

# INNOITALY

the present future

[www.innoitaly.com](http://www.innoitaly.com)

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31013 Codognè (TV)  
Italy

INNOITALY 2024



# In nature, beyond electronics.

**Think about the world  
of electronics and then  
focus on the sound of  
nature.**

**With INNOITALY you  
will no longer perceive  
the boundaries.**

## about

We want to overcome the paradigms of traditional electronics by making it sustainable, energetically independent and versatile.

For a future in which IoT customers will forget the conventional meaning of electronics because electronics will become part of nature itself. Our devices are designed to simplify and solve problems, invisibly.

Positioning themselves within the natural ecosystem, respecting the environment and having a positive impact on the supply chain, with a special consideration for the lifespan of individual electronic components.

All certified made in Italy.

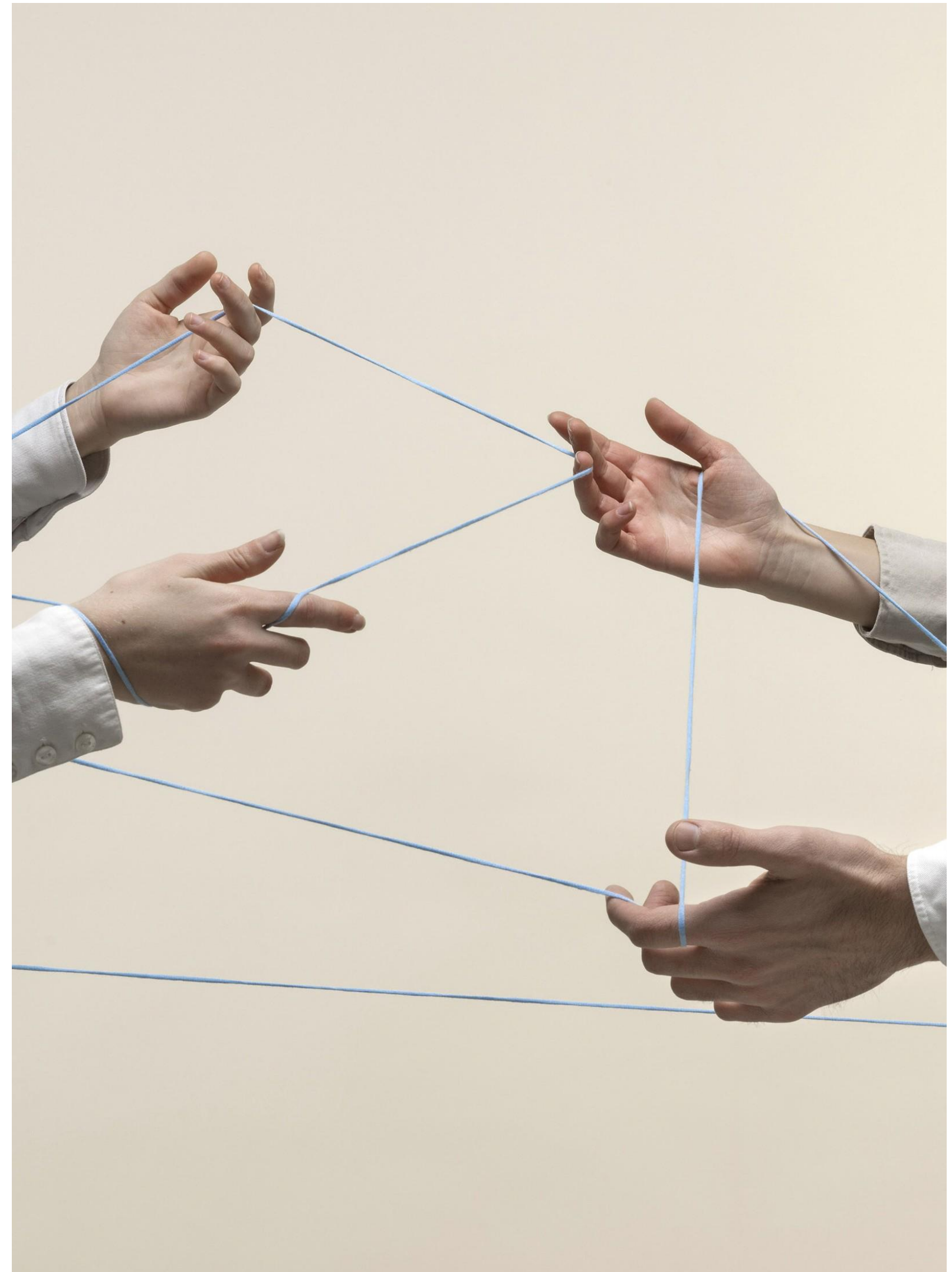
To go beyond simple electronics, going back to nature.

Pensa al mondo dell'elettronica e poi focalizzati sul suono della natura. Con INNOITALY non percepirai più il confine.

Vogliamo superare i paradigmi dell'elettronica tradizionale sviluppando soluzioni sostenibili, energeticamente indipendenti e versatili.

Per un futuro in cui i clienti IoT dimenticheranno il significato tradizionale di elettronica perchè diventerà intrinseca e dipendente dall'energia della natura stessa. I nostri dispositivi sono progettati per semplificare e risolvere i problemi, in modo invisibile. Posizionandosi all'interno dell'ecosistema naturale, rispettando l'ambiente e avendo un impatto positivo sulla filiera e sulla vita dei singoli componenti elettronici. Il tutto certificato made in Italy.

Per spingersi oltre la semplice elettronica, tornando alla natura.

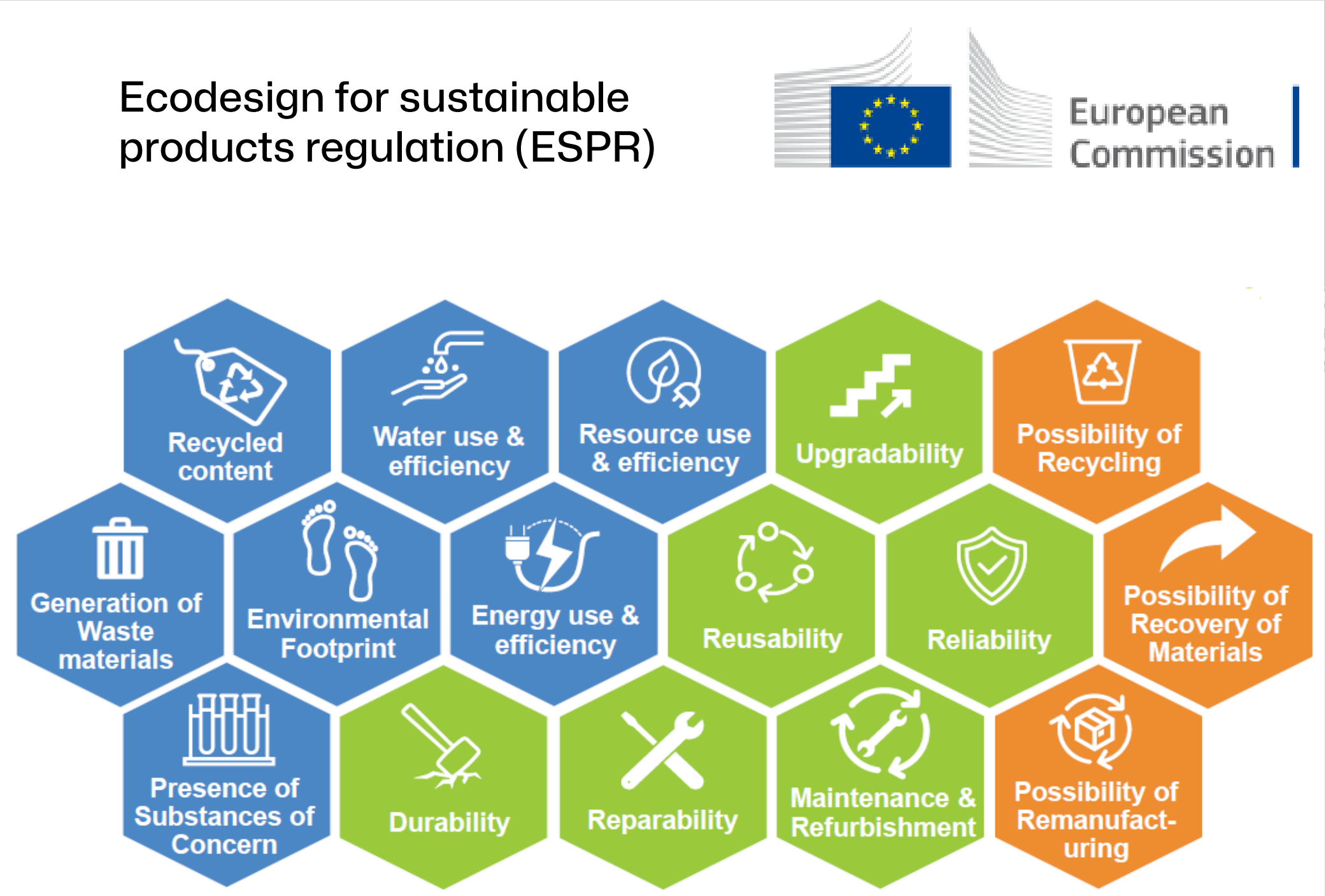


# Traditional electronics: problems to solve.

 Ecological impact

 Social impact

 Economic impact





# The main problem with traditional electronics: sustainability x3 | social, ecological, economic

The IoT and sensors business generate a huge amount of electronic waste. Only due to that, more than 30 billions of primary batteries are thrown every year. And this number is going to increase.

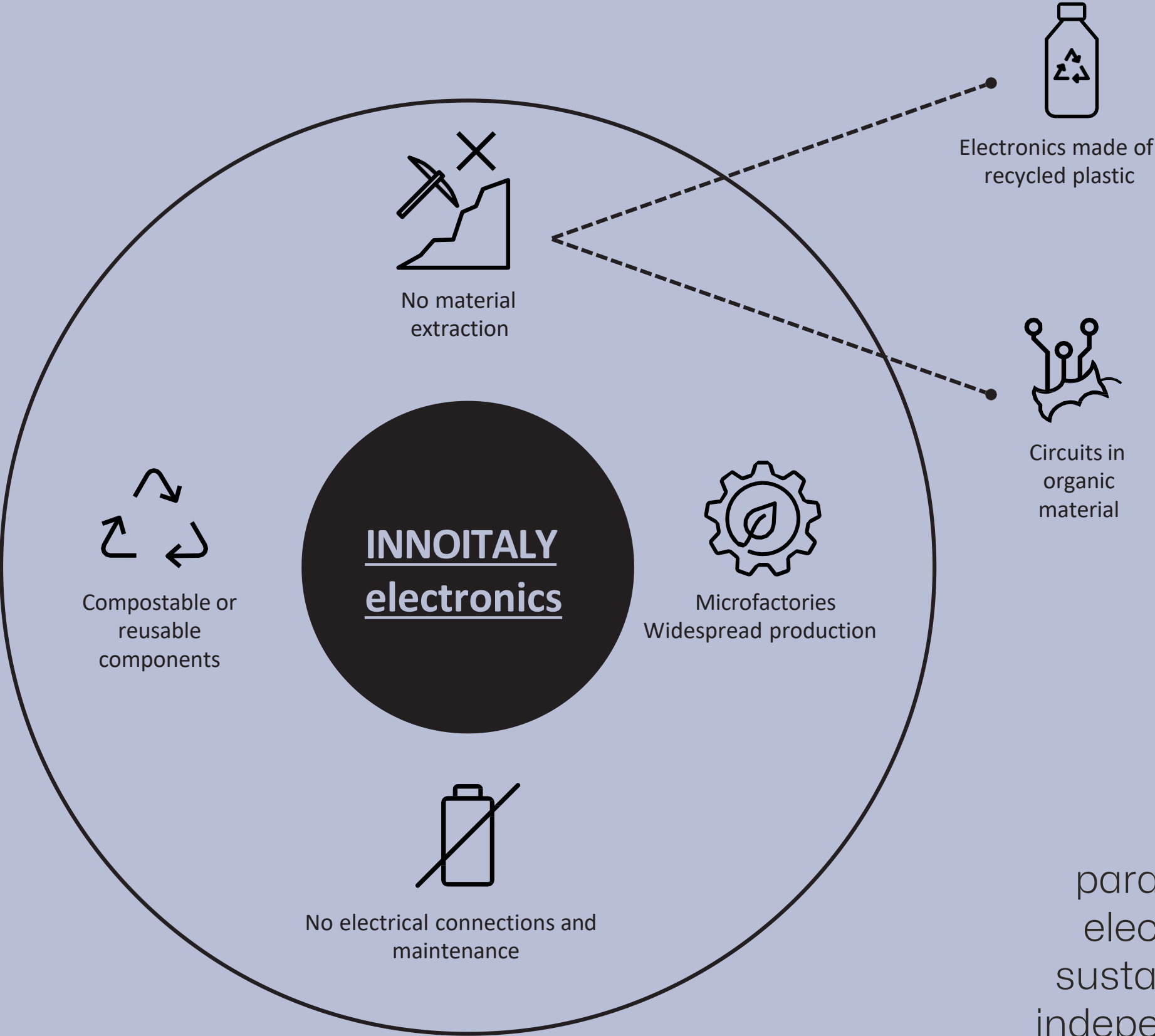
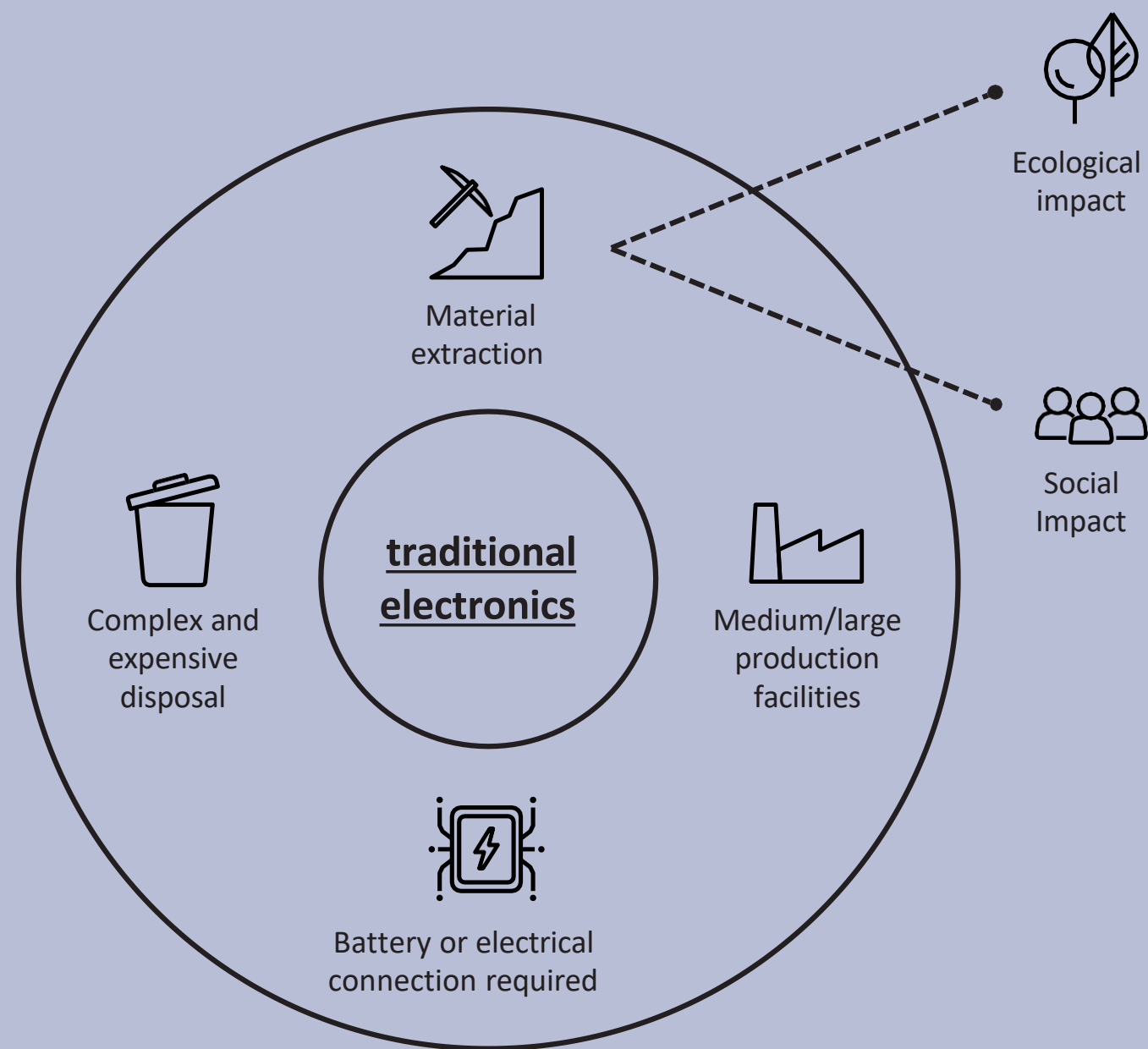


At the expected growth rate of electronics, by 2030 there will be raw materials shortage. This will translate in a **significant production cost increase** for the traditional electronics. This is why the time is now for moving forward and overcome the current electronics sustainability issues and dependencies.

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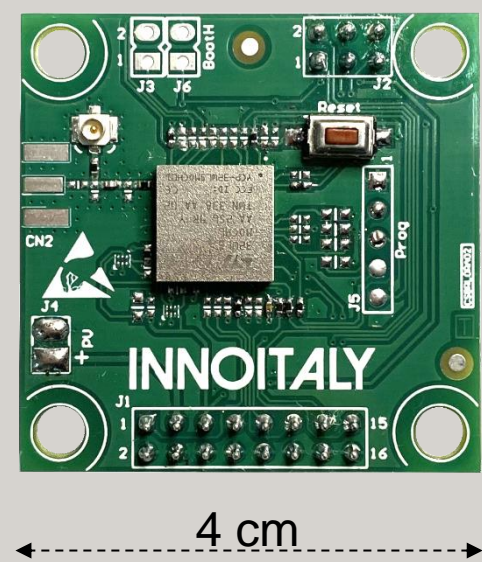
# Small Ecotech, Big Changes.



We overcome the paradigms of traditional electronics by making it sustainable, energetically independent and versatile.

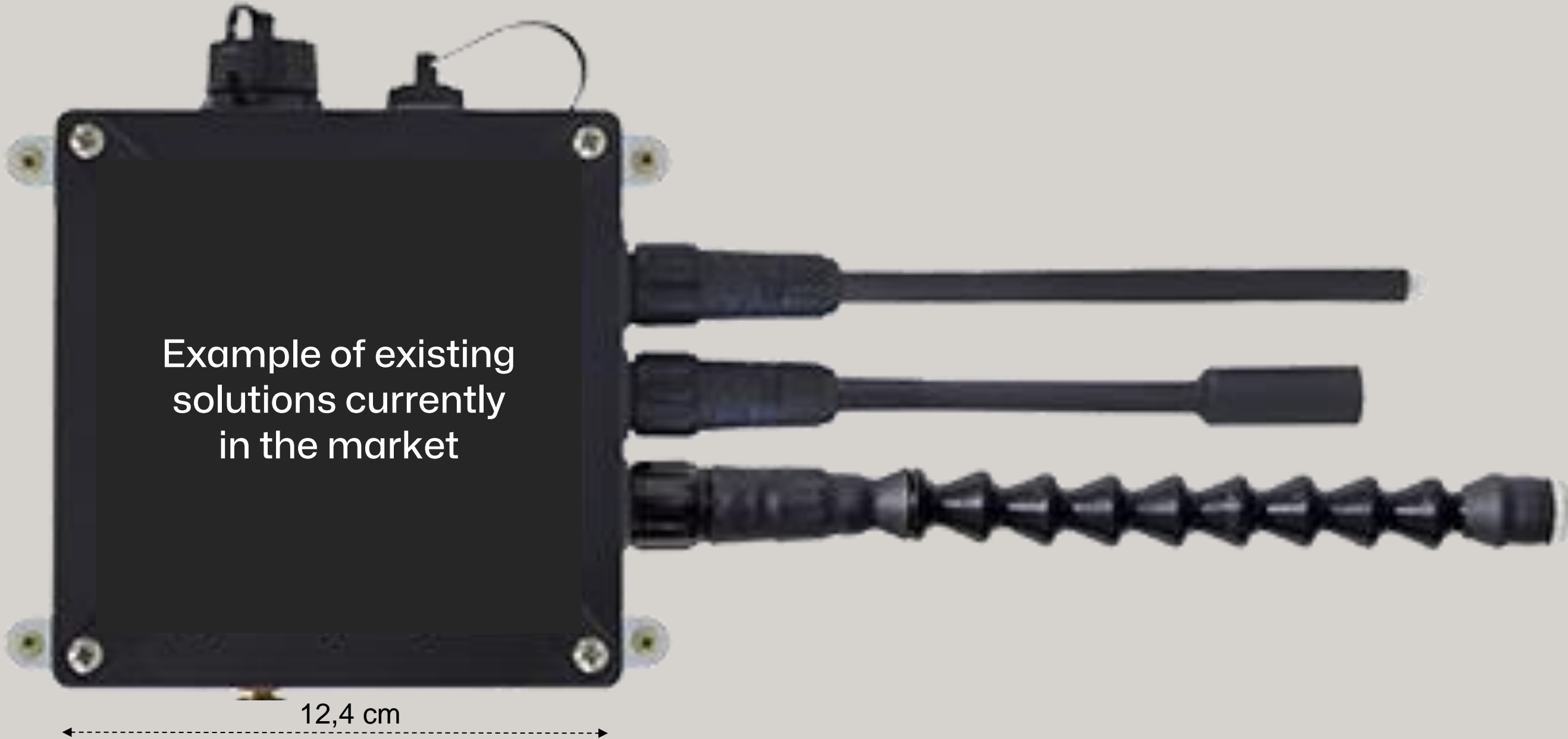
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# Sometimes, small is better.



## Onboard sensors

- Accelerometer
- Luxmeter
- Pressure
- Presence
- Spectrometer
- Temperature
- Humidity
- Modular architecture for adding additional sensors





# Our startup has not just started.



Michele Carlet  
ceo & founder.  
35+ years in the  
advanced electronics  
manufacturing  
industry

Roberto La Rosa  
founder.  
IC mixed signal  
senior principal  
designer at STm.  
30+ scientific  
publications

Roberto Santolamazza  
founder.  
director of t2i  
technological transfer and  
innovation , previously  
manager at Omron,  
Ferrari and Accenture.

**140 anni di  
esperienza  
messi a  
sistema**

Carlo Sam  
cmo & cofounder.  
20+ years of global  
marketing exeperience in  
various multinationals  
like Electrolux and L&S

Davide Brunelli  
founder.  
associate professor in  
electrical engineering  
at Trento University.  
250+ scientific  
publications,  
h-index 48

Complete biographies  
available on the [website](#)

# INNOITALY



# Our willpower is a lot, but together is easier.



**POLITECNICO  
DI TORINO**



UNIVERSITÀ DEGLI STUDI DI NAPOLI  
**FEDERICO II**



UNIVERSITÀ  
DI TRENTO



life.augmented

**checkup**  
OBJECTS WITH LIFE INSIDE

advanced research

advanced research

advanced research

components supply

industrialization and production

**emo**

**THEKE**



**Maxfone**

info**Factory**

**TRENTINOSVILUPPO**  
IMPRESA INNOVAZIONE MARKETING TERRITORIALE

industrial design

museum case & exhibitions design

backend development

backend development

Acceleration

**INNOITALY**



# A positive impact for a positive present also in the future.

Why not contribute  
to the change?

## mission

Electronics connects, simplifies and solves. INNOITALY develops and creates innovative solutions, but with a positive impact on the environment and on society.

Even with small but significant gestures, be part of the change. Many small individual changes generate a great evolution.

Innoitaly does this by anticipating the future with continuous scouting of the latest technologies and the most sustainable solutions with the aim of accelerating positive change in the electronics sector and leaving a green footprint in the present and future.

Perchè non contribuire al cambiamento?  
L'elettronica connette, semplifica e risolve.  
INNOITALY sviluppa e crea soluzioni innovative, ma con un impatto positivo sull'ambiente e sulla società.  
Sii parte del cambiamento anche tu, bastano piccoli gesti, perchè tanti piccoli gesti potranno costruire un grande cambiamento.  
Innoitaly lo fa anticipando il futuro con scouting continui delle ultime soluzioni tecnologiche con l'obiettivo di accelerare il cambiamento positivo nell'ambito dell'elettronica e lasciare un'impronta sostenibile nel presente e nel futuro.

# INNOITALY

# Not only values, but strong beliefs.

## Positive Impact

We minimize waste and production costs in a circular economy model, limiting the use of rare and precious raw materials and reducing the risk of social and environmental impact.

All our products are Energy Independent and most components will be recycled and recyclable.

## Transparency

The data detected by our devices are recorded in the blockchain, becoming absolute and reliable information.

Real data, in real time.

## Technology at the service of Human Beings

We develop small but versatile products that can bring new sustainable and effective solutions, serving the environment and mankind, to improve and accelerate sustainable change. Because everyone alone can do little, but many little, together, become infinitely much.

## Made in Italy

We leverage the Italian and European ecosystem, from the founding members to the stakeholders, up to the choice of the individual electronic components.

### Impatto Positivo

Riduciamo al minimo gli sprechi e i costi di produzione in un modello di economia circolare, limitando l'uso di materie prime rare e preziose e riducendo il rischio di impatto sociale e ambientale. Tutti i nostri prodotti sono indipendenti da fonti etiche tradizionali e la maggior parte dei componenti saranno riciclati e riciclabili.

### Trasparenza

I dati rilevati dai nostri dispositivi vengono registrati nella blockchain, diventando informazioni assolute e affidabili. Dati reali, in tempo reale.

### Tecnologia a servizio dell'uomo

Sviluppiamo prodotti piccoli ma versatili, che possono portare nuove soluzioni sostenibili ed efficaci, al servizio dell'ambiente e dell'umanità per migliorare e accelerare il cambiamento sostenibile. Perché ognuno da solo può poco, ma molti poco insieme, possono diventare infinitamente tanto.

### Made in Italy

Facciamo leva sull'ecosistema italiano ed europeo, dai soci fondatori agli stakeholder, fino alla scelta del singolo componente elettronico.



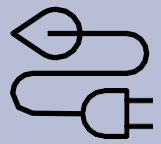
# Energy from nature.



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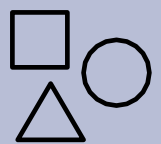


# Natural energies in sustainable electronics.



## independent

Self-powered electronics, not dependent on batteries or wired power sources, without the need for maintenance and create additional electrical networks and systems to transmit data and information (i.e. with direct connection with LEO).



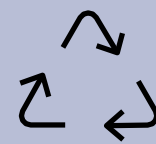
## simple

Easy to use because maintenance-free associated with a digital-twin to constantly monitor and manage the data.



## versatile

Usable in different fields and sectors, capable of adapting to changes and upcoming innovations.



## recyclable

Made with recyclable and compostable materials. Easily separable, so as to reuse the components with a longer end of life (2<sup>nd</sup> life electronics).



### indipendente

Elettronica autoalimentata, non dipendente da batterie o fonti di alimentazione cablate, senza necessità di manutenzione e creazione di reti e sistemi elettrici aggiuntivi per la trasmissione di dati e informazioni (es. con connessione diretta con



### versatile

Utilizzabile in diversi campi e settori, in grado di adattarsi ai cambiamenti e alle innovazioni future.



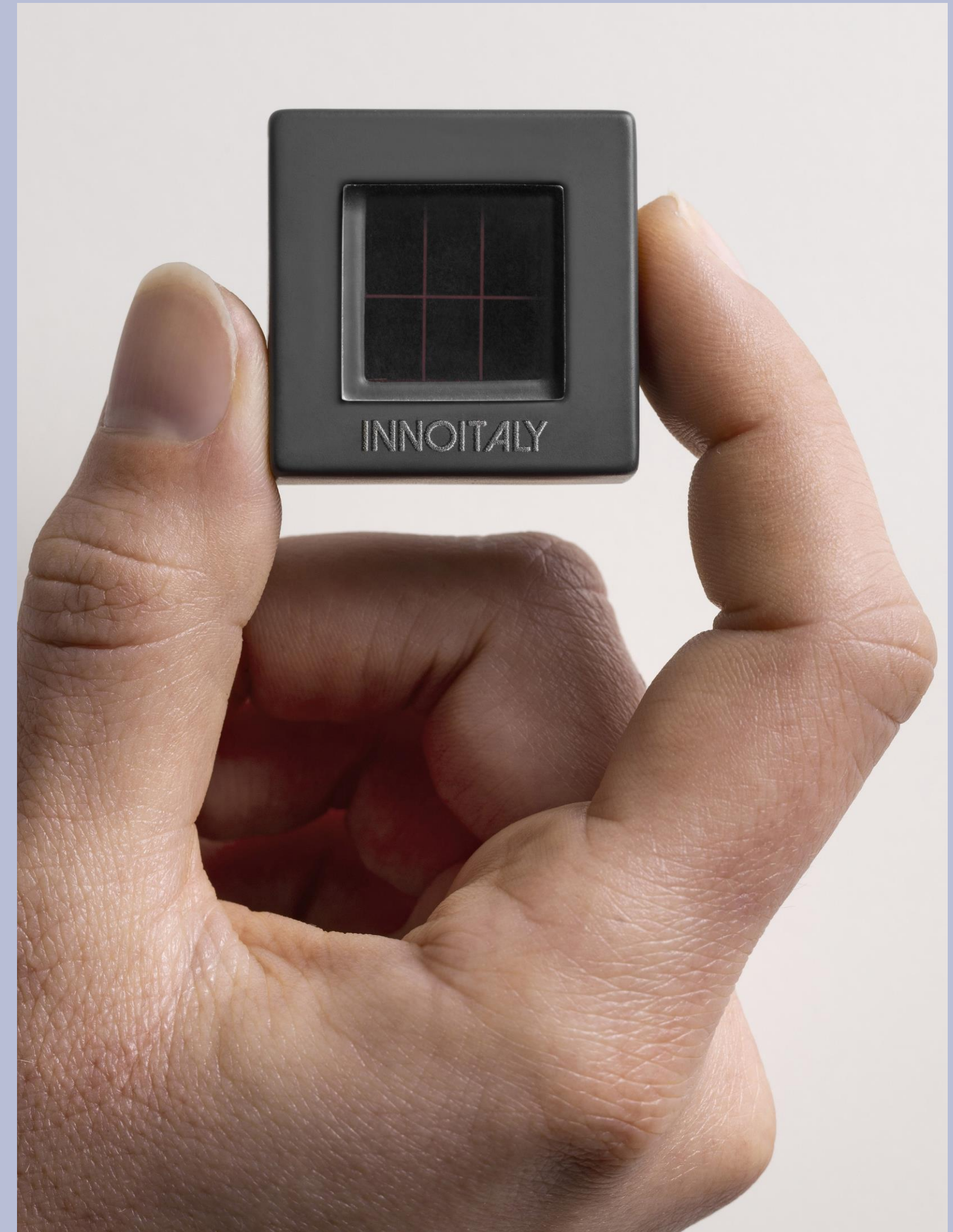
### semplice

Facile da usare perchè esente da manutenzione e associata ad un gemello digitale per una gestione remota e costante dei dati.



### riciclabile

Realizzato con materiali riciclabili e compostabili. Facilmente separabili, in modo da riutilizzare i componenti con un maggiore fine vita (2<sup>nd</sup> life electronics).

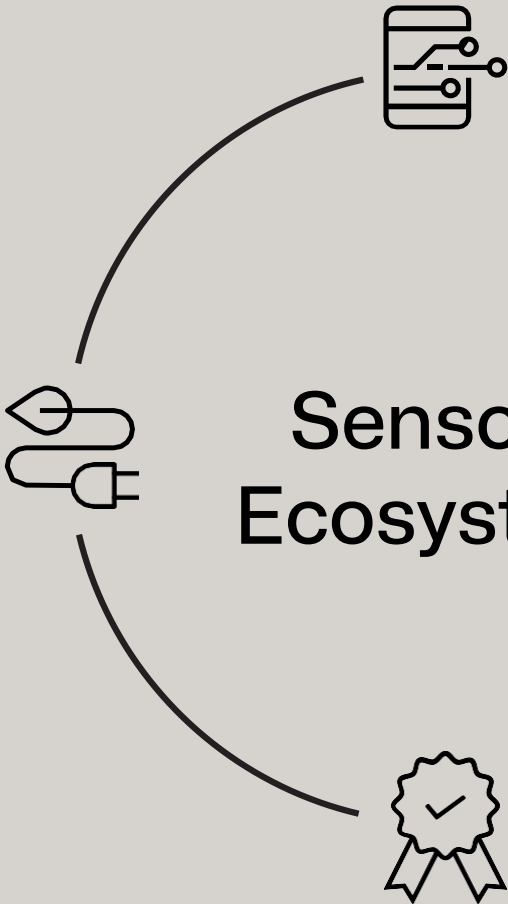


# What does INNOITALY do?

# & you?

## 1. intelligent solutions

hardware + firmware + software + embedded artificial intelligence ↓  
not to provide single data, but the related knowledge



## 2. sustainability

## 5. Widespread social responsibility

The immediate impact of INNOITALY alone is minimal, but if a conscious choice is done today, in the future will have a positive footprint. The choices we make depend on us and define us. Are you ready to do your part?

## 4. energy independency

ready-to-use electronics.  
endless usage (long-lasting).  
new usage scenarios.

## 3. certifications enabler

blockchain data ↓  
all new range of opportunities to claim and proof the ability to reach and respect certain certifications requiremets

- Step 1  
sustainability by usage
1. consumption optimization and behaviour during usage

2. no need for maintenance (i.e. no battery replacement)
- Step 2  
sustainability by design
1. compostable components

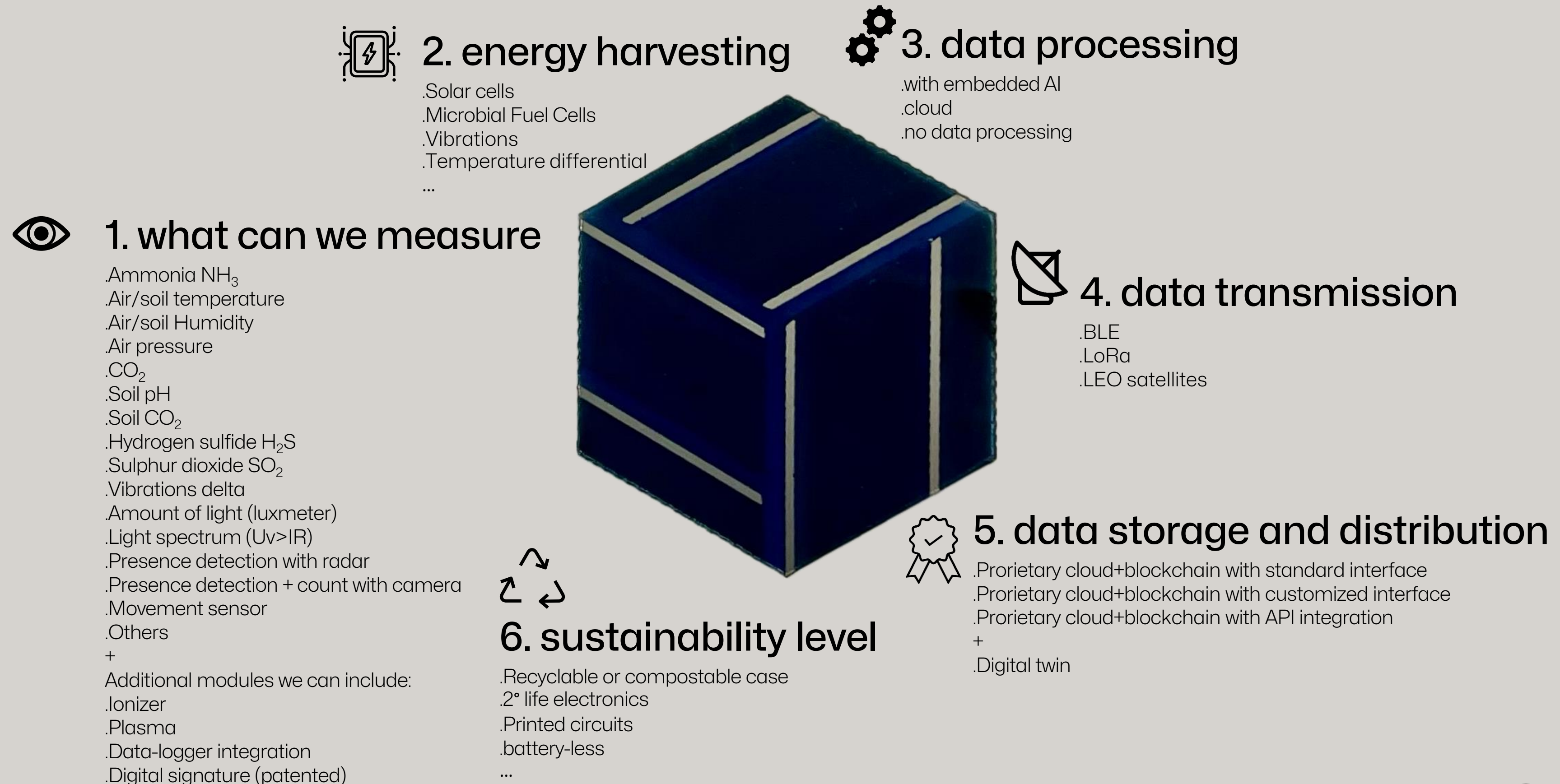
2. organic electrical circuits

3. possibility to easily reuse and remove components

4. reduced amount of components and devices required for the trasmission from sensor to database

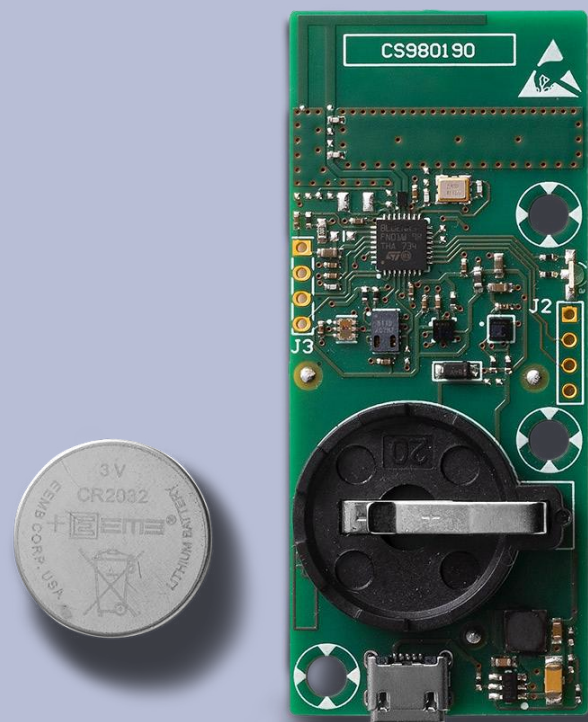


# The solution for you, tailored in 6 dimensions.



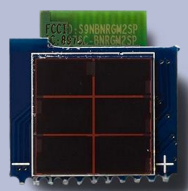
# INNOITALY

Only clean,  
natural  
energy.



Traditional electronics

limited to a maximum battery life of 10 years
requires battery charging or replacement
deployment dependent on maintenance accessibility and/or infrastructure availability
limited in downsizing due to the battery dimensions
high cost of disposal



INNOITALY electronics

<b>Energy Autonomy</b>	virtually infinite lifespan without battery limitations
<b>Maintenance Requirements</b>	no maintenance required
<b>Deployment</b>	deployable where needed without maintenance concerns or communication infrastructure needed
<b>Size/Weight</b>	can be downsized to chip size, offering compact design advantages
<b>Green Footprint</b>	easy to reuse, promoting environmental sustainability

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We have been selected by **ITA<sup>®</sup>** ITALIAN TRADE AGENCY to represent the Italian innovation at **CES2024 in Las Vegas.**





# Model A

Ultra-low energy consumption and energy-independent sensors with Microbial Fuel Cell.

## case studies

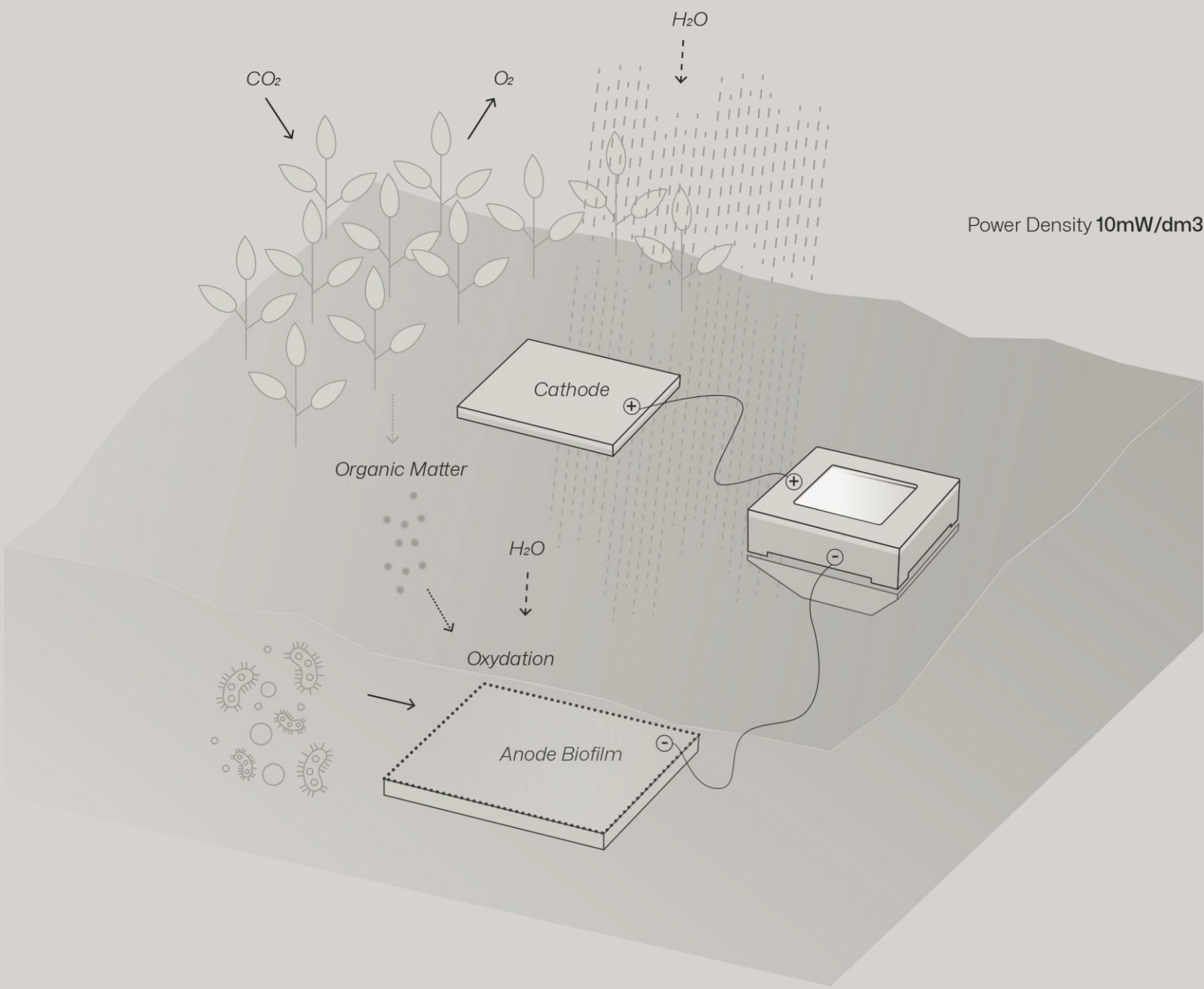
With this very small sensor you will be able monitor the plant health everywhere, also overnight, without any need for maintenance or set-up. With the digital-twin every data set can be easily monitored remotely and thanks to the blockchain data storage can provide absolute data, also for business certifications purpose.





# Model A

Ultra-low energy consumption and energy-independent sensors with Microbial Fuel Cell.



Sector	Agritech, Farm, Home gardening
Main features	Microbial Fuel Cell, energy independency, ultra-low power data collection and sharing, BLE   LoRa   LEO data transmission, digital twin, blockchain data
Collected data	Air humidity   temperature, Soil humidity   temperature   pH, amount of light (lux) and spectrum (from UV to IR), presence detection
Added value	Maintenance-free, no limits in terms of application geography, absolute data thanks to blockchain storage, long-lasting device



# Model B

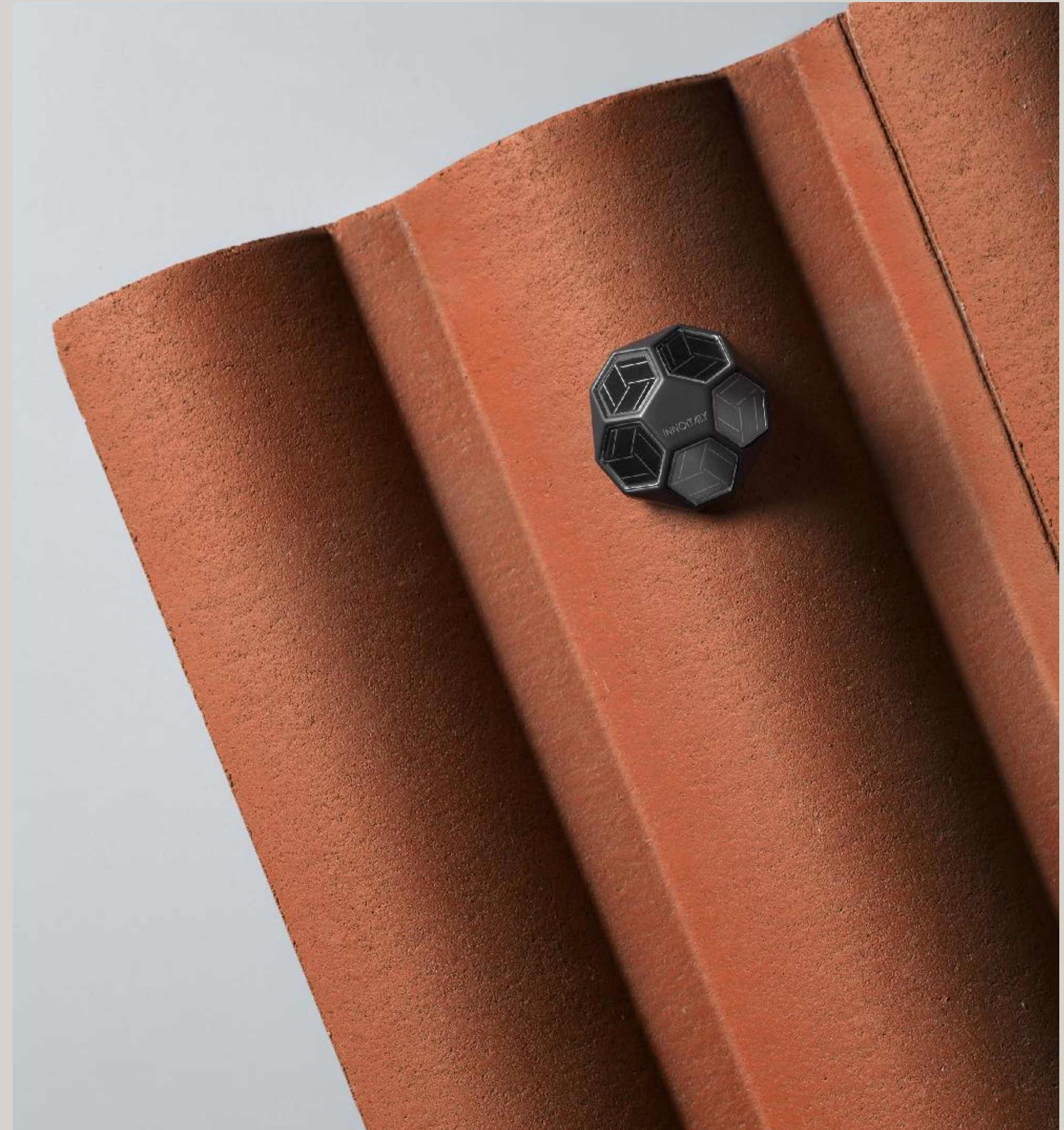
registered design

Ultra-low energy consumption  
and energy-independent sensors  
with solar cell dome.

## case studies

No need to bother any longer about where the indoor sensor is positioned or from where the light is arriving to power it.

With this very small and energy-independent device, you will be able to control different home | office | gardening automation solutions, without the hassle of the maintenance (i.e. no need for battery replacement ever). With the digital-twin every data set can be easily monitored remotely and thanks to the blockchain data storage can provide absolute data, also for business certifications purpose.





# Model B

registered design

Ultra-low energy consumption  
and energy-independent sensors  
with solar cell dome.



360° solar cell dome (registered design)



Sector	Home automation, Outdoor automation, Office automation
Main features	360° solar cell dome (registered design), energy independency, ultra-low power data collection and sharing, BLE   LoRa   LEO data transmission, digital-twin, blockchain data
Collected data	Air humidity   temperature, amount of light (lux) and spectrum (from UV to IR), presence detection
Added value	Maintenance-free, no limits in terms of indoor/outdoor usage, absolute data thanks to blockchain storage, long lasting device



# Model C

Patent pending

Advanced all-in-one, wireless, batteryless preservation and protection solution for precious artworks.

## case studies

Thanks to this invisible and fully integrated solution within the artwork case, you can remotely monitor all the key preservation parameters, without the need of any external power supply or wiring. The solution is also detecting and warning if someone tries to touch or remove the protection case. With the digital-twin every data set can be easily monitored remotely and thanks to the blockchain data storage can provide absolute data, also.

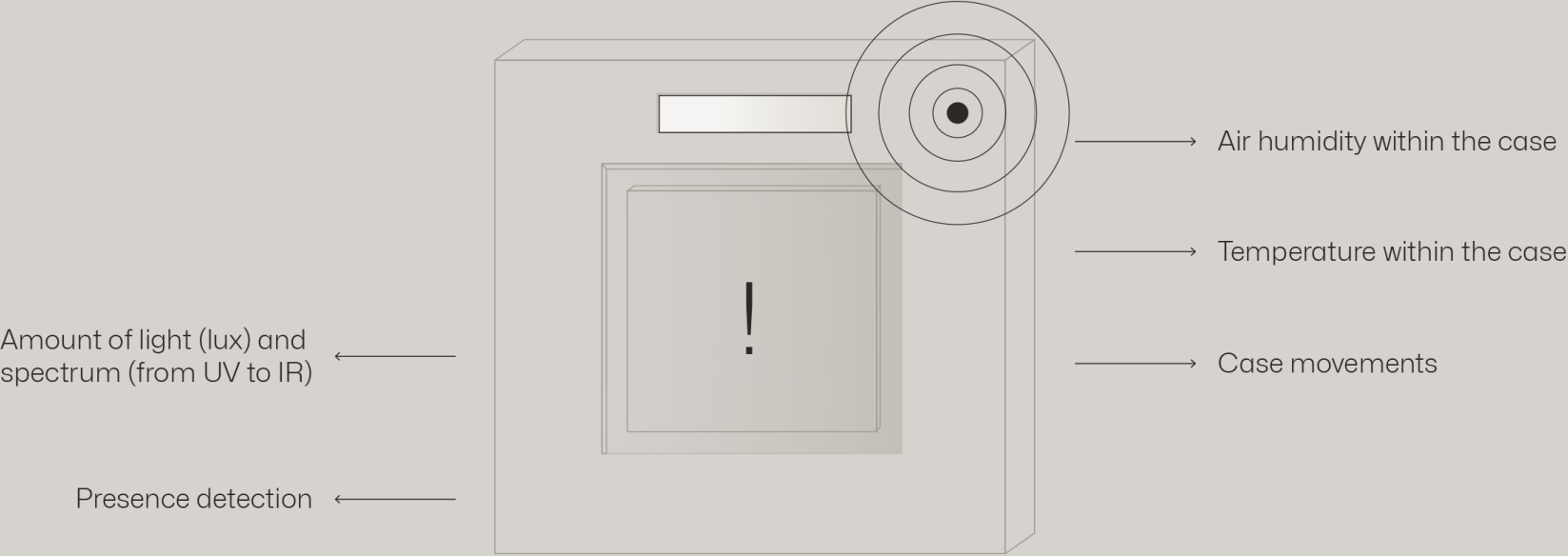




# Model C

Patent pending

Advanced all-in-one, wireless, batteryless preservation and protection solution for precious artworks.



Sector	Museum, private art collection
Main features	Energy independency, ultra-low power data collection and sharing, bi-polar ionizer (ozone free), LoRa data transmission, digital twin, blockchain data, attempted removal and vandalism detection, presence detection, data-logger mode, digital signature
Collected data	Air humidity   temperature within the case, amount of light (lux) and spectrum (from UV to IR), presence, case movements
Added value	All-in-one preservation and protection solution for precious artworks



# Precision farming.

Patent pending.

Integrated solution of energy-independent sensors and bistable valves for precision irrigation.

## case studies

With this ecosystem and energy-independent sensors and bistable valves, it is possible to transform a traditional water system into a precision irrigation system, without the slightest need to create a supporting electrical wiring network in/above the ground. Thanks to the patented solution of feeding and controlling bistable valves, it is possible to cut water consumption by at least 30 percent, while simultaneously going on to improve the health of plants and soil, and thus their productivity.



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energy Independent sensor  
ecosystem for remote monitoring  
with LEO Satellites.





# Remote monitoring with LEO Satellites.



## ENERGY-INDEPENDENT SENSORS ECOSYSTEM

We develop advanced energy-independent sensor ecosystems capable of connecting to various LEO constellations (169MHz and 433MHz Apogeo/Kinéis).

Collaborating with STMicroelectronics, we have successfully tested indoor transmissions to the Kinéis constellation for infrastructure monitoring.

Currently, we are at TRL 8, with plans to advance to TRL 9 on constellation completion.

## ENERGY-INDEPENDENT SENSORS DEVELOPMENT FOR SPACE

In collaboration with leading universities, we are pioneering the development of energy-independent sensors for space applications, currently at TRL 3-5.

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# Remote monitoring with LEO Satellites.



## FEATURES

### 1. ENERGY-INDEPENDENT LoRa SENSORS to LEO through Gateway

Our energy-independent sensors transmit data via LoRa to a gateway. This gateway collects and compresses the data into a single packet, optimizing transmission costs by sending it to the LEO constellation.

Why We Use LoRa:

1. Our LoRa nodes have significantly lower energy consumption than standard BLE.
2. LoRa offers a much wider range compared to BLE, covering kilometers.

### 2. ENERGY-INDEPENDENT LEO SENSORS WITH EMBEDDED AI

Our cutting-edge energy-independent sensors process data using **embedded AI** before transmitting the information directly to the LEO constellation.

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