

Energy and Circularity Startups

Avox

Inner Tech

Veridis

#INVESTORSDAY

HIGH
TECH XL

THE HYDROGEN PRODUCTION CHALLENGE

Green hydrogen is a key enabler for de-carbonising heavy transport and multiple industries. It will also help manage the demand and supply of renewable energy.

However, green hydrogen is not yet a cost-effective alternative to fossil fuels since it is around 4 times more expensive.

Current electrolyzers have high CapEx and OpEx, because of immature and inefficient technology and the small economies of scale. This leads to high production costs and limited adoption of green hydrogen.

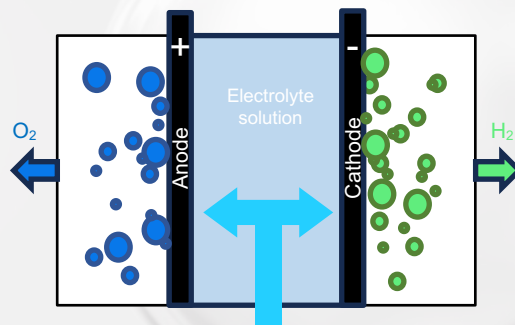
AVOXT TECHNOLOGY

AVOXT develops a membrane-less alkaline electrolyser. This system uses the robustness and proven track record of alkaline electrolyzers. At the same time, it achieves efficiencies higher than commercial PEM electrolyzers (<46kWh/kg) and increases operational flexibility, uptime and lifetime.

The membrane-less electrolyser is able to pressurise the hydrogen directly. The system intends to separate the gasses from the electrolyte directly, eliminating the need for additional compressors and gas-liquid separators.

THE AVOXT SOLUTION

1. Our electrolyser setup aims for a system energy consumption below 46kWh/kg H₂.
2. Our system is designed to increase the operational lifetime and reduce maintenance costs and downtime compared to traditional electrolyzers.



APPLICATION DOMAIN

AVOXT is developing its next-generation 5+MW electrolyser modules for green hydrogen production on an industrial scale.

AVOXT will first target chemical, fuel and power companies and other heavy industries to replace grey hydrogen production plants.

CONTACT

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MANAGEMENT TEAM



Ton Rademaker
CEO
Operations & Finance



Pascal van Bakel
CTO
Technology

PARTNERS



Research
Partner



Pilot
Partner



Development
Partner



Venture
Accelerator

A new approach to Electric Vehicles (EV) battery pack testing, that would uniquely predict and prevent battery fire events, and enable fix and reuse. We will dramatically increase the life cycle of battery packs and facilitate scaling and standardizing of their use in both automotive and stationary applications.

BACKGROUND

- With rapid growth in electric vehicles (EV) volumes, batteries represent 50% of the value; costly to produce using scarce material.
- Only 20% of batteries will come close to living up to their full life cycle of 20 years, in cars or in second life stationary applications, while the rest turn up recycled to raw materials early on.
- There is a need to reverse this picture and optimise re-use.

PROBLEM

EV Batteries deteriorate over time, and are shifted towards stationary applications. Simultaneously, the risk for Thermal Runaway (battery fire) grows. Once a fire event starts, it is hard to put it out, and the damage to life and property is huge.

The existing measures , like the Battery Management System (BMS) and other electrical measures, cannot diagnose physical deformations such as cracks and swellings before they affect the performance. Therefore, batteries tend to get prematurely shifted towards recycling, as they become hazardous.

Therefore, the use of EV batteries is not optimised. There is a need to use them for longer, either in a car or in stationary applications, to save money and valuable resources

SOLUTION

Stage 1: A CT machine, large enough to scan a standalone battery pack for failures. Addressing: automakers and second life companies, to address recalls and allow maximal monetising of the pack, repair and re-use.

Stage 2: Drive in drive out chamber to scan the car with the battery, in situ. Addressing: Transactions of e-fleets and individual second-hand cars, maximising selling price and ensuring safety.



Team



Efrat Avnet Steinberg, CEO
LLB, MBA (Startupbootcamp AMS COO, TLV Economic Development Authority BusDev Director).



Hans Buurman, CTO
PhD (Applied Physics) Medical Industry, R&D. Philips Principal Scientist, IKNL Head of Development.



Mark Crocker, COO
BSc (Computer Science) Founder and MD IT company, offering operating system fixes to major blue-chip players in the IT market having offices in UK and Asia.

Market, snapshot 2030

A battery should be scanned every few years, at any given decision point in time: when goes below 80% capacity, upon a recall, when a used car is sold, when sent to recycling, when building a new energy storage unit.



These numbers represent Monetary value, containers and SAAS, scanning of total Electric private vehicles (TAM), related to the number of used cars and batteries that require scanning on that year in the various use cases.

Breakthrough, Mature Technology

5 granted patents, successful commercial POC. In-house own lab. Currently performing complete battery pack paid projects of scans with Fraunhofer EZRT, Germany.

Business Model and Data Strategy

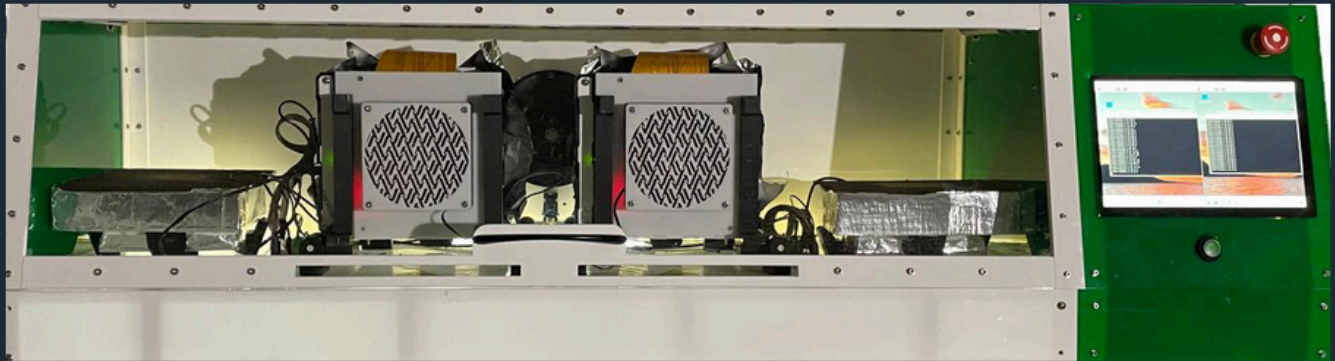
- Hardware sales of CT machines.
- Recurring software/AI licenses and SaaS automatic diagnostics services (the largest global database).
- Monetising Data: selling to battery cell producers.

The Ask

€2M Seed in equity (and a similar amount in non dilutive instruments) - R&D, scale production, expand pilots, and gather real data from specific partner sales.



When knowing your plastic composition matters



PROBLEM

The EU's plastic recycling goals for 2030 are ambitious but we need better technologies to analyse our complex mixed plastic streams. Conventional technologies are not to analyse large volumes of heterogeneous plastic waste.

SOLUTION

Veridis revolutionises plastic recycling with **MADSCAN®**, the first thermal analysis technology that unlocks the composition of complex plastic waste streams. This provides batch-representative insights, into every plastic type present and allows for process optimisation and material valuation based on data.

TECHNOLOGY

Within 1-2 hours, Veridis **MADSCAN®** measures the thermal behaviour unique to each polymer, detecting the different polymer subtypes in a batch and their fraction sizes with >99% accuracy. **MADSCAN®** is designed to analyse any plastic type and colour for flakes and granules, with minimal sample preparation and automated data analysis.

APPLICATION

The **MADSCAN®** systems can be used next to the line at mechanical and chemical plastic recycling to measure incoming feedstock, enable process optimisation and ensure outgoing product quality, greatly increasing its commercial value.

VISION AND MISSION

Veridis designs and develops industry-leading, innovative technologies for complex material characterisation, aiming to create a better future for humanity and the planet through a sustainable, circular economy.

TEAM



**Nigel
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Founder



**Jeroen
Glansdorp**
CEO, Co-founder



**Daan
Vijfhuizen**
CBO



**Floris
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CTO, Co-founder

MADSCAN® technology unlocks the true potential of plastic recycling, creating a win-win for businesses and the environment. Let's work together to turn plastic waste into a valuable resource.



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Eindhoven/Amsterdam, The Netherlands

Health & MedTech Startups

VitalWear

Tomosono

Sonic Precision

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Autonomous Detection of Pressure Ulcer Onset



VitalWear discovers vital information by embedding optical fiber sensing technology in textile materials, to create innovative sensor surfaces and, ultimately, sensor textiles, for non-invasive medical applications.

VitalWear's first application focus is the prevention of pressure ulcers, which annually affect 2.5m patients in the United States alone. Pressure ulcers often occur for immobilized or desensitized patients when skin cells under pressure die due to mechanical stress or due to disrupted blood supply.

VitalWear reduces the number of pressure ulcer cases and lowers the amount of time that the nurses need to spend on pressure ulcer prevention. By monitoring temperature in addition to pressure, around the clock and autonomously, without the need for a nurse to be present, VitalWear detects pressure ulcers at an early stage, so that their full formation can still be prevented, and indicates which patients currently do not need to be repositioned, so that the nurses can save precious time.

VitalWear's core team consists of senior innovators with a history at companies such as Philips and ASML and provides the required technology, innovation and business competencies. In addition, VitalWear surrounds itself with additional expertise in photonics, textile integration and healthcare.

To complete its pre-seed financing strategy after confirming more than € 1m in loans and grants, VitalWear is seeking € 500k from passionate private early-stage investors with expertise in healthcare. With these investments, VitalWear will develop its Minimum Viable Product and carry out clinical validation experiments before the end of 2025. VitalWear will then raise a Venture Capital Seed round of € 1.5m to facilitate its outcome-oriented clinical trial. The total financing requirements for VitalWear to establish scalable operations in multiple markets are estimated at between € 8m and € 12m during a period of about 5 years.

NEED AND OPPORTUNITY

Pressure ulcers represent a significant, world-wide healthcare challenge, which in the United States every year leads to the death of 60,000 patients and to additional healthcare costs of more than \$ 26b – as well as to 17,000 legal cases against healthcare institutions, which are settled for an average of \$ 250k.

The current clinical practice guidelines call for the frequent repositioning of at-risk patients, which implies that guideline-compliant pressure ulcer care is currently very time consuming for nurses. This mechanism is not yet “smart”, i.e. the repositioning actions are carried out purely based on timers – and not based on actual patient-specific information. As a result, some pressure ulcers are not caught early enough, so that pressure ulcer incidences are still much too high, while some patients are repositioned too often, causing unnecessary work for the nurses and unnecessary disruptions, especially also at night, for patients.

To avoid both under- as well as over-treatment and to provide optimized, patient-specific pressure ulcer prevention, there is a need for a solution that detects the actual development of a pressure ulcer at an early stage and informs the nursing staff accordingly.

SOLUTION AND TECHNOLOGY

The VitalWear solution consists of sensor sheets, a readout device, data processing and interpretation algorithms, and a user interface for the nurses.

VitalWear leverages optical fiber sensing technology, which detects physical properties with high accuracy, and translates the sensor readings into pressure and temperature measurements. Temperature changes on the skin surface indicate the early stages of the development of a pressure ulcer. Local skin temperature decreases when blood flow is obstructed (ischemia) and increases when the body reacts to cell damage underneath the skin (inflammation).

VitalWear integrates the sensors into textile materials to create flexible and versatile measurement sheets, which are placed between the patient and the underlying surface (e.g. mattress or wheelchair). VitalWear's algorithms analyse the collected measurements over time to determine the specific risk for each individual patient.

VitalWear's initial prototype demonstrates the capability to monitor pressure and skin temperature distributions. First pre-clinical experiments are scheduled for Q1 2025.

COMPETITIVE ADVANTAGE

VitalWear's unique monitoring and decision support solution informs nurses which patients need attention to prevent a developing pressure ulcer from fully forming and which patients currently do not need to be repositioned. The monitoring focuses on the body areas where pressure ulcers typically occur, especially sacrum and heels.

VitalWear's solution improves upon competitors as it monitors continuously and autonomously, without requiring active support by the nurses, and as its textile measurement surface is fully comfortable for the patients. VitalWear enables the transition from a time-based, generic risk management approach to an information-based, patient-specific prevention approach.

IMPACT

Via timely interventions triggered by early detection, VitalWear lowers pressure ulcer incidences.

By not disturbing patients that currently do not actually require repositioning, nurses reduce, without higher risks for their patients, the amount of time that they need to allocate to pressure ulcer prevention.

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Tomosono

MISSION & VISION

Our ultimate vision is timely, accessible and inclusive imaging and treatment for every patient in the world. By building stroke, cancer and musculoskeletal solutions, we make healthcare directly available anywhere to anyone.

For starters, we will develop a diagnostic imaging solution for the knee. We will target specialized care in imaging and orthopaedic clinics for various knee problems to allow patients to live a full life.

CONTACT



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PROBLEM

Diagnostic imaging is a bottleneck.

Knee - In the Netherlands the amount of knee related problems requiring imaging is increasing rapidly (doubles every decade):

- Over 300.000 patients received 2nd line care, with over 200.000 knee imaging scans (X-ray, CT, MRI, Ultrasound);
- Total yearly diagnostic and treatment cost for knee problems in 2nd line care are almost 500M€.

Breast - Imaging based screening is only done in the Netherlands for females aged 50 and up, leading to underdiagnosis in females under 50.

Stroke - Delayed imaging and treatment for stroke patients, reduces survival chances 5% every 15 minutes.

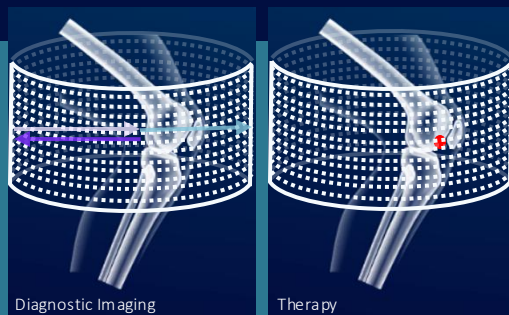
SOLUTION

Initially, we are developing a standardized, operator skill-independent ultrasound-based solution that is portable and safe. This will allow for:

- Orthopaedic surgeons to perform dynamic 3D imaging directly with the patient in the examination room.
- After this beachhead market is established and learnings are incorporated, we will move into additional clinical areas:
- This non-X-ray based imaging safely opens the door for screening of breast cancer at a younger age.
 - A revolutionary AED-like solution for stroke that would shorten the time for diagnosis and treatment, saving lives and tremendous indirect cost related to disabilities.

It has a low barrier to entry, as it can be used outside the radiology department, delivers easy image acquisition & interpretation due to standardized 3D volumes and automatic tissue characterization, requires no harmful X-ray radiation, has fast scanning and treatment options build-in. Leading to earlier detection and treatment.

TECHNOLOGY PLATFORM



Our novel Ultrasound Tomography platform is truly a new modality. In a single, seamless workflow, physicians can precisely diagnose with 3D dynamic imaging and directly treat with High Intensity Focused Ultrasound (HIFU).

Now is the time to develop and bring it to market:

- Latest wafer-based ultrasound sensor technology;
- Availability of massive compute power to generate the dynamic 3D images;
- AI to optimize acquisition time and to assist the physician in image analysis.

Stroke: Investigational device ready and start clinical evaluation

Breast: Investigational device ready and start clinical evaluation

Product Launch EU
Product Launch North America



Incorporation Tomosono B.V.

March 2024



2D imaging prototype design ready

December 2024



2D imaging prototype with superior image quality ready

Q1 2026

Investigational 3D device ready and start clinical evaluation

Q4 2026

Results published & regulatory file submitted

Q4 2028

Product Launch EU

Q4 2029

Q4 2030

Confidential

Collaborating partners:





A medical device company specializing in the development of innovative catheters for the ablation treatment of cardiac arrhythmias

MISSION & VISION

To set the **new standard in catheter ablation** of cardiac arrhythmias by empowering electrophysiologists with comprehensive information and advanced ultrasound visualization technology, ensuring precise, **first-time-right treatments** for every eligible patient, and ultimately improving patient outcomes and quality of life.

CONTACT



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www.sonicprecision.us (under construction)



Eindhoven, The Netherlands

PROBLEM

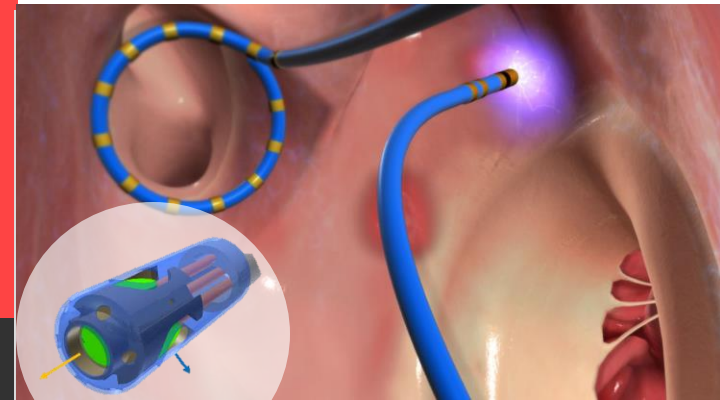
Atrial fibrillation and ventricular tachycardia are the most prevalent **cardiac arrhythmias**, with over 5 million new cases diagnosed annually. **Catheter-based ablation** has emerged as a well-established curative intervention, achieved by electrically isolating specific regions of the heart. However, one of the primary challenges faced by electrophysiologists is accurately assessing the transmural and durability of the lesions created during ablation. This is caused by that fact that clinicians are effectively **“operating in the blind”**. The lack of real-time information on myocardial **wall thickness and immediate feedback on lesion formation** frequently leads to either underdosing, resulting in incomplete isolation, or overdosing, which increases the risk of complications and decreased functionality of the myocardium. Consequently, **more than 20% of patients require a repeat procedure** within a year to achieve symptom relief.

SOLUTION

Introducing an innovative dual source (RF and PFA) ablation catheter with embedded **ultrasound sensors in the tip**. This cutting-edge technology provides real-time monitoring of **catheter stability, procedure safety, and ablation quality**, during cardiac arrhythmia treatments. With ultrasound visualization a tailored approach is now possible allowing for more precise treatment and improved clinical outcomes.

TECHNOLOGY

The catheter tip is equipped with four nearfield ultrasound sensors, enabling it to sense in four different orientations. Advanced algorithms can delineate tissue contact and characteristics, as well as visualize the myocardial wall, including lesion formation. The catheter connects to a generator capable of delivering both radiofrequency ablation and pulsed field ablation, aligning with the latest trends in medical device technology.



TEAM



Rene
Aarnink

CEO



Marcel
de Groot

CCO



Joanneke
Groen

CPO

Solutions for Industries Startups

Spectrik

Luper Technologies

Sandgrain

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MISSION

Enabling the emission reduction solutions by developing gas sensors which provide manageable, real-time data of the performance of those systems

VISION

By developing gas sensors which provide real-time actionable data; emission reduction systems can solve the challenges we face right now like global warming and biodiversity.

PROBLEM

There are measures to reduce emissions, but there is **no visibility** into the mechanical drift of those devices, no control and no customization for the users of such HVAC systems is possible. This results in the ultimate problem, which is too high concentrations of harmful gasses in the environment.

SOLUTION

With the data provided by our sensor, we give control back to the farmer; offer insight into mechanical drift and enable customization so that emissions are also effectively reduced.

APPLICATION

We are first developing a sensor for stable installers for in stable measurements. Second, we are developing a sensor for extensive livestock so that emission reduction system suppliers can monitor their performance. Finally, we are developing a platform technology that can measure gasses for multiple markets and industries.

TECHNOLOGY

By using a photonic integrated circuit, we are able to measure accurately in the parts-per-million/billion/trillion range. Integrating multiple lasers with different wavelengths, we can also measure more than one gas within a single system while being small, energy-efficient and robust.

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TEAM



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Europees programma voor transitiegedreven innovatie



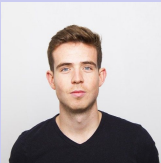
Cleaning our skies

Our mission is to clean our skies by creating innovative air cleaning systems, enabling industries to eliminate their emissions. We aim for zero air pollution, protecting our planet and its inhabitants.

A strong founding team



Maarten Kieft
CEO



Daan Jansen
CTO



Prof. Matthew Johnson
CSO

A lose-lose dilemma

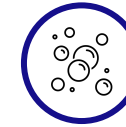
Industrial air pollution leads to more than 7 million deaths yearly, with factories facing million euro fines and shutdowns due to emissions of lethal and malodorous compounds.

Existing solutions are extremely costly, ineffective in harsh conditions, and environmentally damaging due to a huge carbon footprint. This underscores the need for a revolution in industrial air cleaning.

Our AirShield

Our revolutionary, patented industrial air cleaning system the 'AirShield' is developed as a effective, efficient and sustainable solution to clean gaseous air pollution from harsh industrial exhaust air.

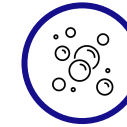
Target pollutants include



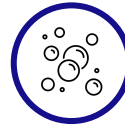
DMS



H₂S



BTEX



Odor

A natural process

Our technology mimics the natural, self-cleaning process of Earth's atmosphere and increases its power over a million times. By leveraging the power of the hydroxyl radical, we create air that is unnaturally clean.

Backed by outstanding advisors



Fred Govaert
Industry



Maarten van Herpen
Business



Prof. Earl Goetheer
Technology

Contact



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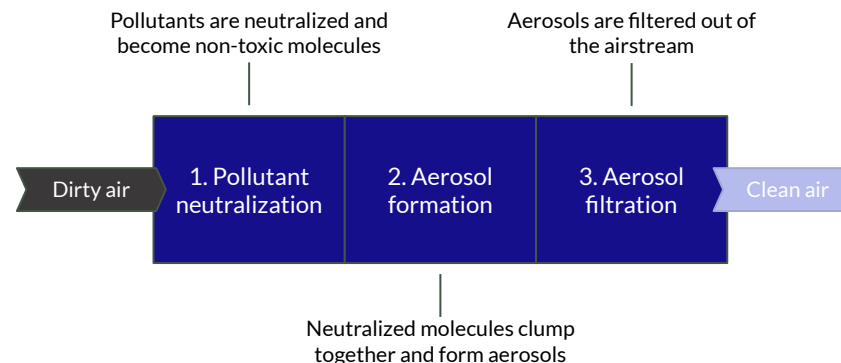
+31 (0)6 5147 5722



<https://luper.tech>



HTC 27, Eindhoven, NL



Benefits at a glance

- **Effective:** 99% removal rate
- **Efficient:** 70% reduction of TCO
- **Environment:** 90% reduction in GWP



MISSION & VISION

Today, the weak security of many connected systems is a real concern, compromising the progress of digitally connected systems and infrastructures.

We believe in restoring security, trust, and peace of mind in an ever-changing and expanding world of connected electronics by offering a robust end to end solution that is easy to integrate and affordable.

CONTACT



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PROBLEM

More and more, devices are always connected, always online: equipment, machines, and infrastructures.

This situation is not as safe as it should be, hacks and unwanted introduction of counterfeit electronics are happening everywhere.

Without a proper knowledge of the system configuration and node identities, system owners are not able to counter these security risks.

TECHNOLOGY

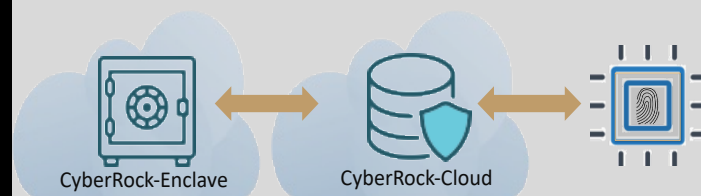
The SandGrain root of trust tokens are **physically unique chips**, like fingerprints, that are immutable. These chips communicate with our **secure CyberRock cloud platform** providing post-quantum resilient cybersecurity. The solution is easy to integrate and highly scalable.

SOLUTION

SandGrain provides the first robust end to end security service based on the combination of a truly unique electronic barcode, a hardware token without software as root of trust, in combination with a cloud service platform.

APPLICATION

Application areas are industrial IoT, industrial equipment, automotive, consumer IoT, government & infrastructure.



TEAM



**René
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Chief Executive
Officer



**Pieter
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Founder &
Chief Technology
Officer



**Joeri
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Chief Commercial
Officer



**Casper
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Founder &
Process
Technology



**Jeroen
Doumen**

Founder &
Security
Architect

Deep-tech scale-ups

inPhocal
Carbyon

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Marking technology with revolutionary speed

Driving economic and transformative impact in manufacturing applications

Revenue by:



Tetra Pak



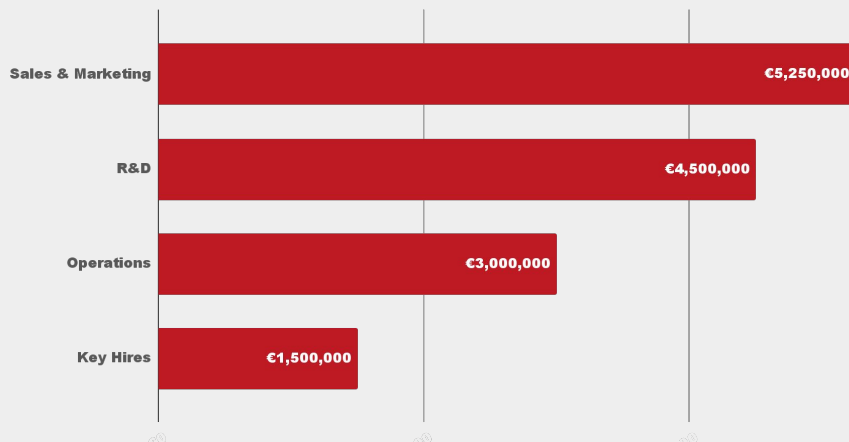
ABInBev



Round

inPhocal is looking for a lead investor to join the €15M Series A, to scale operations and monetize our technology across the FMCG market.

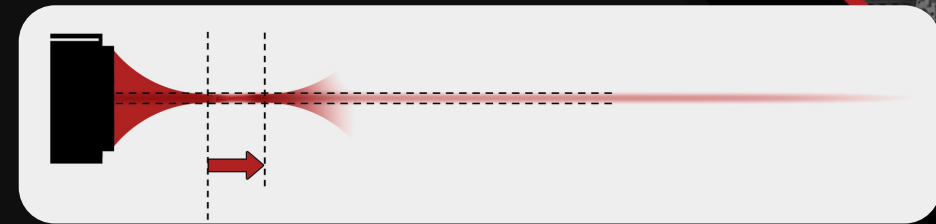
HIGH LEVEL CAPITAL ALLOCATION - €15M SERIES A



Technology

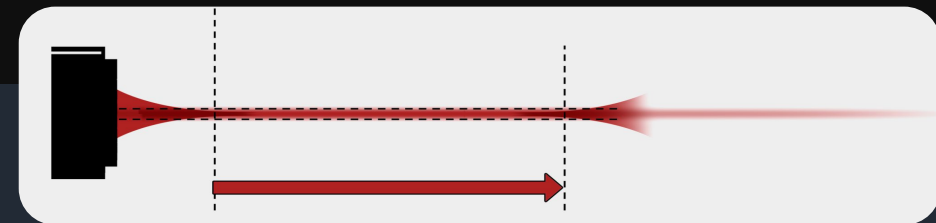
Thanks to our patented innovation, we hold the most disruptive and reliable optical system, allowing us to generate unique laser beams.

conventional laser beam



less than 0,5 cm focal range

inPhocal laser beam



Up to 10 cm focal range

Thank you for your valued interest, for further details feel free to reach out to our esteemed CEO, Robert van Tankeren. Via email robert@inphocal.com or call him for a nice chat at, +316 123 07 883.



MISSION & VISION

Our purpose is to reverse climate change by restoring the atmospheric carbon balance. It's our vision to capture CO₂ from the atmosphere on a gigaton scale worldwide. We are on a mission to develop a scalable and affordable direct air capture solution using breakthrough technology.

PROBLEM

Humans emit 40 billion tons of CO₂/year. Concentration of CO₂ in the atmosphere is the highest in 2 million years: it has risen from 280 ppm in 1750 to 420 ppm in 2022. And keeps rising. Global CO₂ emissions need to be net zero by 2050. But even if we make it, our planet is warming up and keeps warming up. There is no net zero, without the removal of carbon. We need deep emission cuts across all industries and a portfolio of carbon capture solutions. Current Direct Air Capture solutions are too big, too expensive, hard to scale or simply not durable.

SOLUTION

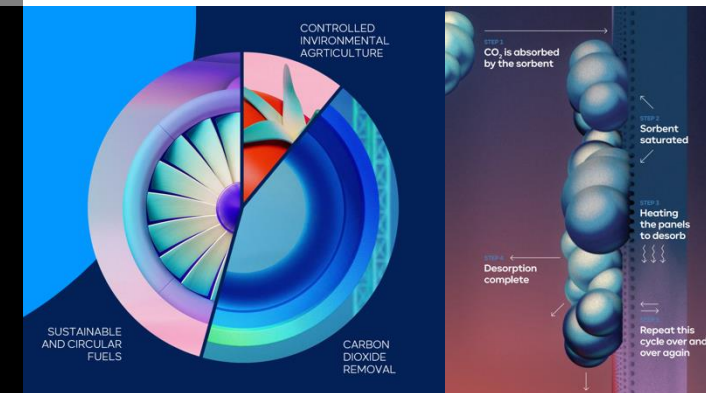
Carbyon is creating a low-cost, mass-scale, direct air capture solution to harvest carbon from the sky. For less than \$100/ton CO₂. Our solution is cheap and very easy to scale.

APPLICATION

The CO₂ we capture can be used to be permanently stored or reused in materials for example to produce sustainable aviation fuels. DAC Markets are growing to more than 5 GtCO₂/year in 2050 to € 1,000 bn.

TECHNOLOGY

Carbyon is the only Direct Air Capture company using a unique fast-swing thin film technology. In 100 seconds, we reach 90% saturation vs. the 6-hour cycles of key competitors. We produce 10X more CO₂ per year with a much smaller machine than the competition.



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TEAM



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Wim Verstappen
Business Manager



Marco Arts
PMO