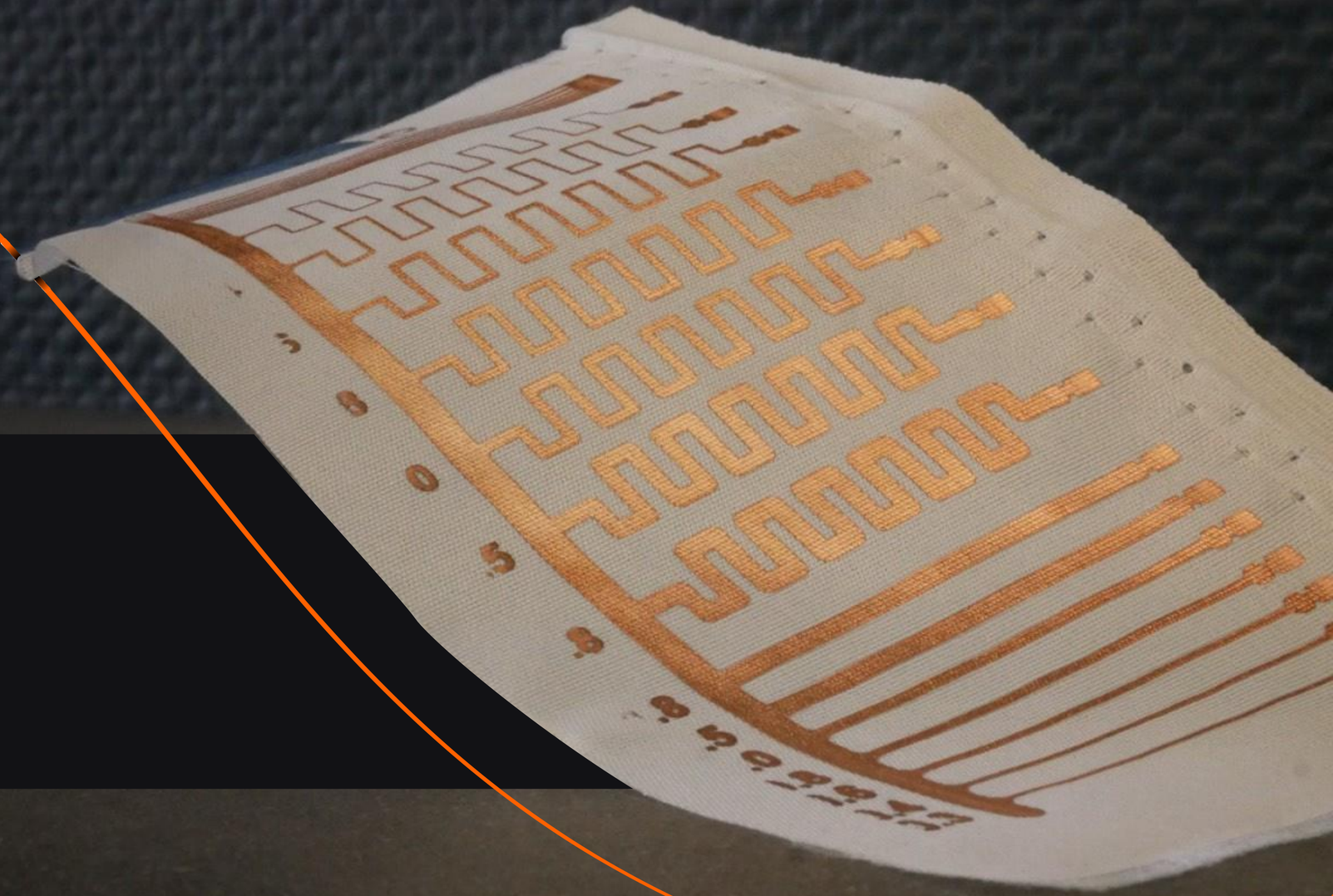
MC VE
TECHNOLOGIE

EOPROMFLEX®

A novel patented Roll-to-Roll process to deploy a proprietary **copper-based paste to print electronic circuits** on composites, leading the smart composite evolution



ABOUT MCVE TECHNOLOGIE

Our Company

Founded in **2019** in Augny, France

Raised more than **€1.8M** included the EU's i-Lab

A strong team consisting of complementary skills and expertise from across Polymeric chemistry, Materials Sciences, Electrodeposition, Industrial manufacturing processes, and Commercial sectors

IP-protected EOPROM formulation and the method for manufacturing printed circuit tracks in the EU and the US

Our Mission

To be a leading manufacturer of formulations and the front-line supplier for the sustainable mass production of flexible electronic circuits to be integrated into composites

We want to become a global corporation in the composite supply chain to industrialize functionalized fabric rolls with end-to-end services, from offering modeling services for the integration of electronic functions in Glass Fiber Reinforced Polymer/Plastic (GFRP) and Carbon Fiber-Reinforced plastic (CFRP) composite material, including order fulfillment, mass manufacturing, and global customer services

MANAGEMENT TEAM

Christian Weisse, BE,

CEO

22+ years of experience in industrialization and development of the product range and managing large-scale projects

Laura Mazzara. PhD,

Scientific Manager 5+ years of experience in electrodeposition and characterization of materials, allowing MCVE Technologie to have its own metallization process

Claude Labro, MSc,

CMO

15+ years of experience in Marketing management of new product strategies on printed electronics. Former European Growth Account Director - Micro Circuit Materials at Dupont de Nemours

Raphaël Vuillaume, BE,

Technical Manager

13+ years of experience in manufacturing processes of printed circuits.

Responsible for the production of the EOPROM® product line.

Problem

Manufacturing and Monitoring of Composite structure

- Traditional methods of manufacturing functionalized composites are associated with **limitations** such as fiber breakage, delamination, cracks, etc. at the site of electronic integration in the composite structure
- **Complex and expensive** manufacturing process
- Regular **human intervention** and **a temporary shutdown of operations** for inspection and repairs
- **Limited design flexibility** - Involvement of several existing technologies in developing traditional smart composites requires homogenous process optimization, restricting design flexibility
- **Limited scalability** due to customization complexities, increased production costs, and challenges in achieving manufacturing consistencies

Global wind power expands:

40 GW in 2020 → 420 GW in 2040 → 840GW in 2050

Global wind power expands : 150m

Current weakness of the sector:

intermittent and random load factor of 0.25 to 0.40

Icing causes production stoppages: between 4% and 15% of potential

Imbalance between the 3 blades => mechanical breakage Additional stresses on composite blades for offshore wind turbines Management of maintenance operations

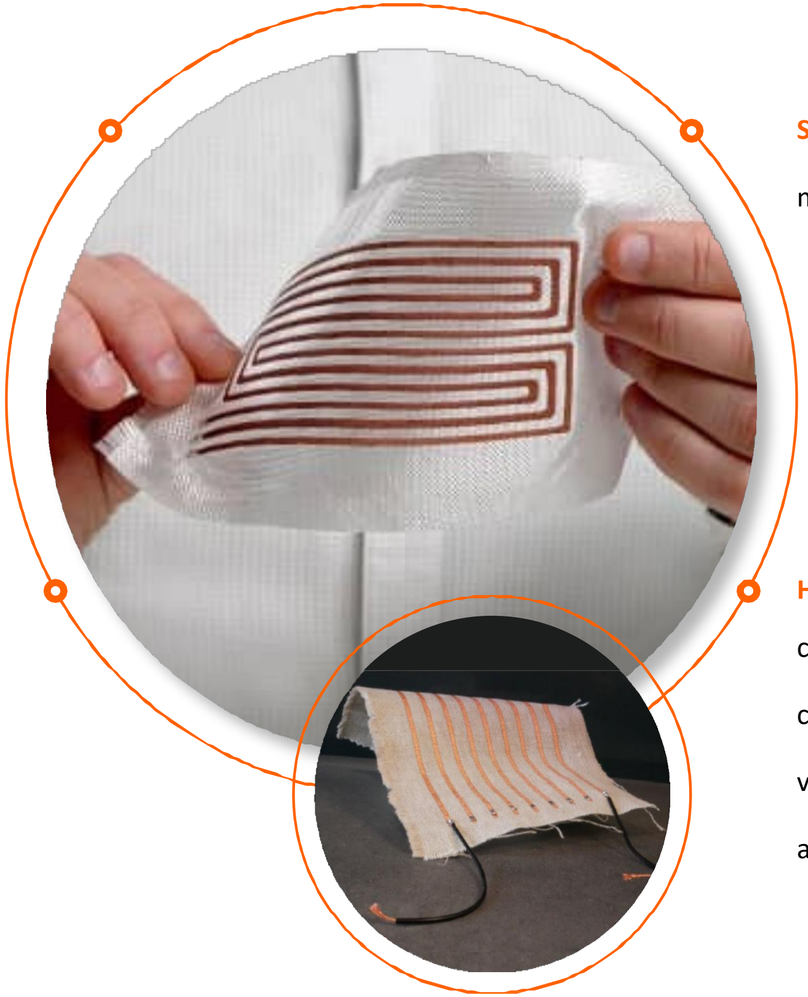
SOLUTION

EOPROMFLEX®

Deposition of a copper-based paste and PZE dielectric on different kinds of substrates (plastics/glass/fabrics), in a Roll-to-Roll (R2R) manufacturing process for Flexible Hybrid Electronics (FHE) that can be buried in composites, without causing any damage

High scalability - continuous Roll-to-Roll manufacturing process enables high-volume production

Streamlined and cost-effective manufacturing process



Real-time composite structural health monitoring, enabling predictive maintenance, and avoiding unnecessary inspections or shutdown of operations

High design flexibility - Ability to print desired circuits onto any kind of substrate, allowing customizable and flexible designing process for various composite structures (wind blades, antennas, aeronautic structures, etc.)

INNOVATION

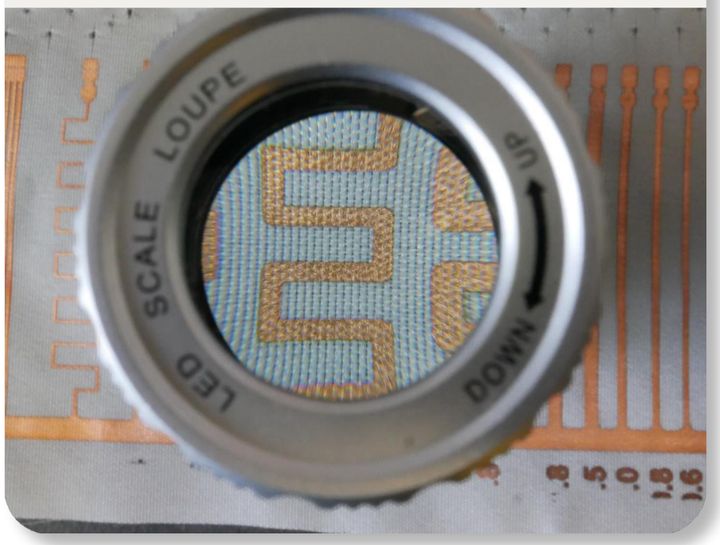
A cost-effective, reliable, and highly scalable functionalized/smart composite roll-to-roll industrial production technology, with the ability to transfer electrical systems and integration of multiple functions to unconventional areas, such as composite structures in applications such as automotive, aerospace, infrastructure, etc., enabling their real-time monitoring and optimization, enhancing their lifespan

01

DEPOSIT OF EOPROM®

FORMULATION

Dispenser / Screen printing / Spraying

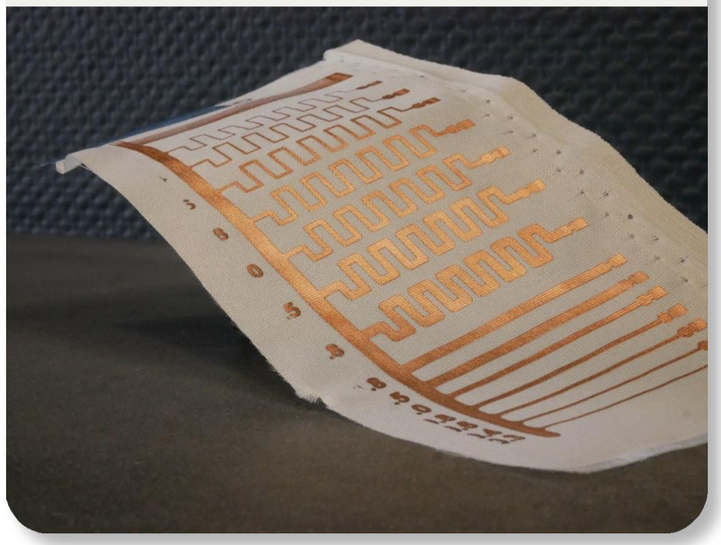


02

DRYING

& CROSSLINKING

Very strong adhesion Flexible

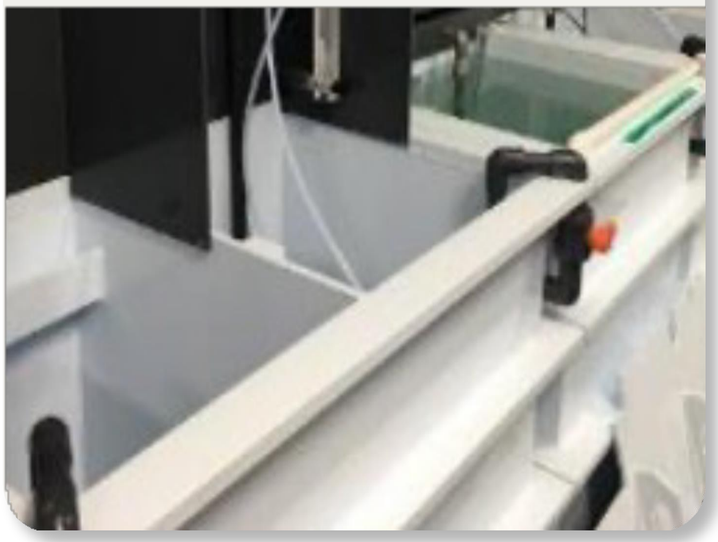


03

BATHS OF

METALLIZATION

Chemical: Cu;
Electrochemical: Ni, Sn, Au, etc.



COMPETITIVE ANALYSIS

	Market Product	Technology	Functions	Durability	In-situ monitoring	Real-time monitoring
	NDT Inspection (France)	CND- Non Destructive testing (NDT)	None	NA	No	No
	Molex-Piezoelectronics (China)	Flexible PCB	Complete	Low	No	Yes
	SCK-CEN (Belgium)	Fiber Optic Sensors (FOS)	Limited	Low	Yes	Limited
	MCVE Technologie (France)	Smart Composites	Complete	High	Yes	Yes

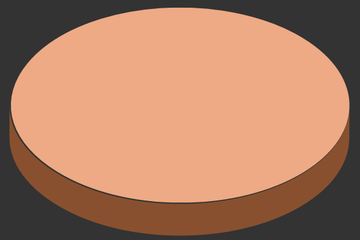
- **NDT**- inability to detect small or incipient defects within structures that can lead to overlooked issues, and challenges in assessing internal structural elements that are difficult to access.

- **PCBs** - associated with durability concerns, delamination, or deterioration issues at the site of insertion, due to differing coefficients of thermal expansion, or due to the creation of voids during the embedding of the electronic components within the composite structures.

- **FOS** – fragile and susceptible to breakage or damage, affecting their reliability and ability to detect localized defects in complex structures.

- **MCVE Technologie's EOPROMFLEX** process will encompass these limitations by manufacturing smart composites, printing circuits directly onto the composite materials at the manufacturing stage, making the integration site safe from future degradation.

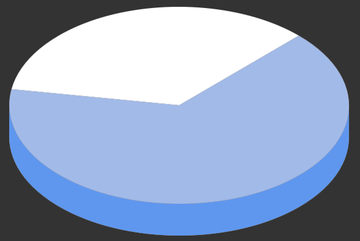
MARKET POSITION



The Total addressable market (TAM) €21B

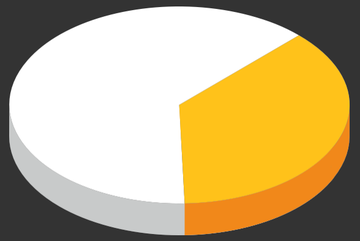
The Total addressable market (TAM) is the **Global smart composites market, which is valued at €21B.**

MCVE Technologie will target the Global structural health monitoring market. This market is expected to grow at a **CAGR of 15.8%**



Serviceable Available Market (SAM) €7.2B

The European share of the target market includes 25% of the Serviceable Available Market (SAM) - €1.8B



Serviceable obtainable market (SOM) €1B

to be about ~60% of this European share, i.e., €1B over the next 8–10 years of commercialization

Main market drivers

The increasing initiatives for public safety along with standardization of the structural health management system by the government are expected to drive the growth of this market

VALUE CHAIN

R&D, IP management, sales…

MCVE TECHNOLOGIE

Customers/End Users

FORVIA techtera GROUPE ROSSIGNOL

DAHER AIRBUS NEXTEAM GROUP

Valeo ANTOLIN Intelligent. Integrated. Inside.

End Users

COMMERCIALIZATION STRATEGY

- **B2B Model:** Direct sale of large sale smart composite rolls manufactured using the EOPROMFLEX process line for Composite manufacturers or Industrial companies interested in introducing smart composites into their production line
- The business model consists of a price of **€60–120/m2** for the smart composite rolls
- In the initial phase of commercialization, KOLs in the EU - Erwan Rochefort (R&D Manager for antenna radome, Naval Group) and Xavier Roussin-Bouchard (R&D Manager, Rossignol Group) will be sought who will emphasize the need for smart composites
- Customers will include composite manufacturers and companies integrating smart composites in France and Germany, followed by the rest of the EU, and subsequently to customers in the US

Structural Health Monitoring Market (France and Germany)

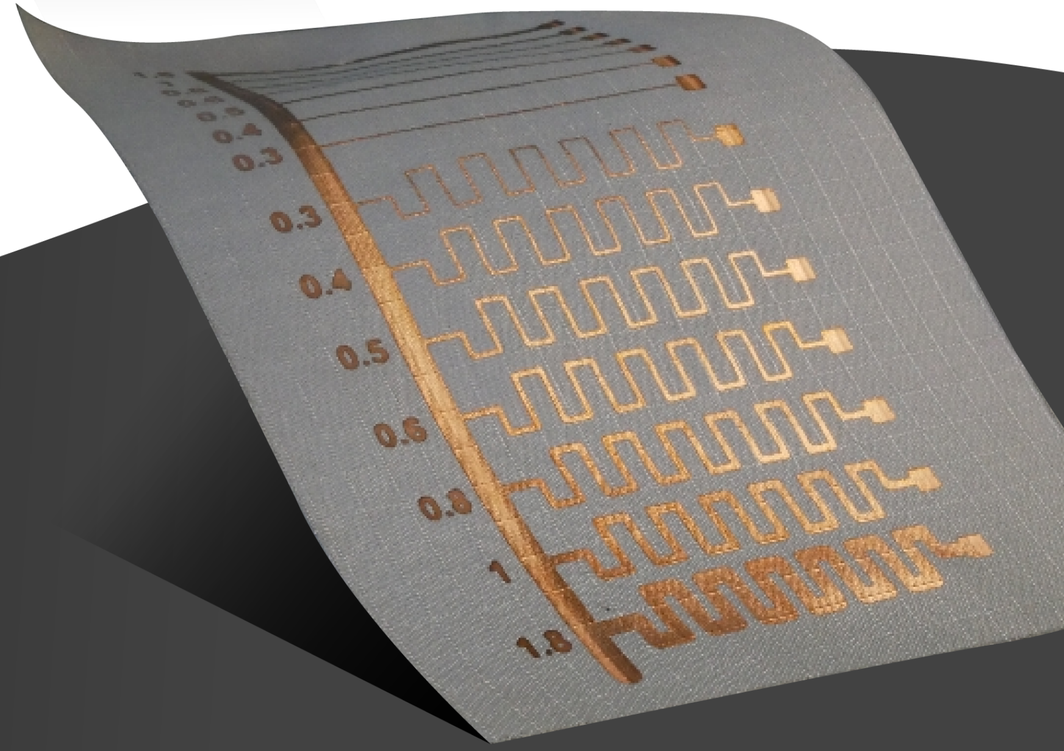
2027

Structural Health Monitoring Market (EU)

2028

Structural Health Monitoring Market (US)

2029

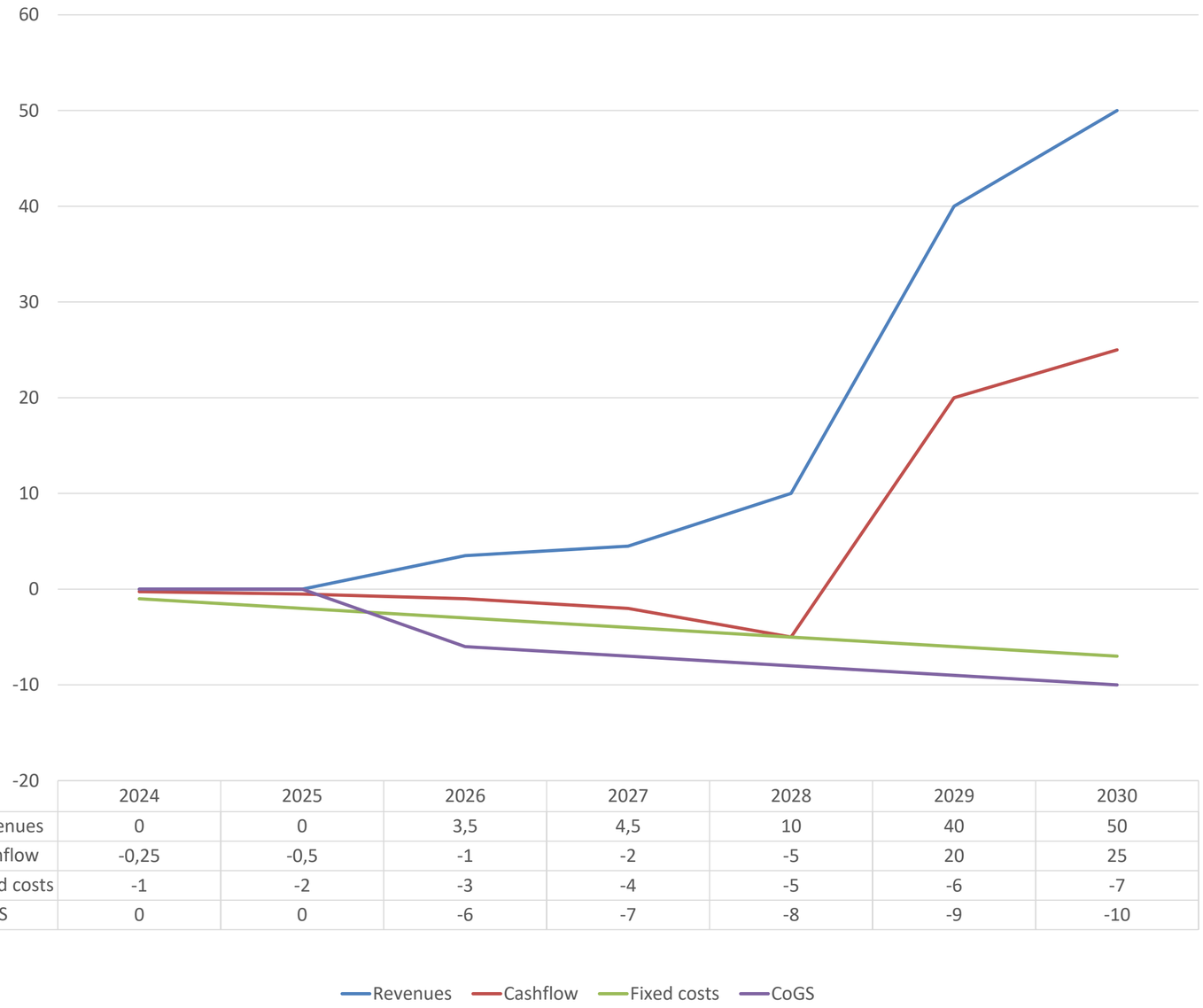


Market Traction

CHOMARAT

porcherindustries®
CONFIDENCE MAKES THE DIFFERENCE

FINANCIAL PLAN



	2024	2025	2026	2027	2028	2029	2030
Revenues	0	0	3,5	4,5	10	40	50
Cashflow	-0,25	-0,5	-1	-2	-5	20	25
Fixed costs	-1	-2	-3	-4	-5	-6	-7
CoGS	0	0	-6	-7	-8	-9	-10

Breakdown:

Price per X

Price per X

Assumptions

Breakeven by 2028 with sales of 10M€ or 225.000 sqm2

Revenues by 2030 €5O Net

gross margin : 55%

20 clients onboarded by 2030

Assumptions

equity request €2M

Matching equity €3M

BUDGET

Total project budget

€6,8M

Funding request

€2M

Matching Equity

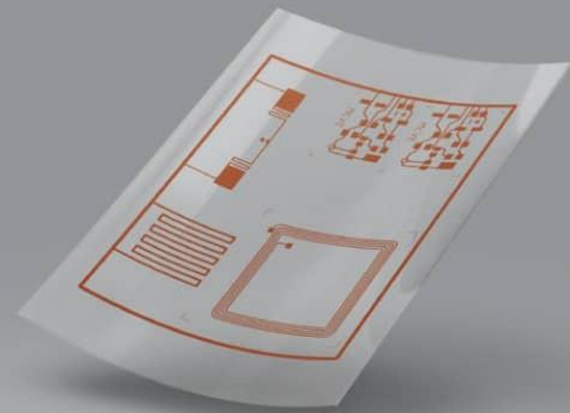
€3M

Credit

€1,8M

Project objectives:

- Optimize EOPROMFLEX
- Engage in communication and marketing activities
- Scale-up production
- Expand the team



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Join us to shape the future of smart composites in Europe!