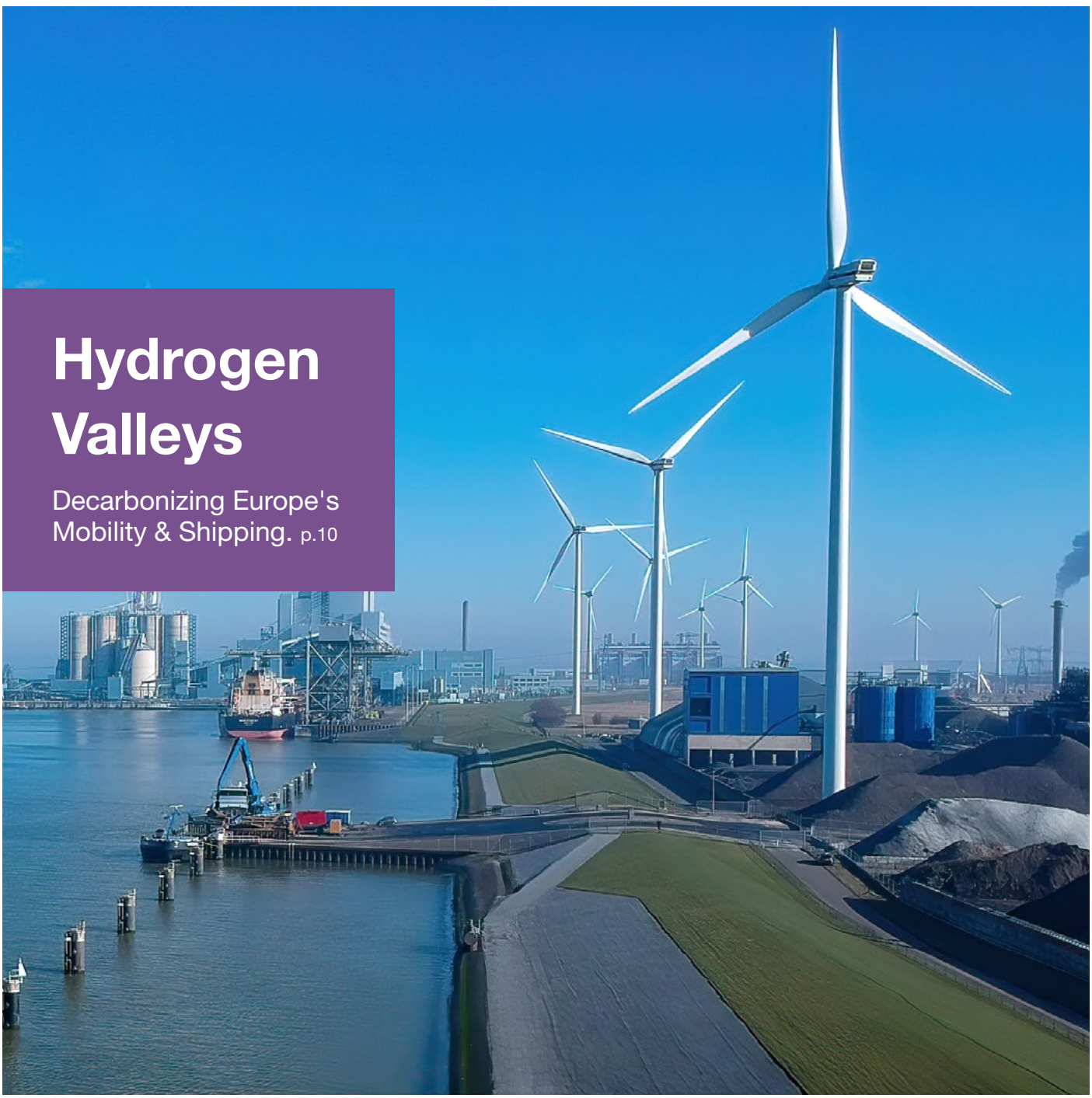
REVOLVE

QUARTERLY INSIGHTS INTO A CHANGING WORLD

N°49 | Fall 2023



Hydrogen Valleys

Decarbonizing Europe's Mobility & Shipping. p.10

Finding Solutions to the Climate Crisis

The record-breaking temperatures of summer 2023 gave us a hint of what the future holds should we fail to act adequately on the climate crisis. If pragmatism prevails, this climate warning will stoke an even greater sense of urgency when it comes to ending our reliance on fossil fuels. The solutions we need must respect our natural world and work for a growing (and increasingly urban) population.

In this issue, we take a closer look at how hydrogen valleys can unlock cheaper and more accessible hydrogen power by bringing providers and users closer together as more companies turn to alternative energy sources to power sectors such as heavy industry and public transport. We also present different perspectives on the possible implications of the EU's Carbon Border Adjustment Mechanism (CBAM) on global trade and developing nations.

With over 70% of the EU's population now living in urban areas, cities are key actors when it comes to testing solutions for the future. Ingrid Skogsmo, Senior Research Leader at the Swedish National Road and Transport Research Institute, tells us how automated vehicle solutions can improve traffic and accessibility.

Within the context of the European Mobility Week, Herald Ruijters, Director of Investment, Innovation and Transport at the Commission's DG MOVE, shares his vision for cities as catalysts for change and we travel to Latin America and the Caribbean, where a climate initiative is trying to reconnect cities with surrounding nature.

We report on the efforts to protect Cyprus' Akamas nature preserve and the greenhouse agriculture taking over south-eastern Spain into a sea of plastic. We also catch up with one Spanish studio's efforts to artistically de-digitalize data and take you on a trip to otherworldly landscapes of Iceland.

Send us your stories, ideas for futures, and other comments at **editors@revolve.media**.

Thanks for revolving with us!

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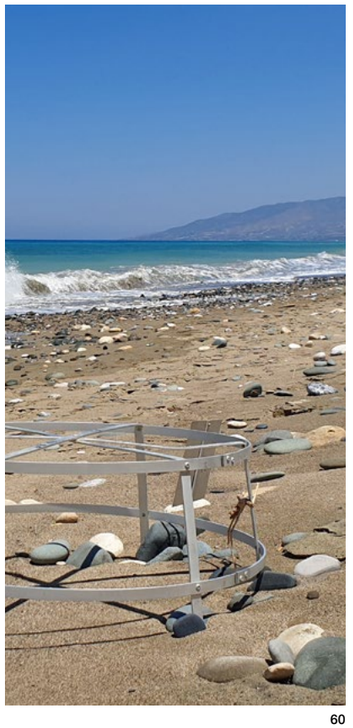

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Mobility

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Second cover option (above):

Gdansk Shipyard, Pomerania, Poland.
Source: Curioso Photography / Shutterstock

Cover image:

Eemshaven harbor, Groningen, Netherlands.
Source: Theodorie / Shutterstock

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Behavioural Change for Urban Mobility

WRITER: **HERALD RUIJTERS**

DEPUTY DIRECTOR GENERAL
DG MOVE, EUROPEAN COMMISSION

Cities as Catalysts for Behavioural Change: Engaging administrations, citizens and businesses in the Mobility Transition

Illustration by Dariana Guevara / REVOLVE

Cities have for thousands of years played a vital role in driving behavioural change and shaping our evolving mobility needs and respective solutions. Urban areas were, and are today more than ever, the hubs in our transport networks. They are often the starting point or final destination for travel of people and goods. Much so in the European Union where more than 70% of the population live in cities and in many areas around the world where we had, or are expecting to have, similar developments.

Our cities are vibrant hubs of innovation and human interaction, making them ideal catalysts for trying out new solutions and implementing the good ones for changing our mobility for the better. Some solutions even appear without any long planning and preparation, they are suddenly there and provide new mobility solutions (and new challenges). Think for example of e-scooters.

The European Commission has for a long time been providing support to cities and citizens to test and embrace innovation. To try and implement new technologies and services and find better solutions to old and new problems. Please do check out our relevant programmes, instruments, and policies, including Horizon Europe, its mission on 100 Climate Neutral and Smart Cities by 2030, the Trans-European Transport Networks (TEN-T) and its 424 urban nodes and the EU Urban Mobility Framework and its very successful concept on Sustainable Urban Mobility Plans (SUMPs). These are amongst the themes to be discussed in the Urban Mobility Days, in Sevilla, 4 to 6 October 2023.

I am very much aware that it is not only in or between cities that people and goods travel. We have increasing numbers of commuters which work or educate themselves in the cities or visit cities for leisure (or temporarily leave the cities for business, leisure, and education). Nearly 30% of our population live in rural and remote areas. They need suitable mobility solutions and have our full attention to that regard. Transferability of solutions (and their acceptance) is important to be able to adapt good solutions for all.

As the world faces pressing challenges related to climate change, air pollution, and congestion, cities are increasingly recognized as key actors in transitioning to more sustainable and efficient transport modes.

I mentioned technologies and systems, instruments, and tools. But the most important factors are the users for which we design the mobility solutions.

It is not easy for humans to embrace change, not even change for the better. Our species and thus our brains have evolved by learning how to preserve energy as much as possible. Business as usual costs least energy (for the moment) and change (for a better long-term future) costs more energy.

So, if we want to jointly change our behaviour for embracing safer, more inclusive, clean, and smarter mobility solutions for the better of our society and our planet, we need to convince many human brains that the long-term benefits will be worth it.

Therefore, we collaborate and co-create this mobility transformation with many stakeholders, including industry players, policymakers, citizens, using initiatives such as the Cities Mission.

We aim at creating an enabling environment that encourages individuals to adopt sustainable and smart mobility options. Cities can, and do, involve citizens in innovative policies, organise awareness campaigns and can thereby influence citizens' travel choices, promote active modes of transport, and reduce dependence on private vehicles. By prioritizing sustainable mobility, cities can significantly impact emissions reduction, air quality improvement, and overall liveability. This is being experimented throughout the world, in over 3000 cities, every year again, in the Mobility Week.

The European Commission is there as a partner for Member States, cities and citizens to jointly progress on this long journey to a sustainable and prosperous future. ●

Hydrogen Valleys Energizing Mobility

WRITER: **JOSH FRANKLIN-MANN**

Renewable energy hubs offer environmental and economic promise, but significant barriers remain.

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Transportation is one of the major contributors to greenhouse gas emissions, primarily due to its reliance on fossil fuels. In an attempt to cut emissions, governments are shifting their focus to alternative sources such as hydrogen, which offers a potentially cleaner alternative. However, issues with storage and transportation have slowed the rollout of hydrogen-powered transport, as often it is not a logistically or economically viable option.

A new focus towards so-called 'hydrogen valleys' offers a potential solution, bringing hydrogen providers and users closer together, reducing transport costs and storage needs, and boosting the chance of more hydrogen-powered transport in communities around the world.

What is a hydrogen valley?

Hydrogen valleys are geographical regions that create a hub for the production, distribution, and use of hydrogen, offering more than one end sector or application in different areas of mobility, industry, and energy. The name is a reference to Silicon Valley, with the idea of creating a localized economy that is fueled by hydrogen, reducing the need for long-distance transportation, something that has been one of the key barriers to the uptake of hydrogen as an everyday renewable energy solution.

These hydrogen valleys can also act as technology hubs, with companies developing new technologies close to those that will be utilizing them and being positioned close to hydrogen production sites. Bringing together a 'critical mass' of expertise and resources encourages collaboration and innovation, creating an 'ecosystem' in which technologies can be developed with hydrogen in the center.

This again reduces the total cost of further research, making progress more effective and potentially maximizing returns on investment in the infrastructure required to set up each valley.

European investments leading the way

In 2021, the EU set up the Clean Hydrogen Partnership as a replacement for the former Fuel Cells and Hydrogen Joint Undertaking (FCH-JU). This new organization focuses on research and innovation opportunities that facilitate the uptake of hydrogen use and meeting EU Green Deal targets.

The Clean Hydrogen Partnership has received €1 billion from government funds, with a further €1 billion from private investment, focusing on the rollout of 'sustainable hydrogen'.

In 2019, the EU also set up the H2 Valleys S3 Partnership to develop fuel cell and hydrogen (FCH) applications and value chains, as well as to contribute to the 'greening' of the production of hydrogen from renewable energy sources. The partnership now has 60 regions contributing, making it the largest hydrogen-related partnership in Europe.

Initial deployment steps

The Northern Netherlands was the first region in Europe to receive EU funding for its hydrogen valley, with sustainable mobility as a central part of the plan in the area. The HEAVENN project has received €90 million and has clean mobility solutions at the core of its plan, listing targets of 105 hydrogen-run public transport vehicles, 20 trucks, and 5 filling stations, along with the creation of an entire hydrogen value chain. This means connecting businesses, producers, and consumers in a small area, keeping transport distances low and reducing costs.

What makes this project a truly sustainable solution is that it prioritizes green hydrogen across all areas of the localized hydrogen economy it is creating. Given the abundance of both off-shore and on-shore wind resources as well as solar power, it aims to use hydrogen as a storage method and as an 'energy vector' for decarbonization beyond electricity production, in particular in industry, heating, and transportation.

The rollout of hydrogen valleys is ongoing across the world. According to the Mission Innovation Hydrogen Valley Platform, there are 83 hydrogen valleys registered, with €115 billion invested in the projects.

No one-size-fits-all

Exploring the different hydrogen valleys in development, it is quickly apparent that these are all vastly different projects, attempting to harness the local environment and cater to the needs of the local population.

Take the BigHit project, for example: an ambitious plan to turn the Orkney Islands in the far north of Scotland into a hydrogen valley. With immense potential for wind and tidal energy to produce hydrogen, the fuel could then be used for boats supplying the islands. These hydrogen-powered boats would have access to hydrogen refuelling stations in the same place as hydrogen-powered trucks, creating a hydrogen ecosystem for transportation and production.

However, hydrogen valleys are challenging. A €16 million project in Western Australia was scrapped in July 2023 as developers better understood the economic potential of having their energy park in closer proximity to users, especially heavy industries. Another project, Green Hydrogen @ Blue Danube, that was focused on transporting hydrogen

1. Gas treatment plant (GZI) in Emmen, The Netherlands. Photo: HEAVENN
2. Hydrogen powered garbage truck in Groningen, The Netherlands. Photo: HEAVENN
3. Electrical infrastructure for DJEWELS 1 & 2 inThe Netherlands. Photo: HEAVENN
4. Hydrogen refueling stations in the Czech Republic. Photo: ORLEN

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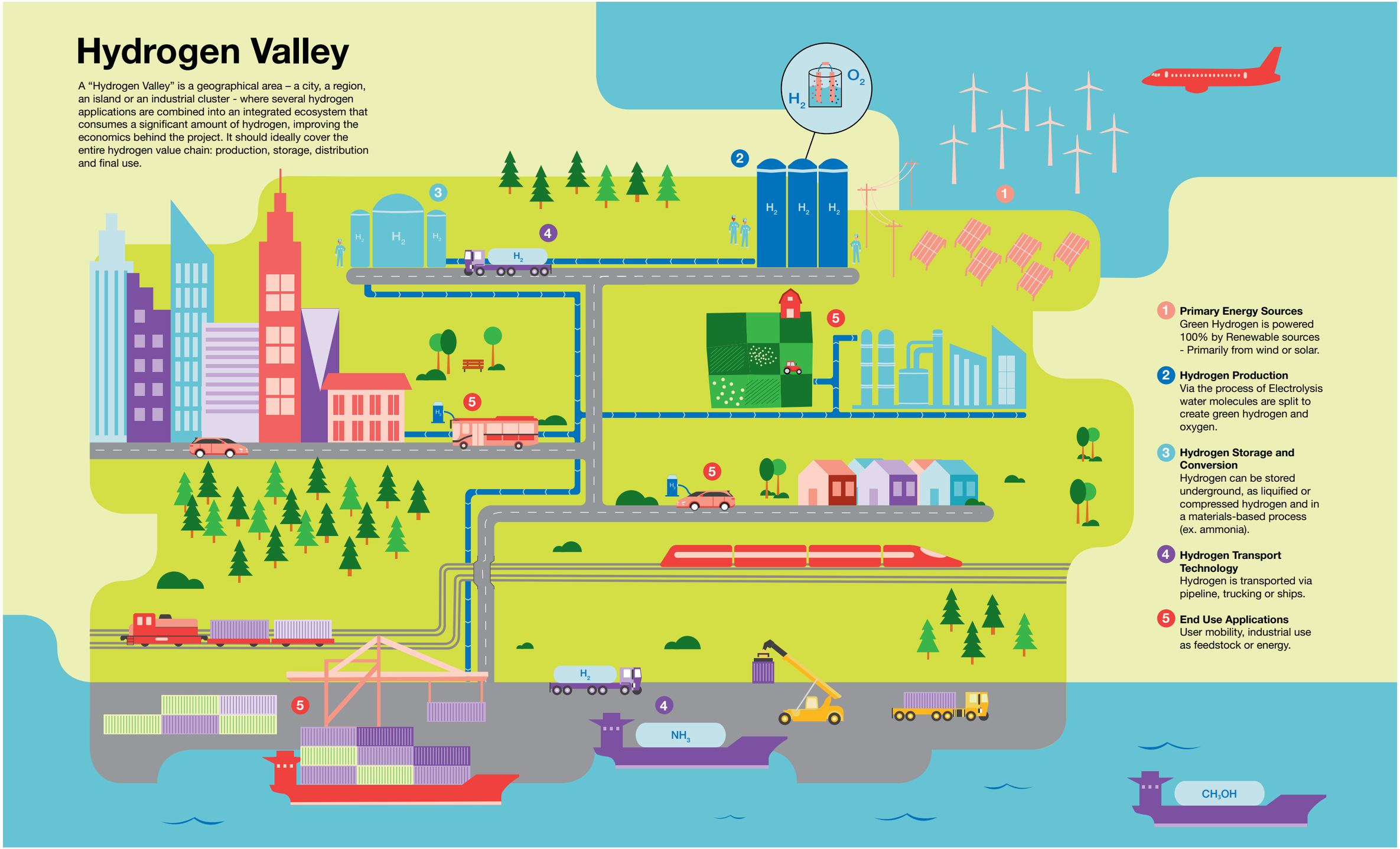
Hydrogen Valley

A “Hydrogen Valley” is a geographical area – a city, a region, an island or an industrial cluster - where several hydrogen applications are combined into an integrated ecosystem that consumes a significant amount of hydrogen, improving the economics behind the project. It should ideally cover the entire hydrogen value chain: production, storage, distribution and final use.



1 **Primary Energy Sources**
Green Hydrogen is powered 100% by Renewable sources - Primarily from wind or solar.

2 **Hydrogen Production**
Via the process of Electrolysis water molecules are split to create green hydrogen and oxygen.

3 **Hydrogen Storage and Conversion**
Hydrogen can be stored underground, as liquified or compressed hydrogen and in a materials-based process (ex. ammonia).

4 **Hydrogen Transport Technology**
Hydrogen is transported via pipeline, trucking or ships.

5 **End Use Applications**
User mobility, industrial use as feedstock or energy.

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from Romania to Austria across the Danube River, was also discontinued in 2023.

This shows the scope of the potentialities and challenges of hydrogen valleys. In some cases, it is unavoidable that hydrogen must be transported long distances; in others, having the production as close to end-users as possible is the way to go. Both are about creating inter-connected hydrogen economies.

Changing identities

Other regions in Europe are now seeking to become hydrogen valleys. This is particularly the case in those that previously relied on fossil-fuels.

LEAG, one of Germany's biggest energy companies whose tagline from a quick Google search reads 'energy from lignite', are promising a transformation away from brown coal in Lusatia, an area close to the Germany-Poland border. They aim to replace the 8GW of electricity produced from coal with up to 14 GW produced entirely from renewables, with 3GW from green hydrogen.

In Poland, PKN Orlen is actively pursuing its hydrogen strategy towards producing and supplying zero- and low-carbon hydrogen as an alternative transport fuel. The company's "Hydrogen Eagle" project, recently approved by the European Commission, signifies a critical step in this direction, with the construction of hydrogen refueling stations across Poland. Linking Gdansk and Gdynia, the Amber Valley project, also led by PKN Orlen, has the goal to catalyze the development of a sustainable hydrogen economy in Poland's Pomerania Region. This comprehensive effort involves the establishment of a complete hydrogen value chain, encompassing hydrogen production, storage, and distribution, ultimately serving diverse applications such as mobility, industry, and energy.

In Czechia, it was reported in July 2023 that three coal mining regions want to become hydrogen leaders in Central Europe, specifically as hydrogen valleys, creating a new identity for regions previously defined as coal hubs.

This is not just the case in Europe. In April 2023, Gujarat, India announced plans for a hydrogen valley innovation cluster with the goal of developing clean hydrogen valleys by 2030. India has stated that it aims to cut emissions in the developing country by 45% by 2030 and is turning to hydrogen valleys as a means of achieving its targets.

Meanwhile in Michigan, USA, General Motors, one of the Big Car faces of mobility in North America has announced it is working with Norwegian green hydrogen company Nel to create a giant new green hydrogen production facility. It may not be branded as a hydrogen valley, but it is again tapping into a wider hydrogen economy.

Not all hydrogen valleys are green

While it may seem obvious for sustainable energy alternatives to focus on green hydrogen, not all hydrogen valleys are focusing on renewables – nor are they necessarily that sustainable. For example, the Kawasaki Hydrogen Road has a broader definition of what producing sustainable energy looks like.

The project is looking to tap into hydrogen resources abroad, which then creates an interlinked hydrogen value chain. One objective is to produce ships that can transport liquid hydrogen. As the first producers of ships that carry liquid natural gas (LNG), there is hope that this could bring together hydrogen-producing sites with consumers, creating distant, but connected, hydrogen value chains.

However, the Kawasaki Hydrogen Road is based on hydrogen fueled by brown coal (or lignite) in Australia, a fossil fuel that often goes unused. This is being branded as a cleaner way to produce hydrogen, and while this offers a short-term solution and some emission savings, it does not go far enough to be called sustainable energy production. It is also facing heavy resistance from local politicians questioning the sustainable merits of the project.

Misleading sustainability claims

One of the highest-funded projects on the H2Valleys list is the Edmonton Region Hydrogen Hub, promising a future "where buses, trains, heavy trucks, home heating, and farm equipment all run on zero-emissions hydrogen fuel, an essential component of the new clean energy system".

When justifying the question 'why hydrogen?', they explain the importance of green hydrogen in the energy transition, but also blue hydrogen. That is produced by using natural gas – a fossil fuel. Energy companies are quick to argue that blue hydrogen is environmentally friendly, with one company suggesting that it has "zero CO_2 emissions".

Many environmentalists are skeptical of blue hydrogen. The techniques to produce blue hydrogen can differ, with some actually producing more emissions than creating electricity with natural gas, while other methods can offer just a 13% reduction.

It is a 'net positive' if emissions are reduced, but should hydrogen produced with these methods still be labelled 'clean hydrogen'?

The Black Horse Project, supported in Slovakia, Hungary, Czechia and Poland, is aiming to put '10,000 emission-free hydrogen trucks' on the road in Central Europe. Yet digging through published plans behind the project, there are still mentions of using grey hydrogen – at least in the short term.

Likewise, the HyNet Project based in northern England describes its fuel only as 'low carbon', offering branded techniques behind the fuel but without giving consumers a clear indication of the environmental impact of their hydrogen.

The future is hydrogen

Despite the questions surrounding the environmental impact of hydrogen and its methods of production, more companies are turning to it as the fuel of the future.

In June 2023, the first hydrogen train in North America took to the rails; meanwhile, the flagship EU hydrogen truck project kicked off in Brussels in March 2023. Even companies like EasyJet are looking to hydrogen to maintain the feasibility of short-haul air travel and cut down flight emissions.

The possibility of emission-free transport in urban areas and over long-haul routes is enticing, but the redevelopment of regions negatively affected by mining or the economic struggles as the industry shrinks would be an even greater achievement.

Hydrogen valleys offer a pathway towards these sustainable and decarbonized transport systems. By integrating local renewable energy sources with hydrogen production, storage, and distribution, these valleys pave the way for a cleaner, greener future.

As technologies evolve and economies of scale kick in, the cost of hydrogen infrastructure is likely to decrease, making hydrogen valleys even more attractive. Creating these interconnected hubs facilitating the hydrogen economy is not yet a perfect plan but does point to a cleaner and more profitable future for heavy industry and transportation.

CBAM: EU Protectionism or Landmark Climate Policy

WRITER: **SUZAN NAZ UZEL**

What is the Carbon Border Adjustment Mechanism (CBAM) and how is it going to change trade globally?

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The European Union (EU) has developed the Carbon Border Adjustment Mechanism – a landmark tool that will impose a carbon levy on materials imported from non-EU countries that may not meet European sustainability standards.

Carbon leakage refers to the potential scenario in which businesses might shift their production to countries with less strict emission regulations due to the cost implications of climate policies. This could happen to avoid higher expenses associated with reducing carbon emissions in their home countries.

To achieve its objective of reducing carbon leakage in high-risk sectors such as cement, iron and steel, aluminum, fertilizers, as well as electricity and hydrogen, CBAM will operate in conjunction with the EU Emissions Trading System (ETS), which was established in 2005 as the world's first international emissions trading system.

The ETS, alongside CBAM, aims to prevent a scenario where manufacturing activities with high carbon emissions relocate to countries with less stringent or lax environmental regulations. Consequently, CBAM will reinforce the principles of responsible production and consumption, reducing the environmental burdens associated with the manufacturing process.

By implementing CBAM, the EU will verify that a payment has been made for the carbon emissions generated during the production of specific imported goods. This mechanism will ensure that the carbon price applied to imports matches the carbon price applied to domestically produced goods. As a result, the EU's climate goals will remain intact, and there will be no undermining of the region's efforts to combat climate change.

The introduction of CBAM by the European Commission is perceived in two different ways.

According to Max Gruenig, Senior Policy Advisor at E3G, though the European Union perceives CBAM primarily as a domestic climate policy aimed at curbing carbon emissions and accelerating both national and international investments in greener manufacturing, the rest of the world views it as a trade policy with potential implications for global trade dynamics.

This manipulation of global trade could also be seen as using climate policy to implement a new kind of neo-protectionism.

1. City Skyline Under Blue Sky and White Clouds. Photo: Natalie Dmay / Pexels
2. A Smokestack Emission of an Industrial Exhaust Pipes. Photo: Chris LeBoutillier / Pexels
3. White Smoke Coming Out from A Building. Photo: Marcin Jozwiak / Pexels
4. Power Plant Air Pollution. Photo: Catazul / Pixabay

CBAM Implementation Timeline

December 2019 – The plan to introduce CBAM was announced by the European Union as part of the European Green Deal.

April 2023 – The European Parliament and the European Council voted on its adoption.

October 2023 – CBAM goes into effect starting October 2023.

From December 2024 – Importers are required to apply for the status of authorized CBAM declarant.

End of 2025 – Importers will be subject to CBAM reporting requirements.

From 2026 – CBAM will be fully operational, requiring importers to pay a carbon import levy for certain carbon intensive goods.

By 2030 – The target year to extend CBAM's scope to cover all sectors covered by the EU ETS.

> "CBAM is first and foremost a climate policy."
>
> – Domien Vangenechten, Senior Policy Advisor at E3G

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What is the EU doing to implement the CBAM?

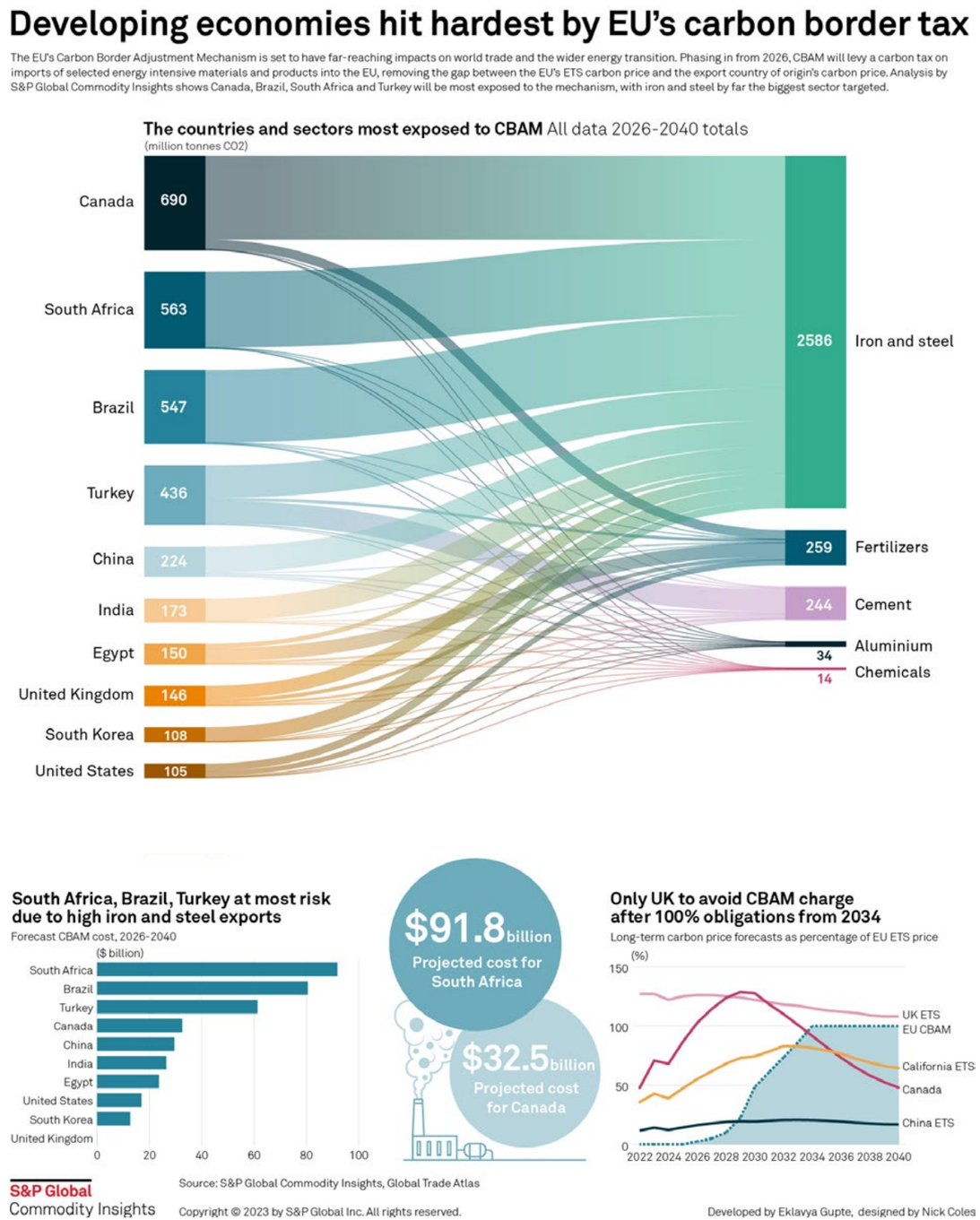
From one standpoint, Yan Qin, Carbon Lead Analyst at London Stock Exchange Group (LSEG), states that the final design of CBAM, as agreed upon during the legislative process, has been carefully balanced to address various concerns. One notable aspect is the incorporation of a three-year transition period, starting in October 2023, which will require the importers of goods covered by the new rules to report embedded greenhouse gas emissions without any financial payments or adjustments.

Initially, CBAM will target imports of specific goods and precursor materials known for their carbon-intensive production processes and high risk of carbon leakage. Qin adds that CBAM demonstrates its commitment to fairness by considering free allowances for certain sectors. This is good news for exporters with carbon-intensive production methods, as it helps create fair competition and avoids putting too much pressure on their businesses. The gradual phase-out of EU ETS-free allowances also benefits exporters because it means that the rise in carbon costs will happen slowly over time, preventing sudden and disruptive changes.

When viewed from a climate justice perspective there is a different opinion. EU Policy Manager at EPICO KlimaInnovation, Sam Williams, points out potential disparities in the design that might not fully address fairness and equity concerns, especially when considering third countries' vulnerability to climate change and their historical responsibility for emissions.

A more nuanced design of the CBAM, considering third countries' responsibility and vulnerability, may have helped to ensure a fairer and more equitable implementation, Williams adds. The EU urgently needs an effective carbon levy that maintains the competitiveness of EU industry and helps green global value chains.

Measuring countries' exposure to CBAM, based on various factors such as trade with the EU, emissions intensity, and their economy's reliance on the production and trade of goods included in CBAM, Williams states that many vulnerable countries, less responsible for, yet most impacted by climate change, might face significant impacts.



Source: Infographic: Developing economies hit hardest by EU's carbon border tax | S&P Global Commodity Insights (spglobal.com)

How can the EU engage with countries outside of Europe?

While pursuing common rules through multi-country coalitions is a definite step forward, unilateral measures such as CBAM risk overlooking the significance of country-specific issues and single variables that shape vulnerability to, and responsibility for climate change, says Sam Williams.

There is a fear that CBAM may primarily affect a select few countries, potentially creating conflicts. This issue is often interpreted by many other countries as a form of neo-protectionism, which can involve a variety of trade restrictions. However, the intention of CBAM is quite the opposite, Domien Vangenechten, Senior Policy Advisor at E3G, suggests. Its aim is to ensure equal treatment between domestic producers and importers, rather than granting an advantage over foreign competitors. According to Max Gruenig, the benefits of CBAM for the EU are relatively minimal, serving more as a political tool to phase out free allocations rather than significantly impacting global emissions or competitiveness within the EU.

Yet the focus solely on carbon pricing may not be the remedy for every nation's climate challenges. Instead, a more nuanced and collaborative approach is required, where the global community comes together to explore diverse strategies and solutions that align with the unique realities of each country.

> “CBAM serves as a poignant reminder that a unilateral one-size-fits-all approach might not effectively address the diverse needs and circumstances of countries worldwide. CBAM alone cannot reduce global emissions in a climate just manner.”
>
> – Sam Williams, EU Policy Manager at EPICO KlimaInnovation

Varying impacts of CBAM

China will be one of the hardest countries hit by the EU’s carbon tax. China's climate envoy and Ministry of Commerce perceive CBAM as a unilateral measure and trade barrier, something expected by the EU. Consequently, CBAM was meticulously designed to align with World Trade Organization (WTO) rules, thereby minimizing the impact of potential disputes on its implementation.

Acknowledging the importance of constructive dialogue and engaging with Chinese stakeholders remains crucial to ensure that CBAM discussions are positioned within the broader context of global climate negotiations.

Chinese policymakers are using CBAM as an external factor to force its own industry to speed up decarbonization efforts. China has committed to carbon peak and neutrality goals, so it is determined to transform its carbon-intensive industry. Considering this perspective, the risks to CBAM are perceived to be limited.

One of the primary goals of CBAM is to encourage more countries to implement carbon pricing. In this regard, when CBAM can exert pressure on China, accelerating the nation’s establishment of its national ETS and including its aluminum and steel sectors in its ETS, this goal of CBAM will be fulfilled, Yan Qin says. Moreover, it is possible that the sectoral expansion of China’s national ETS might mirror the evolvement of the EU CBAM too, watching which sectors will be covered in EU CBAM regulations next.

Max Gruenig, Senior Policy Advisor at E3G, underlines the concerns raised by middle and developing countries in emerging markets. He argues that the EU's efforts to establish a level playing field may inadvertently hinder their own development. These countries feel pressured to quickly meet the EU's environmental standards, but their emissions and development paths are overlooked. In Gruenig's view, a more understanding and accommodating stance from the EU could go a long way in fostering equitable global collaboration.

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Hitting developing countries hardest

Despite the potential successes in pushing the energy transition forward, CBAM would disproportionately affect developing economies, especially in Africa and the Middle East, exacerbating economy-induced social issues such as gender inequality, education levels and disparities between suburban and rural areas. Lower-income countries heavily reliant on fuel exports, like Cameroon, Egypt, and Nigeria, along with other African nations such as Ghana and Morocco, would experience a more significant impact. For instance, Mozambique, responsible for over 7% of the EU's total aluminum imports, is often cited as a prime example of the potential ramifications.

Turkey is the EU's third-largest exporter of carbon-intensive goods, making its aluminum, electricity, cement, and iron and steel industries particularly exposed to EU financial levies and taxes when CBAM is implemented in 2026. Without cutting carbon emissions, these sectors could face significant carbon taxes on their exports to the EU.

When CBAM is implemented in 2026, importers will face new financial obligations, and the free allowances provided through the ETS will gradually decrease. This change is expected to be mirrored in Turkey, leading to higher carbon prices within the EU and a more significant impact on the country.

Given the weight of Turkey’s exports, investing in green transformation becomes crucial at this stage, the former Ambassador of Turkey and the Ex-Chairman of the Executive Committee of the OECD and Chief Climate Change Negotiator, Mithat Rende, says.

While some countries are gearing up to implement their own carbon pricing initiatives, there is a prevailing notion that the design of CBAM lacks nuance and fails to adequately consider the vulnerabilities of countries with limited resources. Targeting heavy polluting players, even in developing countries, without hampering more vulnerable sections of society that are less responsible for climate change, should be the path that we should follow, Williams adds. In a scenario where this is not considered, implementing this mechanism may not achieve a fair and equitable outcome for all parties involved.

The future of CBAM

A revision of CBAM is expected in 2026. Depending on the political composition of the next European Parliament from 2024, there is a realistic chance that the current roadmap could be reversed at some point, given the viewpoints of the potential next EU legislature.

If CBAM and the phaseout of free allowances create extra burdens for EU industries, such as stricter rules on the carbon footprint of imported goods, additional supportive policies could contribute to achieving the climate and sustainability objectives of CBAM.

But cooperation with third countries is of paramount importance in ensuring that these countries are not left behind in both the energy transition and global development. ●

Automated Mobility for Road Safety

WRITER: **BELÉN G. CARMONA**

Automation has the potential to increase the accessibility of mobility.

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When we think about automated mobility solutions, we immediately picture self-driving cars taking us to a new and futuristic era of mobility where traffic does not exist, and we can use our time in more productive ways while commuting. But when will this be realistic? How can it make our mobility more sustainable, and how can it help improve our mobility systems today?

REVOLVE talked to Ingrid Skogsmo, Ph.D., Senior Research Leader at the Swedish National Road and Transport Research Institute (VTI) - President at the European Conference of Transport Research Institutes (ECTRI), and an expert in automated and connected mobility, self-driving vehicles, and road safety to try to answer those questions and understand a bit better what autonomous mobility is all about – and what it is not.

What solutions can automated and connected mobility bring to the road transport sector?

'Automated solutions' is a very wide expression. It can be a driver's support system, like adaptive cruise control, an automated system partly (that is not fully) automated; it can be, completely self-driving vehicles without any driver at all like robo-taxis and robo-deliveries. Driver support systems can help drivers perform better. Also, connected solutions can be a part of the traffic management systems, in which case they can help to make transport more fluent and efficient. If it is completely automated, it can obviously be in places where you cannot access it with the driver. It may give new opportunities to work in mines, for example, connected and automated vehicles can thus bring solutions over a very wide spectrum.

Why are these innovations important for more sustainable mobility?

Implemented in a thoughtful way, traffic could be more fluid thanks to automated solutions. It may become more efficient and contribute to less time in congestion and less emissions. But sustainability can also mean safety. If you can help drivers perform safer by using connected and automated systems to detect things in a clearer way, for example, if you detect pedestrians earlier, predict their intentions and then transfer that back to the vehicle so it automatically brakes, that of course can improve safety. It can improve the performance of the drivers, but also if you think about sustainability, being fairer, giving access to groups that, maybe, were not able to move independently before, like people with reduced capabilities, vision problems, or mobility problems, maybe this can allow you to have a much more independent type of mobility.

> "Automated solutions can also help improve the working conditions for drivers or to create better jobs in different locations that can be hard to work in, like mines or very remote areas."

Which users' needs does automated mobility address?

If we do not need a driver, then part of the operation or the service cost would be reduced. This could help create better business cases for delivering things to rural or more remote areas with automated vehicles going there. Today it may be too expensive to send deliveries to people living in these areas. So, if we can do that without the driver, automated solutions could serve areas that are not accessed today. Of course, this assumes vehicles that are able to cope with the traffic environment in remote and rural areas, which is not necessarily the case yet.

On another note, automated solutions can also help improve the working conditions for drivers or to create better jobs in different locations that can be hard to work in, like mines or very remote areas.

What are the main safety concerns and how can they be tackled?

We need to be patient. Five years ago, everyone said that technology was ready. But experience has proven that it was not as easy as we thought. We are learning a lot, and we must test the technologies, but of course in a controlled manner.

One of the challenges is how you validate the performance of an automated system. It is not just how many miles you have driven without running into something, it is much more. You must have a broader perspective, so it is all about 'testing, testing, testing,' but doing it in a controlled way and taking step-by-step approaches in introducing the systems. In most European countries you need to have a permit for automated driving on public roads. When applying for a permit you must prove the safety case – you must show that you will not cause any safety problems and show how you will tackle different challenges, like how the automated vehicle will react if a pedestrian enters in front of the vehicle. Take shuttles, for example.

Today the focus is on not running into anything and the brakes may be designed to ensure that if the shuttle travels at say 40 km/h you do not hit a pedestrian. For a shuttle traveling at a much lower speed, for example, 15 km/h, the brakes really kick in quite aggressively if it detects a pedestrian in front of the vehicle. At this quite low speed, this may be uncomfortable and dangerous for the passengers in the shuttle. There is an unbalance between the interior and exterior safety that needs to be addressed.

We, the public and the users, must understand the limitations of what automotive vehicles can and cannot do. Also, of course, when designing these systems, that should be done so they are "foolproof" – it should not be possible to misuse them. It is critical to be humble and not oversell systems while they are still being developed.

Why is it important to consider the stakeholders' involvement and perspective? Is there enough communication and collaboration with the manufacturers implementing the solutions?

Communication between different stakeholders and bringing in different points of view can always be improved and there are several actions aiming to do so. In Europe, we have the CCAM

> “We, the public and users, must understand the limitations of what automotive vehicles can and cannot do.”

Partnership, where CCAM stands for Connected, Cooperative, and Automated Mobility. The partnership involves about 200 different stakeholders: manufacturers, researchers, member states, cities, regions, operators, suppliers, and the telecom industry. Even if some user groups are also represented, the interaction with them can be further improved.

Within this partnership, we have seven different areas that we are addressing. Vehicles are, of course, one topic being discussed, but there is also one team working on societal aspects and people’s needs.

Now, I think everybody understands that automated mobility will only make an impact if it is used, understood, and appreciated, and to achieve that you cannot just say, “look, here is our new technology, please like our new technology.”

The technology has to serve a purpose and I think this is understood, there is a lot of concern about thinking about people, bringing in users, of what people do, where CCAM solutions can be of use, what can make life better, funnier, easier, cheaper. I think this recognition is increasing and we have to work on the mechanisms and projects that make this happen.

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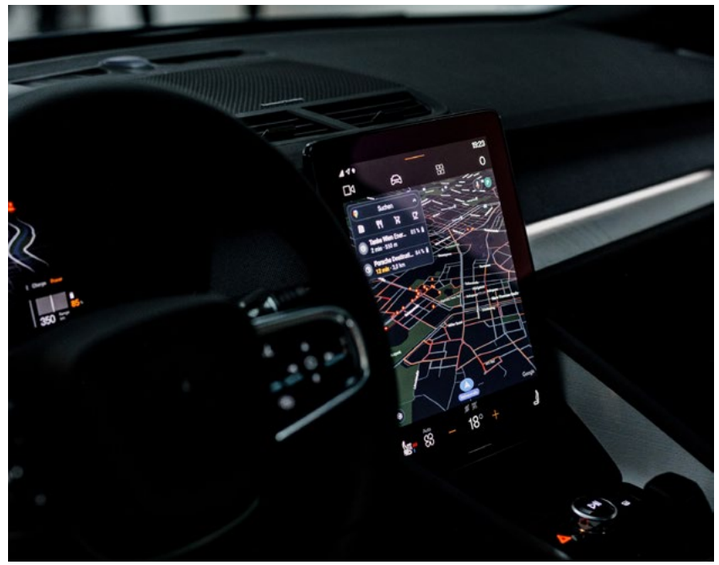

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1. Electric vehicle recharging in a parking lot. Photo: Michael Fousert /Unsplash
2. Belén Gutiérrez Carmona interviews Ingrid Skogsmo. Photo: Aske Berentsen / REVOLVE
3. The dashboard of a car with a GPS device. Photo: Patrick Langwallner / Unsplash
4. Vehicles in a highway crossing in Kuala Lumpur, Malaysia. Photo: Deva Darshan / Unsplash
5. An autonomous shuttle in South Korea. Photo: Daesun Kim / Unsplash

What is the test phase status? When do you expect this to become a commercial reality or commonplace on the roads?

There are systems out there today. Adaptive cruise control is something along these lines, emergency breaking in new vehicles too. I think you will see more autonomous solutions in closed areas, in industrial areas there are already tests taking place, and there are driverless trucks transporting things. It will take a long time until you have no steering wheels in most vehicles that can take us everywhere; this is a long term. Testing and validation have to go on and will take quite some time.

I used to work on the policy side, and the task was to ‘accelerate the deployment of automated mobility.’ I have also been involved in implementing a shuttle project in Sweden, these square-type shuttles for six to eight people, with a safety driver, and I felt that we ran into new surprises every day – like the grass had grown and the sensors did not accept that. It will take some time until we have those robo-cars that pick you up and drive you to any place you want. I do not think I will ever live to see that being widespread.

What policy barriers do these solutions find, especially in the EU context? Is there any country taking the lead or can you give some examples?

In the European perspective, there are different approaches to what you are allowed on the road and how you get a permit for operating on the public roads. The procedures are different but there are efforts to harmonize more how we do this.

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It is hard to say if somebody is taking the lead or not, it depends on where you look, but I think we need some common ideas of how you validate things, what is valid, and what is required to release automated vehicles for wider use in public areas.

There are standards being set up for human-machine interaction for vehicles. Single components and elements of automation are being standardized and that goes throughout Europe. There is a lot being done and that is good because if you sum up all these experiences, we probably can get some good ideas on what best practice is. The beauty of Europe is this multitude that we can learn from, and I think that is the task we must take on.

One barrier to implementation is the difficulty of knowing exactly what is safe enough, another one is that you lack common standards. Regulation, permissions, how you deal with cross-border communication, you have to find business cases, how to fund these, and with what infrastructure. Also, a further barrier is to agree on who is responsible for what, and how to deal with responsibility and liability. If we can take a European approach, and leverage Europe's diversity in handling the issues we have discussed here, we will have a good chance to bring CCAM on the road where it makes sense, is useful and appreciated, and thereby can contribute to higher accessibility. ●

"I think everybody understands that automated mobility will only make an impact if it is used, understood, and appreciated."

Iceland Raw

PHOTOGRAPHY AND TEXTS BY **WILHELM WESTERGREN**

With a population of just a few hundred thousand people living mostly in the capital of Reykjavik, the Nordic island nation of Iceland is known for its active volcanoes, bubbling geothermal bathes, erupting geyser and spectacular geysers. Located on the way to the Americas, Iceland is also known as a way station for the Vikings on their voyages to discover new lands, and it's location has positioned the national airlines – Icelandair – as a viable option for making a pitstop on the way to Europe and back for travelers hailing from North America. Here we take you on a spectacular tour of the island to get a flavor of what you could discover during short layover.

VIEWS

Above: Foss á Síðu is a waterfall in southern Iceland. The Fossá River drops down over a basalt cliff and ends 30 meters below before it continues on its way to the Atlantic Ocean.
Below: Marine mammal bone on display outside the town of Djúpivogur. **Side:** Throughout June and July, Iceland comes alive with the color of blooming lupines.

The lush landscape next to Skógafoss with Icelandic sheep, which are thought to be one of the world's purest and oldest sheep breeds. They are strong and sturdy animals with beautiful, thick coats.

Side: Storage room in one of the old turf buildings at Glaumbær, giving insight into the settlement of Iceland in the ninth century. **Above:** The raw and ever-changing landscapes south of Kálfafellsstaður in the Southern Region. **Below:** As its name suggests, the Icelandic horse is a breed of horse developed in Iceland. They are long-lived and hardy. The breed is still used for traditional sheepherding work in its native country, as well as for leisure, showing, and racing.

Jökulsárlón is a glacial lagoon bordering Vatnajökull National Park in south-eastern Iceland. The Glacier Lagoon flows through a short waterway into the Atlantic Ocean, leaving chunks of ice on a black sand beach.

Above: In the early morning of February 12, 1988, the fishing ship Hrafn Sveinbjarnarson III GK 11 was shipwrecked at Hópsnes, just off the cape near Grindavík, Iceland. **Below:** The rugged landscape south of Húsavík on the eastern shore of the Skjálfandi Bay, also known as the whale capital of Iceland. **Side:** Two old timber houses near Glaumbær. The old turf buildings at Glaumbær are a fine example of building construction on the larger farms in Iceland in times gone by.

Side: Goðafoss is one of the most spectacular waterfalls in the country, falling from a height of 12 meters over a width of 30 meters. **Above:** Svínafellsjökull is a glacial tongue of the Vatnajökull Glacier, the largest glacier in Iceland and in Europe. **Below:** Hverir is a geothermal area under the Namafjall mountain which lies in the Krafla volcano fissure zone.

Dettifoss is a waterfall in Vatnajökull National Park in south-eastern Iceland. Dettifoss is situated on the Jökulsá á Fjöllum River, which flows from the Vatnajökull Glacier and collects water from a large area in the Northeastern Region.

Above: Fish farm close to Djúpivogur town in the Eastern Region, forming part of the Berufjörður fjord landscape. **Below:** Bubbling mud pool at the Hverir geothermal area. The area also features fumaroles, steam vents and a bare orange-red landscape.

Climate Capitals of Latin America and the Caribbean

WRITER: **ELIZABETH VERGARA**

Revolutionizing urban sustainability: CC35's drive to reconnect Latin America's capitals with nature.

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Latin America and the Caribbean have experienced a series of social, economic, and environmental changes that have impacted the region's relationship with its natural resources. During the pre-Columbian era, many indigenous civilizations maintained a close connection with nature, practicing sustainable agricultural techniques and valuing conservation and spirituality related to the natural environment.

The arrival of European colonizers in the 15th century produced a drastic change in the region's relationship with its natural resources. The colonizers focused on the extraction and exploitation of resources, especially minerals such as gold and silver, to finance the development of the European colonial powers. This excessive exploitation had significant negative consequences, such as the destruction of ecosystems, the oppression of the indigenous population, and the introduction of diseases that decimated native communities.

In the following centuries, the region became a periphery of the world economy, characterized by the export of raw materials and the import of manufactured goods. This economic model, known as the "dependent development model", deepened the disconnect between Latin America and the Caribbean and its natural wealth. The region's economies depended largely on the intensive exploitation of natural resources, such as extensive agriculture, mining, and oil extraction, without developing industries that added value to these resources.

In the 20th century, social and political movements arose throughout the region seeking greater autonomy and social justice. Agrarian reforms were carried out in many countries to distribute land among peasants, and natural resources were nationalized to control their exploitation and benefit the local population. However, these processes met with resistance from powerful interests, both internal and external, that sought to maintain the region's economic dependence.

All these events enhanced people's disconnection from nature not only by the rapid growth and development in cities but also by the contemporary human being's dominance over it.

Some of the causes are the exploitation of natural resources, deforestation in the Amazon region, and the contamination of rivers due to mining. This has raised concerns for the environmental preservation and protection of the rights of local communities. And it is important to highlight that there are significant efforts to promote conservation and a greater connection with nature in the region, through government initiatives, non-governmental organizations, and local communities.

Now, why is it essential that these cities reconnect with their natural environment? Because by doing so they will guarantee sustainable development, a better quality of life for their inhabitants, protection of the environment, resilience in the face of the climate emergency, promotion of sustainable tourism, and cultural and spiritual connection.

Today, the climate emergency represents a growing threat to the region, with extreme events such as hurricanes, droughts, and floods that disproportionately affect and endanger life on the planet, and notably the life of human beings. Therefore, cities in the region should prioritize reconnecting with nature and the benefits this can bring through the Capital Cities 35 (CC35) organization.

Source: BID: Inter-American Development Bank

The Americas and their individual commitments to climate change

The region is vulnerable to the impacts of climate change due to its diversity of ecosystems, its dependence on natural resources, and its high proportion of the population living in vulnerable areas, such as coastal zones or regions prone to drought or floods.

For these reasons, several countries in the Americas have adopted actions to address climate change and promote environmental sustainability. That is the case with international agreements such as the Paris Agreement. Brazil, for example, has made progress in renewable energy production through the expansion of hydropower and other countries have implemented forest protection and restoration policies, as well as biodiversity conservation programs to mitigate greenhouse gas emissions and preserve the natural wealth of the region.

Some cities in the region are implementing efficient mass transit systems and promoting the use of bicycles as a means of transportation. Resilient agricultural practices and the improvement of early warning systems for extreme weather events are also being promoted.

Although Latin America has shown its commitment to climate change, challenges remain such as reducing greenhouse gas emissions more ambitiously, promoting social inclusion in mitigation and adaptation measures, and strengthening regional cooperation and financing.

CC35: Climate integration through local diplomacy

Capital Cities 35 (CC35) is the first climate initiative in Latin America that was created and promoted thanks to the leadership of Spanish-speaking capital cities. The coalition is made up of mayors from various cities in the Americas, who commit to reducing local greenhouse gas emissions, strengthening the resilience of cities in the region, and leading the climate agenda in the context of the Conference of the Parties (CoP) of the United Nations Framework Convention on Climate Change (UNFCCC). In addition, CC35 focuses on implementing the agreements established in the Paris Agreement and in the United Nation's 2030 Agenda.

The objective is to develop the region's capacity to deal with climate change and this can be achieved through actions such as green financing, technical assistance, innovation, and the exchange of experiences.

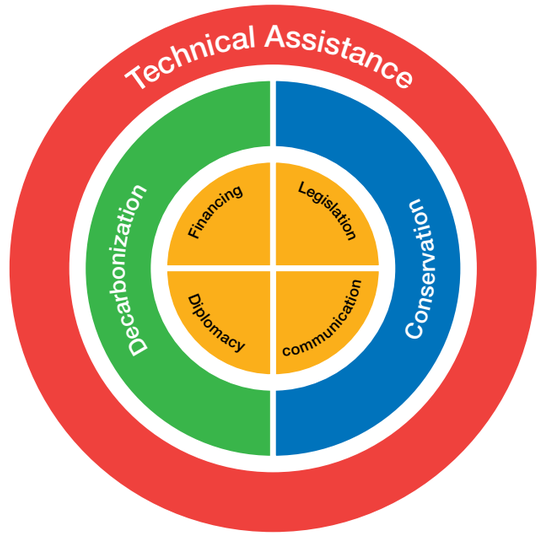
“In the face of the climate emergency, humanity can no longer wait for national governments, it is time to guarantee a possible destination from the bottom up from the Americas. We cannot remain in the pages of history as accomplices in the destruction of this planet.”

– Sebastián Navarro, Secretary General of CC35

By facilitating dialogue and negotiation between different entities, local diplomacy contributes to support cooperation, understanding, and sustainable development at the regional level, as well as to the peaceful resolution of conflicts and the exchange of knowledge and experiences in areas of common interest. In an increasingly interconnected world, local diplomacy plays a crucial role in addressing regional challenges and building a more sustainable future.

The region is exposed to climate impacts, such as rising temperatures, water scarcity, desertification, extreme weather events, and rising sea levels, however, the context of climate change allows the countries of the region to unite, promote effective actions, protect their natural resources and biodiversity, establish regional cooperation agreements and mechanisms, and actively participate in international negotiations. In this way, Latin America and the Caribbean can significantly contribute to global efforts to combat climate change and promote sustainable development in the region.

For CC35, the alliances and dialogues of the mayors are fundamental and important to carry out green projects that combat climate change through resilience, mitigation, and adaptability A significant case is the technical assistance of the Forum of Local Environmental Authorities, which sought to promote a socially just post-pandemic green transition through local diplomacy.



CC35 and its axis of work together with the 35 Capitals in the face of the climate emergency. Source: CC35

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Rapprochement of the city with nature

In the face of the climate emergency, the 35 capitals part of CC35 propose to reconnect cities with nature based on 2 axes:

Decarbonization and conservation are essential to connect cities and nature, with mutual benefits. By reducing carbon emissions, climate change and its negative impacts on ecosystems are mitigated – especially in cities that emit large amounts due to their population density and economic activity.

Embracing cleaner technologies and practices, such as renewable energy and sustainable transportation, create healthy and sustainable environments. The protection of biodiversity by connecting natural areas promotes the conservation of endangered species and maintains the ecological balance in urban areas, improving the quality of life and mental and physical health. Decarbonization and conservation strengthen the resilience of cities in the face of climate change, reducing the risk of extreme events and taking advantage of the ecosystem services of natural ecosystems.

That is the purpose of CC35 and its commitment to conciliation with nature through different programs:

- Jurisdictional or government programs that propose a **green+ approach** refer to promoting green in urban areas. This financing program’s purpose is conserving biodiversity, reducing greenhouse gas emissions, promoting renewable energies, and sustainable management of natural resources, among others.

- **Carbon parks** are designated land areas used to conserve or restore ecosystems with the goal of absorbing and storing atmospheric carbon. And they can include forests, wetlands, mangroves, or other natural ecosystems that have a high carbon sequestration capacity within cities.

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- **From zero zone to zero carbon** is an **aid project for Haiti** whose purpose is a set of measures that seek to reduce carbon emissions to zero, through the implementation of policies and actions that promote sustainability and environmental protection.

- Choosing Quito as **Green Capital of the Americas** implies that the city has implemented successful policies and programs to protect the environment, preserve natural areas, encourage eco-efficiency, and promote sustainable development. The city may have adopted measures such as reducing carbon emissions, promoting renewable energy, proper waste management, protecting green spaces, and environmental education. This recognition not only highlights Quito's efforts in environmental conservation but can also increase the visibility and attractiveness of the city as a tourist destination, since its commitment to sustainability and the protection of the natural environment is recognized.

Turning every capital into "green capital" is an objective and desire of CC35.

Finally, the cultures of indigenous peoples must be claimed and recognized as these communities have historically been stewards of the earth and have a deep understanding of and respect for the environment. Incorporating their knowledge and traditions into efforts to become a "green capital" can be a way to honor your ancestral connection to nature and learn from its wisdom.

The importance of this axis of CC35, where governments, communities, and individuals work together in this common objective of "green capitals" is to reconnect with nature. The transition towards greener and more sustainable cities implies changes in urban planning, infrastructure, transport, energy, and lifestyles.

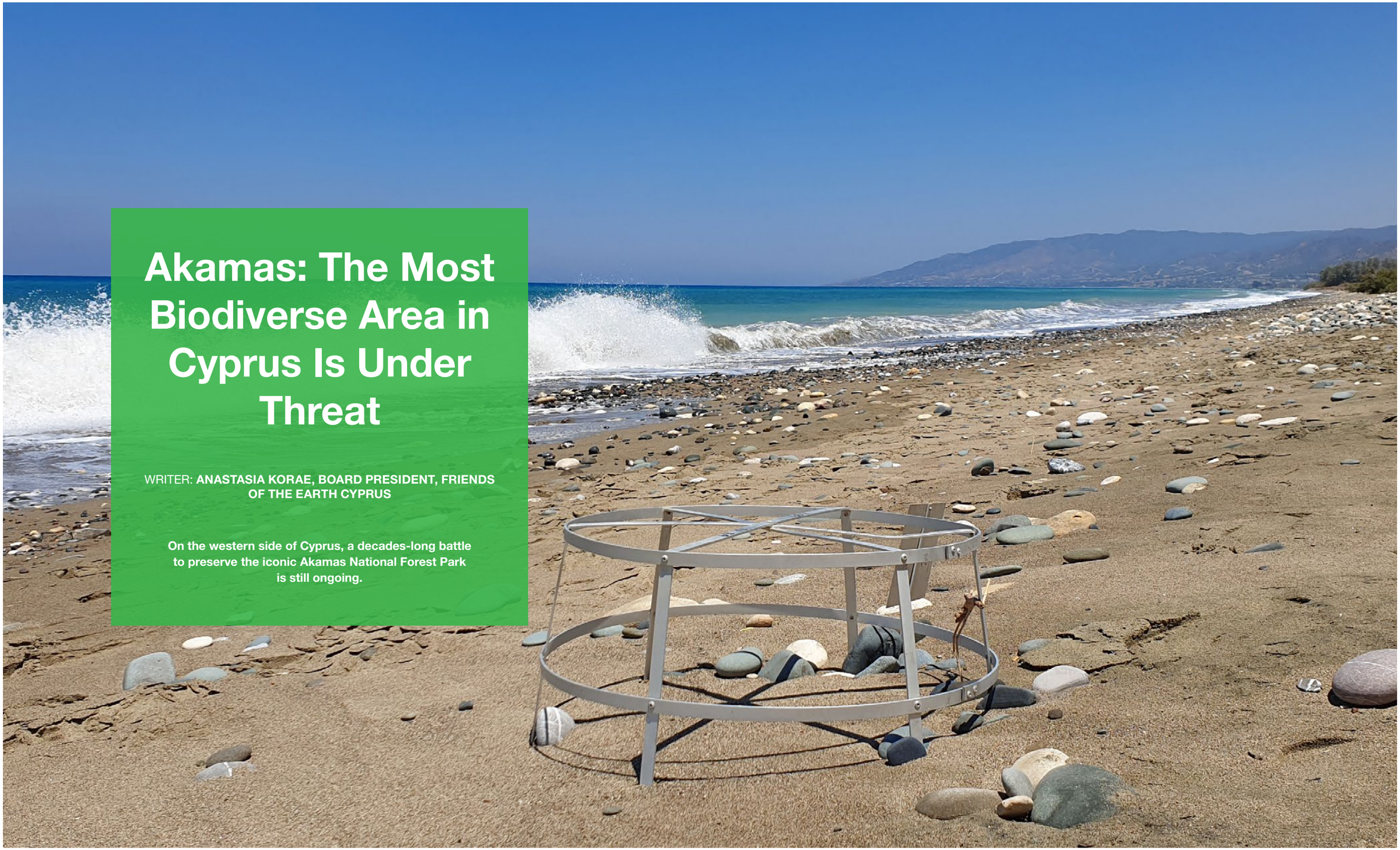
If every capital in Latin America and the Caribbean commits to becoming a "green capital" hand in hand with CC35, it can have a significant impact on climate change mitigation and environmental conservation. In addition, a powerful message of leadership and hope would be sent regionally and globally. ●

1. Bogota, Colombia. Photo: Michele / Adobe Stock
2. Orla of San Raimundo in Manaus city, amazon, Brazil. Photo: Creative Design N. / Adobe Stock
3. Amazon. Photo: Christian Vinces / Shutterstock
4. Amazon. Photo: Curioso Photography / Shutterstock

Akamas: The Most Biodiverse Area in Cyprus Is Under Threat

WRITER: **ANASTASIA KORAE, BOARD PRESIDENT, FRIENDS OF THE EARTH CYPRUS**

On the western side of Cyprus, a decades-long battle to preserve the iconic Akamas National Forest Park is still ongoing.



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In 2009, the Government of the Republic of Cyprus designated part of the Akamas peninsula as a Natura 2000 site as several of Akamas's habitats have been designated as Special Protection Areas under the EU Birds Directive and as Sites of Community importance under the EU Habitats Directive.

The area is considerably fragmented since it has different ownership statuses (state-owned forest land and private land) and it is governed by three different spatial planning regimes that will regulate future development in the area. To make things even more complicated, five government departments are responsible for Akamas' protection and management, in addition to several local authorities that have jurisdiction over the area.

Despite its obligations under EU and national law, Cyprus has failed to establish adequate conservation objectives and measures for Akamas that would ensure that species and habitats are adequately protected, all while fragmentation contributes to lack of coordination, conflict of interests, and complications when it comes to policy making and law enforcement.

A unique peninsula

Akamas peninsula is located on the westernmost part of the island of Cyprus and covers a terrestrial and marine area of pristine and diverse landscape. It hosts archaeological sites and a variety of habitats, from pine forests to low shrubs, from valleys to streams, from grasslands to fruit trees, and from gorges to sandy shores.

Species of European importance, such as the Mediterranean Monk Seal and the Egyptian Fruit Bat form colonies on Akamas, the Green Turtle and Loggerhead Turtle nest on its shores, while the Bonelli's eagle breeds on the mountainous parts of the peninsula. Akamas is the most biodiverse area under the effective control of the Republic of Cyprus and one of the few remaining natural areas that has not been irreversibly damaged by the tourism industry and other sectors.

Pressures and threats

Until the year 2000, the peninsula was used by the British Army and Navy for military exercises and as a firing range. Thankfully, this is no longer the case, but over the past few decades, the area has been facing various pressures and threats, including but not limited to fly-tipping, arson, legal and illegal hunting, overgrazing, uncontrolled movement, and parking of motor vehicles and anchoring of tourist boats, illegal expansion of a quarry zone, and unlicensed structures and buildings.

This unique natural area is gradually degrading due to increased human presence and activity, and the most recent government plans are not exactly reassuring of the future. Corporate interests and inefficient governance interact dynamically and uncover new and persisting challenges for the extremely vulnerable ecosystems. If the worst scenarios become a reality, a unique natural area of national and European significance will suffer irreversible damage, while the loss of the competitive advantage of the area will probably affect the long-term economic prospects of local communities.

An incapable justice system, lack of transparency and legislation gaps

Frequently, the current laws are disregarded as construction projects proceed without the required permits, such as excavations, roadwork, and building construction. Surprisingly, those responsible for such violations often escape prosecution and penalties, what creates substantial barriers to pursuing timely legal remedies, especially in cases related to environmental matters, including the Akamas region. Only after a protracted five-year legal process was the rightful entitlement of environmental NGOs to engage with the national courts for the purpose of ensuring environmental protection officially acknowledged by the relevant court.

Lack of transparency concerning policy-making and law-making are also longstanding issues public consultation procedures are compromised by design and citizens are left to speculate what certain key policy documents prescribe to make representations. This is standard practice, but it clearly constitutes a violation of EU legislation and of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. Another problem is the fact that the Cypriot Parliament refuses to record the meetings of Parliamentary Committees and obstructs the direct access of citizens to information.

Landowners of private property within the Natura 2000 sites claim that they are being deprived of their development rights since their plots, which were classified as tourist zones, were later designated as protected sites. Development rights are contingent on zoning plans, but a legislative gap exists for undevelopable properties. The state hasn't provided maps or discussed options like compensation or exchange for these plots.

Last, but not least, the Seventh Protocol to the Barcelona Convention on Integrated Coastal Zone Management in the Mediterranean, which came into force in 2011, has not yet been ratified

by the Republic of Cyprus. The said Protocol imposes a no-building zone of a width of 100m from the shore when at present, special deviations from national legislation allow constructions within 30 meters from the shore in certain cases.

The role of the Church and Corruption: A deeply rooted phenomenon

A Specially Protected Area of Mediterranean Importance called "Lara-Toxeftra" in Akamas is private land that belongs to the Greek-Orthodox Paphos Bishopric. The Paphos Bishopric and the Cyprus Archbishopric have been interfering in the functioning of public institutions for the purpose of serving their own financial interests for many years. Since the 1990s they have been advocating for tourist development in the area and they even facilitated the transport of large volumes of sand from the beach to a golf course under construction, without facing any consequences. The church often receives favourable treatment and has strategic influence that undermines the effectiveness of institutions under different circumstances that affect the common cultural and natural heritage on the island.

In Cyprus, real estate firms collaborate with legal experts, accountants, politicians, and officials, leveraging their influential networks to exploit power for personal benefit supporting measures such as to amend laws and encourage investments through a controversial "golden passport" scheme. In 2020, Cyprus made international headlines when Al Jazeera's Investigative Unit published leaked documents that revealed that 2,500 people, including convicted criminals from third countries, paid to become citizens of the Republic Cyprus and, consequently, citizens of Europe.

As a result, the European Commission considered that such schemes have implications for the EU as a whole and took measures against Cyprus. And even though the said scheme was repealed, officials still try to satisfy the wishes of affluent investors by devising new methods to bypass – as far as possible – legislation that protects the environment.

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1. Volunteers patrol beaches and search for turtle tracks every morning during the summer months. Special cages are then placed over any nests identified to protect them from human activity and invasive predators (such as foxes) until they are ready to hatch. Photo: Anastasia Korae
2. Akamas landscape. Photo: Anastasia Korae
3. An active citizens movement that has been demanding the adequate protection of Akamas through advocacy and protesting. Photo: Anastasia Korae
4. A turtle hatchling has just started its journey. It is estimated that only around 1 in 1,000 marine turtle hatchlings make it to adulthood. Photo: Anastasia Korae
5. Akamas landscape. Photo: Anastasia Korae
6. Akamas landscape. Photo: Anastasia Korae

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Violations of EU law and the EU's involvement

Admittedly, the Republic of Cyprus does not have a good track record when it comes to environmental matters and good governance. Several environmental infringement cases are open with the European Commission, and some of them are in fact directly related to Akamas peninsula and the Natura 2000 sites. The EU Commission has sent multiple formal notices and reasoned opinions urging Cyprus to take effective and legally binding actions to achieve compliance.

Following a petition submitted by Friends of the Earth Cyprus to the European Parliament in 2022, the Commission stated that it will "continue to maintain pressure on Cyprus so that adequate conservation objectives and measures are established for all Special Aras of Conservation, including the one of Akamas. Otherwise, the Commission will not hesitate to take adequate action against Cyprus, including if necessary, referring the infringement case to the Court of Justice of the EU". The EU Parliament has also decided to keep the Petition open in order to follow up developments and ensure that the *acquis communautaire* is applied.

Conservation efforts and a movement working for Akamas

The situation is not, however, entirely grim. The competent government departments, alongside a handful of NGOs and local communities, have been working on research, conservation, and education in Akamas. A conservation project for turtles has been implemented since the 1970s and has had extremely encouraging results for the populations of both species of Mediterranean turtles: the Green Turtle and Loggerhead Turtle.

Moreover, a focal point has been the active citizens movement demanding the adequate protection of Akamas through advocacy and protesting. Over the years, thousands of people

took to the streets to show opposition to plans that allow large-scale tourist developments, extensive road networks, roundabouts, constructions, and business activities that undermine the Natura 2000 sites and the economic prospects of local communities.

A holistic vision for Akamas

The Standing Committee of the Bern Convention on the Conservation of European Wildlife and Natural Habitats recommends that "the Government of the Republic Cyprus declares the whole of the Akamas peninsula a national park, a biosphere reserve or a protected area with comparable international protected status, including in the protected area the Natura 2000 area, aiming to facilitate a coordinated management of sea-turtle nesting beaches in north-west Cyprus, and to ensure that the Akamas Peninsula, as a whole, including a terrestrial and a marine part, be managed in a sustainable, integrated way".

This is the vision shared by the movement working for Akamas that, however, goes a step forward and recommends the setting up of a special entity for the integrated management of the peninsula, drawing from the experience of other Natura 2000 sites that are being properly managed. This entity could be charged with monitoring the enforcement of applicable rules and coordinating the activities taking place on the peninsula, ultimately ensuring environmental protection and sustainable development for local communities.

The delicate ecological balance that has been shaped over millions of years cannot be left to chance. Focused action and undivided attention will be needed to rectify the irregularities and achieve meaningful progress. It will not be easy, and it will take time, but in the face of a biodiversity crisis and climate crisis, areas such as Akamas need to be protected and restored, using all the opportunities provided by the European Union – for the sake of current and future generations.

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Navigating Spain's 'Sea of Plastic'

TEXT AND PHOTOGRAPHY BY: **JAKE THREADGOULD**

The booming greenhouse business of providing evermore vegetables to Europe has taken over south-east Spain.

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Plastic greenhouses cover an area greater than Malta in Spain's southern Almería province, where a boom in highly efficient and profitable intensive agriculture has turned the region into the fruit and vegetable garden of Europe.

A hillside vantage point provides a panoramic view of a portion of the *"mar de plástico"* (sea of plastic), as it is locally known, that has swallowed up Almería's Mediterranean plains. Towns and villages rise from it like little islands. However, the sheer scale of the *mar de plástico* can only truly be appreciated from space. To an astronaut orbiting overhead, swathes of Almería appear bleached of all color as the sun's light rebounds off some 370km2 of thick plastic sheets. This is the largest concentration of greenhouses on the planet.

Mapping plastic

Back on Earth, we are standing on a low ridgeline in the countryside just north of the Cabo de Gata Natural Park.

"You can see it on the map," Umberto Zanesi, a member of *Ecologistas en Acción* (Ecologists in Action), a Spanish environmentalist group, tells REVOLVE as he zooms in our location on his phone. He is not referring to the sea of plastic in this case, but rather a dumping site where plastic waste from greenhouse farms has been left to sit in the open.

It is one of nearly 400 illegal dumping sites that his organization has flagged and pinned on an interactive map of Almería province as part of an initiative called *Stop Vertidos Ilegales* (Stop Illegal Dumping). Zanesi says one of the group's main challenges is to get local authorities to act. This dump, he adds, has been here for around five years. On its website, the group says it has officially reported 198 illegal waste dumps but that just 11 have been cleaned up.

Some of the plastic sheeting at the dump we have come to visit, which spans 100m2, is at a later stage of breakdown. A spiny-footed lizard darts through the plastic flakes littering the soil in search of shelter. The longer the plastic remains here, the greater the chance microplastics will seep into the earth and the water system. The sea along the coast of Almería has been found to have three times the average quantity of microplastics, according to the Institute of Environmental Assessment and Water Research (IDAEA).

The sea along the coast of Almería has been found to have three times the average quantity of microplastics than elsewhere.

Source: IDAEA.

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According to the regional government of Andalusia, 85% of agricultural plastic waste is recycled but 15%, or some 5,000 tons annually, is not. By law, local greenhouse farm owners must dispose or recycle waste plastic through official channels although there is no formal mechanism in place to follow the disposal chain from start to finish. It means illegally dumped plastic waste is untraceable. Running parallel to the official disposal channels are unregulated services that undercut prices to take plastic off farmers' hands. Zanesi believes a lot of the issues around plastic waste in the region stem from structural deficiencies linked to the development model of the local agro-industrial sector.

"While they invest in boosting production and maximizing profits, issues like waste management and water management, as well as the impact of chemicals and social issues, always figure as secondary problems that they attempt to solve subsequently, and never reach a definitive solution," he tells REVOLVE.

Zanesi points out that the environmentalist group wants to work with the farmers in the region. "In this sense, we believe that the whole market chain, from the producers to the distributors and consumers, should be co-responsible for these impacts and assume the environmental costs. Some 80% of the produce is exported, for which reason it is the European market, the governments, and the EU who must look for formulas to build a truly sustainable agro-industrial model."

More crop per drop

The model of agriculture in Almería — and in other parts of southern Spain — is highly productive. The use of greenhouses in this warm climate means farmers can harvest produce several times a year and sell fresh fruit and vegetables to northern European countries during the winter. Hydroponic irrigation, which can be precisely controlled by computers, also means that the use of water in this arid corner of Spain – home to what is considered Europe's only true hot desert – is extremely efficient.

However, put together, the sheer sum of greenhouses that occupy the province means there is a large collective demand for freshwater. The Jevons paradox springs to mind. *Ecologistas en Acció*n says the aquifers in the region are overexploited and exposed to microplastics and to salination by seawater, which seeps into groundwater when levels are lowered.

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This situation has led to a rise in desalination plants, which are very energy-intensive and present secondary issues such as increased carbon emissions due to their reliance on fossil fuels. This challenge is being addressed in Almería by the EU-funded WATER-MINING project, which is researching the use of solar energy from concentrated solar power (CSP) to fuel desalination processes.

Pride, prosperity & poverty

The intensive greenhouse farming in Almería is astronomical in scale and colossal in terms of economics. Since the 1960s, this ever-expanding cluster of greenhouses has brought relative prosperity to a region previously blighted by poverty. It is a major source of local pride, and income.

Today, during the growing periods, thousands upon thousands of greenhouses burgeon with tomatoes, peppers, zucchini, cucumbers, eggplants, melons, watermelon, and lettuce. Between October 2021 and 2022, Almería's greenhouses produced over 3.5 million tons of fruit and vegetables, drumming up some 2.79 billion euros. Around 3/4 of the produce in that campaign was exported to 13 European Union countries and the United Kingdom. Germany was the top buyer that year, shipping in nearly 950,000 tons of produce.

The prowess of the expanding agricultural model ripples across the local economy. In El Ejido, a major town in the sea of plastic, adverts sell greenhouse insurance and seeds while phone numbers spraypainted on the side of greenhouses offer bleaching and plastic disposal services.

However, the shantytowns and rundown buildings in the region tell another side of this economic success story. It is a well-documented one of often dire working and living conditions for the many thousands of mainly migrant workers who toil away in the greenhouses often at night to avoid the heat of the day.

A maze of plastic

It is mid-July 2023 and many of the greenhouses are empty, lying in wait for the next planting season the following month. There is little action, although occasionally the silent and languid heat that has settled over the nameless dirt tracks is interrupted by a passing worker on an electric scooter. The odd truck emblazoned with images of vegetables trundles down the lanes of plastic.

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1. A truck moves along the road near La Mojonera, Spain.
2. A view of the mar de plástico in Almería, Spain.
3. Vegetation grows next of an illegal plastic dump in Almería, Spain.
4. Greenhouses overlooking the landscape near Almería, Spain.
5. Tomatoes to be used as natural fertilizer at the RECICLAND project site in La Mojonera, Spain.
6. A gecko inside a manmade shelter at the RECICLAND project in La Mojonera, Spain.

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On the ground somewhere between La Mojonera and El Ejido, on the Campo de Dalías coastal plain south-west of Almería city, greenhouses line the labyrinthine roads that wind from roundabout to roundabout, town to town. Here, the sea of plastic is at its most dense as small-scale farms seemingly jostle for every inch of land. In stark contrast to the nearby Cabo de Gata Natural Park, there is little room here for nature among the 222km2 of greenhouses.

Some organizations in the sea of plastic are working to address ecological degradation. At the Andalusian Institute of Agricultural and Fisheries Research and Training (IFAPA) in La Mojonera, the multi-pronged RECICLAND project is underway to boost local biodiversity and the sustainability of the greenhouse farming model in the region.

At RECICLAND's demonstration site behind the IFAPA center, researchers are demonstrating the potential of green corridors as a biodiversity booster as well as more circular solutions within agricultural practices, including efficient ways to reuse, recycle and manage plastic and organic waste.

Waste not, want not

One of the effective solutions at the trial site is the reuse of waste organic products such as fruit and vegetables discarded at harvest. While it seems simple, this practice is the root of a domino effect that goes beyond improving the local soil health with natural fertilizers, says Alvaro Sánchez, director of IFAPA's La Mojonera center.

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“Incorporating crop waste into the soil is a way to fix CO2 while also reducing the need to transport said residues, which also reduces CO2 emissions, as is the case with the recycling of other elements such as plastic covers, containers, irrigation materials […] but the implementation of these practices that we promote in the project have other greater and more direct benefits in the lives of farmers and consumers,” he tells REVOLVE in an interview.

“The reuse of crop waste increases the organic matter of the soil, which leads to edaphic ecosystems with greater and more balanced biodiversity. This improves the plant health of crops and leads to the reduction of phytosanitary treatments. A high content of organic matter results in lesser use of fertilizers, which have become exponentially more expensive in recent years, and in less soil contamination by nitrates,” Sánchez notes.

This ethos of circularity is also reflected in the plastic waste management innovations on show at the center, as demonstrated by one of the bug hotels fabricated from discarded plastic piping that once served an agricultural purpose.

“The recycling of inorganic material like plastic provides a chance to give a second life to these materials, which are no longer treated as waste but become a new primary material to make new products. Increasing biodiversity creates a more resilient environment in the face of insect plagues and helps us ward against this at a lower cost,” he says, adding that “these practices have a very positive impact in many aspects: environmental, economic, commercial, and food.”

A greener future?

Dr. María Del Mar Tellez Navarro, a lead technician at the center, tells REVOLVE that encouraging biodiversity through the introduction of native hedgerows can also benefit local ecosystems in a region dominated by greenhouses.

“Greenhouse horticultural crops are a more intensive production system than other agricultural or outdoor systems. These hedges are made up of multi-annual plants of varied sizes and that are well adapted to the environment. The selection of species is carried out in such a way that flowering is staggered, to attract beneficial insects throughout the year and reduce the visual impact of the agricultural infrastructure,” she explains.

The benefits of the green corridors are on full display at the RECICLAND project site, where despite the summer heat, native plant species add color and shade to the landscape. Occasionally dotting these hedgerows are man-made wooden boxes that provide shelter to local geckos. Since it was launched in 2021, some 1,116 people, including representatives of public organizations, the private sector, and education centers have visited the RECICLAND demonstration site to gain knowledge.

“Without a doubt there is a growing interest in various technical solutions to manage farming waste, and that are in line with the reuse or recycling of inorganic and organic materials generated by greenhouse agriculture,” Tellez adds.

Looking out from the IFAPA education center, the view is much the same as elsewhere in this corner of Almería — a sea of white plastic that stretches down to the Mediterranean Sea. But thanks to projects like RECICLAND, perhaps one day the landscape will look just a little greener. ●

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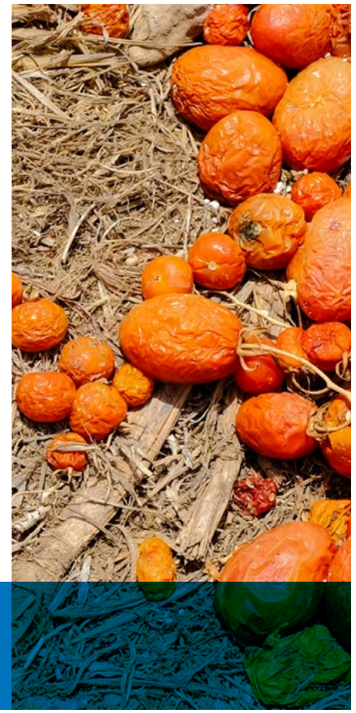

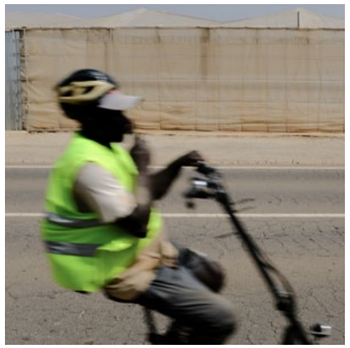

Data You Can Feel

WRITER: **JAKE THREADGOULD**

How a studio seeks to drive action by making digital data tangible.

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> “When you put it in a non-digital context, and you place it in front of something that is related to the data, you can use the context to understand the data and the data to understand the context.”

In our digital age, we have a wealth of open data at our fingertips. Climate charts, inflation graphs, temperature maps — the list goes on. The proliferation of these data can lead to a cacophony of information that plays into digital fatigue (there is a graph for that, too) and often the overflow of information can lead to less rather than better understanding of different phenomena. You need to know where to start, how to sort the huge amount of information available and finally, how to visualize it.

Some remedies to this have come in the form of data visualization, content curation, among others, but what if we were to go a step further, by removing the data from the digital sphere altogether?

At the Tangible Data workshop on the outskirts of Madrid, two creators stand back to observe a prototype of their latest design. Rising like a volcanic plume from the table in front of them are 10 evenly spread, jagged bolts of laser cut wood that have been fixed together by nuts and bolts, and partially wrapped in a white cloth as a part of an ongoing experiment to see what materials can be used to embellish the details.

The bottom half of the structure is marked by a series of undulating waves that rise to the final third of the model, at which point it blooms out rapidly to an area far greater than the base. Each of the wooden components is identical down to the smallest groove. Taken individually, the shape of the planks might even look vaguely familiar. There’s a good reason for that. What we are looking at here is a reimagining of a NASA line graph tracking the smoothed global average temperature between 1880-2021. This becomes clearer for the viewer with a tilt of the head.

Bringing data to life

The graph is alarming enough by itself, but by removing it from the digital world and reimagining it in the physical one, Antonio Moneo, founder of Tangible Data, and his colleague David San Román Gomendio, a creative whose dedication is evidenced by the numerous artworks on display in his workshop, have literally and figuratively given it a new dimension — one that makes you stop and think.

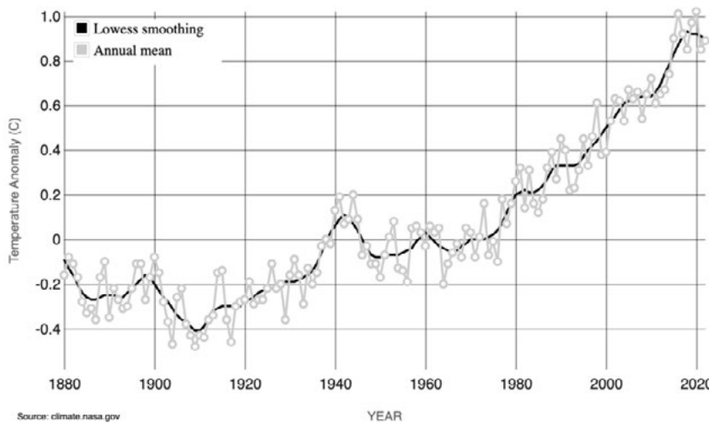
The pair are set to display the final product at the 2023 Data for Development Festival taking place between 7-9 November 2023 in Uruguay. It is their largest work to date, which is fitting considering the scale of the challenge it represents.

The sculpture recasts the NASA data, which shows how the average global temperature has increased just over 1°C (33°F) since 1880. Armed with the context, the viewer can read further into the design and pinpoint the last time temperatures dipped below average in the mid-1970s. The rapid opening of the structure at its top end is explained by the record-breaking temperatures we have witnessed in recent decades, with 2016 and 2020 claiming the grisly accolade as the hottest years ever (so far).

“When you put it in a non-digital context, and you place it in front of something that is related to the data, you can use the context to understand the data and the data to understand the context,” Moneo told REVOLVE in his workshop.

San Román and Moneo took the raw data and introduced a 10-year moving average to soften the edges of the sculpture. For Moneo, a self-confessed open data and sustainability lover, this process of data physicalization not only makes data more accessible, but it can also awaken a curiosity in the viewer and drive action by making people think.

1. Antonio Moneo framed between two Tangible Data prototype models. Photo: Javier Liaño Berjano
2. Antonio Moneo and David San Román Gomendio observe their latest structure at the Tangible Data workshop in Madrid. Photo: Javier Liaño Berjano
3. A physical representation by Tangible Data of global temperature changes. Photo: Javier Liaño Berjano
4. A representation of Covid cases at a Madrid hospital, with a call-to-action QR code. Photo: Javier Liaño Berjano
5. A representation of Covid cases at a Madrid hospital, with a call-to-action QR code. Photo: Javier Liaño Berjano



Moneo added that they want to create "data sculptures that are easy to interpret and help us raise awareness of complex challenges to audiences without a background in data analysis or access to specialized knowledge. Our first objective is to attract their attention, spark curiosity and use all their senses to interpret the data."

He then realized that "they create an emotional experience. We create small sculptures that can be touched and passed around, and large breathtaking sculptures where the audience can use their body dimensions to understand the changes in the data."

"Once you have got this sensory experience with the data sculpture," he also noted, "you will better remember the underlying message," says Moneo, adding, "then we aim to add an extra layer and invite users to take action on that message. We want our data sculptures to be the channels for that action."

"Once you have got this sensorial experience with the data sculpture, you will better remember the underlying message."

Raising awareness

Tangible Data's climate change sculpture forms part of a trio of models designed to represent the pillars of the Environmental, Social, and Governance (ESG) framework. The second was crafted to represent the evolution of extreme poverty rates in the world between 1981-2020 based on World Bank data. Finally, the third physicalized data related to transparency and trust in public institutions.

Moneo explained that their initial exhibition was to illustrate the intricate aspects of sustainability, particularly as it was becoming fashionable. However, they anticipate a shift in this trend as people are growing weary of the constant emphasis on sustainability without a deep understanding of its complexities. Moneo recognized the general lack of comprehension regarding ESG and proposed the idea of crafting three sculptures to symbolize these components.

Going forward, Moneo plans to turn his attention to the United Nations' 17 Sustainable Development Goals (SDG) agenda with a sculpture to represent each one of such goals. His idea is to raise awareness of their importance and offer an update on the data.

"When you look at the data today, it is outdated. After Covid, most of the indicators have changed dramatically. For example, extreme poverty was going down for 25 years steadily, and in 2021, for the first time in 25 years, it will increase due to Covid," he told REVOLVE.

He further noted that "Covid has driven poverty and inequality, and when you look at the data that is available, it stops in 2020. So, we are looking at the world post-Covid with data from pre-Covid times, and that makes no sense. If we were confused about the SDG agenda before, we are even more confused now."

Calls to action

The sculptures and models produced by Tangible Data are designed to stop people in their tracks and provide a different angle on data, and they can serve as a conduit to action.

Previous examples of Tangible Data include a 3D model of Covid-19 cases. The model, based on a company dataset showing the early waves of the coronavirus and concluding with the explosion of Omicron, was attached to a wooden plinth emblazoned with a QR code that directed viewers to a hospital donation page.

This ethos is encapsulated by Tangible Data's central framework: Feel, Remember, Act. The sculpture's first impression is to ignite the senses, which then reinforces the message enclosed in the design and prompts voluntary action to address the issue raised.

Digital fatigue & fake news

The internet is awash with open data and information, although its accessibility varies around the world. However, this open nature of the internet, and of course social media, makes it prone to misinformation, fake news, and skepticism. Both Moneo and San Román believe that data physicalization offers a way to help combat this.

"There is a lot of data out there that is false. There are a lot of people who don't believe in climate change, who don't believe data. But if you go to such lengths to take the time and invest the

money needed to display this design on the street, you make it more believable. I think it sticks more because it's more direct," San Román told REVOLVE.

Moneo adds: "There are many public institutions that have invested a lot in data visualization and dashboards that actually do not work. I think there's a general feeling that those visualizations don't tell the story and we need other ways of representing the data."

"Together with data visualization, we have a new cousin in the family, which is data physicalization, which is making data physical, and there's data sonification, which is turning data into sound. There are other ways, but because of the evolution of technology and the decreasing costs, these techniques are becoming more available."

For Moneo, growing public skepticism at a time of high investment in science and data, whether that be related to climate or to Covid-19, among others, is paradoxical. "The challenge is not only to make data available but to make it accessible for all. Data should reach people, and not vice versa."

"Together with data visualization, we have a new cousin in the family, which is data physicalization, which is making data physical, and there's data sonification, which is turning data into sound."

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