

DEEPTTECH DYNAMICS 2026

BY

IN PARTNERSHIP WITH



bpifrance



FRANCE DEEPTTECH
Quand la science entreprend

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Introduction

by Dr. Rodolphe Rosier

DEPUTY DIRECTOR OF ENTREPRENEURSHIP & INNOVATION AT CENTRALESUPÉLEC



This first DeepTech Dynamics study is the result of a collective effort led by CentraleSupélec in collaboration with Bpifrance, France DeepTech, and numerous players in the ecosystem, to analyse the plurality of growth dynamics among deep tech startups. It describes both the innovation challenges that many players face, and the different trajectories for market access. This dual perspective opens up new insights into the factors that determine the success of entrepreneurial initiatives in deep tech.

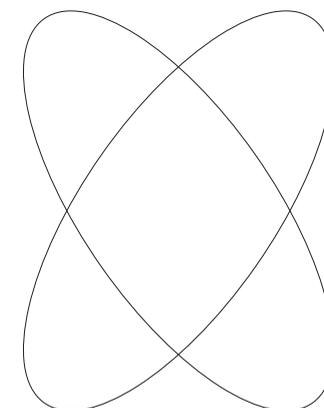
The diversity of the cases studied—from startups such as Expliseat, which designs ultra-light aircraft seats, to Unseenlabs, a pioneer in space RF detection, to companies such as Aqemia, which is redefining drug discovery through statistical physics, and Alice & Bob, which is engaged in the race for logical qubits—illustrates the extent to which the very notion of “deep tech startup” covers heterogeneous realities, both from a scientific and industrial point of view.

This diversity renders inadequate more traditional approaches based solely on sectoral industries (health, space, energy, quantum, biotechnology, etc.). It calls for the development of cross-cutting analytical frameworks capable of transcending traditional categorisations in order to better understand the conditions for growth, innovation timelines, capital requirements, and market access strategies specific to deep tech.

This is precisely the aim of this report: to offer a structured interpretation of innovation trajectories, enabling us to distinguish between startups that are part of existing value chains and those that need to explore new uses or create industrial and regulatory infrastructures from scratch.

The originality of the study lies in its methodology, which combines a quantitative analysis, conducted in partnership with Bpifrance and the teams at the DeepTech Observatory, with around forty in-depth interviews with executives from scale-ups and specialised investment funds, thanks to a unique partnership with France DeepTech. The combination of these two approaches provides unique material for objectively assessing the dynamics observed, identifying archetypes, and explaining the real determinants of deep tech growth in France.

With the annual support of 50 deep tech startups through our accelerator, 21st by CentraleSupélec, we are convinced that such a cross-cutting analysis grid can be a useful tool for entrepreneurs, investors, as well as public decision-makers who design policies to support innovation. It helps to shed light on the challenges faced by deep tech entrepreneurs and to better anticipate the conditions that will enable them to deal with the critical stages of their development.



Editorial Bpifrance



PASCALE RIBON
DeepTech Director



Since the launch of the DeepTech Plan in 2019, operated by Bpifrance on behalf of the French government as part of France 2030, French deep tech has experienced unprecedented growth. With more than 2,800 deep tech startups and 410 new creations in 2025, France is now the world's fourth largest deep tech ecosystem in terms of fundraising, while Europe now accounts for nearly 20% of global investment in the sector.

The real challenge now is to enable today's deep tech startups to become the technological and industrial leaders of tomorrow, capable of transforming our value chains in a sustainable way, strengthening European technological competitiveness, and addressing major economic, environmental, and societal transitions.

In a more demanding and selective market environment, Bpifrance is convinced that effective support for deep tech requires a detailed understanding of innovation trajectories, development timelines, and the specific needs of companies, going beyond sector-specific approaches alone. Not all deep tech companies follow the same growth paths, face the same risks, or use the same levers for value creation.

It was with this in mind that CentraleSupélec, with the support of Bpifrance and France DeepTech, conducted the DeepTech Dynamics study. By offering a new cross-cutting framework, this study sheds light on the diversity of deep tech models, their market access dynamics, and their industrial trajectories. It provides valuable indicators for better understanding the key success factors, both for entrepreneurs and investors and, more broadly, for the entire ecosystem.

For Bpifrance, making the deep tech ecosystem more transparent is now a strategic priority. This is essential in order to mobilise all players in the ecosystem and attract more capital to help structure and scale up the sector. In this regard, we support the production of content such as DeepTech Dynamics, which is part of the implementation of reference tools to support the growth of an ambitious, diverse, and sustainable French deep tech industry. ●

Editorial France DeepTech



ROMAIN ROULLIS
General Manager



Since its creation at the end of 2023, France DeepTech has worked closely with all players who contribute to the development, growth, and influence of the deep tech sector in France, such as Bpifrance and CentraleSupélec.

So, when we were approached by the 21st teams to take part in the DeepTech Dynamics project, it was only natural to offer our support: first, by sharing contacts from our members networks and partners to facilitate meetings and interviews with entrepreneurs and investors active within the association and, more broadly, within the ecosystem; and secondly, by sharing our observations in the field. This contribution was enriched by our contact with those who contribute every day to the emergence of disruptive technologies driven by bold deep tech startups with an international outlook.

We are very proud of the results of this research, analysis and forecasting work, which opens up new perspectives in understanding, building, and supporting entrepreneurial projects in deep tech.

We will now ensure our members have full access to the study, to fuel their vision and strategic thinking in a rapidly changing economic and technological environment. We also plan to use it to encourage investment funds and change the way they identify and classify the startups they finance and support.

In this regard, we are convinced that the new analytical framework proposed in the study will give investors, both GPs and LPs, new insights that will enable them to channel more capital into deep tech. The report will thus help entrepreneurs, as well as OTTs and academic institutions, to better understand the major dynamics of innovation and market access.

Enjoy reading! ●

Executive summary

A diverse target audience

This study is intended for entrepreneurs and investors, as well as all players in the ecosystem (technology transfer organisations, incubators, accelerators, and public decision makers) who want to better understand the real dynamics of growth in deep tech.

A clear observation

Deep tech is an extremely diverse universe, scientifically, industrially, and commercially. Traditional sector-based approaches (health, space, energy, quantum, etc.) **are no longer sufficient to explain innovation trajectories and market access.**

A new classification: the Deeptech Quadrant

The study proposes a structuring framework, the Deeptech Quadrant, which identifies four archetypes of startups and provides new keys to understanding the different growth dynamics for designing their products and building their markets.

A key contribution

Deeptech Dynamics offers a new, cross-sector perspective for deciphering the innovation trajectories and market access strategies of deep tech startups.

A tool for an entire ecosystem

This new roadmap helps entrepreneurs to clarify their trajectory, allows investors and support structures (SATT, OTT, incubators, accelerators) to refine their strategies, and encourages public actors to design support policies that are better adapted to the diversity of deep tech models.

Glossary

Explanation of concepts and terms for a proper understanding of the study

Value curves

(Kim & Mauborgne)

A tool from "Blue Ocean Strategy" that allows you to visualise, for each attribute, a company's level of offering compared to its competitors. It highlights differentiating factors and unexplored strategic spaces.

Product architecture

The way in which a product's functions are broken down into subsystems and how these subsystems are linked together.

The dominant architecture determines the industry standard that will guide innovation for all players in the value chain.

"Neo-deeptech" investors

Investors who are new to the deep tech segment (corporates, generalist funds, family offices, serial entrepreneurs, business angels, etc.).

Innovative design theory

(Hatchuel, Le Masson & Weil)

Theoretical framework (C-K Theory describing innovative design processes by modelling the back-and-forth between the space (K) of knowledge and the space (C) of concepts. It formalises disruptive innovation processes and distinguishes between regulated design and innovative design.

Deep tech

Startups that are based on scientific innovation with high barriers to entry and requiring significant technological de-risking. Deep tech startups have strong market potential but require significant investment in R&D and industrialisation before they can be brought to market (see Bpifrance).

Exploration partners

Partners of a company who test, explore, or experiment with potential uses without any immediate commercial commitment. They help reveal new use cases and market segments.

Go-to-market (GTM)

A strategy that describes how a startup brings its offering to a given market, specifying the target, value proposition, customer access channels, and marketing steps.

Design partners

Early-stage customers or manufacturers who co-develop a solution with the startup by sharing their needs, constraints, and user feedback. They validate technical feasibility and reduce product risk.

Go-to-market strategy (GTM)

A coordinated set of actions to introduce a product to a market: customer targeting, value proposition, channels, pricing, and deployment plan. It aims to accelerate product adoption and reduce its cost of entry into a given market.

1

Analysis

Mapping the diversity and challenges
of market access for deep tech startups

↳ Methodology	<u>10</u>
↳ Deep tech Innovation	<u>12</u>
↳ Deeptech Quadrant	<u>16</u>

Methodology applied to the study

The study is based on a dual analysis, both quantitative and qualitative.

The quantitative component is based on an examination of a cohort of 242 deep tech startups that raised more than €18.5 million between the 1st of January, 2010, and the 31st of December, 2025. The startups studied cover maturities from the seed stage to Series D (see table on the distribution of startups in the cohort according to their last round of financing). The results obtained cover a wide range of industries, but do not include biotech (health) (23 startups in the sample were therefore not taken into account). The data was extracted from the Dealroom database.

The qualitative component is based on some 40 interviews conducted with founders of deep tech startups (15) and managing directors of French investment funds specialising in deep tech (25), which helped us identify the obstacles and opportunities that shaped their companies' growth trajectories and access to their end markets.

STARTUPS

ALICE & BOB	AQEMIA	DUST	EXOTEC	expliseat
FinX	GENOMINE	Gadium	INNOVAFEED	Latitude
RENAISSANCE FUSION	SIPEARL	spark	GANYMED ROBOTICS	exotrail
VERIKOR				

DEEPTECH-SPECIALISED VC FUNDS

360 CAPITAL	ALIAD Venture Capital by Air Liquide	aster	NON asterion	AUDACIA Le meilleur investissement, c'est l'audace.
breega	Crédit Mutuel Innovation	daphni	elaia	EURAZEO
Exergon	INNOVACOM PEOPLE. VENTURES. PEOPLE. AGAIN.	Jolt Capital	KARISTA	DMNES
PARTECH	STARBURST	SUPER NOVA INVEST	TECHNOFOUNDERS	(w)C Walden Catalyst
wind CAPITAL				

Graph 1: Breakdown of startups in the cohort according to 1) their latest funding round and 2) industry from Bpifrance's Deeptech Observatory



242
startups studied

8.7 years
average age

€18.5bn
total funding raised between 2010 and 2025

32%
have AI-based technology

A new innovation regime for deep tech startups

What is the boundary between high-tech engineering and deep tech? How can we distinguish between a large space industry group developing innovative technology and a deep tech startup from Newspace? Similarly, how does a small modular nuclear reactor project differ from the EPR2?

To clarify these differences, management research¹ offers an analytical framework that allows us to make a clear distinction between innovations in advanced engineering and those specific to deep tech innovation.

- **Advanced engineering** is based on the development of new knowledge from identified concepts, targeting markets whose value is already established.

Example: NVIDIA and its Rubin platform, designed to meet the increasing computing-power requirements and energy-efficiency constraints of data centres dedicated to artificial intelligence.

- **Deep tech innovation** involves exploring new concepts while simultaneously developing associated markets. This dynamic implies a transformation of the existing value chain.

Example: NVIDIA's COSMOS platform, which is a generative AI platform specialising in the creation of realistic physical simulations for robotics and autonomous vehicles. It offers world foundation models (understanding of the physical world) and tools for generating synthetic training data.

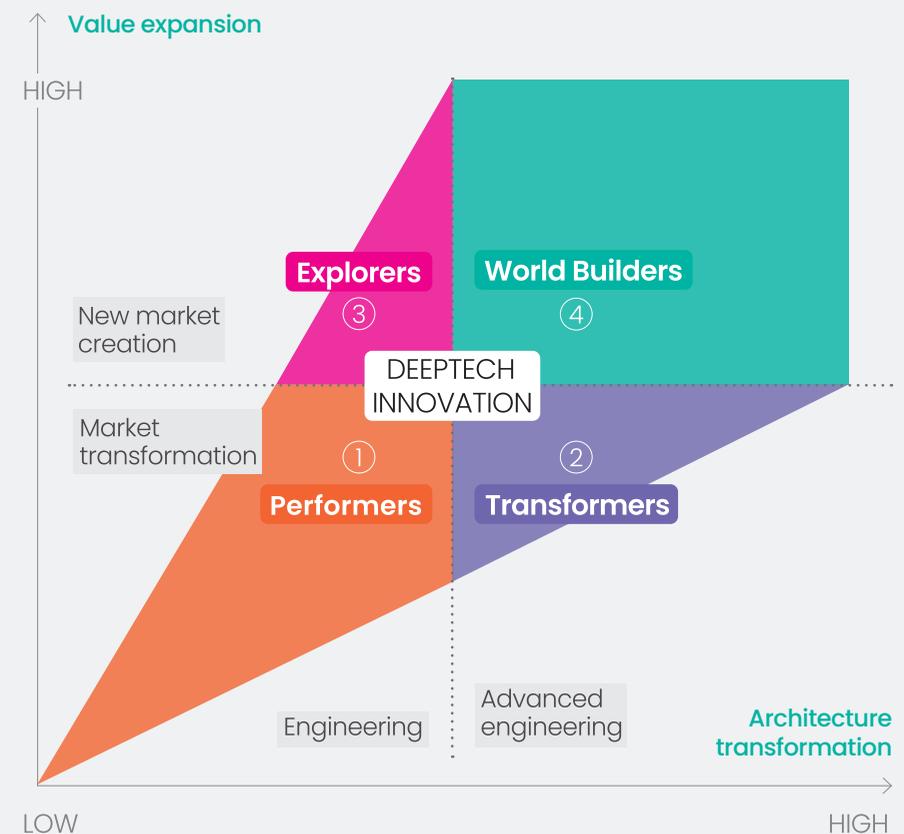
¹ See bibliography

Deep tech innovation thus constitutes a new innovation regime, the challenge of which is to design the unknown. More specifically, the innovation activity of deep tech entrepreneurs will **consist of simultaneously designing new product architectures and new market spaces** where the value of innovations remains to be explored. What are the benefits for users? What changes to their processes or workflows will be necessary? And what economic models will emerge?

Deep tech innovation can therefore be represented as a process of dual **expansion**: on the one hand, **product architectures**, which may remain unchanged or undergo profound transformation (see horizontal axis, Graph 2); on the other hand, **value**, with uses that may remain close to the existing ones or introduce major disruptions (see vertical axis, Graph 2).

This combination allows us to identify **four main categories of deep tech startups**, forming the "Deeptech Quadrant": **the Performers, the Transformers, the Explorers and the World Builders.**

Graph 2: Delimitation of the deep tech innovation domain and the four deep tech archetypes: Performers, Transformers, Explorers, and World Builders.



Four new archetypes of deep tech startups to understand their different growth challenges

Deep tech innovation reveals four new archetypes of deep tech startups that correspond to very different innovation challenges and market access trajectories for entrepreneurs.

The DeepTech Dynamics study aims to examine the following for each archetype:

- the challenges of designing new architectures;
- prototyping and value exploration strategies;
- mechanisms for building product-market fit;
- sources of competitive advantage and barriers to entry;
- keys to approaching investment funds.



Explorers

Versatile startups that explore different possible uses for multifaceted innovations in new markets. These startups often test multiple markets simultaneously before finding a use case where they can leverage their value proposition.

VALUE
+



World Builders

Startups that create new industrial sectors from scratch based on new architectures, requiring the construction of new standards and unprecedented value chains.

ARCHITECTURE
+



Performers

Startups that improve the performance of dominant solutions within an existing industry. Disruptive innovation supports the benchmark standard in a known competitive environment subject to stable regulations.



Transformers

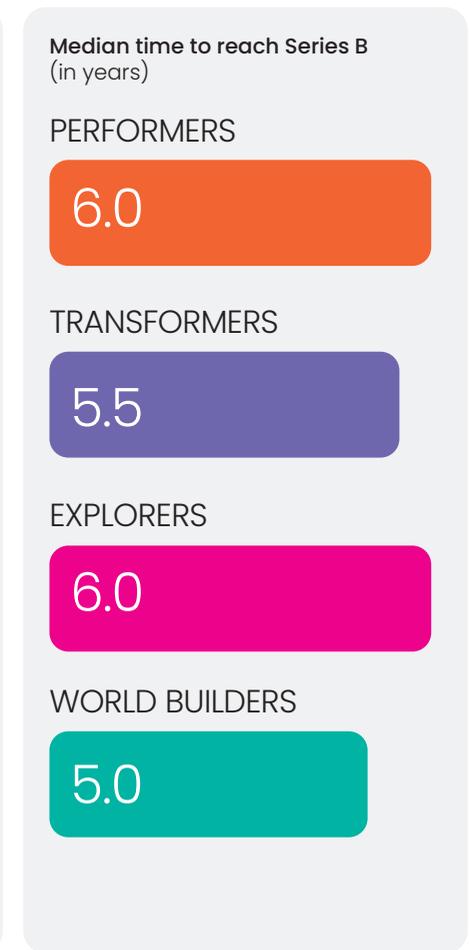
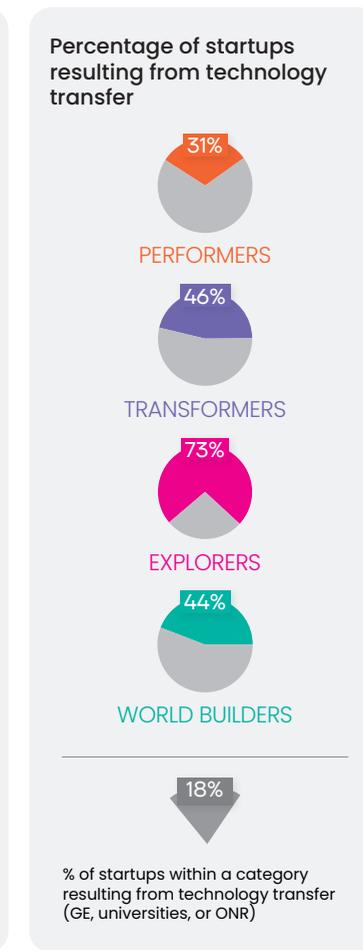
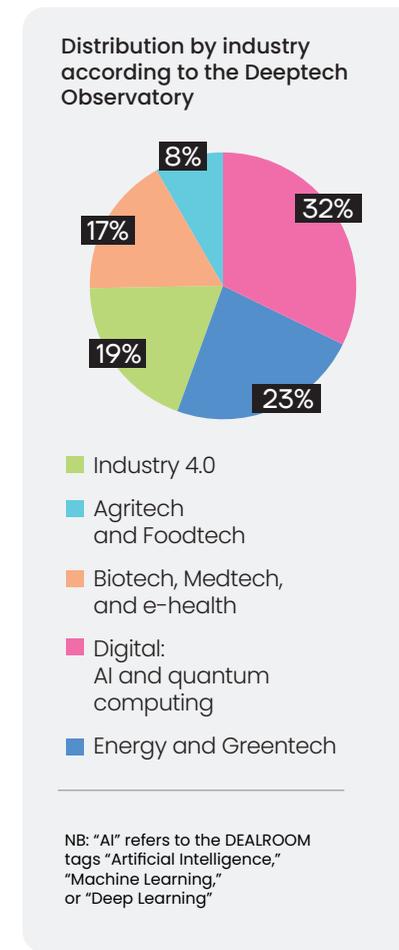
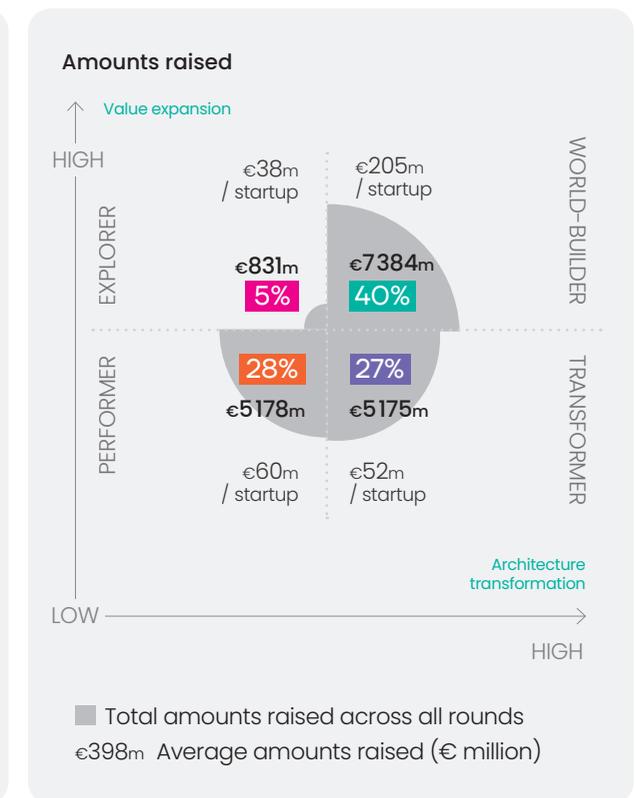
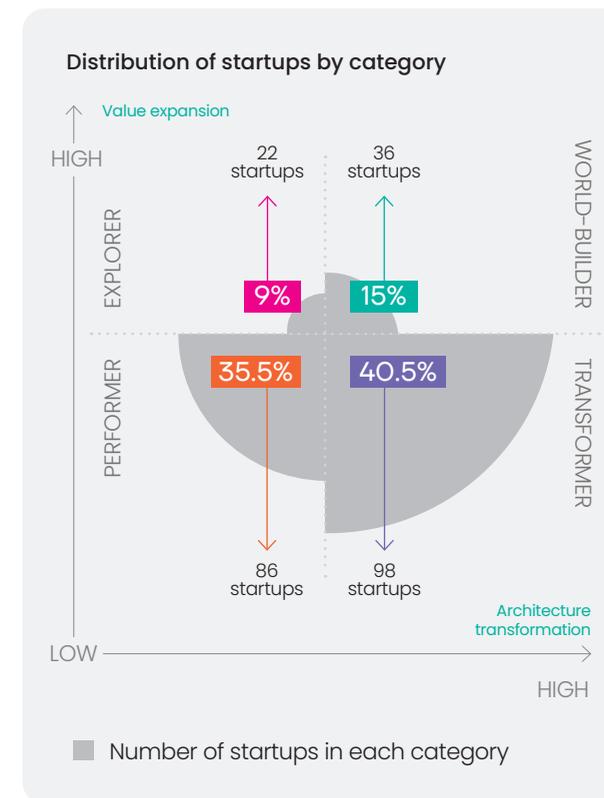
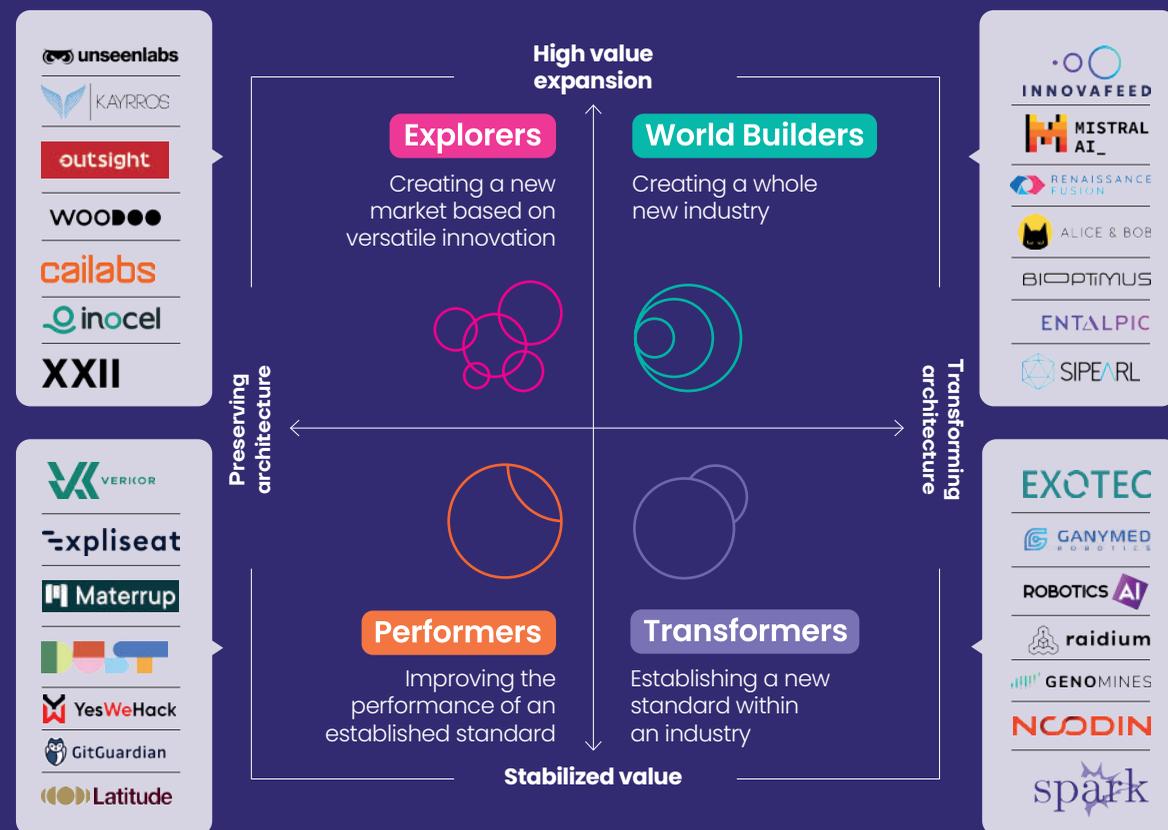
Startups that develop a new architecture leading to the emergence of a new standard within an industry. This new architecture redefines the organisation and power relations between clients and their suppliers, often leading to the transformation of existing business models.

-

"Deeptech Quadrant" framework

A model of the growth dynamics of deep tech startups

These four archetypes of deep tech startups form what is known as the **Deeptech Quadrant**. This new framework breaks with a strictly sector-based interpretation of innovation by proposing a cross industry analysis grid for all technology sectors (AI, NewSpace, nuclear, quantum, etc.). It reveals that deep tech does not follow a single trajectory, but rather a variety of winding trajectories, depending on the intensity of value exploration and transformation of the value chain and regulations within the innovation regime.



2

Modelling

Exploring the innovation trajectories
of the four major deep tech categories

Startup profiling

↳ Performers	20
↳ Transformers	24
↳ Explorers	28
↳ World Builders	32

Performers

Innovating while maintaining industry standards

Deep tech Performers are startups that develop disruptive innovations to improve solutions that are already dominant in a competitive and regulated sector. They rely on advanced technologies and complex expertise, but operate in fields where engineering is already well established, such as space, nuclear power, supercomputers, and cutting-edge agronomy.

Their priority remains to convince investors, customers, and industrial partners of the technical superiority and concrete benefits of their technology.

The competitive advantage of a Performer startup

Performers can be easily identified and analysed by investors. They are backed by the highly technical expertise of their teams and solid intellectual property, and create barriers to entry and strengthen their position in their market over the long term.

Série B

6.0 years

(DATE OF SERIES B - CREATION DATE)

Revenue

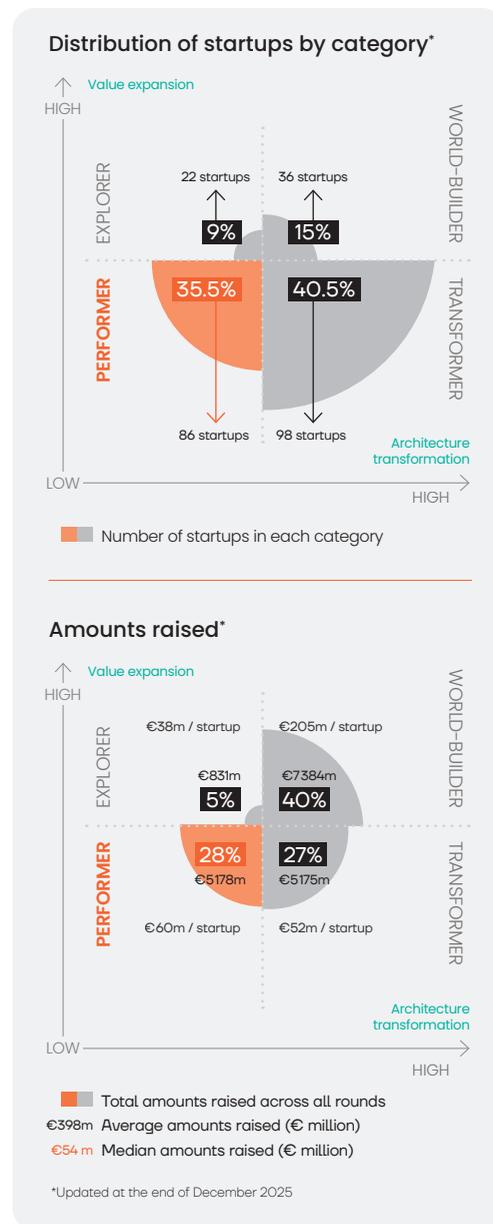
€1470k

(MEDIAN)

Jobs

55

(MEDIAN)



Expliseat

The journey of a deep tech company that's rethinking airplane seats

→ Aerospace/Aeronautics industry

2011-2014 Certification

Expliseat wants to design an ultra-lightweight airplane seat that combines titanium and composites, thus halving the weight of traditional seats. The startup obtains EASA certification for its flagship product, the TiSeat EI, paving the way for its first customers.

2015-2018 Conquest

Expliseat quickly conquers the turboprop aircraft market and gains credibility with regional airlines.

2019-2021 Acceleration

Expliseat strengthens its position with new products for single-aisle aircraft, design innovations, and accelerated industrialisation driven by post-COVID demand for lightweight seats.

2021-2025 Expansion

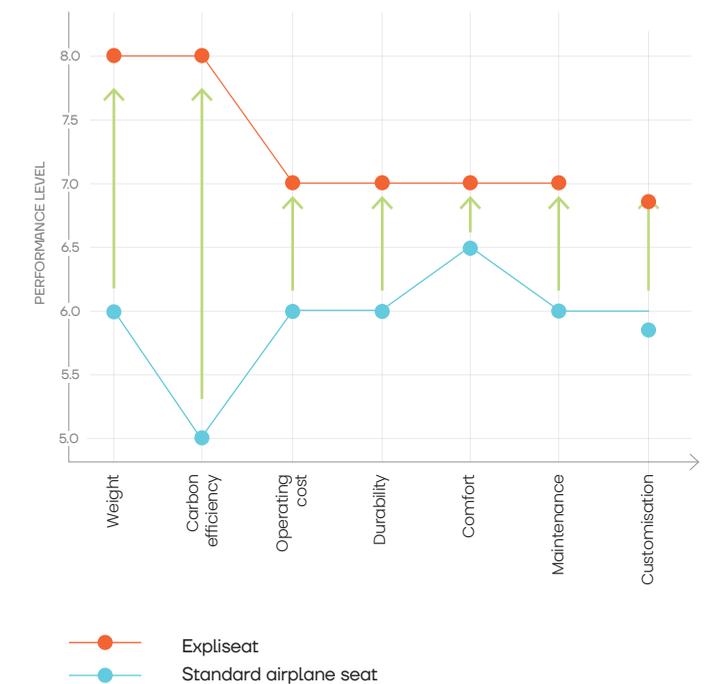
Expliseat becomes a strategic equipment manufacturer: new seats (TiSeat 2), diversification into retrofitting, international expansion, and fundraising for industrialisation.

With more than 40 customers in 15 countries, Expliseat is one of the few French aerospace scale-ups to combine disruptive innovation, strong commercial traction, and a direct contribution to the decarbonisation of the sector.

Expliseat's competitive advantage:

Expliseat's solution reduces the weight of aircraft seats by 35%, thereby lowering fuel consumption and the carbon footprint of airlines, while maintaining a level of comfort equivalent to market standards.

Value curve - Expliseat vs. standard aircraft seat

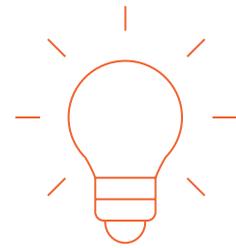


AMAURY BARBEROT
CEO, Expliseat

"Today's airlines expect ultra-lightweight, certified, customisable seats that can be delivered quickly."

This is the industrial challenge that our teams take on every day in the service of decarbonising transport."

Entrepreneurs

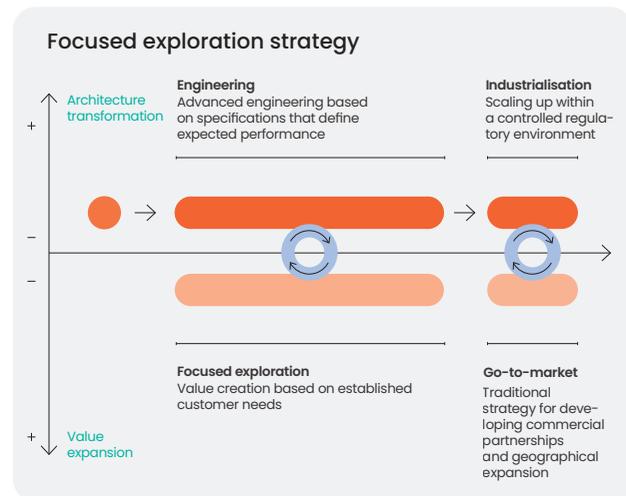


Choosing your market access strategy

For Performers, entrepreneurs must be responsive in order to quickly deploy their solution in an already structured market, while offering technological, operational, and economic performance that is significantly superior to the standard product.

To achieve this, they can rely on a classic strategy of developing a minimum viable product (MVP) and co-building the offering with their first customers to quickly demonstrate return on investment.

The challenge for these startups is therefore to adopt a rapid execution strategy, while proving the reliability and effectiveness of their solution in real-world conditions. They must convince their first pilot customers, influencers, and integrators to validate performance indicators and establish their credibility in the market.



How to win investors' trust

Performers operate in an existing market, with clearly identified customers and mature competition. Investors expect clear evidence of consistency between the technology, the value proposition, and the commercial appeal, as the benchmark is immediate.

Your credibility therefore depends as much on technical strength as on the ability to execute quickly, industrialise, and capture market share in an already structured market.

3 keys to presenting your project to an investment fund:

- Differentiation** → **Show what makes you unique and attractive:** performance, costs, reliability, security, but also patents and expertise.
- Initial results** → **Present concrete evidence of your project's success:** proof of concept (POC), pilot tests, initial revenue, and go-to-market strategy.
- Industrialisation strategy** → **Explain how you will scale up:** stages, costs, partners, certifications, and reliability of your supply chain. A fund will want to understand that you can deliver safely and support rapid growth.

Investors



Assessing the potential of a deep tech Performer

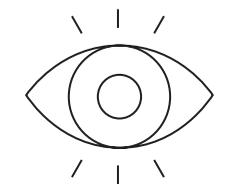
Performers optimise technology that is already understood by their market and establish themselves within well-established value chains. To quickly stand out from existing solutions in terms of reliability, cost, integration, and performance in use, they must demonstrate rapid execution, solid industrialisation, and early customer validation.

Therefore, an initial mismatch should not be considered a failure, but rather a strong indication that they must adjust the performance, price, or integration of the solution.



MAXENCE VALERO
Deeptech Investment Manager,
Crédit Mutuel Innovation

“We invested in Expliseat—the world leader in ultra-light technologies—because their innovation immediately responds to its market: a 30% reduction in weight, a 6% reduction in CO₂ emissions per flight, and technology protected by 100 patents, which creates real barriers to entry.”



Performer: what are the strategic opportunities?

Team

- Execution-oriented team with strong sector knowledge.

Market

- Existing market.
- Simple sizing/existence of comparables.
- Reliable growth rate forecasts.

Competitive advantage

- Know-how and IP.
- Barriers to entry: mainly customer locking.

Transformers

Inventing a new model to transform an industry

Deep tech Transformers are startups that develop emerging models leading to the emergence of a new standard within an industry. The goal is to redefine the organisation and relationships across the entire value chain and transform existing business models.

The competitive advantage of a Transformer startup

The value of Transformers lies in their ability to create a new standard that redefines market practices and performance criteria. This allows them to shift competition, control their key relationships, control the adoption of their standard, and influence regulation, thus creating solid barriers to entry.

Série B

5.5 years

(DATE OF SERIES B - CREATION DATE)

Revenue

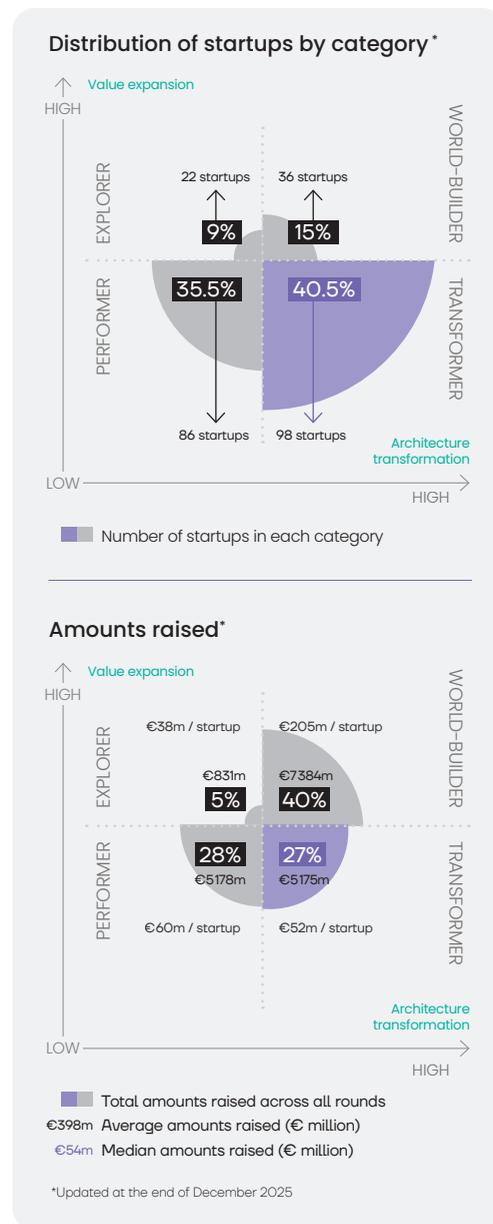
€804k

(MEDIAN)

Jobs

50

(MEDIAN)



The rise of a deep tech company transforming the nickel industry

→ Mining sector / biotechnology / sustainable extraction

2020-2021

Exploration

Genesis of the project at the intersection of mining and biotechnology. Market and science literature analysis identifies an alternative to conventional mining. Genomines positions itself as a low-carbon metal extractor.

2021-2022

Identification

Genomines identifies metal-bearing land compatible with its solution, a key advantage that will determine future production volumes.

2022-2023

Validation

First demonstration of the technology; first production and validation of nickel from plants, refined to a purity compatible with battery requirements and validated by partners.

2023-2024

Demonstration

Genomines consolidates its model with pilot tests and a low carbon footprint, while positioning itself as a complementary carbon-free supplier.

In 2025

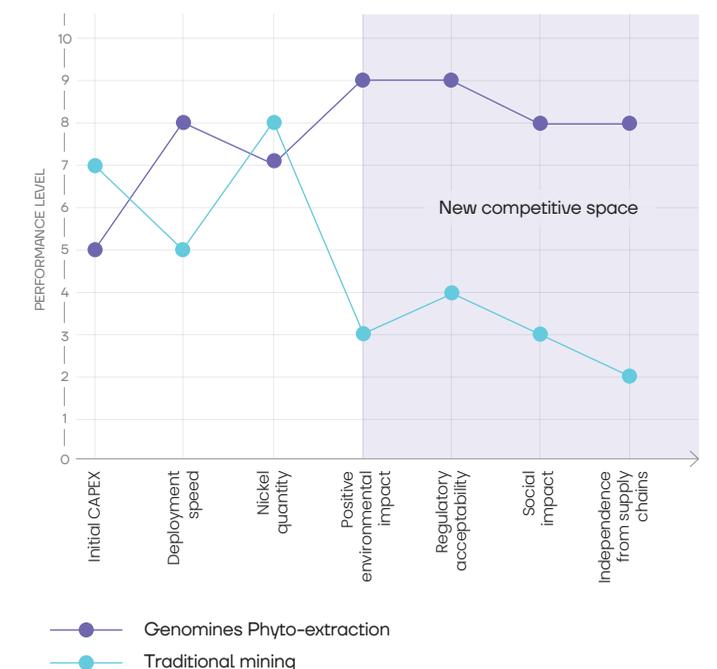
Expansion

Genomines raises €45 million to finance its international expansion and confirms interest from European and American funds. **The startup is thus producing a biological nickel that is aligned with European targets.**

Genomines' competitive advantage:

Genomines' solution opens up a new competitive space where environmental and social impact, as well as the ability to scale up, become key criteria for adoption. At the same time, it enables very high levels of nickel purity to be achieved, in line with European requirements for battery manufacturers.

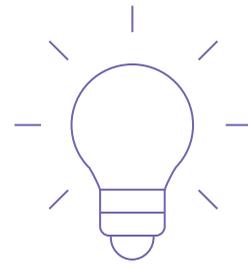
Value curve - Genomines (phytoextraction) vs. traditional mining



FABIEN KOUTCHEKIAN
CEO,
Genomines

“The hardest part wasn't making the science work, but turning it into an industry. Genomines is moving forward by aligning biology, agronomy, chemistry, and real economics, a learning process that takes place directly in the field.”

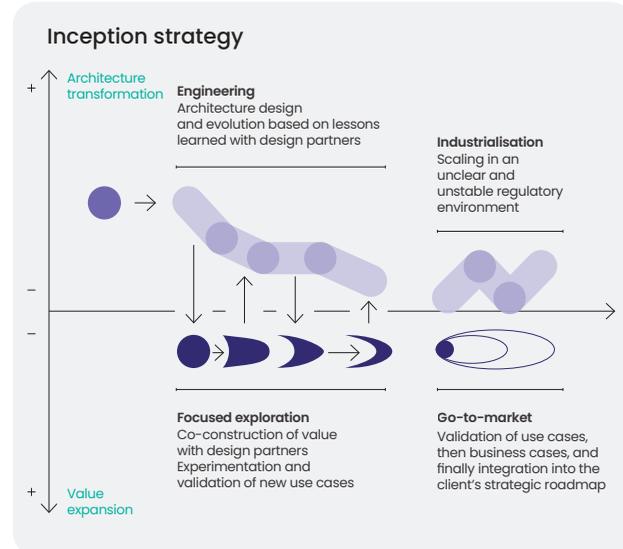
Entrepreneurs



Choosing your market access strategy

For Transformers, traditional market access approaches (launching a simple minimum viable product (MVP) or directly targeting the largest market) do not work. The problem is that value will only materialize if customers agree to partially transform their business conditions, i.e., their processes or their professions.

For these startups, the challenge is to create a new standard by gradually introducing innovation into existing practices until it becomes indispensable. To encourage adoption, they rely on key partners (design partners, influencers, integrators) and follow a clear roadmap: co-developing their offering with design partners, industrialising their solution, and shifting the lines to adapt the regulatory framework.



How to win investors' trust

Transformers seek to profoundly change the practices of an existing industry. Their adoption is therefore slower, as their technology redefines standards and creates new barriers to entry.

To convince investors, it is essential that they understand your long-term vision and your strategic plan for imposing this new standard within a timeframe compatible with their investment.



3 keys to presenting your project to an investment fund:

Value and transformation

→ **Explain what your technology actually changes:** practices, costs, existing constraints, and show why your solution is unique on the market.

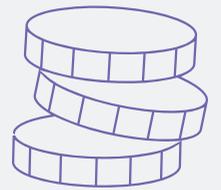
Adoption levers

→ **Present your strategic partners and levers,** and show how they facilitate the adoption of your innovation despite constraints (long industrial cycles, regulations, and supply chain dependencies).

Control and confidence

→ **Show how your roadmap reduces risks and uncertainties** at each stage and facilitates the adoption of this new standard.

Investors



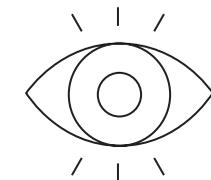
Assessing the potential of a deep tech Transformer

Transformers tackle an existing industry by seeking to impose a new model that could become the future standard in the sector. To attract market players and establish themselves in this already well-established environment, they must rethink the entire value chain: hardware-software integration, performance, reliability, and certifications, all of which are barriers to entry that are difficult to replicate.

To assess their full potential, it is essential to focus on their long-term vision, their technological and industrial strength, and their ability to become new standards, rather than on their immediate commercial results.



"The phytoextraction technology developed by Genomines represents a profound change for the mining industry, capable of transforming the global balance of nickel supply. It is for these reasons that we have invested in this promising startup."



Transformer: what are the strategic opportunities?

Team

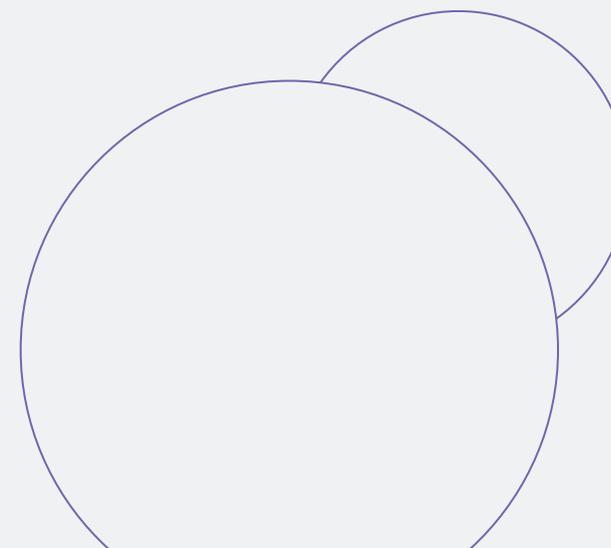
- Team with strong sector knowledge that has already deployed a solution requiring changes to an organisation's processes/culture.
- CEO or CMO with experience in technology change.
- CTO with industrialisation skills in unstable regulatory environments.

Market

- Market undergoing reconfiguration.
- Complex sizing due to the creation of a new competitive space.
- Unreliable growth rate forecasts.

Competitive advantages

- IP and creation of new business models.
- Barriers to entry: creation of a new standard with associated regulations.



Explorers

Creating new markets through versatile innovation

Deep tech Explorers are startups that develop emerging technologies in new markets. Their “protean” nature allows them to test multiple sectors simultaneously to determine where their innovation will bring the most value and be economically viable. This exploration is all the more complex as each of them has its own variations and specificities. It would be unwise to try to conquer them all, or, conversely, to bet everything on a sector perceived as more attractive.

The competitive advantage of an Explorer startup

As pioneers, Explorers can create new market spaces where previously no solution existed. By developing new uses and business models, they open the door to multiple opportunities. They introduce new attributes for both products and performance criteria, redefining the challenges and creating competitive spaces where potential rival startups will be disqualified.

Série B

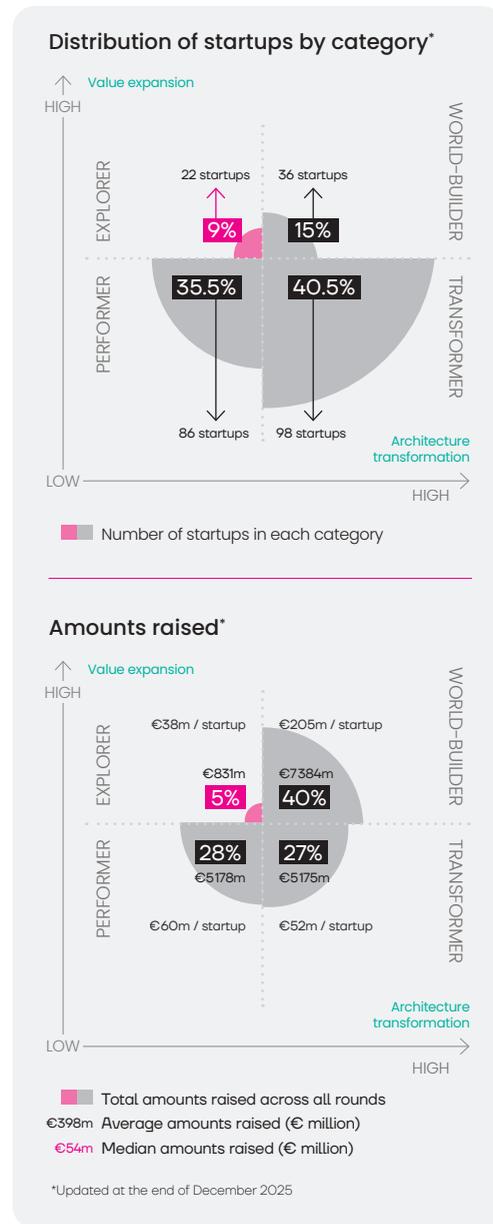
6.0 years
(DATE OF SERIES B – CREATION DATE)

Revenue

€515k
(MEDIAN)

Jobs

70
(MEDIAN)



The trajectory of a deep tech expert in maritime surveillance

→ Space industry / maritime surveillance

2015–2017

The quest

Unseenlabs wants to adapt RF detection space technology, currently used to identify “invisible” ships, for civilian use. Maritime and military institutions are intrigued by the technology, but the market is slow to respond.

2017–2019

Experimentation

Unseenlabs tests offshore, energy, insurance, and maritime security applications. The need exists, but adoption remains slow. The startup confirms its uses without finding a driving market.

2019–2021

The turning point

Unseenlabs convinces stakeholders involved in the fight against illegal fishing. Adoption is rapid, results are solid, strengthening international credibility and opening up access to maritime and military institutions in an environment of increasing AIS manipulation.

2021–2024

Product-market fit

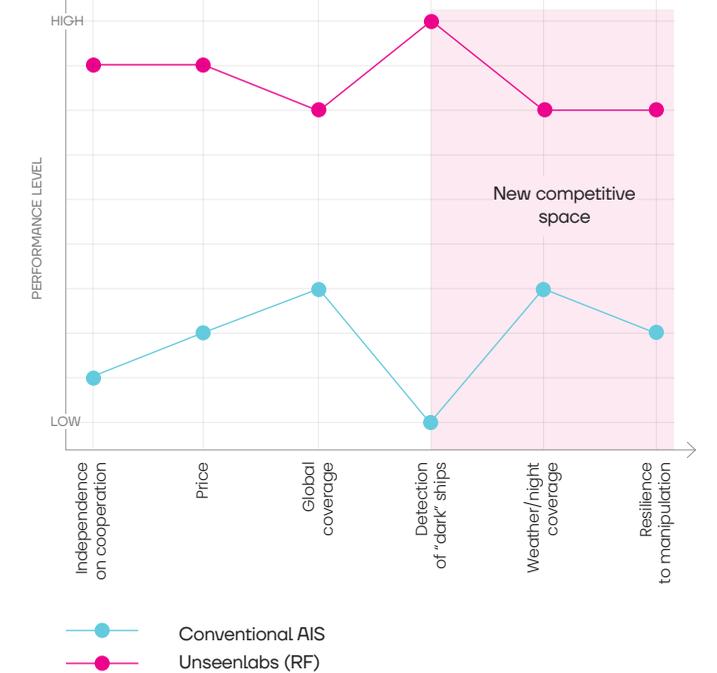
RF detection becomes a complementary standard to AIS. The startup moves into “data-as-a-service,” offering global geolocation that can be integrated into command systems.

Demand accelerates, and the €85 million Series-C round in 2024 finances a constellation of 25 satellites by 2026. **Since then, Unseenlabs has established itself as a leading player in maritime surveillance.**

Unseenlabs’ competitive advantage:

Unseenlabs’ solution is more expensive, but is independent of maritime cooperation, excellent at detecting “invisible ships,” and offers global 24/7 coverage and high resilience to AIS spoofing.

Value curve - AIS vs Unseenlabs (RF)

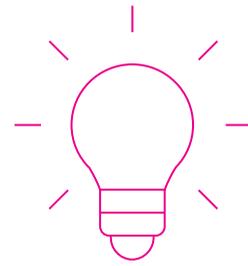


CLÉMENT GALIC
CEO and co-founder of Unseenlabs

“Technology only makes sense if it finds its market. We made a clear choice to focus on maritime surveillance, concentrating first on this initial market before expanding.”

Entrepreneurs

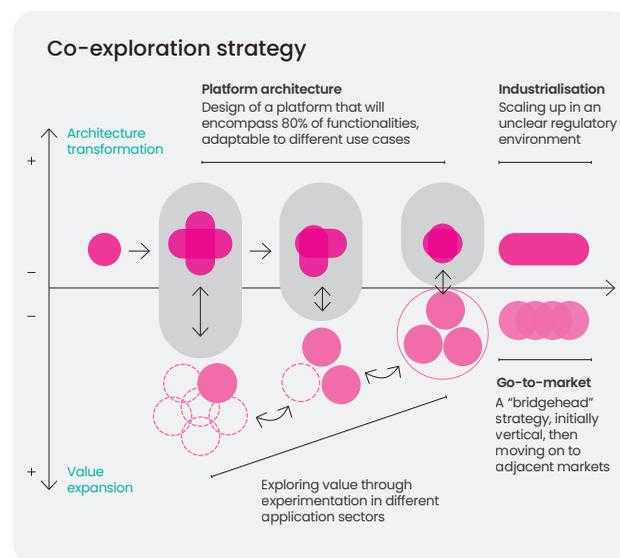
Choosing your market access strategy



In the case of an Explorer, entrepreneurs cannot rely on the usual strategy of developing a minimum viable product (MVP) and simultaneously examining several business sectors or industries: this approach would be too time-consuming and costly. Targeting a single market would also be too risky, as it is highly uncertain.

The challenge for these startups is therefore to adopt a more gradual and adaptive navigation strategy consisting of testing a flexible product that can be marginally adapted to different use cases (delayed differentiation logic), then considering market opportunities on a market-by-market basis, starting with intermediate and less risky segments.

In doing so, the startup can map the potential of each segment in terms of value and feasibility without having to reinvent its product with each iteration.



How to win investors' trust

Investors sometimes view Explorers with ambivalence, especially from Series A onwards, when they are expected to have found their natural market.

To convince investors, it is essential to clarify the strategic trajectory of your startup exploring several applications, demonstrating its ability to prioritise its markets and transform this diversity into a clear and controlled growth plan.



3 keys to presenting your project to an investment fund:

Overall vision

→ **Describe your target market**, even eight or ten years down the line, to enable investors to immediately grasp your project's potential.

Market access strategy

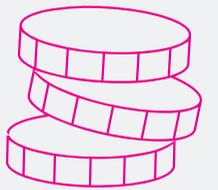
→ **Present intermediate markets as key stages in your roadmap** to facilitate the adoption of your technology. Specify their size, use cases, purchasing motivations, and associated business models.

Platform strategy

→ **Show how your main features can be extended to different use cases**, and how your developments can be combined without having to rebuild everything for each new market.

Investors

Assessing the potential of a deep tech Explorer



Explorers test several possibilities in succession before focusing on their final market. Their challenge is therefore not to offer a finished product (product-market fit), but to build a path to market: a structured exploration that simultaneously advances industrialisation and customer understanding.

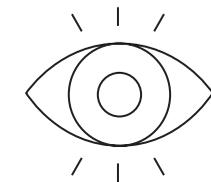
In fact, the lack of fit with an intermediate market should not be seen as a failure but as a source of essential learning. It remains crucial not to evaluate these startups according to the standards of a linear model, at the risk of concluding too early that there is no opportunity.



MICHEL DE LEMPEDES

Managing partner,
Omnes Capital

“Unseenlabs presented many interesting use cases for the military and civilian sectors and for applications other than ship surveillance. However, the potential and benefits of military surveillance were sufficient to fully justify our commitment.”



Explorer: what are the strategic opportunities?

Team

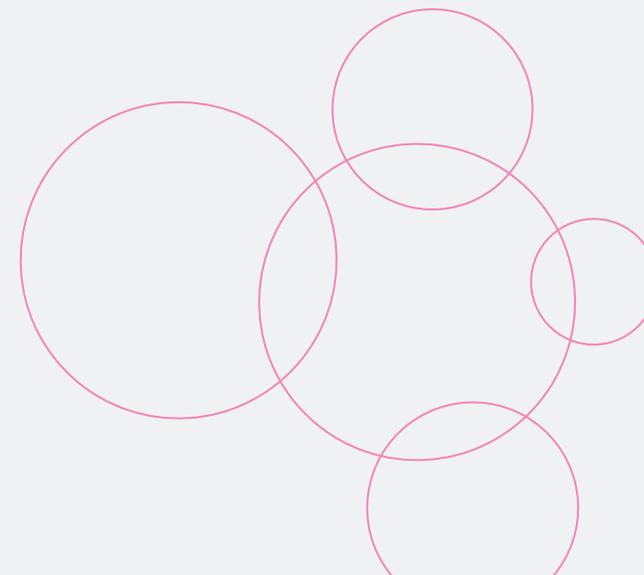
- Team with strong sector knowledge that has already deployed a solution requiring changes to an organisation's processes/culture.
- CEO or CMO with experience in technology change.
- CTO with industrialisation skills in unstable regulatory environments.

Market

- Market in the process of being created.
- Complex sizing due to the creation of a new competitive space.
- Unreliable growth rate forecasts.

Competitive advantage

- IP and creation of new business models.
- Barriers to entry: creation of a new standard with associated regulations.



World Builders

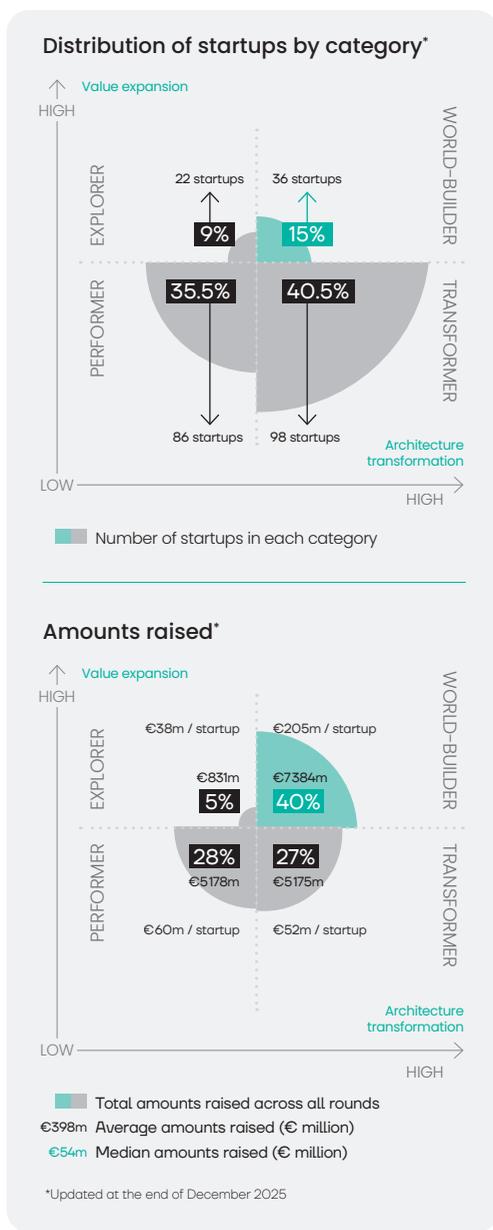
Creating a whole new industrial universe from scratch

World Builders are startups that shape future production volumes. To achieve this, they rely on innovations that ultimately become their technological foundation and distinctive advantage. In this way, they build a sector that did not previously exist and generate new market needs. This involves organising viable industrial production while operating within an unclear regulatory framework. In other words, while creating the product, they must also create the future foundations of a market.

The competitive advantage of a World Builder startup

World Builders construct and control an entirely new value chain. They establish their own relationships with future suppliers, partners, and customers, while often benefiting from a regulatory framework that they themselves will shape. By defining the rules of an emerging market, they naturally assume a dominant position from the outset, creating a sustainable competitive advantage that is difficult to replicate.

Série B	Revenue	Jobs
5.0 years <small>(DATE OF SERIES B - CREATION DATE)</small>	€362k <small>(MEDIAN)</small>	35 <small>(MEDIAN)</small>



The rise of a deep tech company ushering in a new era of industrial quantum computing

→ Quantum computing

2020-2021

The beginning

Alice & Bob aims to build a universal, fault-tolerant quantum computer while creating a new market around this new infrastructure. Cat qubits pave the way for realistic industrial machines.

2022-2023

Adoption

Alice & Bob establishes its first cloud partnerships (Equinix and Google), integrates its solutions into HPC workflows (SLURM), and tests concrete use cases in optimisation, simulation, and cryptography, without disrupting existing IT chains.

2023-2025

The alliance

Alice & Bob brings together quantum software publishers, integrators, data centres, and experts capable of transforming industrial needs into usable algorithms, while navigating a complex regulatory framework.

2025-2030

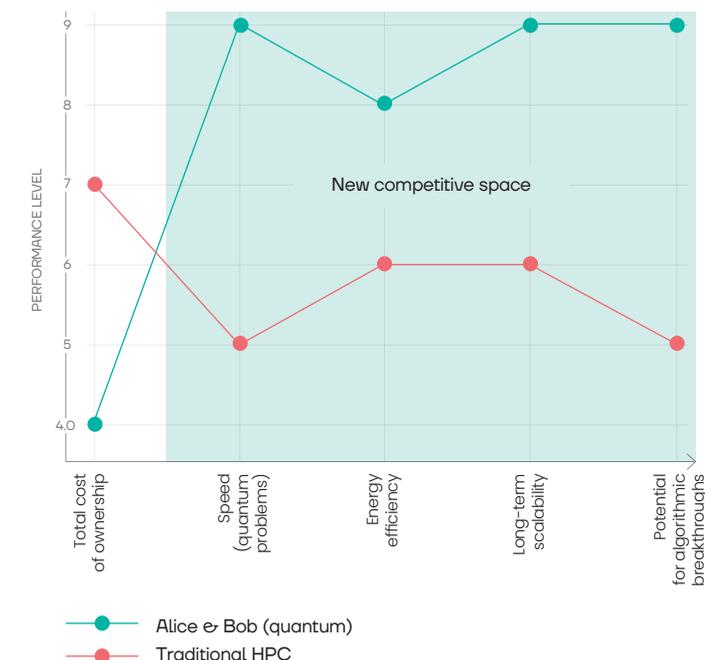
Deployment

With its 4,000 m² laboratory near Paris, **Alice & Bob is positioning itself as a quantum computer supplier for the computing industry by 2030.**

Alice & Bob's competitive advantage:

Alice & Bob's solution completely redefines the competitive landscape compared to traditional high-performance computing (HPC) approaches. Rather than seeking to surpass HPC in terms of raw power, it aims to tackle categories of problems that HPC, even at exascale, cannot solve.

Value curve - Alice & Bob vs. traditional HPC (adjusted criteria)



THEAU PERONNIN
CEO,
Alice & Bob

"Our belief is simple: a universal quantum computer cannot exist without solid building blocks. Today, we are building the quantum infrastructure that will enable researchers and businesses to solve problems that the world cannot tackle today."

Entrepreneurs

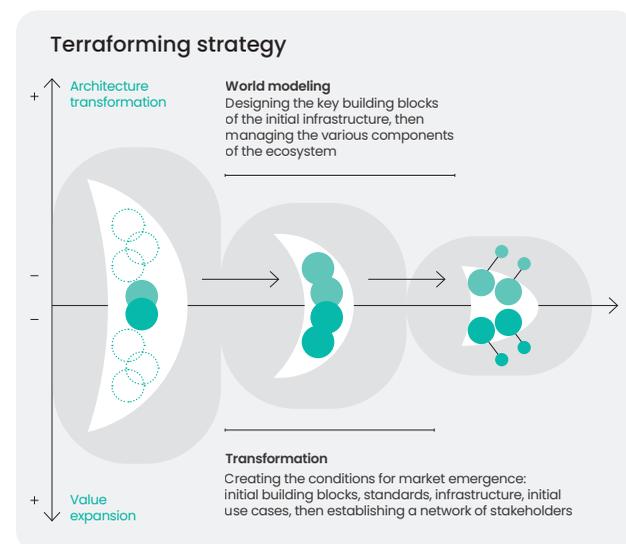
Choosing your market access strategy



For World Builders, the challenge is to create an industrial sector that does not yet exist: they cannot target multiple segments or aim directly for product-market fit because the technological infrastructure and the market must be built simultaneously.

These startups must follow a “terraforming” strategy: they don’t just launch a product: they create the conditions for the market to exist. They develop the basic technology, establish standards and infrastructure, test the first concrete applications, and build a network of partners capable of using and deploying this new technology.

To achieve this, they create proofs of concept that model the initial infrastructure, structure the ecosystem with integrators, regulators, and early adopters, and expand the market to larger segments and more complex industrial challenges.



How to win investors' trust

Investors may be sceptical of World Builders who are creating an entirely new market.

To convince them, it's not enough to simply enter an existing market: you need to show that you can lay the first bricks in the value chain, develop the first use cases, and forge alliances with founding partners.



3 keys to presenting your project to an investment fund:

Vision

→ **Formalise your ambition:** how will the industry be structured on a global scale? What are the key enablers and milestones? Which links in the value chain will be essential to deploy as a priority?

Credibility

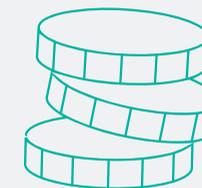
→ **Provide concrete evidence:** scientific results, prototypes, regulatory milestones, institutional partnerships. Show that your future is under construction, not speculative.

Ecosystem

→ **Present the stages of your roadmap:** industrial alliances, consortiums, emerging standards, first customers. Investors need to understand the logic and order in which you are assembling the various elements

Investors

Assessing the potential of a deep tech World Builder



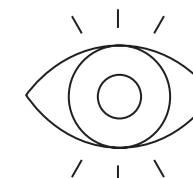
World Builders don't just enter an existing market: they create new infrastructure, industries, or industrial paradigms. Their credibility depends on their ability to establish the technological, regulatory, and operational conditions necessary for the market to emerge. Their progress depends on industrial coalitions, the definition of standards, and an extensive evangelisation process.

The lack of immediate adoption is not a negative sign: it reflects the time needed to implement systemic change. This type of investment is most often aimed at specialised funds to support these startups and anticipate subsequent rounds with late-stage or infrastructure-specialised investors.



JULIEN MACQUET
Investment Manager,
Elaia

“With Alice & Bob, we are looking at a disruptive technology that, if it delivers on its promises, could permanently transform many industrial sectors.”



World Builders: what are the strategic opportunities?

Team

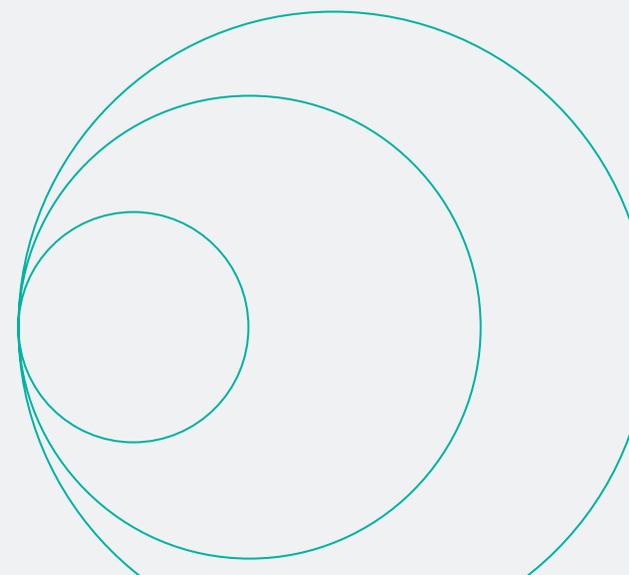
- Visionary team capable of orchestrating the development of a standard, partnerships, and regulatory lobbying.
- CFO with solid expertise in late-stage and infrastructure fundraising mechanisms.

Market

- New industry.
- Complex sizing as it relies on the effective implementation of a new value chain.
- The growth rate will depend on the speed of infrastructure deployment.

Competitive advantage

- Creation of a new, highly capital-intensive industrial sector.
- Barriers to entry: strategic alliances, network effects, industrial know-how, and standardisation.



3

Perspectives

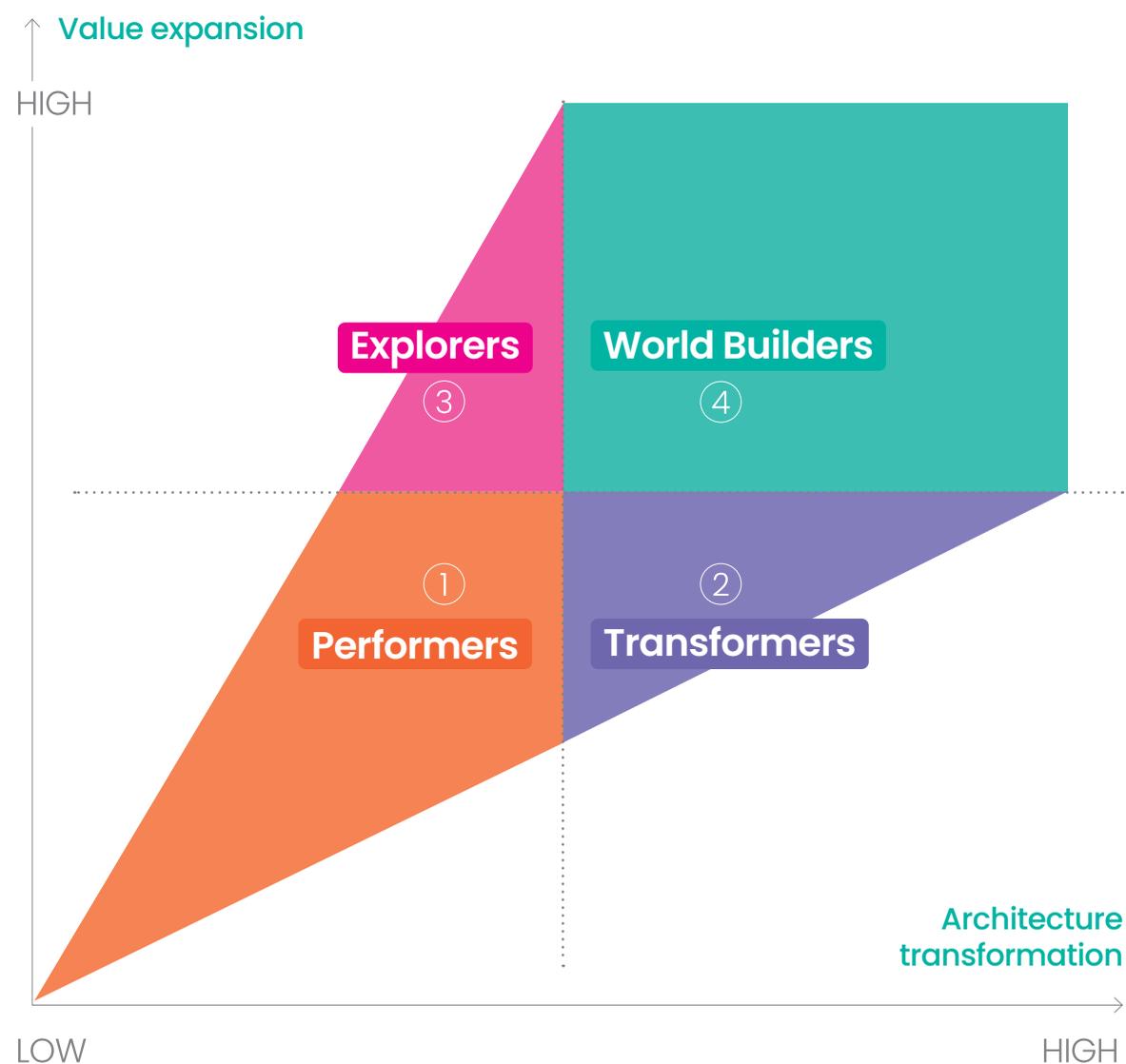
Emergence of a new paradigm
to shape the deep tech of tomorrow

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for deep tech innovation 38
 - ↳ A new framework
for rethinking
product-market fit 40
 - ↳ A new shared
reference framework
for stakeholders in the
deep tech ecosystem 42
-

A new roadmap for deep tech innovation

The four archetypes define a new topography of innovation territories and offer new keys to understanding.

Topography of deep tech innovation territories.



Performers

Innovating within the framework of industry standards

Performers focus on innovations that will seamlessly integrate with an already established architecture.

- **For entrepreneurs**, the challenge is to quickly demonstrate the tangible benefits of these innovations (performance, cost, efficiency) and ensure rapid user adoption.
- **For investors**, the advantage lies in their accessibility: the market is clear, decision cycles are short, and value creation is rapid.

Transformers

Reinventing an Industry from the Ground Up

Transformers rely on disruptive technologies that can transform an entire sector. With complex value chains, new standards, and industry inertia, the challenge is not simply to demonstrate the value of a new technology, but to inspire an entire industry to reinvent itself.

- **For entrepreneurs**, the key is to launch pilot projects early on with industrial partners to test and validate these new processes.
- **For investors**, these startups offer a strong potential for differentiation, but also present high barriers to entry and require teams with solid industry expertise.

Explorers

Exploring still-uncertain markets

Explorers operate in a space where neither the product nor its uses are yet clearly defined. Innovation is built step by step.

- **For entrepreneurs**, the approach relies on rapid iterations, pilot projects, and a product platform logic, allowing for the reuse of lessons learned from one use case to another.
- **For investors**, this category requires questioning the strategic roadmap and how the different markets interact.

World Builders

Building a new global ecosystem

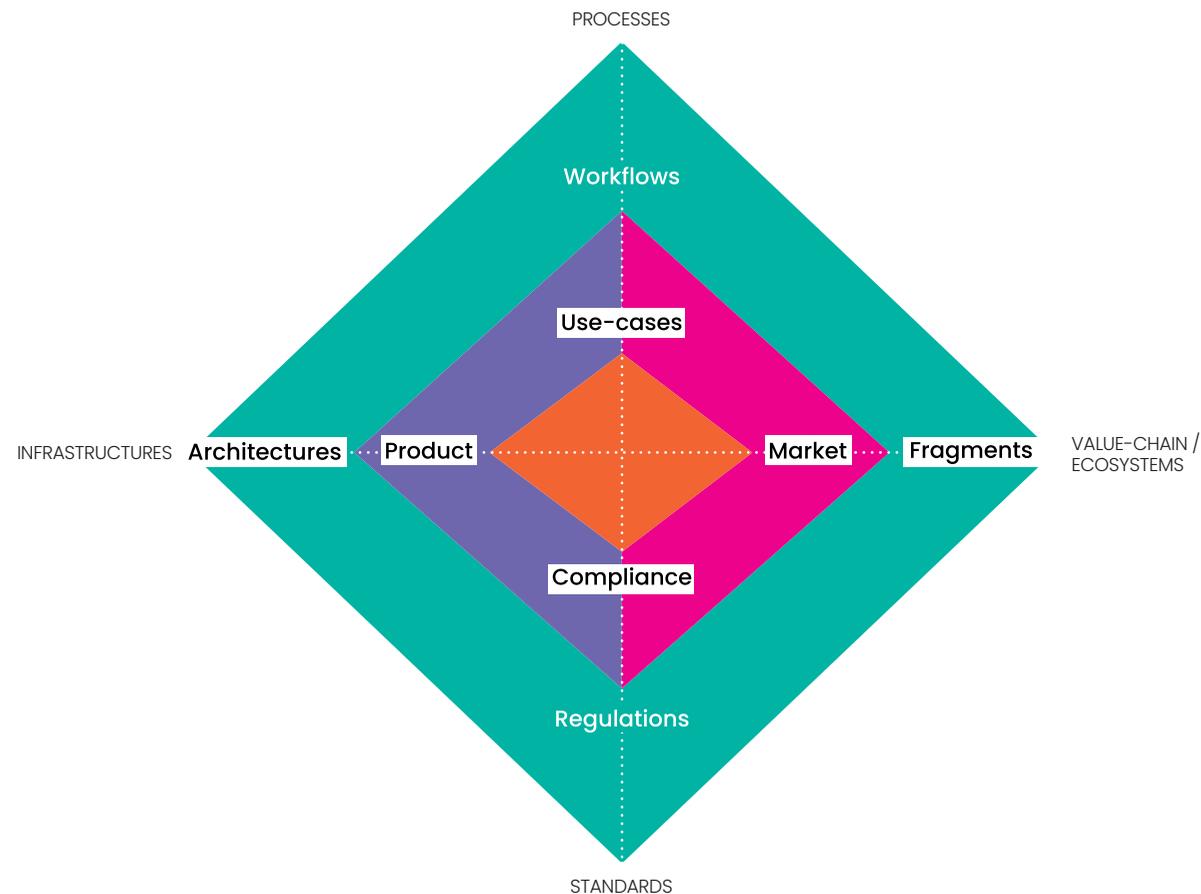
World Builders undertake the most ambitious projects. Their innovations require creating a new value chain: a new technological and industrial foundation, new uses and a new regulatory framework.

- **For entrepreneurs**, this implies a very long-term vision and the ability to unite people around a common ambition.
- **For investors**, it represents a real strategic gamble, requiring significant, even unprecedented, capital and specialised co-investors.

Rethinking product-market-Fit as a multidimensional map

In a landscape marked by the diverse territories of deep tech innovation, product-market fit (PMF) can no longer be simply the encounter between a product and its market.

Rethinking the product-market fit: a two-dimensional space where the levers to activate depend on the archetypes.



For Performers: The PMF involves testing the value proposition and its alignment with use cases in an existing market, without challenging the regulatory framework.

For Transformers and Explorers: The market does not pre-exist; it must be explored within a space akin to a "pioneer front" where innovations are hybrid and uses are still unstable. PMF convergence is built by activating four variables: architecture, customer workflows, market fragments, and regulations.

Finally, for World Builders: Neither the market nor the value chain pre-exists. PMF involves simultaneously developing an offering, its infrastructure, new industrial processes, and an ecosystem of new players.

CATEGORIES	Performer deeptech	Transformer deeptech Explorer deeptech	World Builder deeptech
VALUE EXPANSION DYNAMICS <small>(value curves, Kim & Mauborgne)</small>			
INNOVATION STRATEGIES	Lean innovation Access the market quickly through lean design of prototypes and via multiple interactions with customers.	Inception Introduce and deploy a new process in experimentation with design partners. Navigation Explore new applications and gradually map value potentials.	Terraformation Shape a new sector by building its infrastructure, link by link.
PRODUCT -MARKET FIT (PMF)			

A new shared framework for stakeholders in the deep tech ecosystem

The Deeptech Quadrant provides entrepreneurs and investors with a framework to refine their action plans and strategies. It is also aimed at support structures (SATTs, OTTs, incubators, and accelerators) that play key roles in structuring and accelerating deep tech growth trajectories.



→ For technology transfer offices and OTTs

Identifying the archetype of a deep tech project from the pre-maturation phase allows for tailored support. The practice of encouraging a project to focus early on a sector or use case can be counterproductive for Explorers and World Builders. Furthermore, licensing can also be complemented by new public-private partnership strategies that will diversify universities' funding sources: for example, the creation of consortia or joint ventures to foster the emergence of new standards.

→ For University Innovation Hubs (PUI or Pôle Universitaire d'Innovation)

Moving beyond a one-stop-shop approach and overlapping programs to play an architect-like role, guiding innovation trajectories. The challenge is to orchestrate differentiated support: rapid execution for Performers, co-creation with industry for Transformers, structured exploration for Explorers, and ecosystem structuring for World Builders. Each hub or PUI could conduct a review to establish specific support pathways for the different archetypes.

→ For Bpifrance and the DGE

Examining the continuum of innovation support in light of the financing needs of certain deep tech archetypes: Transformers and, to a greater extent, World Builders are undertaking highly capital-intensive projects, requiring substantial investments in infrastructure, industrialisation, and supply-chain structuring before any significant commercial traction can be achieved. Without instruments adapted to these CAPEX needs and long horizons, these projects risk being weakened or slowed down, despite their major strategic potential. Adapting the Deeptech Plan to these realities would help secure the emergence of industrial champions that can sustainably transform entire industry.

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Michael Kearney, General partner, Engine Ventures

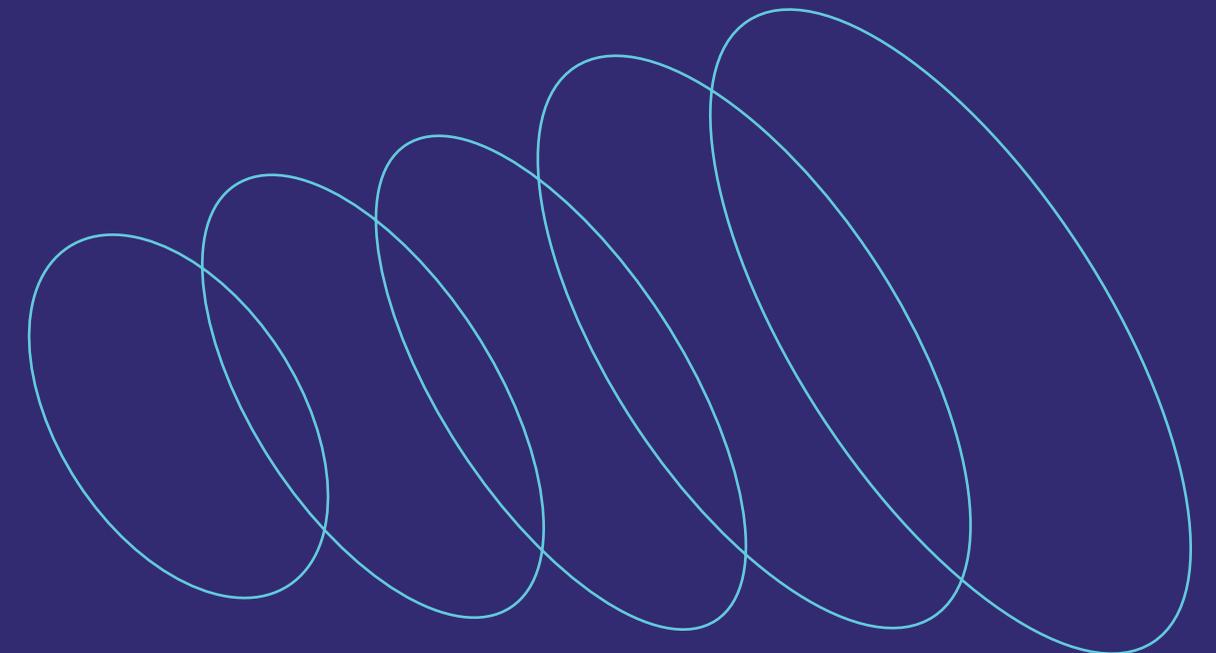
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Michel de Lempdes, managing partner, Omnes Capital

Théau Peronnin, CEO and co-founder, Alice & Bob

Maxence Valero, Head of Deeptech Investment, Crédit Mutuel Innovation



ABOUT



Bpifrance finances businesses –at every stage of their development– through loans, guarantees, and equity investments. Bpifrance supports them in their innovation projects and international expansion. Bpifrance also now insures their export activities through a wide range of products. Consulting, training, networking, and acceleration programs for startups, SMEs, and mid-sized companies are also part of the services offered to entrepreneurs. Thanks to Bpifrance and its 50 regional offices, entrepreneurs benefit from a local, single point of contact to effectively support them in meeting their challenges.

Learn more: www.bpifrance.fr



France DeepTech is an association created in 2023, open to all deep tech stakeholders, fostering an ecosystem of partnerships and healthy creative competition. Its objective is to bring together and unite the various players in the French and European deep tech sectors, particularly entrepreneurs, deep tech investors, and research laboratories, in order to promote the emergence and/or rapid growth of ambitious and bold entrepreneurial projects that are likely to make a decisive contribution to solving major contemporary challenges and maintaining French and European technological competitiveness and independence—guarantees of sovereignty and freedom.

Learn more: www.francedeep.tech.org



CentraleSupélec was founded in 2015 through the merger of École Centrale Paris (1829) and Supélec (1894), and is today one of the leading engineering and systems science schools. A public institution and founding member of Université Paris-Saclay, it trains more than 5,400 students each year across four campuses in France (Paris-Saclay, Metz, Rennes, and Reims).

With 18 laboratories and research teams, the school leverages a unique ecosystem of innovation and technology transfer, supported by 3,000 partner companies and an exceptional alumni network that has spawned more than 1,270 startups, including 10 unicorns with a combined valuation of €82 billion.

CentraleSupélec has a strong global focus, welcomes 25% international students and collaborates with over 170 of the world's most prestigious partner universities. As the leading institution of the Centrale Schools Group, it also oversees campuses in Beijing, Hyderabad, and Casablanca.

The school is driven by an ambitious strategic plan, and aims to double its graduating class between 2022 and 2032 and strengthen its impact on major societal challenges: ecological and energy transitions, national and European sovereignty, health, and quality of life.

Learn more: www.centralesupelec.fr



21st by CentraleSupélec is an impact accelerator, supporting students, researchers, and entrepreneurs in the development of deep tech startups, from ideation to scaling up.

21st has its roots in CentraleSupélec's entrepreneurial DNA, which has been the source of numerous success stories in France and internationally, and supports over 200 high-impact environmental and societal projects each year, focusing on three main areas of innovation: Climate & Biodiversity, supporting the climate transition, in partnership with AgroParisTech; Health & Care, supporting healthcare and medical research; and Future of Industry, supporting industrial recovery and technological sovereignty, in partnership with the DATAIA Institute. The supported startups benefit from access to the Paris-Saclay and STATION F campuses, as well as a unique ecosystem combining strategic coaching, mentorship, funding, 18 research laboratories, over 400 faculty members, and a network of 50,000 alumni.

Learn more: www.centralesupelec.fr/entrepreneuriat

Deeptech +



Deeptech+ is an executive program led by CentraleSupélec, ESSEC Business School, and Systematic Paris-Region, designed to support researchers, doctoral students, entrepreneurs, and deep tech project leaders in transforming scientific innovations into high-potential startups.

Conceived as a key link between research and investment, Deeptech+ provides the essential strategic skills needed to successfully navigate the initial stages of startup creation and prepare for fundraising: go-to-market strategy, financing, intellectual property, team structuring, and investor pitching.

The program, which leverages the academic expertise of CentraleSupélec and ESSEC, as well as the Systematic Paris-Region ecosystem, combines high-level instruction, feedback from entrepreneurs and investors, and hands-on support.

Learn more: www.exed.centralesupelec.fr/executive/deeptech-plus

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