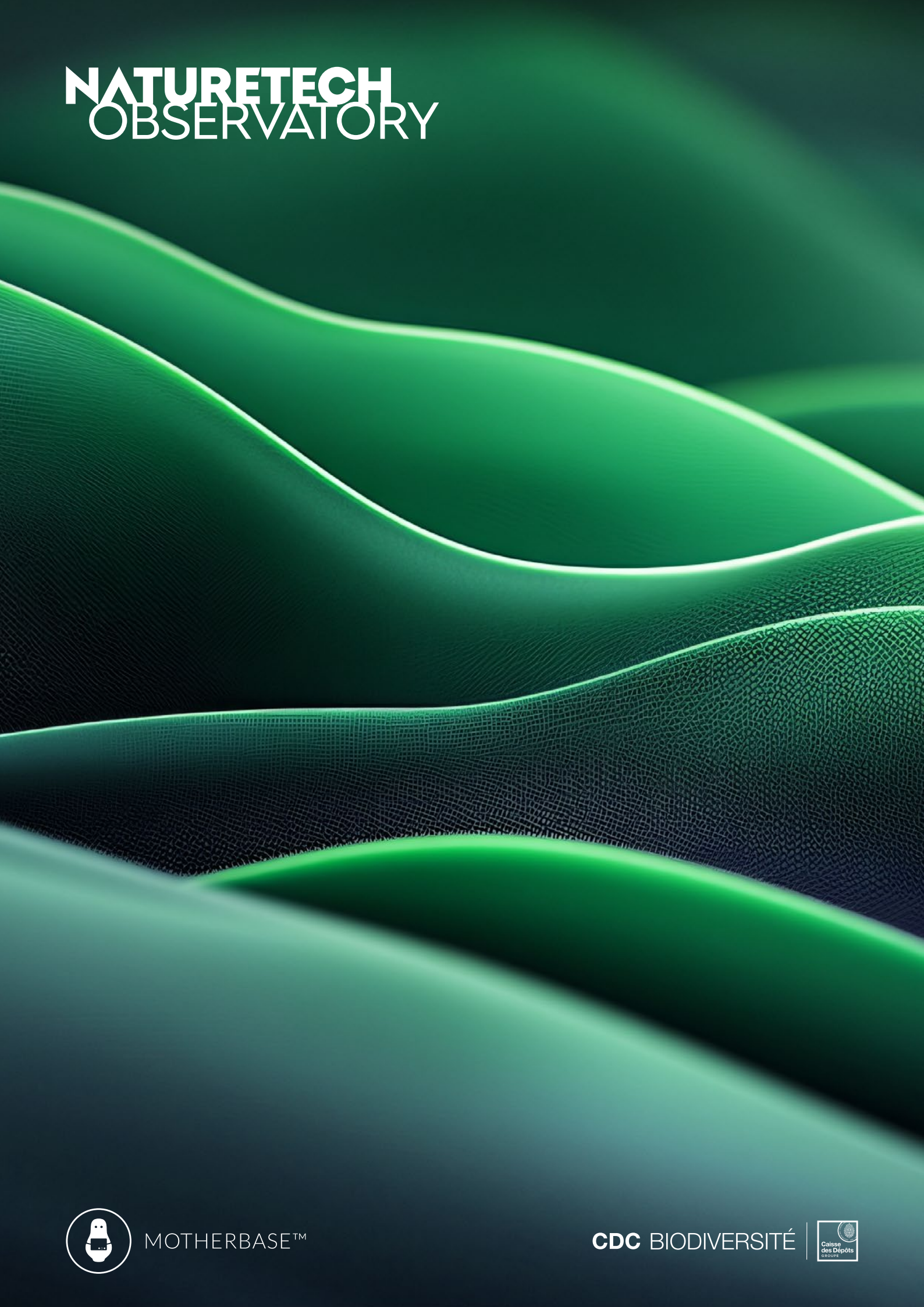
NATURETECH OBSERVATORY



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CDC BIODIVERSITÉ | Caisse des Dépôts GROUPE

About us

Who we are

The NatureTECH Observatory was founded and launched in 2025 by UChange and CDC Biodiversité with the support of its Mission Economics for Biodiversity (MEB) to present and classify an ecosystem of start-ups committed to nature.

U Change's innovative, open and scalable methodologies accelerate the digital transformation of your organization. MotherBase is an intelligent directory of startups. It gathers more than 3000 automatic notices regularly enriched by our experts.

CDC BIODIVERSITÉ is a subsidiary of *Caisse des Dépôts* entirely dedicated to actions in favour of biodiversity and its long-term management. It acts on behalf of project owners, local authorities, and companies, delegating the management of their actions, whether voluntary or regulatory (ecological compensation), to restore and manage natural areas. Within CDC Biodiversité, the *MEB,* a *Caisse des Dépôts* initiative hosted by the company, aims to identify, study and test innovative tools linking economy and biodiversity. It has been promoting the mainstreaming of biodiversity within the world of business and public policy for over 10 years through its technical analysis and research and development tools, such as AgriBEST or the Global Biodiversity Score.

What we do

We combine data, economic analysis and environmental expertise to explore the NatureTECH emerging ecosystem.

- **Database:** by using the Motherbase database, we collect and sort over 1000 start-ups developing different technologies in line with the Global Biodiversity framework of Kunming-Montreal.
- **Analysis:** thanks to the data appendix, we analyse economic trends and draft micro and macro analysis by sector and technologies.
- **Community**: because defending nature is a collective affair, we are a catalyst for businesses and investors committed to stop and reverse the biodiversity loss.

What we define as NatureTECH

$$NatureTECH = \left(Biodiversity - \frac{Sixth\ Mass\ extinction}{Mitigation\ Hierarchy}\right) \times Startups$$

Biodiversity - According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), biodiversity refers to the variety of all forms of life on Earth and the interactions within and between each of these, including three levels among them ecological diversity (ecosystems); specific diversity (species) ; genetic diversity (genes). Biodiversity is fundamental for ecosystem health and human well-being and underpins essential ecosystem services businesses rely on, such as food, clean water, air quality, climate regulation, and the cultural and spiritual benefits humans derive from nature.

Sixth Mass extinction - also known as the Holocene extinction or Anthropocene extinction, it refers to the rapid loss of animals, plants and biodiversity on Earth, driven primarily by human activities (Barnosky et al., 2011). Currently, the species extinction rate is estimated between 1,000 and 10,000 times higher than natural extinction rates—the rate of species extinctions that would occur if we humans were not around (WWF, 2024). It is a clear indication of our ecosystems' health overall decline and their ability to support our current economic activities for much longer.

Key drivers as described by IPBES include:

- **Land-use change** (e.g., deforestation, urbanization, agriculture)
- **Overexploitation** of ressources (e.g., overfishing, poaching)
- **Pollution** (e.g., plastic waste, chemicals, air and water contamination)
- **Climate change**, which alters ecosystems and threatens species unable to adapt
- **Invasive species**, introduced by humans, which outcompete native species

Mitigation Hierarchy – How to bend the curve of biodiversity loss? By a rapid and systemic mitigation of our negative impacts thanks to a structured and stepwise strategy toward achieving no net loss of biodiversity (2030). Such a hierarchy seeks to deeply transform our organisations:

- **Avoid:** the first and most important step, which seeks to avoid impacts on biodiversity by carefully planning and designing projects and products to prevent or minimize damage**.** *Sobriety is the key – just leave it alone.*
- **Reduce:** if impacts cannot be entirely avoided, this step involves reducing the extent, intensity, and duration of biodiversity impacts as much as possible (replace with a more sustainable material, reduce the duration or the surface of a project, etc.). *Sometimes, less is more.*

Restore: 30% of of degraded terrestrial, inland water, coastal and marine ecosystems need to be restored by 2030 to ensure a safely operating space for humanity within planetary limits (GBF, 2022)**.** This can be made through two different channels of financing: regulatory (offset) or voluntary contribution (certificates). *A way to repair something that has been broken.*

Disclaimer on the Observatory - we don't need just TECH, but we definitely need relevant TECH

Overall impact of technical solutions - The aim of this platform is not to assess which start-ups are needed to tackle the biodiversity crisis, but to identify a trend and a general opportunity to contribute to the Kunming-Montreal targets.

No analysis has been conducted regarding the relevance of the solutions in reducing the biodiversity crisis. As it stands, we rely on statements made by start-ups and leave it up to the reader to form an opinion.

Start-ups can't replace public policies and structural changes – by analysing and promoting the NatureTECH ecosystem, we could be indirectly underlying the idea that start-ups can break the tie. Such an opinion could diminish the severity of the current crisis and the magnitude of the structural changes to be implemented.

For instance, a start-up specialising in cosmetics can develop organic, pesticide-free products using less resource-intensive materials . The product seems to fit with an overall reduction of the cosmetic industry global footprint – yet there is no guarantee that this product will not be purchased 10 or 100 times more, cancelling any reduction of the associated pressure as part of a rebound effect[1]. In fact, analysing the overall effect of a solution means taking into account the resulting changes across an entire issue or economic sector.

Adding product-oriented approaches will not solve a problem for which solutions are not always scalable and venture-capital compatible. For instance, ecosystem restoration projects often require adaptability and flexibility better suited to project finance.

Let's bring TECH to the table - We think it is time to break down walls and mix the in-depth expertise of the biodiversity community with the agility of start-ups and early-stage investors. Why?

Investing in NatureTECH start-ups seems to be a good proxy to mainstream biodiversity and nature in the business world. Private equity can bring innovative approaches to environmental issues and challenges, particularly by helping small businesses to scale and industrialise biodiversity-friendly solutions. It facilitates research and development, enhance market expansion, and optimize operational efficiency by providing the necessary capital, strategic guidance, and operational expertise to help emerging companies scale their innovations.

Existing solutions need dedicated channels within venture capital. Their inspiring stories can be a strong catalyst to the global business world and help gather larger crowds (and money) for the conservation or restoration of nature.

For instance, reporting solutions powered with AI and aligned with CSRD obligations[2] make it easier for companies to report and comply with environmental standards. In a very different way, satellite-imagery solutions enable more accurate data to be collected and serve monitoring and assessment of ecosystems.

To this day, our analyses are an ongoing process, we deliberately did not assess the transformative potential in terms of biodiversity preservation about any of the developed solutions, nor did we assess their scientific robustness. You can contact us for further details about this incoming investigation at contact@naturetechobservatory.org.

1 This is called the Jevons Paradox. *It describes the counterintuitive phenomenon where improvements in the efficiency of resource use lead to an overall increase in consumption rather than a decrease. This occurs because greater efficiency reduces the cost of using the resource, thereby increasing demand.* Alcott, B. (2005). Jevons' paradox. *Ecological Economics, 54*(1), 9-21.

2 The **Corporate Sustainability Reporting Directive (CSRD)** is a European Union regulation that enhances sustainability disclosure requirements for companies, mandating them to report on environmental, social, and governance (ESG) factors. It aims to improve transparency, accountability, and comparability of sustainability information, expanding the scope of reporting to more businesses and aligning disclosures with the **European Sustainability Reporting Standards (ESRS)** (European Commission, 2022).

Taxonomy

To dive deep into the NatureTECH journey, our methodology and the way we carry on our analysis focus on two major aspects:

- The issue tackled
(Categories – Biodiversity solutions)

- The financial support and confidence in the solutions and startups from the investment community
(Category – Fundraising)

CATEGORIES

Biodiversity solutions

We mixed and combined four levels of analysis to conduct our classification of NatureTECH start-ups according to their ability to reverse biodiversity loss:

- Which step of the **Mitigation Hierarchy** does the solution developed deal with?
- Which **driver of biodiversity loss** does the solution tackle?
- What kind of **technology** is developed?
- How close the technology developed is to **"real" biodiversity**?

Mitigation Hierarchy

A structured and stepwise strategy toward achieving no net loss of biodiversity (2030). The final goal of the mitigation hierarchy is to transform business models to make them resilient and sustainable.

Inform*

Provide data, analysis and information about the current and future states of biodiversity and about impacts and pressures footprint assessment of organisations.

→ Monitoring and reporting platforms, data collection tools, awareness raising programs, consultancies, ...

* We chose to add this step into the mitigation hierarchy as they aren't any problem solving that can be made prior to a clear understanding of the situation. This step is usually not mentioned into the classical representation of the mitigation hierarchy (ex: TNFD)

Avoid*

Lift a pressure by implementing a new product or by transforming processes once harmful for biodiversity.

This step implies the implementation of a structural change in the consuming habits that could lift a driver of biodiversity loss/ contribute to the conservation of ecosystems and natural habitats.

This category focuses on the design and manufacture of the product, rather than its commercialization or removal (ex-ante).

→ Plant-based meats, plastic-free containers, pesticide-free agricultural solutions, conservation, etc.

Reduce

Minimize a pressure by implementing less environmentally harmful products or processes.

This category focuses on the design and manufacture of the product, rather than its commercialization or removal (ex-ante + ex-post)

→ Precision agriculture, circular economy, waste management, etc.

Restore

Enhance the ecological integrity of a given ecosystem, either by directly acting on the environment (such as carrying out ecological engineering work) or by protecting it from external pressures.

→ Carbon or biodiversity credits, nature-based solutions, nature in the city, revegetation, reintroduction of species, etc.

* About the Avoid and Reduce categories: we focus our analysis solely on the products sold by the start-up. The analysis is therefore based on a constant consumption and production system, all things being equal. For example, a cosmetic product that claims to reduce the use of chemicals that are potentially harmful to the environment is assigned to the 'reduce' category, based on its components, but without considering any potential rebound effect.

Drivers of biodiversity loss

Direct drivers of biodiversity loss as described by IPBES (2019) are caused by indirect anthropic drivers (values, behaviors, production and consumption patterns, etc.) such as agricultural or industrial expansion.

Climate change

Direct driver pathways of climate change are related to changes in climate and weather patterns impacting *in situ* ecosystem functioning and causing the migration of species and entire ecosystems.

→ Carbon credits, seaweed farming, consulting in climate strategy, etc.

Invasive species

Invasive alien species are animals, plants or other organisms that are introduced by humans, either intentionally or accidentally, into places outside of their natural range; they out-compete local and indigenous species for natural resources, with negative implications for biodiversity.

→ Invasive species control systems; Biocontrol, etc.

Pollution

Pollution, including from chemicals and waste, is a major driver of biodiversity and ecosystem change with especially devastating direct effects on freshwater and marine habitats.

→ Plastic-free solutions, waste management, alternative to fossil fuels and fertilisers, etc.

Overexploitation of resources

The anthropogenic exploitation of wildlife has occurred throughout human history, leading to biodiversity loss and extinctions; however, the recent rate of loss has accelerated sharply. The most overexploited species include marine fish, invertebrates, trees, tropical vertebrates hunted for bushmeat, and species harvested for the medicinal and pet trade.

This category only includes biotic resources, ie ressources from living organisms.

→ Sustainable fishery, alternative to wildlife-based raw materials, monitoring tools for wildlife data collection, etc.

Land use change

Land-use change is the major human influence on habitats and can include the conversion of land cover (e.g. deforestation or mining), changes in the management of the ecosystem or agro-ecosystem (e.g. through the intensification of agricultural management or forest harvesting) or changes in the spatial configuration of the landscape (e.g. fragmentation of habitats).

→ Less intensive agriculture / forestry management; restoration of ecological corridors; rewilding, etc.

Education and awareness-raising

Increasing public understanding, engagement, and action regarding environmental issues and biodiversity conservation.

- Professional training and capacity building through serious games, consultation framework, etc.
- Specialized medias on biodiversity related topics
- Labels and awareness-raising programs

Technologies

Technical, financial or organisational tools, systems, and processes developed to apply the mitigation hierarchy on human activities.

Green finance and investment

Financial practices, informations and investment strategies that support biodiversity conservation.

- Carbon and biodiversity credits
- CSR data and analysis
- Green banking and crowd-funding for sustainable projects
- Green bonds, blended finance etc.

Agriculture and sustainable exploitation

Practices, innovations, and policies that promote the responsible use and management of natural resources in agriculture, forestry and aquaculture.

- Innovations in agro-ecology, such as hydroponics, vertical farms and regenerative farming practices
- Pesticide reduction: Development of alternatives to chemical pesticides, such as biopesticides
- Sustainable forestry and soil regeneration
- Aquaculture (fish farms, aquaponics and algae farming)

Circular economy and resource management

Efficient and sustainable use of resources through systems and products that minimize waste, extend the life cycle of products, and promote the recycling and reuse of materials.

- Recycling and reuse of resources and materials
- Closed loop systems and industrial symbiosis
- Development of new biodegradable and sustainable materials to replace plastics and other environmentally damaging materials.
- Water and waste reprocessing

Field data collection

Collecting indicators about the health of an ecosystem, species diversity and abundance, or about changes in practices; or transforming these processes by bringing new processes and technologies.

- Field surveys: using connected sensors (cameras, microphones) or naturalist surveys to collect data on habitats, species behaviour and environmental conditions, enabling better management and protection of ecosystems.
- New technologies such as drones, sensors (acoustic and e-dna): equipped with advanced sensors to monitor ecosystems in real time, detect illegal activities such as poaching or deforestation, and track health/gain indicators.

Data analysis and MRV*

Using collected data to assess and manage the ecological footprint of a product or an organisation.

- Data analysis - identifying the dependencies and impacts of an organisation on biodiversity (footprint)
- Predictive modelling - developing models to predict the impact of environmental changes or human activities on ecosystems and take preventive measures.
- SaaS software for reporting and sharing CSR data

* As in « Measurement, Reporting, Verification ».

Blue economy and ocean restoration

Sustainable use, conservation, and restoration of ocean and coastal resources

- Regeneration of marine or aquatic ecosystems
- Marine pollution reduction
- Sustainable Fisheries and Aquaculture

Ecosystem restoration

Repairing, rehabilitating, and revitalizing degraded, damaged, or destroyed ecosystems to restore their ecological functions.

- Ecological engineering activities

Urban nature and green spaces

Development, enhancement, and preservation of green and natural areas within urban environments.

- Greening roofs, workplaces and streets
- Urban forests, tree planting initiatives and biodiversity-friendly landscaping
- Grazing of green spaces, setting up beehives

Biotechnology

Any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use (FAO, 1999)

- Biofuels
- Environmental remediation (plants absorbing and transforming pollutants)
- Disease resistance in agriculture by genetic modifications

Levels of relationship with real biodiversity

Low

Indirect impact on a driver of biodiversity loss

- Carbon footprint calculation ; plastic packaging alternatives ; green banking

Medium

Direct impact on a driver of biodiversity loss

- Innovative systems for treating water ; Plant-based food ; regenerative agriculture

High

Direct impact on biodiversity abundance

- Restauration and rewilding of damaged ecosystems; Biodiversity footprinting agency ; monitoring biodiversity through the study of environmental DNA

CATEGORIES

Fundraising

The fundraising infos are mainly collected form Crunchbase. The information collected has been verified. Some amounts, particularly for seed financing and debat-based financing, are in fact not disclosed. The maximum amounts calculated from this database can therefore be considered as a low range for the general financing of NatureTECH start-ups.

Seed Financing

Intended for the very early stages of a start-up's development, these funds help validate an idea or develop a minimum viable product (MVP).

- Angel: Capital provided by business angels.
- Pre-Seed: Initial stage to test and validate an idea.
- Seed: Financing to develop a product and access the market.

Equity-Based Financing (Equity Financing)

These funds involve giving up equity in the start-up in exchange for capital, typically used to accelerate growth or scale up.

- Venture: Investments by venture capital funds for high-growth companies.
- Private Equity: Investments in private companies at later stages.
- Equity Crowdfunding: Collective participation in exchange for equity.
- Corporate Round: Strategic investments by large companies.
- Post-IPO Equity: Additional fundraising by a publicly traded company.

Debt-Based Financing (Debt Financing)

These funds allow start-ups to raise money without giving up equity but require repayment with interest.

- Convertible Note: Debt that can be converted into equity during a future funding round.
- Debt Financing: Traditional loans that must be repaid with interest.
- Post-IPO Debt: Debt raised after a company goes public.

Alternative Financing and Grants

These funds do not require giving up equity or repayment and are often allocated to specific projects or for social/environmental impact.

- Grant: Non-repayable funds.
- Non-Equity Assistance: Non-financial support (resources, incubators, mentorship).
- Generic Funding Round: Miscellaneous funding not specified in a particular category.

Undisclosed

The origin of the fundraising is not publicly known or referenced in Motherbase.

WHAT WE CONSIDER AS A STARTUP

According to the Banque Publique d'Investissement (BPI), France's leading public investor in start-ups, a company must meet three conditions to be considered a start-up:

- Strong growth prospects
- Use of a new technology
- Need for substantial financing.

In other words, a startup is experimenting and iterating, always confronting its business model to market opportunities.

The NatureTECH Observatory also includes several organisations that might be classed as SMEs or associations, whose solutions and actions have a direct influence on the start-up ecosystem they are a key part of.

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MOTHERBASE™

Motherbase is an AI-powered SaaS solution for identifying, evaluating, and qualifying ecosystems and innovation entities. As of April 2025, Motherbase tracks and updates 190,000 innovation entities worldwide on a monthly basis.

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