

Eco

ROMANIA

Europe's Last Great Wilderness

Nature • Sustainability • Circular Economy • Green Innovation

November 2026

by

InfomediuEuropa®

www.infomedi.u.eu

Agrivoltaics
Biodiversity & Natural capital
Water reuse
Circular economy
Sustainable tourism

ECOMONDO
The green technology expo.

ITALIAN
EXHIBITION
GROUP
Innovating the future

Distributed at ECOMONDO - The leading international event in Europe for technologies, services and industrial solutions in the Green and Circular economy sectors.



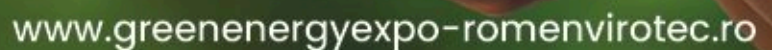
Associação Mineira de Rádio e Televisão
Fundada em 1960

The leading fair for

WASTE | WATER |

ENERGY | SMART CITY

MARCH 23 – 25, 2027
BUCHAREST, ROMEXPO



 **Grădinaru**

PROFI PRINT

For the World We Leave Behind

There are moments when we need to pause and ask ourselves: what are we leaving behind? What kind of air will our children breathe? What forests will they walk through? What rivers will they still be able to call clean?

Protecting the environment is not only about regulations, technologies, or European targets. It is about our love for the places that shaped us, our respect for nature, and our responsibility toward the generations that will follow.

At Ecomondo, we meet people who believe, just as we do, that change is possible. People who turn concerns into solutions and ideas into action. People who understand that every gesture matters.

Through Ecopedia, we aim to bring these stories closer to our readers and show that a greener future is built every day through simple choices, courage, and commitment.

The future does not begin tomorrow. It begins with us.

Let us care for nature as we would care for our own home. Because, in truth, it is our home.

With hope and responsibility,
The ECOPEDIA Editorial Team

November 2026

Ecopedia

by

InfomediEuropa

www.infomedi.eu

General manager:
Emanuela Cretu,
ema.cretu@infomedi.eu

Deputy Editor in Chief:
Stere Cretu,
redactie@infomedi.eu

Editors:
Ella Dobre, Rareș Crețu
Ana Mihalcea, Relu Ștefan,
Alina Ionescu
redactie@infomedi.eu

Graphic designer
Laura Ionescu

Subscriptions:
abonamente@infomedi.eu

Marketing & Events
marketing@infomedi.eu
evenimente@infomedi.eu

Office Assistant: fax:
office@infomedi.eu

Magazine edited by:
InfoMediu Europa &
Partners

Romania: Europe's green treasure waiting to be discovered

By Emma Cretu

Romania – where nature still tells the story of an authentic Europe

In a world where rapid urbanization and industrial development have profoundly altered Europe's natural landscapes, Romania remains one of the few countries that still preserves an authentic connection between humanity, nature, and tradition. Situated at the crossroads of Central Europe, Eastern Europe, and the Balkans, Romania is a surprising destination for those seeking genuine experiences, remarkable biodiversity, and spectacular scenery.

Spanning over 238,000 km² and home to approximately 19 million inhabitants, Romania boasts an impressive variety of ecosystems: mountains, ancient forests, rolling hills, fertile plains, a Black Sea coastline, and the best-preserved delta in Europe.

The Carpathian Mountains, which stretch across the country for over 900 kilometers, form the backbone of the Romanian landscape. These mountains harbor some of the European Union's most significant populations of brown bears, wolves, and lynx. In many areas, the forests remain virtually untouched by human intervention, offering visitors the chance to experience a true wilderness—something that has become increasingly rare in Western Europe.

Romania ranks among the European countries with the highest levels of biodiversity. Approximately half of the plant, bird, and animal species found on the continent can be encountered here. For enthusiasts of nature, photography, ecotourism, and wildlife watching, Romania is a truly premier destination.

Yet, its true value lies in the unique balance between nature and local communities. In many rural regions, traditional agricultural practices endure, helping to preserve natural habitats of rare beauty. Romanian villages maintain a way of life that has vanished from other parts of Europe decades ago.

Romania is more than just a place to visit; it is an experience that allows travelers to discover what Europe looked like before the modern era—all while still enjoying contemporary comforts and amenities.

The Danube Delta – Europe's Last Natural Paradise

For nature lovers and environmental enthusiasts, the Danube Delta stands out as one of the most impressive destinations on the continent. A UNESCO World Heritage site, the Delta is the largest wetland in the European Union and one of the world's most vital sanctuaries for biodiversity.

Here, the Danube River concludes its nearly 3,000-kilometer journey, flowing into the Black Sea and creating a captivating labyrinth of channels, lakes, floating islands, forests, and reed beds.

With over 300 bird species and thousands of plant and animal species, the Delta serves as a vast, open-air natural laboratory. Great white and Dalmatian pelicans, cormorants, egrets, and countless other species draw researchers, photographers, and tourists from across the globe every year.

A trip to the Danube Delta offers far more than just the chance to observe

nature. Visitors discover multicultural communities that have lived in harmony with their surrounding environment for centuries. Romanians, Lipovans, Ukrainians, and other ethnic groups have created a unique cultural heritage here.

Ecotourism is constantly evolving, with numerous guesthouses and local operators promoting sustainable experiences rooted in respect for nature and the responsible use of resources.

At the same time, the Danube Delta stands as a European model for conservation and sustainable development. Initiatives focused on ecological restoration, biodiversity monitoring, and environmental education demonstrate Romania's commitment to protecting its natural heritage.

For participants at Ecomondo, the Danube Delta serves as a perfect example of how nature conservation and local economic development can go hand in hand, generating benefits for both communities and ecosystems.

Living traditions, authentic villages, and a unique cultural heritage

Romania is one of the few European countries where traditions are not merely preserved in museums but remain an integral part of everyday life.

In regions such as Maramureș, Bukovina, Transylvania, or the Hațeg Land, visitors can encounter folk artisans crafting wood or hand-weaving textiles, discover centuries-old wooden churches, and meet communities that uphold customs passed down through generations.



Transylvania is arguably Romania's most well-known region. Renowned for its spectacular landscapes, medieval fortresses, and the legends surrounding Dracula, it offers far more than just a tourist icon. Cities such as Braşov, Sibiu, Sighişoara, and Cluj-Napoca harmoniously blend historical heritage with the energy of a modern, innovative society.

Sighişoara, one of the best-preserved inhabited medieval towns in Europe, transports the visitor to another era. Sibiu, a former European Capital of Culture impresses with its elegance and cultural diversity. Braşov delights visitors with its location at the foot of the mountains and its vibrant atmosphere.

Bucovina draws visitors with its famous UNESCO-listed painted monasteries, while Maramureş captivates with its monumental wooden gates and rural landscapes that have remained virtually unchanged for centuries.

Romanian gastronomy rounds out the cultural experience. Traditional recipes rely on local ingredients, many sourced from sustainable agriculture and artisanal production. From the dishes of the Danube Delta to the mountain cuisine of Transylvania, each region offers a distinct culinary identity.

For international visitors, Romania offers a rare opportunity to discover an authentic, diverse, and welcoming European culture—far removed from overcrowded tourist trails.

The Romania of the Future: Sustainability, Innovation, and Opportunity

Romania is about more than just nature and tradition. In recent years, the country has solidified its position as a key player in the green transition, renewable energy, and the circular economy.

Investments in environmental infrastructure, waste management, energy efficiency, and renewable energy production have seen rapid growth. Numerous projects, supported by European funding, are contributing to the modernization of communities and the achievement of sustainability goals set at the European level.

Romania's technology sector is one of the most dynamic in Eastern Europe. Cities such as Bucharest, Cluj-Napoca, Iaşi, and Timişoara are home to innovative ecosystems that develop digital solutions for environmental protection, smart energy, and resource management.

For investors, Romania offers an attractive combination of natural resources, a skilled human capital, and development opportunities within an economy undergoing a major green transformation.

For tourists, the advantage is just as clear: Romania remains one of the most affordable European destinations, offering authentic experiences, spectacular landscapes, and renowned hospitality.

Today, as more and more travelers seek responsible, sustainable, and authentic destinations, Romania finds itself in a privileged position. It is a place where biodiversity meets culture, where traditions coexist with innovation, and where every journey becomes a discovery.

Romania is not just a country to visit; it is an experience to be lived.

Discover Romania!

Wild mountains. The Danube Delta. Medieval towns. Living traditions. Welcoming people. The green heart of Europe awaits you.

The green transition is no longer just about collecting waste or installing renewable energy capacity. It entails transforming material flows, infrastructure, and economic models so that resources remain within the productive cycle for as long as possible. For Romania, this shift represents, simultaneously, a European obligation, an administrative challenge, and an industrial opportunity.

Circular Romania:

By Emma Cretu

From Waste Management to Renewable Energy and Innovation

At Ecomondo - one of Europe's premier events dedicated to the green and circular economy - the discourse on waste is shifting decisively from mere disposal toward resource recovery. The 2026 edition, held in Rimini from November 3rd to 6th, brings together companies, public authorities, researchers, technology providers, and investors - all focused on industrial solutions for the green transition.

Against this backdrop, Romania presents two complementary realities. The first is a waste management system still burdened by historical shortcomings - ranging from inadequate separate collection to an over-reliance on landfilling. The second is a market in transformation, where the Deposit-Return System, investments in recycling, composting initiatives, and a growing interest in biogas, biomethane, solar and wind energy, and energy storage are paving the way for new value chains.

The stakes go beyond mere compliance with European Union legislation. The true objective is to shift the focus from the costs of waste management to the economic value of recovered resources. What Modern Waste Management Entails

Waste management encompasses the full range of activities involved in the prevention, collection, transport,

sorting, treatment, recycling, recovery, or disposal of materials resulting from human and economic activity.

However, an effective system does not begin at the gates of a sorting facility or a landfill. It begins at the product design stage and continues throughout the product's entire lifecycle.

The European waste hierarchy establishes a clear order of interventions:

1. Prevention: reducing the quantity of materials used and avoiding the generation of waste;
2. Preparation for re-use: repairing products and reintroducing them into consumption;
3. Recycling: transforming waste into secondary raw materials;
4. Other forms of recovery: including energy recovery under controlled conditions;
5. Disposal: primarily through landfilling, as a last resort.

This hierarchy shifts the meaning of waste management. The objective is no longer to move trash from one place to another, but rather to reduce the amount of material that becomes waste and to recover the material,

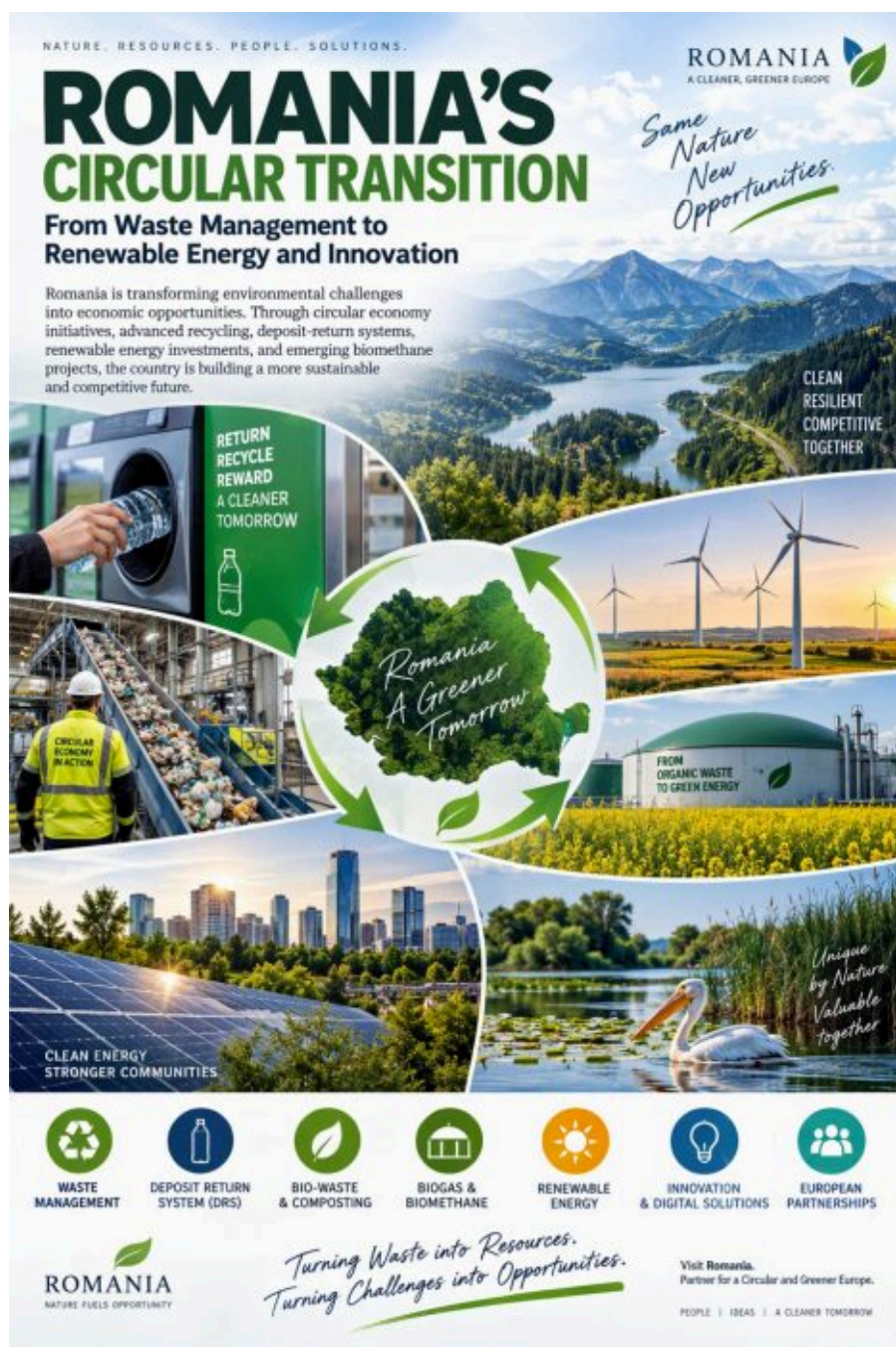
biological, or energy value from waste streams that cannot be avoided.

For Romania, one of the challenges lies in coherently connecting all the links in the chain: accessible separate collection, appropriate containers, efficient operators, sorting and treatment facilities, markets for secondary raw materials, digital traceability, and the implementation of the "pay-as-you-throw" principle. If any of these links fail, recyclable materials become contaminated, and the costs for the entire system rise.

Municipal waste represents only the most visible part. The economy also generates industrial, agricultural, medical, hazardous, textile, and electronic waste, as well as construction and demolition debris, sewage sludge, and significant quantities of biowaste. Each waste stream requires specific technologies, regulations, and economic models.

The circular economy: waste becomes a resource

The linear economy follows a "take, make, consume, and dispose" path. The circular economy aims to keep products, components, and materials in use for as long as possible. It integrates eco-design, reuse, repair, refurbishment, recycling, and the use of secondary raw materials.



the consumption of virgin resources, the extension of product lifespans, the volume of secondary raw materials utilized, and the emissions avoided.

The Deposit-Return System: A Shift in Scale

One of the most prominent Romanian circular economy projects is the Deposit-Return System (DRS) for beverage packaging. Consumers pay a deposit of 0.50 lei when purchasing a product and recover it upon returning the eligible plastic, metal, or glass packaging.

The DRS introduces several essential elements for a functional circular economy: a direct financial incentive, a national infrastructure, packaging traceability, and the creation of cleaner material streams. These features increase the likelihood that PET, aluminum, and glass will be transformed into high-quality secondary raw materials.

In 2024, approximately 3.38 billion plastic, 1.52 billion metal, and 1.23 billion glass containers subject to the DRS were placed on the market. The reported annual return rates were 55% for plastic, 55% for metal, and 53% for glass. By December 2024, monthly return rates had risen to 70% for plastic, 74% for metal, and 62% for glass, signaling an acceleration in the system's adoption.

The lesson of the DRS extends beyond the realm of packaging. When responsibilities, funding, infrastructure, and incentives are integrated into a coherent system, public behavior can shift rapidly. At the same time, experience shows that infrastructure development must encompass small towns, rural areas, and retailers with limited space. However, the Deposit-Return System (DRS) cannot replace the separate collection of other types of packaging waste, nor can it substitute for the management of biowaste, textiles, or electrical equipment. It should be viewed as an efficient component of a broader system.

Circularity is not synonymous with recycling. Recycling typically occurs at the end of a product's life cycle. The circular economy seeks to extend this cycle and reduce the consumption of raw materials, energy, and water, starting as early as the design phase.

For companies, this transition entails rethinking products and packaging, minimizing production losses, recovering materials, incorporating recycled content, and developing services for repair or post-use take-back. For public authorities, it involves green public procurement, infrastructure for separate waste collection, and data-driven planning. For consumers, it means having access to durable, repairable, and reusable products, while also adopting responsible behavior.

Romania has a National Strategy for the Circular Economy and an action plan that outlines 52 priority actions across nine economic sectors, with short-, medium-, and long-term timelines. The targeted areas include agriculture and forestry, the automotive industry, construction, food and beverages, packaging, textiles, electrical and electronic equipment, waste, and water and wastewater management.

However, the value of such a plan lies not merely in its existence, but in its implementation. Romania requires comparable indicators, clearly defined institutional responsibilities, sustained funding, and the monitoring of outcomes. Circularity should be measured not only by the tonnage collected, but also by the reduction in

Biowaste: the link with the greatest untapped potential

Food scraps, garden waste, livestock manure, agro-industrial by-products, and organic sludge should not be treated as valueless waste. When managed separately, these materials can be transformed into compost, biogas, biomethane, and organic fertilizers. If mixed with other waste, they contaminate recyclables and generate emissions in landfills.

Consequently, the separate collection of biowaste is a crucial prerequisite for modernizing the Romanian waste management system. In densely populated urban areas, this requires regular collection services, appropriate containers, and regional composting or anaerobic digestion facilities. In rural and peri-urban communities, home or community composting can complement centralized infrastructure.

One such investment is the bio-drying composting plant project in Râmnicu Vâlcea. Launched in 2025 and scheduled for completion in 2027, the project has a total value of approximately 18.37 million lei and aims to establish a modern facility that uses energy-efficient technologies to convert organic waste into compost. New Recycling

While such projects are significant, their outcome depends on the quality of the raw material. Compost and digestate can return to agriculture only if biowaste is collected free of contaminants and the final products meet quality standards.

Biogas and biomethane: the link between waste, agriculture, and energy

Biogas is obtained through the anaerobic digestion of organic matter – that is, its decomposition in the absence of oxygen. Feedstocks can include food waste, manure, agricultural residues, sewage sludge, and organic by-products from the food industry.

The resulting gas consists primarily of methane and carbon dioxide. It can be used locally for the simultaneous production of electricity and heat, or it can be purified to meet biomethane standards. Once purified, it can be

injected into the gas grid, used as a transport fuel, or consumed in industrial processes.

The advantages are numerous. The controlled treatment of waste and organic matter reduces uncontrolled methane emissions, generates renewable energy, and yields digestate, which can partially replace mineral fertilizers. Furthermore, biogas plants can produce energy in a controllable manner, complementing variable sources such as solar and wind power.

Romania possesses a significant agricultural base, a diversified food industry, and substantial volumes of organic waste; yet, the biogas sector remains underdeveloped. According to an analysis by the Energy Policy Group, as of 2022, the country had an installed biogas production capacity of approximately 23 MW, with no installed capacity for biomethane production. Strategic documents reviewed in 2024 projected a biomethane consumption of 4.27 TWh by 2030, with the potential for it to account for 5% of total gas consumption.



Moving from potential to investment requires clear regulation regarding the injection of biomethane into the grid, guarantees of origin, technical standards, predictable permitting processes, and stable contracts for the supply of raw materials. It is also necessary to avoid competition between energy crops and food production. Priority must be given to sustainable waste and residues.

The model with the greatest potential for Romania is a territorial one: farms, food processors, local authorities, wastewater treatment plants, and gas or energy distributors can form regional partnerships. This reduces logistics costs and ensures that economic value remains within the community.

Renewable Energy and New Energy Infrastructure

The circular transition and the energy transition reinforce one another. In many cases, recycling consumes less energy than producing materials from virgin resources, while renewable energy reduces the carbon footprint of industrial processes. At the same time, solar and wind equipment, as well as batteries, must be designed with repair, reuse, and recycling in mind.

Romania possesses solar, wind, hydropower, biomass, and geothermal resources. In recent years, investments in photovoltaic and wind capacity have been driven by European funds, bilateral contracts, and the need for companies to reduce both their costs and their emissions.

In April 2025, the Ministry of Energy announced a call for proposals – with an estimated budget of 300 million euros – for private-sector investments in new renewable energy capacity intended for self-consumption. The maximum amount of aid available could reach 20 million euros for a project, with the requirement that at least 70% of the energy produced be used for self-consumption.

Self-consumption can transform sorting facilities, recycling plants, factories, farms, and wastewater treatment plants into more resilient consumers. Photovoltaic panels, heat pumps, biogas-based cogeneration, and storage systems can be integrated into a digital energy management framework.

However, the development of renewables must be accompanied by grid modernization, storage capacity, flexibility, and forecasting capabilities. Without these, projects may face grid connection limitations, and energy produced during certain periods may not be utilized efficiently.

Romanian innovation: from infrastructure to data

In the environmental sector, innovation is not limited to spectacular technology. It can take the form of a sensor that optimizes a collection vehicle's route, a digital system that tracks waste from the generator to the recycler, a facility that recovers high-quality materials, or a contractual model that brings together multiple producers of organic waste.

Areas of immediate relevance for Romania include:

- Automated sorting, utilizing optical sensors, recognition systems, and advanced separation technologies;
- Digital traceability, to reduce reporting errors and monitor waste flows;
- Smart containers, which transmit fill-level data to optimize collection;
- High-quality recycling, including the production of recycled granules and materials suitable for reuse in high-value applications;
- Anaerobic digestion, for the valorization of food waste, agricultural waste, and sludge.
- Recovery of critical raw materials from batteries and electrical equipment;
- Industrial symbiosis, where the waste from one enterprise becomes the raw material for another;
- Digital product passports, which provide information on composition, reparability, and recycling.

Innovation must be complemented by foundational infrastructure. One example is the expansion of separate waste collection in Sibiu County, through a project with a total budget of approximately 12.67 million euros - of which about 9.88 million is a European contribution. The stated objective is to increase the share of recycled and recovered waste while reducing landfilling.

Such investments demonstrate that digitalization and advanced technologies cannot replace collection bins, regular services, and institutional responsibility. They can, however, make these elements more efficient and transparent.



What Romania Can Offer Its European Partners

Romania has the potential to become more than just a market for environmental equipment. Its geographical location, industrial base, agricultural sector, renewable resources, and technical capacity can support the development of a regional hub for recycling, the bioeconomy, and clean technologies.

Realizing this potential requires several conditions:

- Stable regulations applied consistently, allowing for long-term investment planning;
- Reliable, comparable, and up-to-date public data on waste generation, collection, and treatment;
- Integrated financing, avoiding isolated projects that lack secured raw material streams or markets for their end products;
- Markets for recycled materials, fostered through green public procurement and requirements for recycled content;
- Partnerships between public authorities, industry, and the research sector, featuring replicable demonstration projects;
- Professional training, as new facilities require operators, engineers, and data specialists;
- Education and communication, ensuring the public understands not only where to dispose of waste but also why the quality of collection is so important.

At Ecomondo, Romania can present a clear proposal for collaboration: joint investments in advanced recycling, the valorization of biowaste, biogas and biomethane production, the recovery of critical raw materials, the digitalization of waste traceability, and the generation of renewable energy for industrial use.

Romanian-Italian cooperation rests on a solid foundation here. Italy possesses industrial expertise in recycling equipment, biowaste treatment, biogas, and environmental services, while Romania offers a growing market, resources, and investment opportunities. Technology transfer must be accompanied by local production, training, and projects tailored to regional conditions.

From an environmental obligation to an industrial policy

Romania can no longer afford to view waste solely as a sanitation issue. Discarded materials represent imported resources, consumed energy, and lost economic value. Landfilled biowaste results in methane emissions and the loss of potential organic fertilizers. A lack of recycling leads to greater dependence on virgin raw materials - at a time when resource security is becoming a strategic issue for Europe.

Waste management, the circular economy, and renewable energy must be integrated into a green industrial policy. This entails aligning investments in waste collection with treatment facilities, linking recycling initiatives to the demand for secondary raw materials, and connecting biogas production with energy infrastructure and the needs of the agricultural sector.

Romania already possesses the building blocks for such a transformation: a Deposit-Return System that has shifted consumer behavior, companies with expertise in recycling, projects for separate waste collection and composting, renewable resources, and access to European funding. What is still missing is the speed and coherence required to integrate these elements effectively.

The future does not belong to the economy that produces the highest volume of goods, but rather to the economy that loses the fewest resources. For Romania, the transition to a circular model could mean cleaner communities, locally sourced energy, specialized jobs, a competitive industrial sector, and a stronger position within European value chains. Ecomondo is the ideal venue for translating this ambition into concrete projects and partnerships.

At a time when many of Europe's best-known destinations are becoming increasingly crowded, Romania remains one of the few countries where nature can still be experienced in an almost untouched state. Home to more than half of the Carpathian Mountain range, vast forests, traditional villages and breathtaking landscapes, Romania offers international visitors hiking experiences comparable to those found in the Alps, but at significantly lower costs and in a far less commercialized setting.

For nature lovers, Romania is more than a holiday destination. It is an invitation to explore.

Romania on foot

By Emma Crețu

7 hiking adventures that reveal the true beauty of the Carpathians



From spectacular mountain trails to footpaths crossing ancient forests and protected natural areas, the country offers opportunities for every level of experience, from leisurely walks to challenging alpine ascents that reward hikers with unforgettable views.



1. Bâlea Lake and the Spectacular Ridges of the Făgăraș Mountains

Few landscapes represent Romania better than the Făgăraș Mountains. Often referred to as the "Alps of Transylvania," they are home to Romania's highest peaks and some of the most impressive hiking routes in Eastern Europe.

For visitors traveling along the famous Transfăgărășan Highway, Bâlea Lake provides the ideal starting point. From here, marked trails lead toward Negoiu Peak and Moldoveanu

Peak, the highest point in Romania at 2,544 meters.

The scenery is extraordinary: glacial lakes, dramatic ridgelines, steep valleys and panoramic views stretching for dozens of kilometers.

Practical Information

- Starting point: Bâlea Lake
- Nearest airport: Sibiu International Airport
- Trail duration: 3-8 hours
- Difficulty: Moderate to difficult
- Best season: July to September
- Accommodation: Bâlea Lake Chalet, guesthouses in Cârțișoara and Sibiu
- Recommendation: Ridge hikes require appropriate mountain equipment and careful weather monitoring.



2. The Sphinx and Babele, the Iconic Landmarks of the Bucegi Mountains



Located just two hours from Romania's capital city, the Bucegi Mountains are among the most accessible hiking destinations for international visitors. The rock formations known as the Sphinx and Babele have become national symbols and attract thousands of visitors every year. Their unusual shapes have inspired numerous legends and continue to fascinate travelers from around the world.

The trails across the Bucegi Plateau combine spectacular alpine scenery with easy accessibility. Visitors can enjoy remarkable views over the Prahova Valley without needing advanced hiking experience.

Practical Information

- Starting point: Bușteni
- Nearest airport: Bucharest Henri Coandă International Airport
- Trail duration: 2-5 hours
- Difficulty: Easy to moderate
- Best season: May to October
- Access: Bușteni-Babele cable car or marked hiking trails
- Ideal for: Families, photographers and first-time hikers in Romania



3. Piatra Craiului National Park, a Hiker's Paradise

For many mountain enthusiasts, Piatra Craiului is the most beautiful hiking area in Romania.

Its narrow limestone ridge, dramatic cliffs and exceptional biodiversity make this region a true paradise for nature lovers. The national park contains dozens of marked routes that cross forests, alpine meadows and striking karst formations.

At the foot of the mountains lie the villages of Măgura and Peștera, often described as some of the most picturesque rural communities in Eastern Europe.

Here, visitors discover an authentic Romania where traditional lifestyles and natural landscapes continue to coexist in harmony.

Practical Information

- Starting point: Zărnești
- Nearest airport: Brașov-Ghimbav International Airport
- Trail duration: 4-10 hours
- Difficulty: Moderate to difficult
- Best season: May to October
- Accommodation: Rural guesthouses in Măgura, Peștera and Zărnești

- Recommendation: Ridge routes are best suited to experienced hikers or those accompanied by a professional guide.



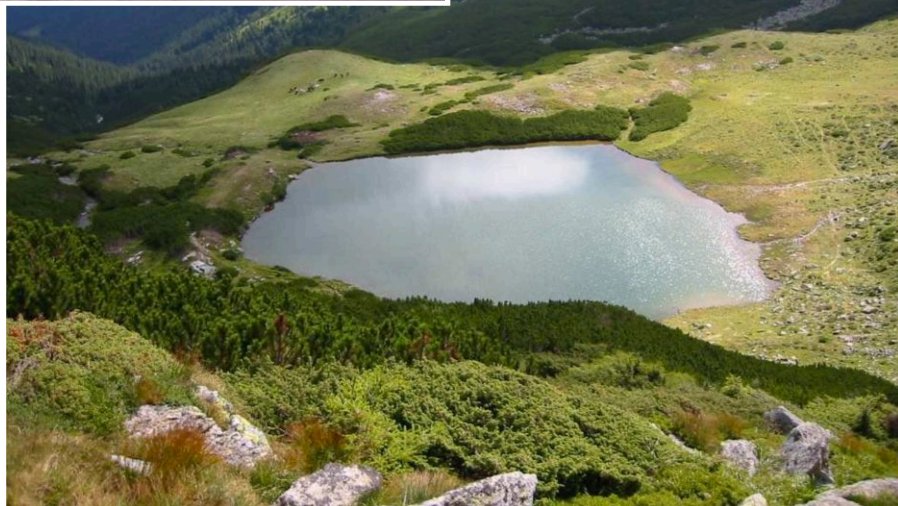
4. The Danube Delta, Hiking Through a Unique Ecosystem

When discussing hiking destinations, few people think of the Danube Delta. Yet this extraordinary region offers some of the most rewarding ecotourism experiences in Europe. The Danube Delta Biosphere Reserve is one of the continent's most important wetlands and is home to hundreds of species of birds, fish and wildlife.

Ecotourism trails near Sulina, Sfântu Gheorghe and Crișan allow visitors to explore landscapes that remained inaccessible for centuries, while enjoying exceptional opportunities for wildlife observation.

Practical Information

- Starting point: Tulcea
- Trail duration: 2-6 hours
- Difficulty: Very easy
- Best season: April to October
- Additional activities: Boat excursions, birdwatching and nature photography
- Wildlife highlights: Pelicans, cormorants, egrets, herons and wild horses
- Recommendation: Book guided tours with licensed local guides.



5. Nera Gorges and Ochiul Beilui Lake

In southwestern Romania, the Nera Gorges-Beușnița National Park shelters some of the country's most spectacular natural scenery. The trails wind through dense forests, alongside crystal-clear rivers and picturesque waterfalls. The highlight of the region is Ochiul Beilui Lake, famous for its striking turquoise waters that resemble those of a tropical lagoon.

The area remains relatively unknown internationally, making it particularly attractive for travelers seeking authentic, off-the-beaten-path experiences.

Practical Information

- Starting point: Sasca Română
- Nearest airport: Timișoara International Airport
- Trail duration: 4-6 hours
- Difficulty: Moderate
- Best season: April to October
- Recommended equipment: Waterproof hiking boots
- Main attractions: Ochiul Beilui Lake and Beușnița Waterfall

6. Rodna Mountains and the Realm of Glacial Lakes

In northern Romania, the Rodna Mountains offer some of the wildest and best-preserved landscapes in the Carpathian range.

The national park encompasses alpine peaks, vast mountain meadows and stunning glacial lakes. Trails leading to Lala Mare Lake and Pietrosu Rodnei Peak reward hikers with magnificent views and the opportunity to observe wildlife in its natural habitat.

For travelers seeking peace, solitude and untouched nature, this region offers a compelling alternative to the more commercial mountain destinations of Western Europe.

Practical Information

- Starting point: Borșa
- Nearest airport: Cluj-Napoca International Airport
- Trail duration: 5-8 hours
- Difficulty: Moderate to difficult
- Best season: June to September
- Highest elevation: Pietrosu Rodnei Peak, 2,303 meters
- Highlights: Glacial lakes, chamois and spectacular alpine panoramas

7. The UNESCO International Geopark of Hațeg Country

Not all memorable hiking experiences require demanding mountain ascents. The UNESCO International Geopark of Hațeg Country offers thematic routes that combine nature, geology, history and cultural heritage.

The region gained international recognition through the discovery of unique dwarf dinosaur fossils, while its trails lead visitors through charming rural landscapes, medieval churches and traditional villages.

It is an ideal destination for families and travelers interested in both culture and nature.

Practical Information

- Starting point: Hațeg
- Nearest airport: Sibiu International Airport
- Trail duration: 1-4 hours
- Difficulty: Easy
- Best season: Year-round
- Highlights: UNESCO sites, medieval heritage and dinosaur-themed trails
- Ideal for: Families and educational groups

Romania at a Glance for Hikers

Romania offers one of Europe's most diverse outdoor experiences:

- More than 900 marked mountain trails
- 13 major national and natural parks
- Over half of the entire Carpathian Mountain range
- Some of Europe's largest remaining areas of natural forest
- The largest brown bear population in the European Union
- The Danube Delta, Europe's best-preserved delta ecosystem

At a time when travelers increasingly seek authentic experiences and meaningful connections with nature, Romania possesses a rare advantage: many of its landscapes remain remarkably untouched by overdevelopment.

Hiking in Romania is about more than physical activity. It is about discovering a country where mountains, forests, villages and protected natural areas continue to coexist in a balance that has become increasingly difficult to find elsewhere in Europe.

For international visitors, Romania is not simply a destination.

It is one of Europe's last great wilderness adventures.

LOCAL CHOICES. PUBLIC TRANSPORT,
WALKABILITY, ACCESSIBILITY, EFFICIENCY,
SMART LOGISTICS, MULTIMODALITY, BIKE,
AUTONOMY, SEAMLESS, ELECTRIFICATION,
SHARED MOBILITY, SAFE STREETS,
SUSTAINABILITY, INNOVATION.
GLOBAL CHANGE.

**MOBILITY
SOLUTIONS
REAL
IMPACT**

3-5 NOVEMBER 2026
BARCELONA

Globally, the equivalent of one truckload of textiles is discarded or incinerated every single second. The fashion industry—once associated exclusively with design and creativity—has become one of the major environmental challenges of the 21st century. Accelerated consumption, the "fast fashion" phenomenon, and the increasingly short lifespan of garments have generated massive quantities of textile waste, placing significant strain on resources, infrastructure, and ecosystems.

Clothing recycling in Europe and Romania

By Emma Cretu

From "fast fashion" to a circular textile economy

For the European Union, textile recycling has become a key component of the transition toward a circular economy. The European Strategy for Sustainable and Circular Textiles aims to transform the industry, ensuring that textile products become more durable, repairable, and recyclable, while viewing waste as a resource with economic value. According to the European Commission, Europeans discard approximately 5 million tonnes of clothing and textiles annually—roughly 12 kilograms per person. Currently, less than 1% of textile materials are recycled into new garments, which underscores the scale of the challenge.



A New Era for European Textiles

As of January 1, 2025, all European Union member states are required to implement separate collection systems for textiles. This measure marks a pivotal moment in the development of the European circular economy and is intended to reduce the volume of textiles that end up in landfills or are incinerated. Data from the European Environment Agency shows that the European Union generated approximately 6.95 million tonnes of textile waste—equivalent to about 16 kg per inhabitant. Of this amount, only 4.4 kg per person is collected separately for reuse and recycling, while 11.6 kg still ends up in the municipal waste stream.

The new European strategy goes beyond mere recycling. It promotes product repair, the second-hand market, reuse, extended producer responsibility, digital product passports, and the use of recycled fibers in new garments. The ultimate goal is to transform the textile sector into a competitive, circular industry capable of reducing Europe's reliance on virgin resources and lessening its environmental impact.

The hidden cost of fashion

Few consumers realize that the impact of a T-shirt begins long before it reaches a store shelf. According to the European Environment Agency, textile consumption has the fourth-largest environmental impact of all consumption categories in Europe—following food, housing, and mobility.



Textile production requires vast quantities of water, energy, and raw materials. Synthetic fibers—polyester, in particular—are derived from fossil fuels and contribute to microplastic pollution. Meanwhile, cotton production entails high levels of water and pesticide use.

For this reason, the reuse and recycling of clothing serve not only as a solution for waste reduction but also as an important tool for conserving natural resources and lowering carbon emissions. ROMANIA: BETWEEN CHALLENGE AND OPPORTUNITY

For Romania, textile recycling is a sector undergoing rapid transformation. Following the entry into force of the European mandate for the separate collection of textiles, local authorities, waste management operators, and the recycling industry must build—almost from scratch—a functional system capable of handling this new waste stream.

Although infrastructure is beginning to develop, the challenges remain significant. While many localities have containers for clothing collection, capacity for sorting, reuse, and recycling remains limited. Recent analyses indicate that a large portion of collected textiles continues to be incinerated or sent to landfills, rather than being transformed into valuable resources.

Experts estimate that Romania generates approximately 160,000 tons of textile waste annually, while the actual reuse and recycling rate remains low, hovering between 6% and 10%.

However, there are also reasons for optimism.

In recent years, significant investments have been made in textile recycling. One example is Roseco Recycling Romania, a company that, in 2024, launched one of the country's most advanced mechanical textile recycling lines. The facility converts non-reusable textiles into recycled fibers, which can subsequently be used in construction, the automotive industry, furniture manufacturing, or the creation of new textile products.



Such investments demonstrate that used textiles should not be viewed as valueless waste, but rather as secondary raw materials capable of driving job creation, innovation, and industrial competitiveness.

The Power of Reuse

Recycling is only one part of the solution. In many cases, reusing clothing is more efficient from the standpoint

Urban mining:

Europe's hidden resource for the Green Transition

By Rareș Crețu

In an industrial facility on the outskirts of Antwerp, tonnes of discarded electronic equipment arrive every day. Old smartphones, broken laptops, obsolete servers and household appliances are dismantled, sorted and processed. To many people, these are simply waste materials destined for recycling. To an increasing number of European policymakers, manufacturers and investors, however, they represent something far more valuable: a strategic resource.

As Europe accelerates its transition toward climate neutrality and industrial decarbonization, demand for critical raw materials is rising at an unprecedented pace. Electric vehicles, solar panels, wind turbines, energy storage systems and digital infrastructure all rely on metals and minerals such as lithium, cobalt, nickel, copper, graphite and rare earth elements.

For decades, Europe has depended heavily on imports to secure these resources. Today, geopolitical tensions, supply chain disruptions and increasing global competition have exposed the vulnerabilities of that dependence. In response, the European Union is looking inward for solutions. One of the most promising opportunities lies in a concept known as urban mining, the recovery of valuable materials from products, buildings and waste streams that have already entered the economy. What was once considered rubbish is increasingly being recognized as a strategic reserve.

A Mine Above Ground

Traditionally, mining has involved extracting raw materials from the earth through large-scale industrial operations. Urban mining reverses this logic. Instead of digging deeper into the ground, it focuses on recovering

resources already embedded in cities, industries and consumer products. Electronic devices provide one of the clearest examples. A single smartphone may contain gold, silver, copper, cobalt and various rare earth elements. Individually, the quantities are small. Collectively, however, millions of discarded devices represent a significant reservoir of valuable materials. The same principle applies to electric vehicle batteries, industrial equipment, telecommunications infrastructure and construction materials. According to European experts, many of the materials required for the green transition are already circulating within the economy. The challenge is not extraction, but recovery.

The Critical Raw Materials Challenge

The urgency surrounding urban mining has grown in parallel with Europe's concerns about supply security. The transition to renewable energy and electrified transport is dramatically increasing demand for critical raw materials. Electric vehicles require substantially larger quantities of minerals than conventional vehicles, while wind turbines, solar technologies and battery storage systems depend on complex supply chains spanning multiple continents.

Recognizing these challenges, the European Union has adopted measures aimed at securing access to critical raw materials while reducing strategic dependencies. Yet opening new mines alone will not solve the problem. New extraction projects often require years of permitting, significant investment and extensive environmental assessments. Meanwhile, demand is growing now. Urban mining offers an additional pathway by recovering materials that

have already been extracted, refined and manufactured. From both an economic and environmental perspective, these materials represent an opportunity that Europe can no longer afford to ignore.

The Growing Mountain of Electronic Waste

Electronic waste has become one of the fastest-growing waste streams in the world. Every year, millions of tonnes of electronic devices reach the end of their useful lives. Smartphones are replaced. Computers become obsolete. Household appliances are discarded. Industrial equipment is upgraded. Many of these products contain materials that remain highly valuable despite the end of the product's functional life. Yet significant quantities continue to be lost. Some devices remain forgotten in drawers and storage spaces. Others are improperly disposed of, exported or processed through systems that fail to recover strategic materials efficiently. For policymakers concerned about resource security, this represents a major missed opportunity. Industry analysts frequently describe unused electronic devices stored in homes and offices as "dormant material banks" waiting to be recovered. The resources exist. The challenge lies in collecting and processing them effectively.

The Economic Logic of Recovery

Urban mining is often presented as an environmental solution, but its economic importance is becoming equally significant. Recovering metals from existing products can reduce exposure to volatile international markets, improve supply chain resilience and support domestic industrial development. Europe has already experienced the

consequences of supply disruptions in various sectors. Critical raw materials have become increasingly intertwined with economic competitiveness, industrial policy and energy security. Unlike imported materials, resources recovered through urban mining remain within the European economy. This creates local value chains involving collection systems, logistics providers, technology developers, recycling facilities and manufacturing companies.

The result is not only resource recovery but also employment, innovation and industrial investment. For regions seeking to develop circular economy industries, urban mining is emerging as a strategic growth sector.

management of increasingly complex waste streams, where products contain dozens of different materials assembled in sophisticated ways. As technology advances, recovery rates are expected to improve further. The future of urban mining will depend not only on collection systems but also on the intelligence of the technologies processing recovered materials.

Batteries: The New Frontier

Few sectors illustrate the importance of urban mining more clearly than batteries. Europe's electric mobility transition is generating growing volumes of batteries that will eventually require refurbishment, reuse

From Waste Management to Resource Management

Perhaps the most significant shift associated with urban mining is conceptual.

For decades, waste management focused primarily on disposal, treatment and environmental protection. While these objectives remain important, the conversation is expanding. The modern circular economy increasingly views waste as a source of secondary raw materials. This change is reflected in European policy discussions, where resource efficiency, material recovery and circular value creation are becoming central themes.

The terminology itself is evolving. What was once considered waste is now frequently described as a resource stream. This transformation may seem semantic, but it reflects a deeper economic reality: materials have value long after products reach the end of their original use.

Europe's Circular Economy Opportunity

Despite progress, major challenges remain. Collection rates must improve. Public awareness must increase. Recycling infrastructure requires further investment. Product design must facilitate easier disassembly and material recovery.

According to Eurostat, only 11.8% of materials used in the European Union in 2023 originated from recycled sources, highlighting how much work remains to achieve true circularity. At the same time, the numbers reveal a considerable opportunity.

If Europe can recover larger quantities of materials already circulating within its economy, it can reduce resource dependency while strengthening industrial resilience and environmental performance.

Urban mining alone will not solve every supply challenge facing Europe. However, it may become one of the most important pillars supporting the continent's green transition. The mines of the future may not be located in remote deserts or deep underground. They may already exist within Europe's homes, offices, factories and waste facilities. The resources are there. The challenge now is learning how to recover them efficiently, responsibly and at scale.



Advanced Technologies Transforming Recycling

The image of recycling as a predominantly manual activity is becoming outdated.

Modern material recovery facilities increasingly rely on advanced technologies including artificial intelligence, robotics, sensor systems and automated sorting equipment. High-resolution cameras can identify different types of plastics and metals within fractions of a second. Machine-learning systems can improve sorting accuracy over time. Robotic arms can separate materials with levels of precision that would have been impossible only a decade ago. These innovations are helping recyclers recover materials that previously would have been lost.

Artificial intelligence is proving particularly valuable in the

or recycling. Rather than viewing spent batteries as waste, industry experts increasingly see them as future sources of lithium, nickel, cobalt and other strategic materials.

This perspective is already influencing investment decisions across Europe. New facilities dedicated to battery recycling are being developed in several Member States, while policymakers are promoting traceability and circularity requirements through legislation such as the EU Battery Regulation. The objective is clear: retain valuable materials within European value chains for as long as possible. In this context, urban mining becomes a critical component of the broader circular economy strategy.



ECOMED Eastern Europe is a Romanian company owned by an Italian company - Riccoboni Holding S.p.A., market leader in the field of environmental services and waste management. The activities of ECOMED started in Romania during the first half of 2006, with the goal of providing several types of environmental services. All the ECOMED's available technologies have been developed and improved during the past 30 years working in Italy, in compliance with all the applicable Italian environmental regulations and European directives.

ECOMED Eastern Europe is providing the best environmental services, with high quality technologies and know-how:

- ✓ **Waste sampling and analysis**
- ✓ **Hazardous and non-hazardous waste packaging, collecting and transport**
- ✓ **Hazardous and non-hazardous waste treatment**
- ✓ **Water supply**
- ✓ **Landfill construction**
- ✓ **Contaminated site management (Soil remediation and water treatment solutions)**
- ✓ **Mobile waste treatment units**
- ✓ **Mobile storage units**
- ✓ **Mud plant rental**
- ✓ **Industrial cleaning**
- ✓ **Underground tanks and pipes - cleaning, inspection, rehabilitation solution**
- ✓ **Ground reservoir - cleaning, sludge removal, oil recovery, maintenance**

www.ecomed-intl.com

BEST ENVIRONMENTAL SERVICES WITH HIGH QUALITY TECHNOLOGIES

Services performed for Oil and Gas Industry, consisting in **hazardous and non-hazardous waste sampling and analysis**, hazardous and non-hazardous waste **collecting**, hazardous waste **packaging**, hazardous and non-hazardous waste **transport**, hazardous and non-hazardous waste **treatment and final disposal**, industrial cleaning of rigs, equipment and mud tanks, water supply, mud tanks renting, waste pit rental, mobile waste treatment equipment.



From the beginning of Company's activity until present, the waste management services mentioned have been provided as follows:

- ✓ Waste Management from onshore drilling rigs: more than 500 onshore drilling rigs (with drilling depth from 800m to 5500m)
- ✓ Waste Management from offshore drilling rigs: 4 offshore drilling rigs
- ✓ Waste Management from workover rigs: more than 750 rigs
- ✓ Waste management from completion rigs: more than 100 completion rigs
- ✓ Water supply for more than 100 rigs
- ✓ Oil sludge Waste Management from cleaning tanks
- ✓ Industrial cleaning of mud plants (mud tanks and mud silos), rig cellars, drilling rigs , waste tanks - after finalizing drilling / completion / workover activities
- ✓ Industrial cleaning of Oil tanks, Pipe lines, Chemical Tanks
- ✓ Industrial cleaning of Offshore supply vessels (Ben Nevis, Makalu)

The quantities of hazardous and non-hazardous waste managed for the services mentioned above: more than 500.000 tons



Digital product passports:

The data revolution behind Europe's circular economy

By Rareș Crețu



A refrigerator reaches the end of its life in a recycling facility in northern Italy. An electric vehicle battery is removed from a car in Germany after years of service. A washing machine manufactured in Poland is repaired and resold in a second-hand market in France. Although these products have followed different journeys, they share a common challenge: access to reliable information.

What materials do they contain? Which components can be repaired or reused? What was their carbon footprint during production? Which substances require special treatment at the end of life?

For decades, much of this information has remained fragmented, inaccessible, or lost as products move through supply chains. Today, the European Union is attempting to

change that reality through one of the most ambitious transparency initiatives ever introduced in industrial policy: the Digital Product Passport, commonly known as the DPP. Far more than a simple QR code, the Digital Product Passport is emerging as a foundational tool for Europe's transition toward a circular economy. Supporters describe it as the digital identity of every product, capable of transforming manufacturing, consumption, repair, reuse and recycling across the continent.

Beyond Sustainability Reporting

The European Green Deal has generated a wave of environmental regulations aimed at reducing waste, improving resource efficiency and lowering carbon emissions. Yet policymakers increasingly recognize

that circularity cannot be achieved without data. A product can only be repaired if technicians know how it was built. Materials can only be recycled efficiently if recyclers understand their composition. Consumers can only make informed purchasing decisions if reliable information is accessible.

The Digital Product Passport seeks to bridge these information gaps. Under the Ecodesign for Sustainable Products Regulation (ESPR), the EU is progressively introducing requirements that will make sustainability-related information available throughout a product's entire lifecycle. Batteries are the first major product category for which a digital passport will become mandatory. The European Commission has confirmed that battery passports become mandatory

from February 2027 for relevant battery categories placed on the EU market. This initiative is expected to expand progressively to additional sectors including textiles, electronics, construction materials and other products with significant environmental impacts.

Why Europe Needs Better Product Transparency

The challenge facing European industry is substantial. Despite years of circular economy policies, Europe remains heavily dependent on virgin raw materials. According to Eurostat, only 11.8% of materials used in the European Union in 2023 originated from recycled sources. The figure illustrates a persistent reality: the European economy remains largely linear. Products are manufactured, consumed and discarded far faster than resources can be recovered and reused.

Environmental experts argue that one reason for this limited progress is the lack of accessible information throughout value chains. A recycler receiving an end-of-life product often lacks detailed knowledge about its composition. Repair operators may struggle to obtain technical specifications. Secondary material markets face difficulties verifying the characteristics of recovered resources. Digital Product Passports aim to address these obstacles by creating a standardized information infrastructure.

A New Era for Manufacturing

For manufacturers, the implications extend well beyond regulatory compliance.

Companies will increasingly need to collect, verify and maintain detailed information regarding materials, components, environmental performance and durability characteristics. For some businesses, particularly those already investing in product lifecycle management systems, the transition may represent an opportunity. For others, especially companies operating complex international supply chains, implementation could require significant adjustments.

Industry specialists believe the most profound impact may occur in supply chain management. Traditionally, sustainability information has been

distributed across multiple databases, certifications and documentation systems. The passport framework creates incentives for companies to improve data collection and interoperability. As European markets become increasingly focused on resource efficiency, transparency itself is becoming a competitive asset.

The Consumer Perspective

Digital passports could also reshape consumer behavior.

Growing numbers of European consumers want information about sustainability, durability and reparability before purchasing products. Yet environmental claims often remain difficult to verify.

The Digital Product Passport may provide access to information such as product composition, repair instructions, recycled content and environmental performance indicators. This development could support the fight against greenwashing by replacing broad marketing claims with standardized and verifiable data. Consumers might eventually compare products not only on price and functionality but also on lifespan, reparability and circularity performance. Such transparency could encourage manufacturers to prioritize product quality and longevity rather than short replacement cycles.

Unlocking Circular Business Models

The economic opportunities associated with digital passports may prove as significant as the environmental benefits. Across Europe, companies are experimenting with circular business models that prioritize reuse, refurbishment and remanufacturing. These activities depend on reliable information. Refurbishers need access to component specifications. Repair specialists require maintenance histories. Recyclers must understand material compositions. Secondary markets need confidence regarding product authenticity and condition. Digital passports can facilitate all of these processes. Experts increasingly view data as a critical enabler of circularity. Without information, products become waste. With information, they become resources.

Challenges That Cannot Be Ignored

Despite growing enthusiasm, implementation remains complex. Industry stakeholders have identified concerns relating to data governance, standardization, confidentiality and cybersecurity. Questions also remain regarding interoperability between sectors and cross-border systems. A 2024 analysis by the Centre for European Policy Studies highlighted concerns related to information silos, data reliability, confidentiality and unclear responsibilities throughout product life cycles. Small and medium-sized enterprises may face particular challenges due to limited digital infrastructure and compliance resources. Nevertheless, momentum continues to build. The battery passport is already moving from concept to implementation, providing a real-world test of how Digital Product Passports may function at scale. The EU's digital battery passport registry became operational in July 2026, ahead of mandatory implementation in February 2027.

A Foundation for the Circular Economy

The Digital Product Passport represents more than another regulatory requirement. It reflects a broader transformation in the way products are designed, manufactured, used and recovered. For decades, industrial systems were optimized primarily for production and consumption. Increasingly, they must also be optimized for reuse, repair and resource recovery. Achieving this transformation requires information. As Europe seeks to reduce resource dependency, strengthen industrial resilience and accelerate circularity, Digital Product Passports may become one of the most important infrastructures supporting the sustainable economy of the future. The products themselves may not change overnight. But the information surrounding them is about to become dramatically more visible, more accessible and more valuable than ever before.

Artificial intelligence for the planet:

By Rareș Crețu

The new intelligence driving circular solutions

The environmental sector is entering a new technological era. Across Europe, artificial intelligence is rapidly moving beyond research laboratories and technology companies, becoming an increasingly important tool in waste management, resource efficiency, energy optimization and environmental protection.

From smart recycling facilities and water treatment plants to climate monitoring systems and industrial resource management, AI is helping organizations process enormous amounts of data, identify patterns and make decisions with unprecedented speed and accuracy.

For many environmental professionals, the question is no longer whether artificial intelligence can contribute to sustainability goals. The real question is how quickly these technologies can be deployed to support Europe's transition toward a more circular, resilient and resource-efficient economy.

As governments and industries race to achieve ambitious climate and circular economy targets, artificial intelligence is emerging as one of the most powerful technologies available to accelerate progress.

The Challenge of Managing Complexity
Environmental systems are becoming increasingly complex.

Cities generate vast quantities of waste. Water networks span thousands of kilometers. Industrial facilities produce enormous amounts of operational data. Renewable energy systems must continuously adapt to changing weather conditions and demand patterns.

Traditional management approaches often struggle to process this growing volume of information.

Artificial intelligence offers a different approach.

Machine learning systems can analyze millions of data points, identify correlations and generate actionable insights in real time. Instead of relying exclusively on historical reports and human observation, organizations can increasingly use predictive intelligence to anticipate problems before they occur. This capability is particularly valuable in environmental management, where



early intervention can reduce costs, improve efficiency and prevent environmental damage.

Reinventing Waste Management

One of the most promising applications of AI can be found in the waste management sector.

Across Europe, recycling operators face growing challenges associated with increasingly complex waste streams. Modern products often contain dozens of different materials assembled into sophisticated combinations of plastics, metals, electronics and composites. Traditional sorting methods, while effective, can struggle to achieve the purity levels required for high-quality recycling.

Artificial intelligence is helping change this reality. Advanced optical sorting systems equipped with cameras, sensors and machine learning algorithms can identify materials in fractions of a second. These technologies can distinguish between different types of plastics, locate contaminants and optimize material separation processes with impressive accuracy.

In many modern facilities, AI-powered systems are capable of analyzing thousands of objects per minute, significantly improving recovery rates and reducing contamination.

The result is higher-quality recycled

materials that can more easily re-enter production cycles.

For a circular economy that depends on secondary raw materials, these improvements are becoming increasingly valuable.

Making Waste Visible

Artificial intelligence is also helping municipalities better understand how waste is generated and managed.

By analyzing collection data, demographic information, consumption patterns and seasonal variations, AI systems can predict waste generation trends and optimize collection routes. Smart waste containers equipped with sensors are already being tested in several European cities. These systems can notify operators when containers approach capacity, reducing unnecessary collection trips and lowering fuel consumption.

The environmental benefits can be substantial. Fewer collection vehicles on the road means lower emissions, reduced traffic congestion and more efficient use of public resources.

What once required reactive management is increasingly becoming predictive management.

A New Era for Resource Efficiency

The circular economy depends not only on recycling but also on using resources more efficiently from the beginning. Artificial intelligence is helping manufacturers achieve this objective. Production systems equipped with AI can monitor material consumption, identify inefficiencies and optimize manufacturing processes. Even small improvements can generate significant environmental benefits when applied across large industrial operations. Increasingly, companies are using machine learning tools to reduce energy consumption, minimize waste generation and improve maintenance planning. Predictive maintenance represents a particularly important application. Rather than waiting for equipment to fail, AI systems analyze operational data to identify potential problems before breakdowns occur. This reduces downtime, extends equipment life and minimizes resource consumption associated with repairs and replacements. In a circular economy, extending product and equipment lifespans is often as important as recycling.

Protecting Europe's Water Resources

Water security is becoming one of Europe's most significant environmental challenges. Climate change, prolonged droughts, changing precipitation patterns and increasing demand are putting pressure on water systems throughout the continent. Artificial intelligence is helping water utilities respond more effectively. Smart monitoring systems can continuously analyze water quality parameters, detect leaks, optimize treatment processes and forecast demand fluctuations. Some utilities are using AI-powered analytics to identify hidden leaks that previously would have gone unnoticed for months. Others employ predictive models to optimize chemical and energy use during treatment processes. These improvements translate into economic savings, reduced environmental impacts and more resilient infrastructure. As climate-related pressures continue to intensify, intelligent water management is becoming increasingly important.

Monitoring the Environment at Scale

Environmental monitoring generates enormous quantities of data. Satellites, drones, air quality sensors, weather stations and monitoring networks collect information

continuously. Processing these datasets manually would be impossible. Artificial intelligence enables environmental agencies, scientists and policymakers to transform data into insights. Machine learning algorithms can analyze satellite imagery to identify illegal deforestation, monitor land-use changes, assess biodiversity trends and track pollution events. In coastal regions, AI tools help monitor marine ecosystems and identify environmental anomalies. In urban areas, they contribute to air quality analysis and pollution forecasting. The ability to detect environmental changes quickly allows authorities to respond faster and allocate resources more effectively. This combination of data and intelligence is transforming environmental governance.

Supporting the Energy Transition

The growth of renewable energy presents another area where artificial intelligence is playing an increasingly important role. Unlike conventional power generation, renewable sources such as solar and wind depend heavily on weather conditions. Balancing supply and demand therefore becomes more complex. AI systems can analyze meteorological data, electricity demand patterns and infrastructure performance to improve energy forecasts and grid stability. As Europe continues expanding renewable energy capacity, intelligent forecasting tools are expected to become even more valuable. The integration of energy systems, storage technologies and smart grids depends heavily on accurate data analysis, an area where artificial intelligence excels.

Challenges and Responsible Deployment

Despite its potential, artificial intelligence is not a universal solution. Environmental experts emphasize that technology alone cannot solve sustainability challenges. Poor-quality data, weak governance structures and inadequate implementation can limit the benefits of AI projects. There are also legitimate concerns regarding privacy, transparency and cybersecurity. The energy consumption associated with advanced computing infrastructure has attracted increasing attention as well. Large-scale AI systems require significant computational resources, creating discussions about balancing technological benefits with environmental impacts. Responsible

deployment therefore remains essential. Organizations must ensure that AI supports environmental objectives rather than simply adding technological complexity. Human expertise continues to play a central role. Engineers, scientists, environmental professionals and policymakers remain responsible for interpreting results, setting priorities and making decisions. Artificial intelligence works best as a tool that enhances human capabilities rather than replacing them.

From Data to Action

Perhaps the greatest value of artificial intelligence lies in its ability to transform environmental information into practical action.

For decades, many organizations struggled not because they lacked data, but because they lacked the ability to process it efficiently. Today, AI offers the possibility of converting enormous volumes of information into meaningful insights that support better decisions. This capability is particularly relevant for the circular economy, where successful resource management depends on understanding complex interactions between production, consumption, reuse and recycling. The future circular economy will likely be both physical and digital. Materials will continue to flow through industrial systems, but information will flow alongside them. Artificial intelligence will help manage these flows, identify opportunities and reduce inefficiencies that would otherwise remain invisible.

The Intelligent Circular Economy

Europe's environmental objectives are ambitious. Achieving climate neutrality, improving resource efficiency and strengthening circularity will require innovation at every level of society. Artificial intelligence is not a substitute for environmental policy, investment or public engagement. However, it is rapidly becoming one of the most powerful tools available to support these efforts. The transition toward a circular economy is fundamentally about making better use of resources. Artificial intelligence helps make better use of information. Together, these two transformations could redefine how Europe manages materials, energy, water and waste throughout the coming decades. In this sense, AI is not merely another technological trend. It is becoming part of the intelligence infrastructure that will help build a cleaner, more resilient and more sustainable future.

Agrivoltaics:

When agriculture and solar energy share the same land

Across Europe, two major challenges are reshaping rural landscapes. On one hand, governments are accelerating investments in renewable energy to reduce dependence on fossil fuels and achieve climate neutrality. On the other, farmers are facing increasing pressure from droughts, extreme weather events, rising production costs and competition for land.

For years, these objectives appeared to be in conflict. Should agricultural land be used to produce food or generate clean energy?

A growing number of scientists, policymakers and farmers now believe the answer may be both. This innovative approach, known as agrivoltaics, is rapidly emerging as one of the most promising developments in sustainable land management. By combining agricultural production and solar energy generation on the same land, agrivoltaic systems challenge the traditional idea that food and energy production must compete for space. What was once considered an inevitable trade-off is increasingly becoming a win-win solution.

A New Approach to Land Use

Traditional solar parks require large areas of land. As renewable energy projects expand across Europe, concerns have emerged regarding the conversion of agricultural land into energy infrastructure.

Agrivoltaics offers a different model. Instead of covering farmland with conventional solar installations, specially designed solar panels are elevated or arranged in a way that allows agricultural activities to continue underneath or between them. In practice, crops, livestock and solar panels coexist on the same field.

The concept first gained attention in research institutions, but it is now moving into commercial applications across several European countries, including France, Germany, Italy and the Netherlands. As climate challenges intensify, the idea is attracting growing interest from governments and investors alike.



reduced heat stress and improved soil moisture retention. The panels also reduce water evaporation from the soil, an increasingly important advantage in regions vulnerable to drought. In southern Europe, where water scarcity is becoming a major concern, this aspect alone is generating significant interest.

Protecting Crops from Climate Stress

One of the most significant benefits of agrivoltaic systems is their ability to reduce environmental stress on crops. European agriculture is increasingly exposed to extreme temperatures, prolonged droughts and more frequent heatwaves. In many regions, farmers are struggling with declining yields and higher irrigation requirements.

Strategically placed solar panels can provide partial shade, reducing excessive solar radiation during the hottest periods of the day. For certain crops, this creates more favorable growing conditions. Research projects conducted across Europe have shown that some fruits, vegetables and specialty crops can benefit from

Producing Food and Energy Simultaneously

Perhaps the most attractive feature of agrivoltaics is its dual productivity. Traditionally, a field produces crops. An agrivoltaic field produces crops and electricity at the same time. This creates new economic opportunities for rural communities. Farmers gain access to an additional source of income from electricity generation while maintaining agricultural activities. In some cases, this diversification can improve financial resilience and reduce vulnerability to fluctuations in agricultural markets. For rural regions facing economic uncertainty, the model offers a practical pathway toward greater stability. It is not simply an energy project. It is an agricultural development strategy.

Success Stories Across Europe

Several European countries are already experimenting with large-scale agrivoltaic systems.

In France, pilot projects combine vineyards with elevated solar panels designed to protect grapevines from excessive heat and hailstorms. Wine producers are increasingly exploring how renewable energy infrastructure can support climate adaptation efforts. In Germany, researchers have tested agrivoltaic systems on crops ranging from potatoes to cereals, with encouraging results regarding both agricultural productivity and solar energy output.

Italy, meanwhile, has positioned agrivoltaics as an important component of its renewable energy expansion strategy. The country's strong solar resources and extensive agricultural sector provide ideal conditions for implementation.

These projects are helping transform agrivoltaics from an experimental concept into a commercially viable solution.

Livestock and Solar Panels

Agrivoltaics is not limited to crop production. In several regions, livestock farming is being integrated with solar infrastructure.

Sheep grazing beneath solar panels has become an increasingly common practice. The animals naturally maintain vegetation growth, reducing maintenance costs while continuing productive agricultural use of the land. The panels provide shelter from intense sunlight and adverse weather conditions, creating additional benefits for animal welfare. This multifunctional approach demonstrates how agrivoltaics can support a variety of agricultural systems rather than a single farming model.

Romania's Untapped Agrivoltaic Potential

While agrivoltaics is advancing rapidly in Western Europe, Romania possesses some of the conditions that could make it one of the future leaders of this sector in Eastern Europe. With approximately 13 million hectares of agricultural land, Romania

is among the largest agricultural producers in the European Union. At the same time, many regions are increasingly affected by prolonged droughts and rising temperatures, particularly in southern and eastern parts of the country.

Recent years have brought repeated periods of severe drought affecting large agricultural areas, reducing yields for cereals, sunflower and maize. Climate change is no longer a future scenario for Romanian agriculture. It is an operational reality. Agrivoltaic systems could offer exactly the combination that many farmers are seeking.



By providing partial shade and reducing water evaporation from the soil, solar panels can help crops better withstand extreme heat while generating renewable electricity. For Romanian farmers facing growing climate uncertainty, this dual functionality could become increasingly attractive.

From the Bărăgan Plain to Dobrogea

Several Romanian regions appear particularly suitable for agrivoltaic development.

The Bărăgan Plain, often described as Romania's agricultural heartland, experiences frequent drought conditions and high solar radiation levels. Similar conditions exist in Dobrogea, a region already recognized as Romania's renewable energy powerhouse due to its extensive wind

farms and rapidly expanding solar sector.

These regions face a dual challenge: maintaining agricultural productivity while adapting to increasingly dry conditions. Agrivoltaic systems could help address both issues simultaneously. Under carefully designed installations, crops continue to grow while the land also generates clean electricity. Instead of competing for land, agriculture and renewable energy become complementary activities. For a country seeking both energy independence and agricultural resilience, this model is particularly attractive.

Opportunities for Vineyards and High-Value Crops

Romania is one of Europe's major wine-producing countries, with internationally recognized wine regions such as Dealu Mare, Murfatlar, Cotnari, Târnave and Drăgășani.

Interestingly, vineyards are among the agricultural applications currently attracting the most attention in agrivoltaic research. Pilot projects in France and Italy have demonstrated that elevated solar structures can protect grapevines from excessive solar radiation, hailstorms and extreme weather events while maintaining grape quality and producing renewable energy. For Romanian wine producers facing increasing climatic variability, such systems could represent a valuable adaptation tool. Similar opportunities may exist for orchards, berry farms and vegetable producers, particularly

in regions where water availability is becoming a limiting factor. The future vineyard may not only produce wine. It may also contribute directly to Europe's clean energy transition.

A New Source of Income for Rural Communities

Romania's rural areas face multiple challenges, including demographic decline, labor shortages and fluctuating agricultural revenues. Agrivoltaics could provide farmers with a second source of income through electricity generation while allowing agricultural production to continue. This diversification may become increasingly important as climate-related risks make agricultural revenues less predictable.

Unlike conventional solar parks, which often remove productive land from agriculture, agrivoltaic projects maintain the farming function of the land. This distinction is particularly important in Romania, where agriculture remains a significant contributor to employment and rural development. For many communities, agrivoltaics is not merely an energy solution. It is also an economic development opportunity.

Challenges and Concerns

Despite its promise, agrivoltaics is not without challenges.

Installing dual-use systems is generally more expensive than developing conventional solar parks. The infrastructure often requires specialized designs, elevated structures and additional engineering solutions.

Selecting suitable crops and adapting farming practices also requires expertise. Not every agricultural activity is compatible with agrivoltaic systems, and results may vary depending on climate conditions, crop types and panel configurations. Regulatory frameworks remain another important consideration. Many countries are still adapting legislation to accommodate dual-use land management models. To achieve widespread adoption, policymakers will need to create clear rules and incentives that support investment while protecting agricultural interests.

Beyond Energy Production

The significance of agrivoltaics extends beyond renewable electricity generation. The concept reflects a broader transformation in how society views land use.

Rather than assigning land to a single purpose, the future may increasingly favor multifunctional landscapes capable of delivering food, energy, biodiversity benefits and climate resilience simultaneously. Such approaches are becoming particularly relevant as Europe seeks solutions to multiple environmental challenges at once. Food security, renewable energy deployment, climate adaptation and efficient resource management can no longer be addressed separately. Agrivoltaics demonstrates that integrated solutions are possible.

Could Romania Become an Agrivoltaic Leader?

Europe's energy transition and climate adaptation efforts are accelerating simultaneously.

Countries that succeed in combining renewable energy development with sustainable food production will likely gain important competitive advantages in the coming decades. Romania possesses abundant agricultural land, favorable solar resources, an expanding renewable energy sector and growing awareness of climate adaptation needs. These conditions place the country in a strong position to benefit from future agrivoltaic investments.

The technology is still emerging, and significant regulatory, financial and technical challenges remain. Yet the potential is undeniable.

As Europe searches for smarter ways to produce both food and clean energy, Romania may find itself uniquely positioned at the intersection of both worlds.

Farming the Future

The fields of the future may look very different from those of the past.

Instead of choosing between agriculture and energy production, farmers may increasingly combine both. Solar panels may become as common a feature of the rural landscape as irrigation systems, tractors or grain silos.

For Europe, the stakes are high. Achieving climate neutrality while maintaining agricultural productivity will require innovative approaches capable of maximizing the value of every hectare. Agrivoltaics is not a universal solution, nor will it replace conventional farming. However, it offers a glimpse into a future where technology and agriculture work together rather than compete for resources. In a continent facing growing environmental and economic pressures, that vision may become increasingly important.

The question is no longer whether agriculture and renewable energy can share the same land. The question is how quickly Europe, and Romania, will embrace the opportunity.



For more than a decade, climate change has dominated environmental discussions in boardrooms, government institutions and international conferences. Companies have measured carbon footprints, established net-zero targets and invested billions in decarbonization strategies. Today, another environmental issue is rapidly moving to the center of policy making, investment decisions and corporate sustainability agendas. **Its name is biodiversity.**

Biodiversity is the new climate

Why Nature Has Become the Next Major Sustainability Challenge for Europe

Across Europe and around the world, governments and businesses are increasingly recognizing that climate stability and healthy ecosystems are inseparable.

Forests, wetlands, rivers, grasslands, pollinators and wildlife do not simply represent natural heritage. They are essential infrastructure supporting food production, water security, economic development and human well-being.

In sustainability circles, a new phrase is becoming increasingly common:

"Biodiversity is the new climate."

Not because climate change has become less important, but because the degradation of nature is finally receiving the attention it deserves.



A Crisis Hidden in Plain Sight

Unlike climate change, biodiversity loss is often difficult to see. Heatwaves, floods and wildfires generate dramatic images and immediate headlines. Biodiversity decline, by contrast, usually happens slowly. Species disappear silently. Habitats shrink gradually. Pollinator populations decrease year after year. Yet scientists warn that the scale of the crisis is enormous.

According to global scientific assessments, approximately **one million animal and plant species are currently threatened with extinction**, many within the coming decades if current trends continue.

The situation in Europe is equally concerning. The European Commission estimates that **more than**

80% of protected habitats in the European Union are in poor or bad condition, while many ecosystems continue to decline due to land-use change, pollution, invasive species and climate change. This deterioration has consequences that extend far beyond environmental protection.

Healthy ecosystems provide services that modern societies depend on every day:

- food production;
- water filtration;
- flood prevention;
- soil fertility;
- carbon storage;
- climate regulation;
- disease control.

When ecosystems deteriorate, these services become less reliable, more expensive and increasingly difficult to replace.

Nature Is Not a Luxury. It Is an Economic Asset.

For many years, biodiversity was perceived primarily as an environmental issue.

Today, economists increasingly describe it as a form of natural capital. Without fertile soils, agricultural productivity declines. Without pollinators, food production becomes more vulnerable. Without healthy forests and wetlands, communities become increasingly exposed to floods, droughts and extreme weather events. The economic implications are substantial.

According to the World Economic Forum, more than half of global GDP, equivalent to approximately \$44 trillion, is moderately or highly dependent on nature and the ecosystem services it provides.

This means that biodiversity loss is no longer just an ecological concern. It is becoming an economic risk.

Agriculture, tourism, forestry, fisheries, pharmaceuticals, construction, energy production and manufacturing all depend, directly or indirectly, on healthy ecosystems.

Protecting biodiversity is therefore increasingly viewed as an investment in long-term economic resilience.

The Pollinator Problem

One of the clearest examples of biodiversity's importance can be found in agriculture.

According to the Food and Agriculture Organization (FAO), **more than 75% of the world's food crops depend to some extent on pollinators such as bees, butterflies, birds and insects.**

Yet pollinator populations are declining across many regions. The causes include habitat loss, pesticide use, climate change and pollution. The consequences could be significant. Reduced pollination impacts crop yields, food quality and agricultural profits. For farmers, biodiversity is not an abstract environmental concept. It is directly linked to productivity and income. This reality is changing the way policymakers and businesses approach nature conservation.

Europe's Ambitious Nature Restoration Agenda

Recognizing the severity of biodiversity decline, the European Union has made nature restoration a strategic priority.

In recent years, biodiversity has become one of the central pillars of the European Green Deal alongside climate action and the circular economy.

The EU Nature Restoration Law represents one of the most ambitious environmental initiatives in decades. Its objective is to help restore at least 20% of the European Union's land and sea areas by 2030, while progressively reversing ecosystem degradation across the continent. The legislation reflects a fundamental shift in environmental policy.

For many years, conservation efforts focused primarily on protecting existing natural areas. Today, the focus is expanding toward actively restoring damaged rivers, wetlands, forests, grasslands and marine ecosystems. The message is clear: protecting nature is no longer enough. Europe must also repair what has already been lost.

Biodiversity and Climate: Two Sides of the Same Coin

Climate change and biodiversity loss are often discussed separately.

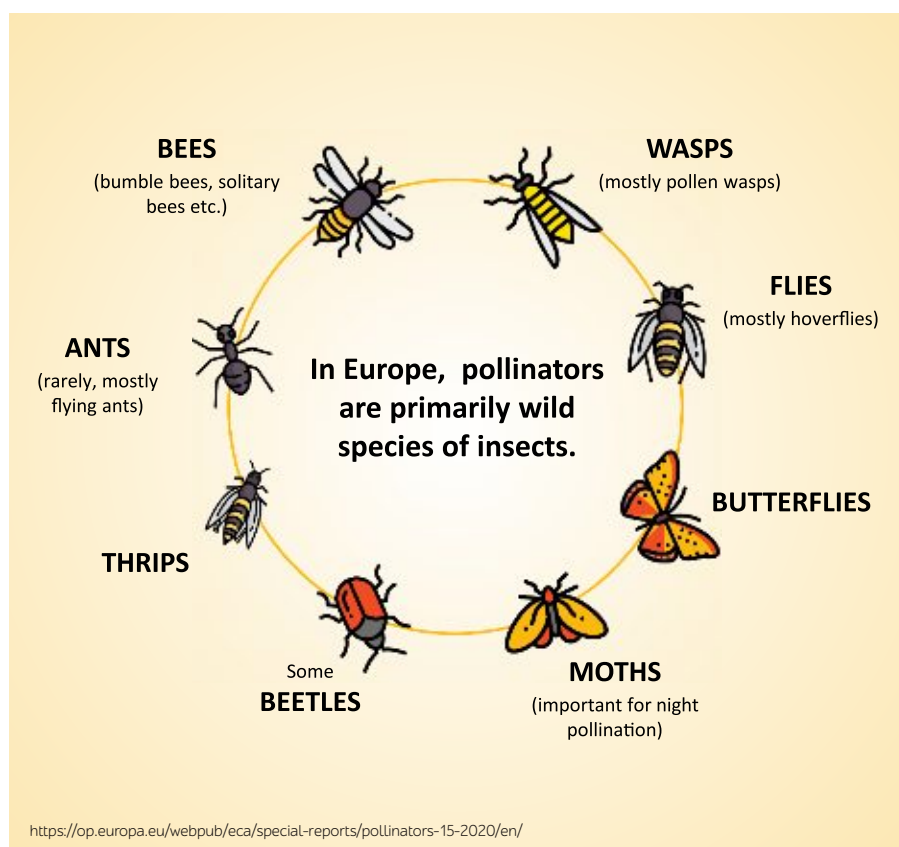
In reality, they are deeply interconnected. Forests absorb carbon dioxide and store vast quantities of carbon. Peatlands and wetlands act as important carbon sinks while helping regulate water cycles. Grasslands support soil health and improve resilience to drought.

Scientists estimate that nature-based solutions could contribute up to 30% of the climate mitigation needed by 2030 to help achieve global climate goals. At the same time, climate change is placing additional pressure on ecosystems through rising temperatures, droughts, wildfires and changing rainfall patterns.

The two crises reinforce one another. Protecting biodiversity helps combat climate change. Combating climate change helps protect biodiversity. Neither challenge can be solved independently.

The Corporate Biodiversity Revolution

A few years ago, sustainability reporting focused largely on greenhouse gas emissions. Today, companies are beginning to evaluate something far broader: their relationship with nature itself. Investors, regulators and financial institutions increasingly expect businesses to understand how their operations affect ecosystems and how



ecosystem degradation might affect their future performance.

Questions that were once rarely asked are becoming standard:

- How much does a company depend on ecosystem services?
- How do supply chains impact biodiversity?
- What financial risks arise when ecosystems decline?
- How resilient are business operations to biodiversity loss?

For many organizations, biodiversity is emerging as the next major frontier of environmental risk management. Just as carbon accounting became commonplace over the past decade, biodiversity reporting may become a standard business practice in the years ahead.

Romania also contains high-nature-value grasslands, traditional agricultural landscapes and extensive areas of relatively intact habitat that have disappeared from many other parts of Europe. These ecosystems are not only environmental assets. They provide economic benefits through tourism, agriculture, water regulation, climate resilience and ecosystem services.

As biodiversity becomes increasingly important in European policy and investment frameworks, Romania's natural capital may become one of its most strategic assets.

The cities of the future will almost certainly be greener, cooler and more connected to nature than those of the past.

Investing in Nature

Perhaps the most significant development is the growing recognition that nature itself represents an investment opportunity. Governments alone cannot finance all the restoration projects required to reverse biodiversity loss. As a result, private capital is increasingly entering the field. Investors are exploring opportunities linked to ecosystem restoration, sustainable land management, biodiversity credits and nature-based solutions. Although these markets remain at an early stage, many analysts believe they could become one of the defining sustainability investment themes of the coming decade. Nature is increasingly being recognized not as a cost, but as an asset.

<https://www.sor.ro/proiect/petlican/pasarile-deltai/>



Romania's Strategic Natural Capital

Within Europe, Romania occupies a unique position in the biodiversity landscape. The country hosts some of the continent's most valuable ecosystems.

The Carpathian Mountains contain extensive forests and support some of Europe's most significant populations of large carnivores, including bears, wolves and lynx.

The Danube Delta, a UNESCO World Heritage Site, remains one of the best-preserved wetland ecosystems in Europe and supports more than 300 species of birds.

Biodiversity in Europe's Cities

Biodiversity is often associated with national parks and remote wilderness areas. Increasingly, however, it is becoming an urban priority. Cities across Europe are investing in urban forests, green roofs, rain gardens, ecological corridors and river restoration projects. These initiatives serve multiple objectives. They reduce urban heat, improve air quality, support pollinators, increase climate resilience and enhance quality of life.

Urban biodiversity is no longer viewed as a luxury. It is increasingly recognized as an essential component of sustainable city development.

The Decade of Biodiversity

For years, climate change dominated environmental discussions because its impacts became impossible to ignore. Biodiversity is now following a similar path.

The decline of ecosystems is no longer viewed solely as a concern for conservation organizations and environmental activists. It is increasingly recognized as a challenge that affects economies, businesses, communities and long-term prosperity. The coming decade may be remembered not only as the decade of climate action, but also as the decade when biodiversity moved to the center of economic decision-making.

Without healthy ecosystems there can be no resilient agriculture. Without biodiversity there can be no water security. Without nature there can be no sustainable economy. And that is why biodiversity is becoming the new climate.

printed on 100% recycled paper produced by Vrancart S.A.



Infomedi Europa magazine:

- Publishes articles on various environmental topics, aiming to inform the public, the business sector and the public institutions and to raise the awareness on the importance of environment protection.
- Brings you market analysis, news, legislation updates and reviews from major environmental conventions, congresses and trade events around the world
- Presents the perspective of specialists in terms of environmental legislation and its implementation and the best opportunities of investment in the field of environmental technologies.
- Attends the most important international events about environment and brings back information on the status of different industrial sectors dealing with the collecting, recycling, treatment and reuse of waste.

For information about advertising in the magazine or advertising opportunities on the website, please contact our Sales Department: Telephone: +40720882855; E-mail: director@infomedi.eu



E26

The Global Stage for the Circular Economy

NOVEMBER
3 — 6, 2026

RIMINI
EXPO CENTRE
Italy

ECOMONDO

The green technology expo.

Organized by

ITALIAN EXHIBITION GROUP
Providing the future

In collaboration with



Ministero degli Affari Esteri
e della Cooperazione Internazionale

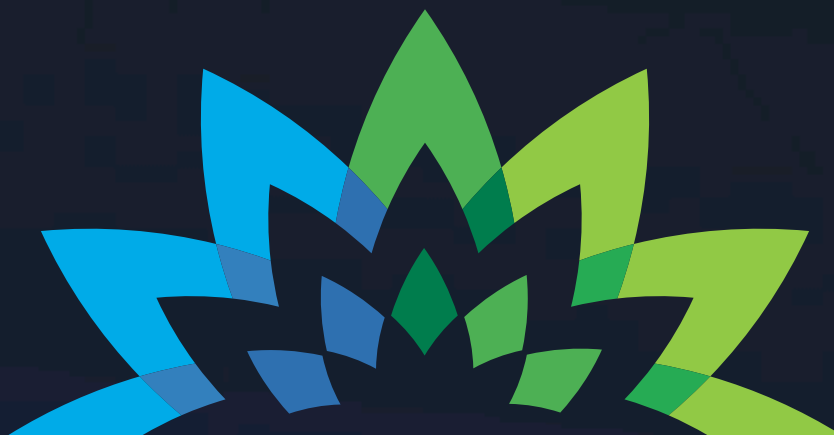


GET YOUR
FREE TICKET



ecomondo.com

www.fimromania.ro/en



THE INTERNATIONAL ENVIRONMENT FORUM

23–25 March 2027
ROMEXPO – BUCHAREST



THE FUTURE OF GREEN ECONOMY DEBATED BY PROFESSIONALS

Managing organization

InfomediEuropa®
REVISTĂ DE MEDIU ȘI ECOLOGIE - MEMBRĂ A EUROPEAN ENVIRONMENTAL PRESS

With the active involvement of



ASOCIATIA
ecoatitudine