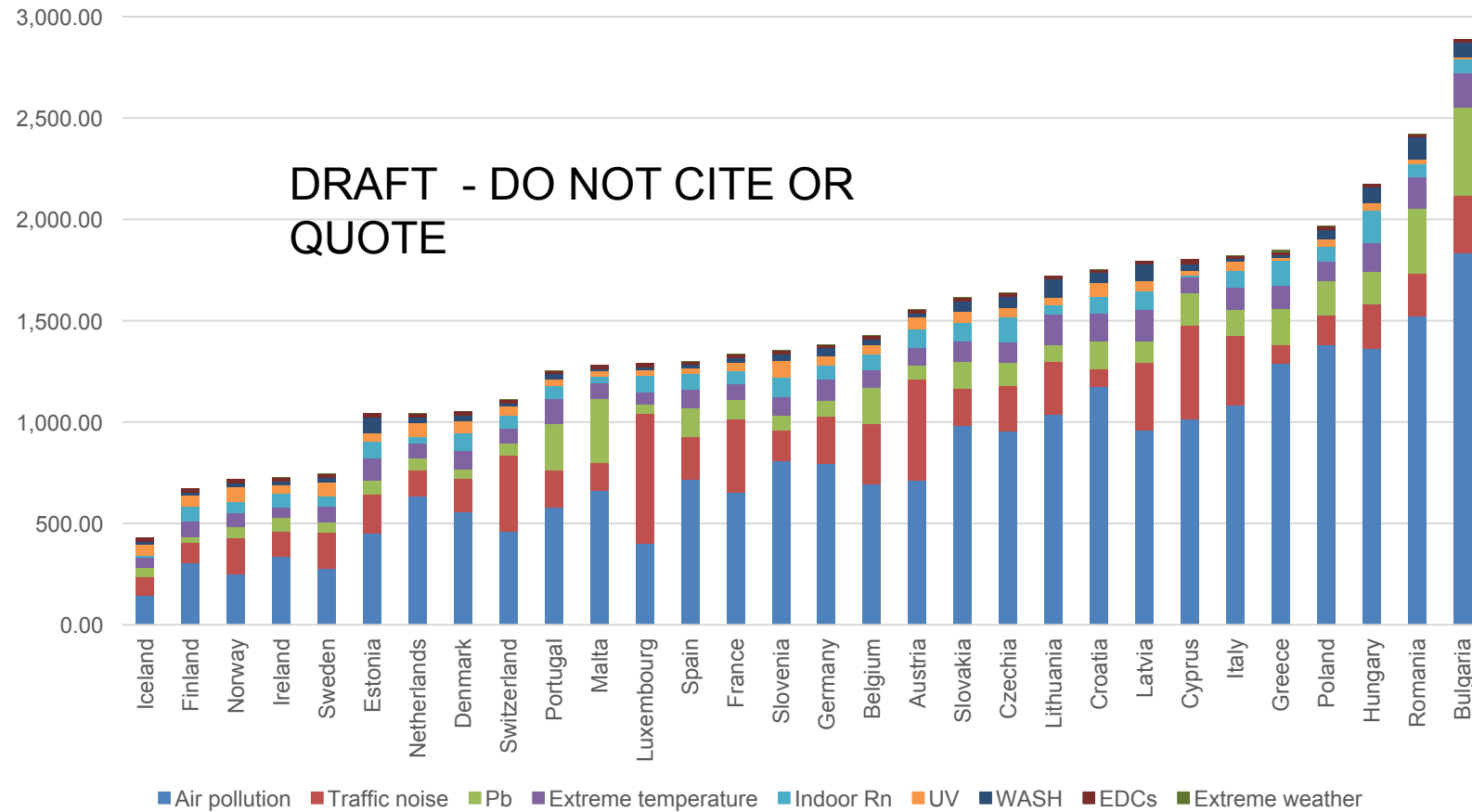
# Environmental Health

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- **Impacts Index** World Health Organization, November 2023, with updated data
- Burden of disease from selected environmental risk factors in Europe
- Metrics: indicators expressed as DALYs (Disability Adjusted Life Years)
- Update frequency: some data yearly, others more (e.g. noise)
- Geographical coverage: EEA member and cooperating countries with enough data.

# BoD results by country, 2019 (latest data available, update ongoing with upcoming GBD and our data)

Annual DALYs per 100 000 population, per country, per risk factor



# Updates and what we are

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## hoping for

- General update frequency limited by availability of updated data for a critical mass of maps/viewers (2/year?)
- Product specific update more frequent
- Design improvement, Additional products (maps, dashboards)
- We hope users find it intuitive, empowering, useful

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The link (live 3 May)

<http://discomap.eea.europa.eu/atlas>

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# THANKS

**Presentation of the ENoLL  
recommendations on leveraging  
Living Labs for zero pollution  
through digital solutions  
and citizens' engagement**



**4th Zero Pollution Stakeholder Platform meeting  
Brussels, 20 April 2023**



# European Network of Living Labs (ENOLL)

- The European Network of Living Labs (ENoLL) is **the international federation of benchmarked Living Labs in Europe and worldwide**. Founded in November 2006 under the auspices of the Finnish European Presidency, the network has grown in 'waves' up to this day.
- It is an international non-profit association which aims to promote and enhance user-driven innovation ecosystems, especially Living Labs.
- ENoLL focuses on facilitating **knowledge exchange, joint actions and project partnerships** among its historically labelled (about 500) members, promoting the establishment of new living labs and enabling their implementation worldwide.
- The certification and labelling of ENoLL Members guarantees the integrity and the coherence of the application of the Living Lab methodology, contributing to consolidate the role of Trust Brokers of the Living Labs with their communities.



**CERTH**  
CENTRE  
FOR RESEARCH  
& TECHNOLOGY  
HELLAS



**We define Living Labs (LLs) as user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings**

**Hes**·SO

# How can Living Labs contribute to the Zero Pollution Action Plan?

To achieve the EU's Zero Pollution Action Plan targets, the involvement of **citizens** and **businesses** is crucial.

**Digital technologies**, such as monitoring of emissions and tools that simulate, forecast, manage, virtualize, and collect and analyse data, play a vital role in the fast transition to a green economy.

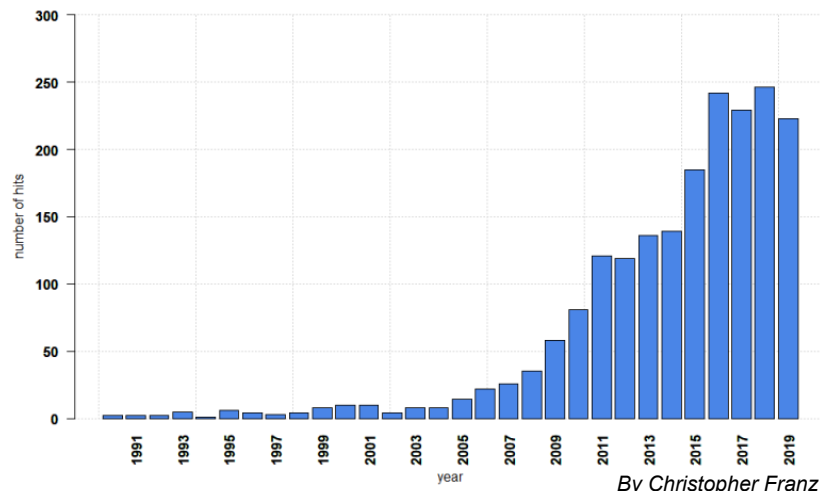
**Citizens are empowered by digital tools**, which support them to become more sustainable.

The concept and practice of permanent **Living Labs** have emerged as an important **infrastructure supporting the green and digital transitions**, promoting innovation through **user and co-creator involvement**.



201 Mobility Living Labs, test beds & initiatives containing living lab elements

Scopus hits for 'Living Labs & Real World Laboratories'



By Christopher Franz

# How can Living Labs contribute to the Zero Pollution Action Plan?



Living Labs and converging community-based action-oriented participatory trans-disciplinary research structures are a key component of **open science** for **sustainable development**.



Living Labs bring together **citizens, institutions, industry, and research**, **engaging citizens** in social practices and connecting the big picture to local action.



Living Labs are important contributors in **speeding up the transition** process to zero pollution and climate neutrality.



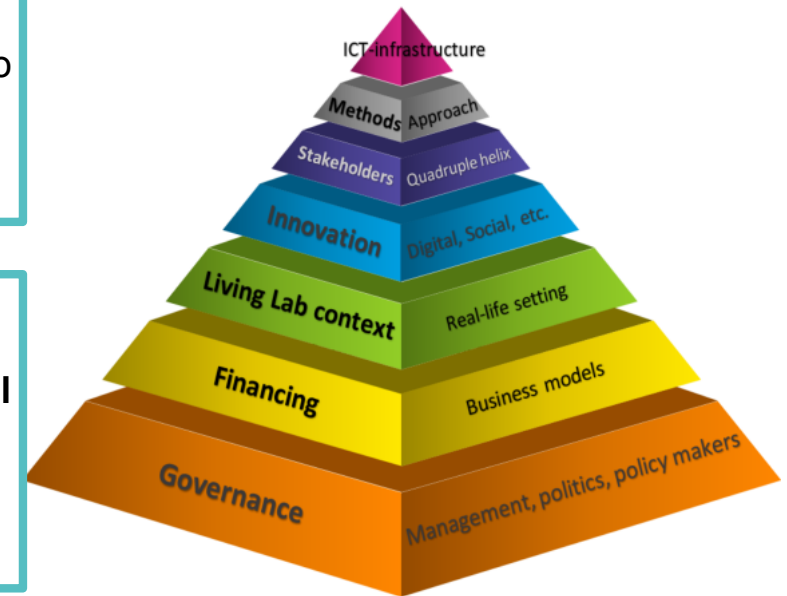
Living Labs can facilitate **visibility** and **access** to open **knowledge**, supporting open data and open-source initiatives and the European Data Spaces.



Living Labs have emerged as a crucial platform to promote **innovation, sustainability, and digitalization**, bridging the gap between citizens, industry, public administration, and research.



Living Labs can be used to **test and demonstrate digital solutions** for reducing pollution and achieving environmental sustainability.

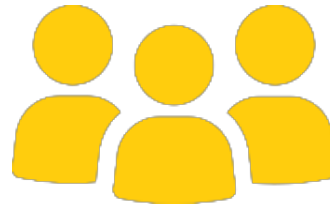


Urban Living Lab framework based on UNaLab cities feedback

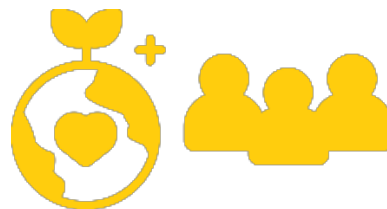
Chronéer, D., Ståhlbröst, A., & Habibipour, A. 2019. Urban Living Labs: Towards an Integrated Understanding of their Key Components. Technology Innovation Management Review, 9(3): 50-62. <http://doi.org/10.22215/timreview/1224>

# Target groups and aim of the recommendations

Recommendations are targeting the businesses civil society, administrations at national, regional and local level, academia and the Living Lab constituencies



- The current set of recommendations are expected to **help stakeholders**, including local and regional authorities, **to accelerate zero pollution efforts**, including by digital solutions.
- The recommendations will also serve to increase innovation readiness & transition capacity of Public stakeholders and **raise cities' & citizens awareness** of the **benefits**



A stylized world map showing continents in dark teal and oceans in light teal, centered within a white circle that is surrounded by two concentric light teal rings. The map is positioned in the upper right quadrant of the slide.

**European  
Network of  
Living Labs**

# Recommendations

# R1: Make every solution socially inclusive

- Living Labs can raise **awareness** for pollution and origins, influencing behaviour towards the environment locally.
- They aim to **reverse the burden** on minorities, women, and lowest-income citizens who are often the most affected.
- Some groups may also be the less informed and capable of decrypting scientific messages while needing immediate solutions.
- Living Labs can use a language, frame and action based on **intuitive information sharing** (dashboarding) on water, soil, and air quality, raising the integration of other thematics, which makes easier to implement citizen science and involvement.





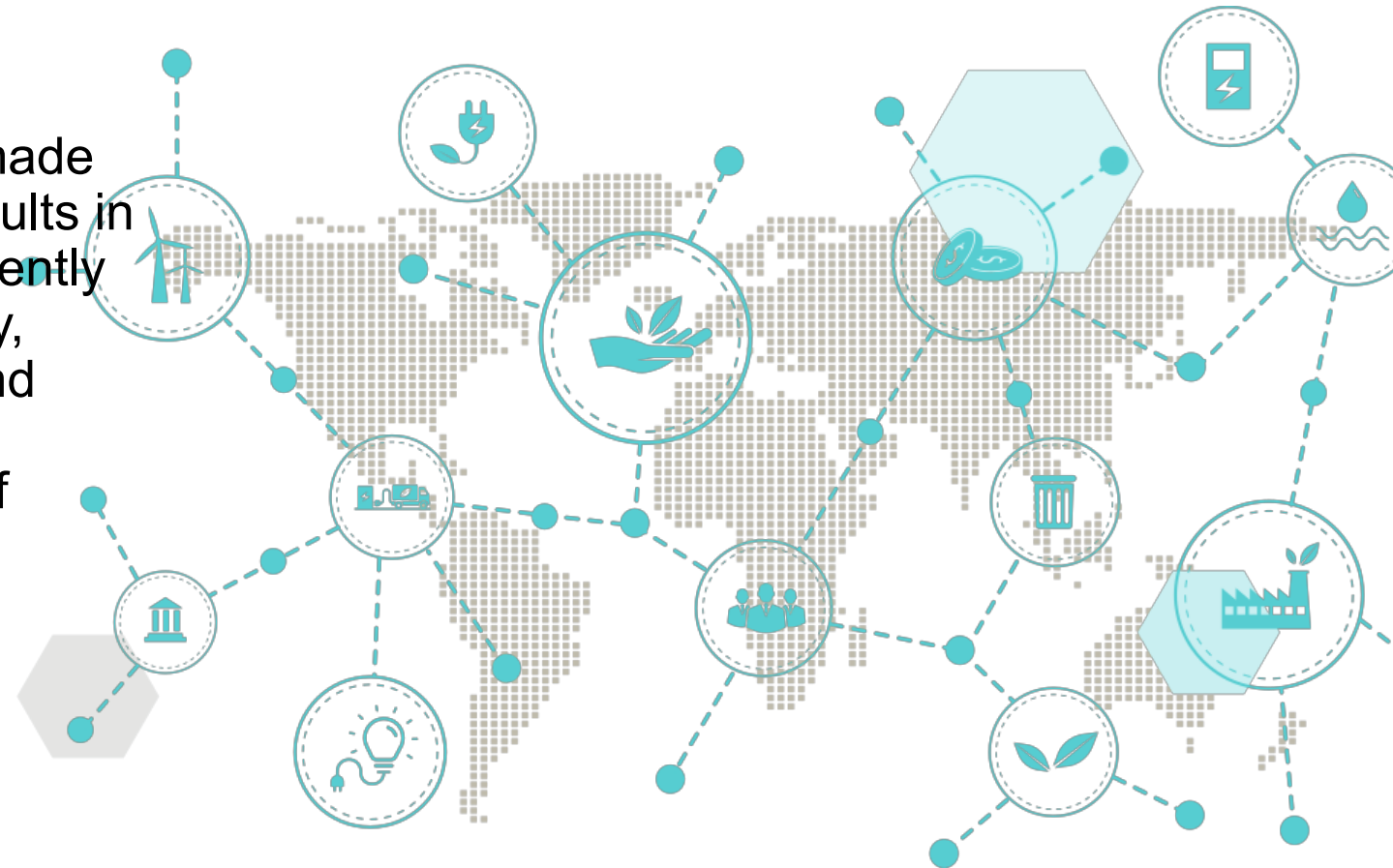
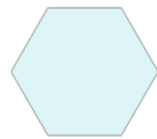
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## R2: Develop & apply integrated, multi-sectoral solutions

- This recommendation emphasizes the importance of **involving stakeholders** from different sectors, such as transport, energy, agriculture, and urban planning, in the development and implementation of solutions.
- With their characteristic co-design hinging on the hybridization of different technologies and social norms, they support a nexus approach in the real environment among sectors, for example, water-energy, water-industry, water-agriculture, water-industry-agriculture-cities, water-energy-food, water-chemicals, extended and adapted to include soil and air.

# R3: Break silos and communicate across a broad range of people and stakeholders

- You need to translate the zero pollution ambition into the specific local context and identify who and to which extent they can contribute to inter/intragovernmental intersection alignment methodology.
- The key alignment across legislation, permits and compliance systems is made easier by sharing information and results in institutional websites and by transparently and comparatively assess replicability, transferability, adaptability of pilots and case studies from a technical, socio-economic, and environmental point of view.





# R4: Ensure policy coherence and coordination

- Innovative and practical responses to policies should be co-developed under the leadership of cities and regions, also drawing on their Smart Specialisation, while increasing this readiness to adopt innovative zero pollution solutions developed elsewhere.
- Living Labs can be used to test and evaluate the effectiveness of policy solutions in real-life settings.
- Raising to the next level involves supporting Living Labs coordinators and actors in translating results in regulatory and legislative proposals and to act to overcome legal barriers.
- This recommendation also emphasizes the need for greater engagement and participation from stakeholders in the policy-making process, to ensure that policies are informed by the needs and perspectives of those affected by pollution.



## R5: Make good use of the zero target for simple and robust heuristics for action

- Set a zero target for pollution makes behavioural and technological choices easier.
- Simple and robust heuristics for action can guide decision-making toward zero pollution.
- This can be achieved by the use of Living Labs, where stakeholders can co-create and test innovative solutions in real-life settings, and through the development of clear indicators and targets that can drive progress (such as the diffusion of zero pollution lifestyles, behaviours and technology).
- One should promote awareness through educational activities, learning materials, and the dissemination of Living Labs activities. This can lead to changes in social norms.



# R6: Use digital solutions to evaluate and monitor pollutant levels and associated socioeconomic costs

- Establish a common understanding for zero pollution among all stakeholders and establishing circular economy in conjunction with a payment mechanism for ecological services and resource efficiency.
- Simulate and forecasting can aid in improving efficiency, such as with Digital Twins that simulate a product’s lifecycle or the processes of an ecosystem.
- Economic activities can be moved online and their environmental impact reduced with virtualization.



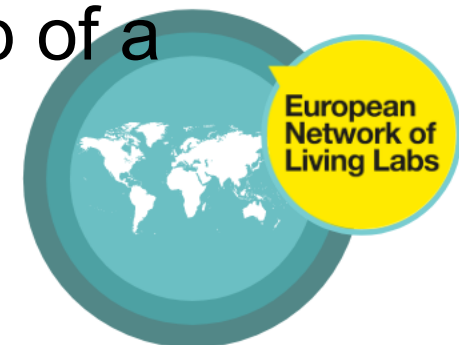
## R7: Invest in the co-design of experimental loops for engaging in experiments, cutting-edge technology trials and investigation

- Ongoing value chain monitoring, and the installation of spatiotemporal high-resolution sensor infrastructure e.g. for agricultural systems' nutrition and needs for pest control.



# R8: Look for adaptive technologies

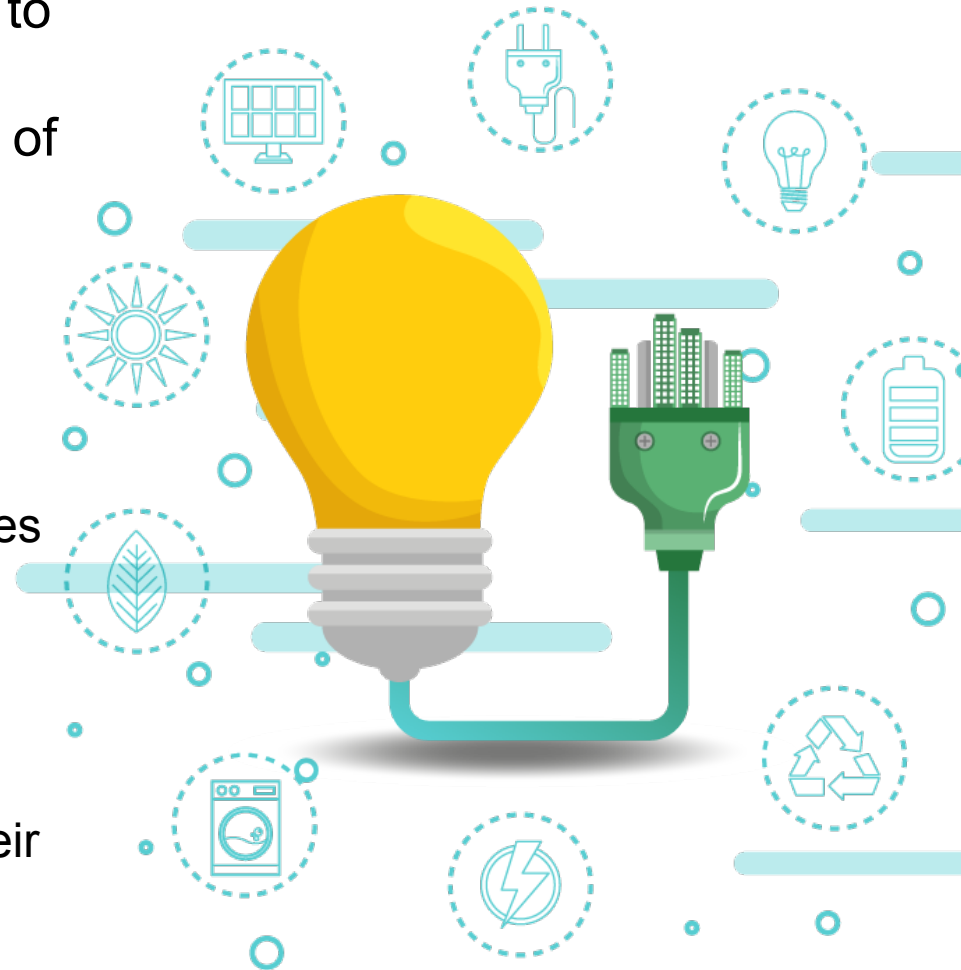
- Living Labs can carry out demonstration activities for new technologies at a pre-industrial scale in a real environment.
- It may also include activities for the optimization/adaptation of technology.
- Demonstration may include issues related to regulation, costs, environmental technology verification (ETV), and end-users/clients' involvement.
- Living Labs can find partners and funding for scaling-up of a specific technology.
- They can also link with green procurement.



# R9: Go beyond the Death Valley of innovation

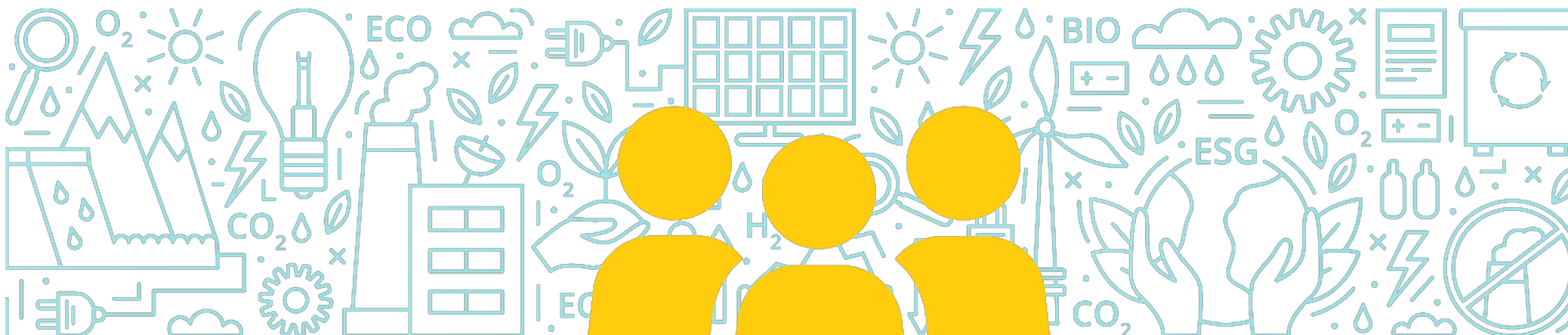
Emerging technologies are slow to take off and risk to fail to arrive to mass production even if they solve the pollution problem. So it's important that Living labs promote niches of early adopters, and test their scalability, replication & transfer. For water this involves for instance:

- Supporting water operators in the transitional shift to the Internet-of-Things era, including the application of various, data sources and smart data fusion.
- Spreading 'matchmaking' of water reuse/recycling techniques to various users (public, industry, governments).
- Evaluating how the risk-based approach has been applied, validated, and (informatively) communicated concerning circular value chains.
- Establishing community of practices and communicating their results.
- Overall, this closes a crucial gap to the uptake of the technology.



# R10: Increase impacts through citizen empowerment and transition capacity building

- Empower citizens to be active participants and adopters in the development and implementation of innovative solutions to mitigate and prevent air pollution.
- This can be achieved through tailored capacity-building programs, such as training and mentoring, supplemented by complementary learning materials and tools.
- Conversely, citizens first-hand knowledge should be channelled into action by others.
- Citizen science and Living Labs can be used to gather air quality data, present evidence for changing citizen behaviour towards sustainability, and test and evaluate innovative solutions.
- This recommendation also emphasizes the need to invest in building up the digital skills of citizens and public authorities.



# R11: Ensure engagement for cooperation among stakeholders and along the value chain and smart cities and territories

- Living Labs can have a role in the identification and production of “activators”, the key bottleneck for the Smart City, because the abundance of sensors and the growing intelligence in analysing their real-time data contrast with the paucity of actions that can be taken Living Labs are a great place where to pose questions like this, to re-imagining social, political, behavioural, and technological “activators” to make the Smart City actually a better place.





# Examples of digital solutions

- A high number of digital solutions for zero pollution exist, which have been successful tested by existing Living Labs, such as:



The ICT solutions for the **agro-ecological transition** by Occitanum and its several open labs in France;



The **HSB Washing Machine Control Unit**, co-studied by the HSB Living Lab in Gothenburg (Sweden);



SofiaCoin, an app that enlists locally-appropriate sustainable practices, keep **track** of them and **rewards** them with free access to innovative ecofriendly services and products (Bulgaria)



CODALoop – Community Data-Loops for **energy efficient urban lifestyles** involving the StadtLabor in Graz (Austria).



# Conclusions



Living Labs stand up for zero pollution and zero emissions. These ambitious targets solicit action, entrepreneurship as well as institutional and citizen engagement.

Digital solutions are a quick win to achieve early successes.

They can build a comprehensive science-informed citizen-centric, business-friendly development.

Interoperability of processes and the adoption of best practices enable in short- to mid-term far-reaching innovations in social norms, lifestyles, consumption and production patterns as well as in skills, and territorial systems.

This can be facilitated by the network of open research, industry, institutions, and citizens that Living Labs nurture.