

BearingPoint®



IoT for Green

Uses and benefits for a more sustainable society

Table of content

Editorial.3

French & global IoT highlights in 2021 & 2022.....6

IoT for Green Market Radar 2022, by BearingPoint.....8

**Analysis of market trends: Green IoT and IoT
for Green.....10**

Methodology11

Results.....12

Geographic breakdown12

Breakdown by source13

Breakdown by environmental benefits14

Benefits by geography.....18

Quantification of the impact of IoT solutions19

Types of quantification by impact21

Green IoT - Focus on 3 key projects.....22

IoT solutions with an eco-design approach23

IoT Business Hub Awards 202229

Jury members.....30

Short-listed companies32

Bibliography48

Editorial committee49

About BearingPoint.....49

Editorial



Sylvain Chevallier
Partner



Ouassim Driouchi
Partner

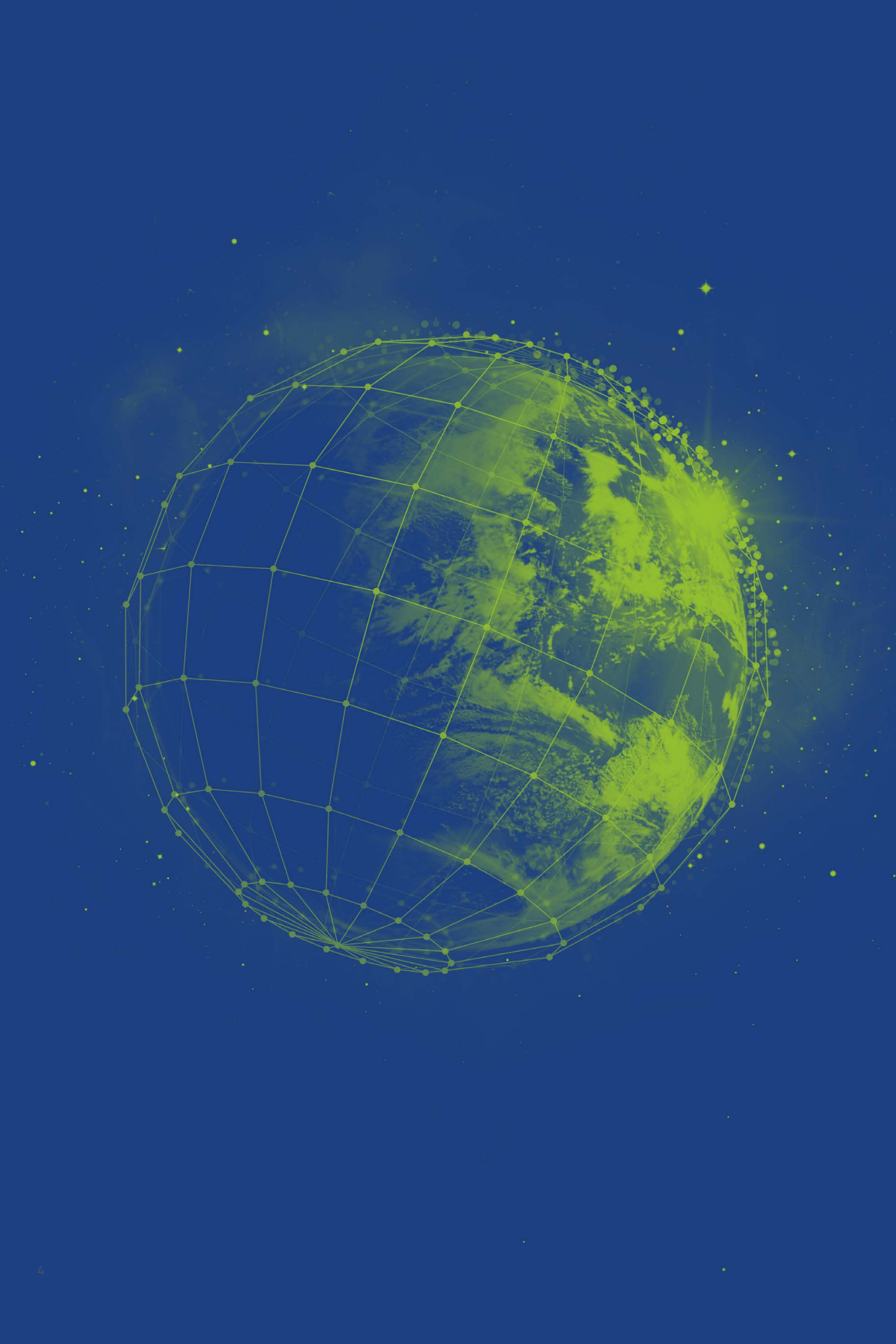
Following the latest meeting of its IoT think tank, held in France and bringing together over 850 IoT professionals from more than 15 industries, BearingPoint is proud to publish its 4th annual IoT white paper. There are now more than 400 private and public organizations, start-ups and large corporations that are actively sharing knowledge and experience around the IoT transformation.

This year's theme, "IoT for Green", is fully in line with BearingPoint's 2025 strategy. At BearingPoint, we believe that sustainable development and the environment are important growth areas. Thanks to our recent merger with I Care, with its 200+ specialist consultants, BearingPoint already offers expertise in sustainability and transformation of impacts under the I Care by BearingPoint banner. This is a complementary set of skills that we are proud to make available for our clients, just as it is available all year long to the members of the IoT Business Hub.

For this year's white paper, we focused on the quantitative analysis of the environmental impact of IoT solutions: not just Green IoT (minimizing the carbon footprint of an IoT solution itself) but also IoT for Green (using IoT to create green impacts). We believe IoT is a key technological lever in the ecological transition, which can be leveraged to save energy, reduce water consumption, cut pollutants and help protect biodiversity. By analyzing more than 100 "IoT for Green" projects and modeling the environmental benefits of IoT uses, we provide quantitative proof to back our conviction. IoT's positive environmental performance should improve with the increased application of eco-design approaches and development of energy harvesting technologies.

We hope you enjoy this white paper, and look forward to engaging with you for future editions.

Should you be interested, please do not hesitate to write to us at iotbusinesshub@bearingpoint.com



IoT highlights in France and internationally in 2021 & 2022

The IoT market has had an eventful year, marked by major consolidation and some technological pivots. In France, LPWAN connectivity was challenged by Objenious' announcement that it would soon be shutting down its public LoRaWAN network and by Unabiz's takeover of Sigfox. Around the world, there has been a surge in partnerships, acquisitions and restructurings as firms rushed to seize new technological and

service opportunities in the market. Examples include the Siemens-Nvidia alliance, the acquisition of Sierra Wireless by Semtech, and Thales and Telit teaming up to create Telit Cinterion. Finally, the Energy Harvesting partnership between Deutsche Telekom, Nowi and Murata, and Siemens' acquisition of Wattsense for efficient connected buildings are two notable Green IoT and IoT for Green stories in 2022.

IoT highlights in 2021 & 2022

Source: BearingPoint

The IoT market was worth
\$740Bn in 2021

Source: BearingPoint - IoT Business Hub 2021 White Paper

September



Facebook et Ray-Ban
reveal their first
connected glasses

Siemens and Nvidia
join forces to develop
industrial digital twins












Vodafone installs a
"smart forest" in Greece
to control fires



June

May

April

-  AR, VR and metaverse
-  Automobile, transportation and logistics
-  Connectivity
-  Water and energy
-  Industry
-  Healthcare
-  Security
-  Smart Building
-  Smart City
-  Specific to France
-  Specific to Europe
-  Specific to Africa
-  IoT for Green
-  Significant event



Enovacom (OBS),
acquires **Exelus** for
its telemedicine
solutions



Bankrupt **Sigfox** is
taken over by its Asian
operator, **Unabiz**

STMicroelectronics announces
a semiconductor plant in
Grenoble



Semtech acquires **Sierra
Wireless** for \$1.2Bn



July

August

Launch of
Sigfox South Africa
to expand OG network
operations on the
African continent

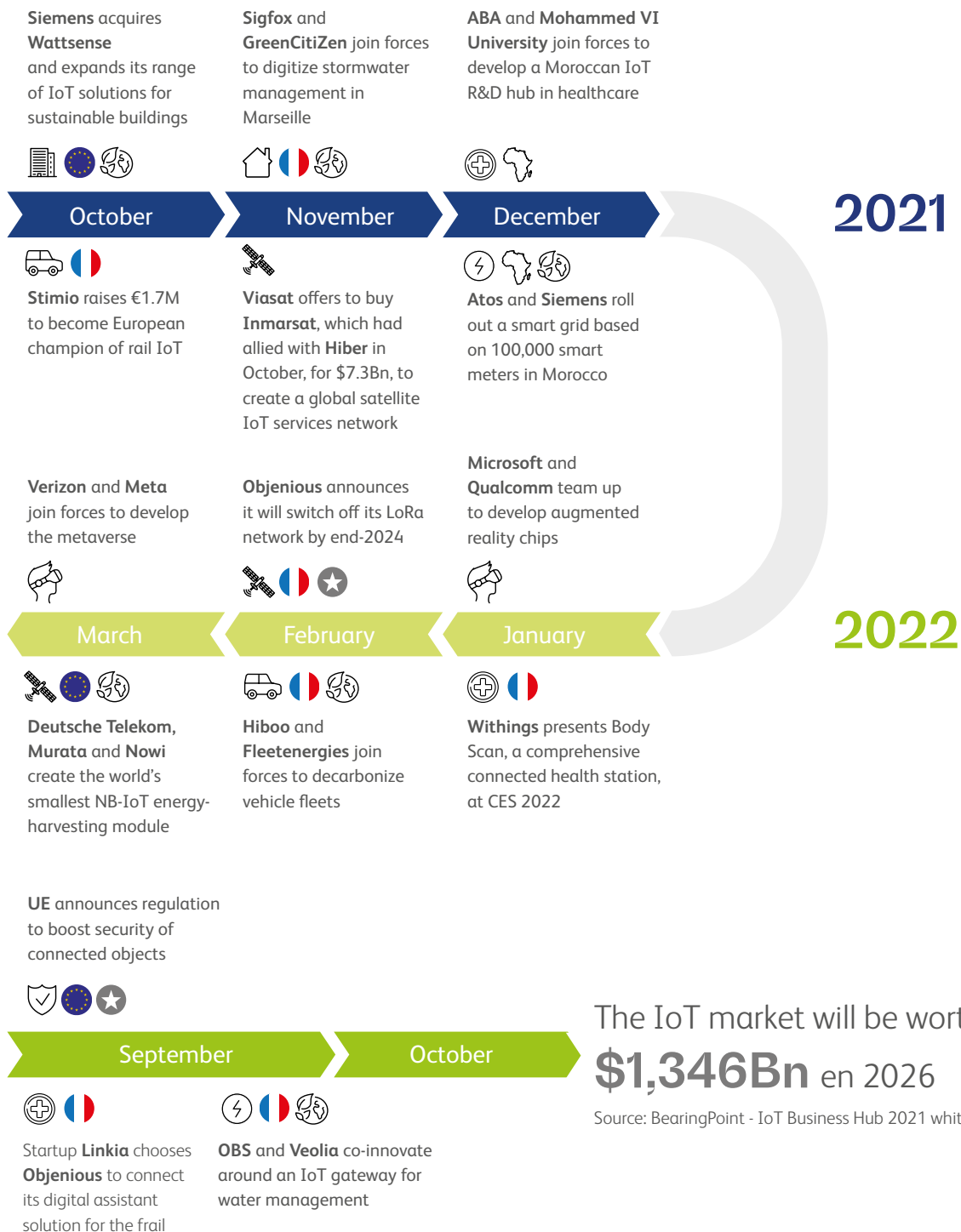


Thalès transfers its
cellular IoT business to
Telit to jointly create **Telit
Cinterion**, the new Western
leader in IoT solutions



Semtech partners with
IoT Ventures and
Lacuna Space to improve
access to clean water for
vulnerable Pacific islands





IoT For Green Market Radar 2022, by BearingPoint

AMERICAS

Canada



Brazil



USA



AFRICA

South Africa



Benin



Tunisia



East Africa



Maroc



The geographical assignment of the logos is linked to the country where the projects were carried out.

EUROPE



France



Spain



Sweden



Switzerland



Russia



Turkey



ASIA

China



India



Japan



Taiwan



Israel



OCEANIA

New Zealand



Germany



UK



Italy



Norway



Netherlands



Portugal



Belgium



Poland



Ukraine



Denmark



Romania



Market Radar 2022

Market trends: Green IoT and IoT for Green

For our 2022 issue on "IoT for Green," we have focused our Market Radar on a sample of over 120 private and public organizations in Europe and the rest of the world that have conducted IoT projects with an environmental component. The aim is to draw up an inventory of public statements on the subject, and to identify the main uses being showcased, any geographical variations and the estimated benefits.

Methodology

To create our sample, we generated a set of keywords around major environmental benefits drawn from the literature on the subject.

The 3 main sources for this were:

- The Summary for Policy Makers in the Sixth Assessment Report of the IPCC Working Group 3¹
- IoT report: "Le monde de l'Internet des objets : des dynamiques à maîtriser" France Stratégie, February 2022²
- "GeSI (2019), Digital with a Purpose: Delivering a SMARTer2030," September 2019.³

Based on this review of the literature, we selected the following 6 main benefits, which were used to generate our keywords:

- Reduction of primary carbon energy consumption

- Reduction of water consumption
- Reduction in the use of materials
- Pollution reduction
- Biodiversity protection
- Improved maintenance

We then analyzed the results pages to verify that they were indeed presenting an environmental benefit obtained via an IoT solution. This allowed us to identify 123 organizations, 110 of which we associated with "IoT for Green" benefits, and 13 with "Green IoT," i.e., minimizing the carbon footprint of an IoT solution itself.

- For the IoT for Green sample, we present figures for the main findings
- For the Green IoT sample, we highlight 3 projects that we found particularly interesting

Figure 1 - Green Market Radar analysis method



1 IPCC, 2022: Summary for Policymakers. In: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.001

2 Impact sociétal et environnemental de l'Internet des Objets | France Stratégie (strategie.gouv.fr)

3 Le Global Enabling Sustainability Initiative est un groupement international d'acteurs du secteur des technologies de l'information et de la communication qui souhaite promouvoir des pratiques numériques soutenables.

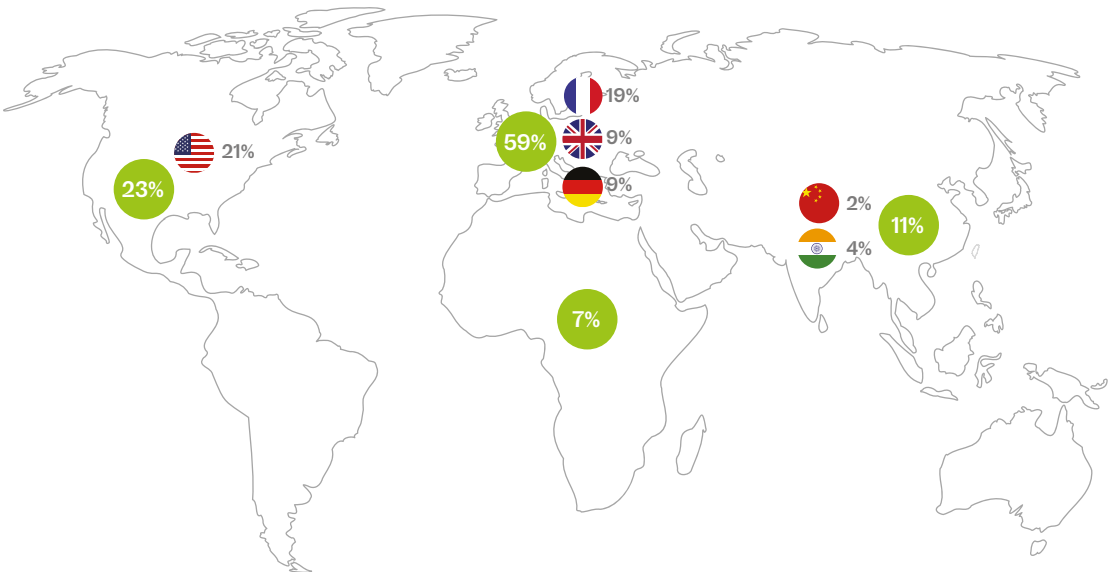
Results

Geographic breakdown

**31 countries in our sample,
60% of organizations are in Europe**

Our sample is taken from 31 countries, with Europe heavily over-represented, making up 60% of the organizations identified. The USA, France, Germany and the UK are the most represented countries with

23, 21, 10 and 10 organizations respectively. Despite its market size, only 2 organizations were identified in China. Africa's IoT market lags behind, but we still identified 8 organizations on the continent.



Breakdown by source

IoT solution providers communicate more on environmental benefits than users

81% of communications on environmental benefits are issued by IoT solution providers, such as Germany's E.on and America's Itron, both of which report results on their websites, even though the benefits being claimed relate to the environmental footprint of users. In Europe though, users are more vocal.

Figure 3 - Distribution of organizations by source of their communication and country of origin (IoT for Green only)

Geographic area	Provider	User	Total
USA	20	2	22
Europe	18	5	23
France	17	4	21
Germany	9	1	10
UK	6	4	10
Africa	7	1	8
Other	12	4	16
Total	89	21	110

Figure 4 – Illustration of environmental benefits reported by E.on on their website

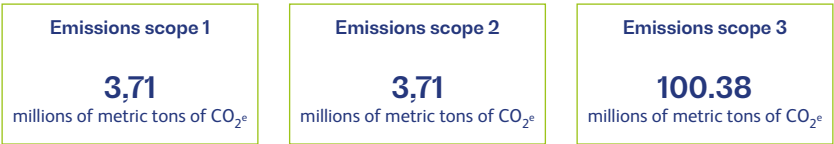
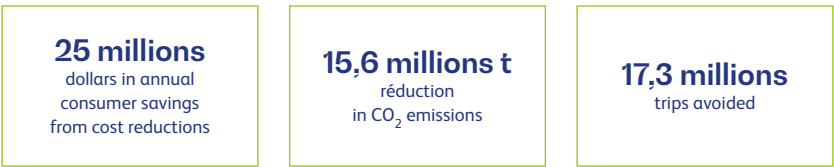


Figure 5 – Illustration of environmental benefits reported by E.on on their website



Breakdown by environmental benefits

1/3 of projects are multi-dimensional, with monitoring energy consumption the most commonly claimed benefit (28%)

More than 33% of the projects analyzed involve multiple uses, with 8% claiming three positive impacts. Synox, for instance, a company offering IoT solutions, has a solution that provides a reduction of

water consumption and predictive maintenance, with positive impacts in three environmental categories: reduction of water consumption, increase in energy efficiency and reduction in the use of materials.

Figure 6 – Illustration from Synox’s website

Synox participates in a more responsible digital environment by committing to concrete actions

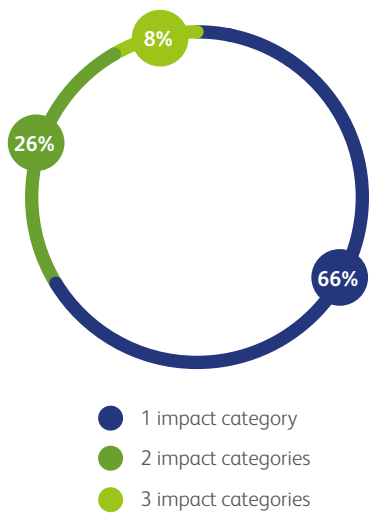


- Integration of eco-design in products
- Being a SAAS Hosting Company : Green IT
- Selection of suppliers or partners on the basis of common values
- Promote projects associated with ethics or the environment
- Recycling of sensors
- Development of battery-free sensors
- Reduction of the carbon impact

“Synox, IoT platform integrator and software publisher, showcases its work on eco-design, sensor recycling, and limiting battery use”



Figure 7 – Number of organizations by the number of categories they impact



We note that the most represented impact category is "Consumption Monitoring," which involves reducing energy consumption by detecting unnecessary use via connected sensors.

An example of a company acting on this area is the Bosch group, with the creation of their Bosch Building Technologies division, which has integrated the Azure Digital Twins platform to analyze energy consumption and make it more efficient.

Figure 8 – Illustration from Bosch's website




Bosch Building Technologies, a division of Bosch Group, developed an in-house energy platform to analyze energy consumption and pursue ongoing energy efficiency. It built the solution on Microsoft Azure and wanted to continue to expand its capabilities. Bosch created its Connecting Building Services offering and deployed Azure Digital Twins so that it and its customers can build contextually aware solutions and create digital representation of assets, environments, and business systems. Now, customers can apply forecasts and predictive insights to make faster, more informed decisions for improving their buildings' performance and carbon footprints.

Another well ranked impact category is the reduction of water consumption, with 13.6% of organizations claiming benefits in this area. We can see that predictive maintenance is another of the big winners. On this point, predictive maintenance offers a real environmental gain: increase in the life span of machines, less frequent malfunctions (a device in bad condition can consume more), reduced energy

consumption, etc. It is for this reason that companies such as Aveva offer IoT solutions for predictive maintenance. Indeed, Aveva has created an analytics platform, Aveva Predictive Analytics, which, thanks to sensors, sends notifications and early diagnoses of equipment problems days, weeks or months before the breakdown.

Figure 9 – Illustration from Aveva’s website



Reduce Downtime with Predictive Analytics

Improving reliability, performance, and safety are among the top priorities for industrial organisations and businesses today. They are focusing efforts and resources on controlling costs and maximising value from existing investments. AVEVA Predictive Analytics helps organisations gain the highest return on critical assets by supporting predictive maintenance (PdM) programs.

Our AVEVA Predictive Analytics solution provides early warning notification and diagnosis of equipment issues days, weeks or months before failure. This helps asset-intensive organisations reduce equipment downtime, increase reliability, and improve performance while reducing operations and maintenance expenditures.

Achieve Asset Excellence

100s of Millions Saved in Early Warning Catches	30% Reduction in Maintenance Costs	25% Improvement in Workforce Efficiency	25% Reduction in Unplanned Downtime
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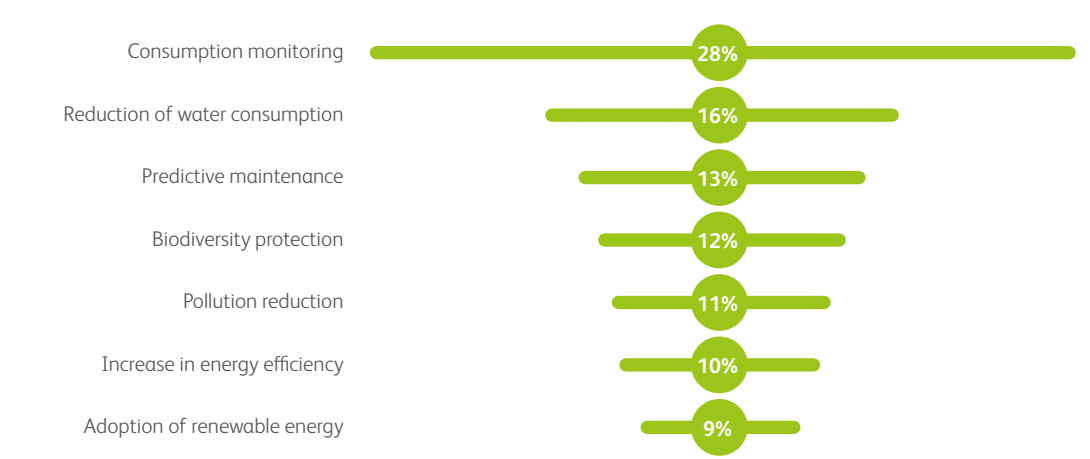
Biodiversity projects are also well represented. These have a longer history: Populations of fauna and flora have been tracked for a long time. Before connected objects, systems used GPS tags or other technologies. Today, many actors in the field, such as African wildlife parks, researchers and scientists, and some impact

companies, are turning to IoT solutions to exploit their many functionalities. Our research identified a South African company, Africa Wildlife Tracking, which offers IoT solutions that help farmers, researchers or conservation organizations to prevent poaching (and other harmful practices).

Figure 10 – Illustration from Africa Wildlife Tracking’s website



Tableau 1 – Breakdown of IoT for Green organizations by use



“2/3 of IoT uses showing environmental benefits are related to energy and water consumption”

Benefits by geography

Europe leads the way in increasing energy efficiency but lags behind in predictive maintenance

Of the six main uses, we found that geographical variance is limited for two of them: consumption monitoring and reduction of water consumption. The disparities are greater for pollution reduction and increase in energy efficiency, which are cited twice as often in Europe than in the USA (+8 points), seemingly reflecting stronger environmental commitment on the European side. One example of a company striving to maximize energy efficiency is French company EHTEch, which offers wastewater heat recovery systems.

When it comes to predictive maintenance, however, the situation is the opposite. It is over-represented in the USA compared to Europe (-13 points). American companies, such as Hewlett Packard Enterprise (HPE), are in the business of predictive maintenance, offering connected IoT objects designed to prevent equipment failures.

Figure 11 – Illustration from EHTEch's website



Figure 12 – Illustration from HPE's website

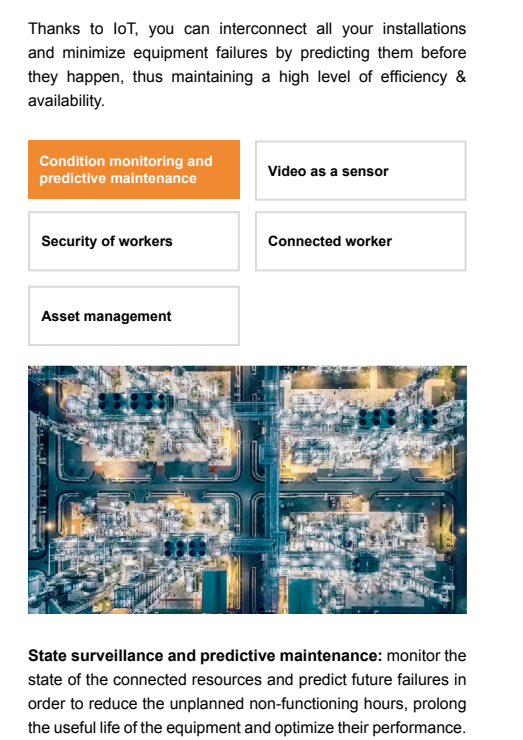
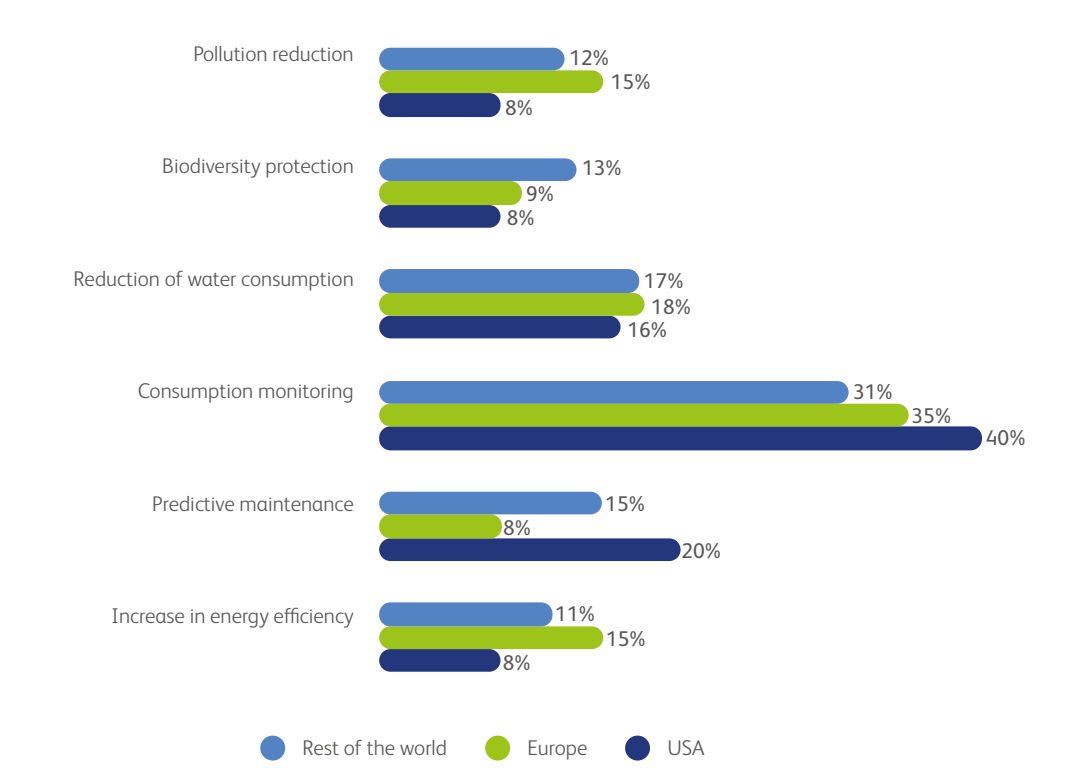


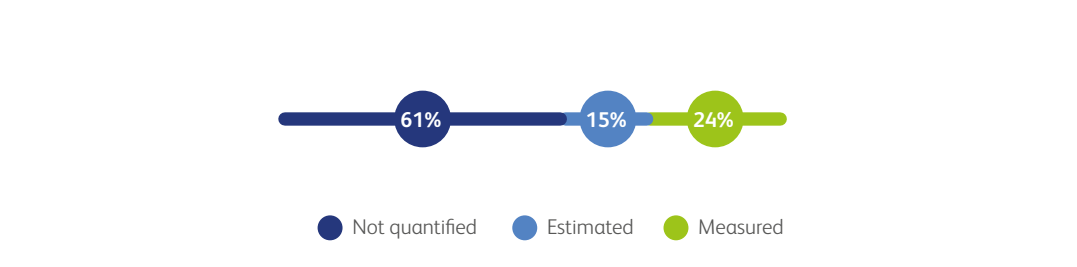
Figure 13 – Breakdown of the top 6 uses in Europe, USA and Rest of the World



Quantification of the impact of IoT solutions

Only 40% of the analyzed projects reported quantified benefits. On the plus side, these were often based on actual measurements.

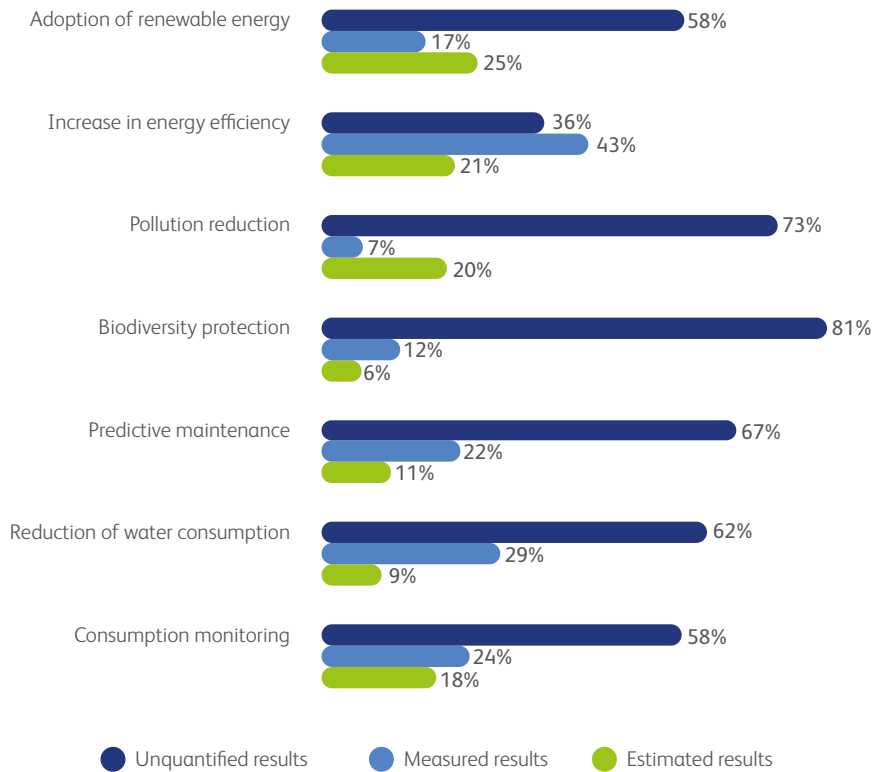
Figure 14 – Level of quantification of environmental benefits



Breaking this down by use and environmental benefits, we find that benefits are most frequently quantified for “increase in energy efficiency.” Conversely, the category where results are least quantified is “biodiversity

protection,” where 81% of companies surveyed do not quantify their impacts. This can be explained by the difficulty of measuring a short-term gain in biodiversity and isolating the contribution of IoT to this benefit.

Figure 15 – Level of quantification of benefits by use case



Type of quantification by impact category

The figures provided by organizations that report quantified results for the impact of their IoT solutions or actions vary widely. Nevertheless, we established that 40% of the quantitative indicators provided are

for carbon footprint or energy savings. It is interesting to compare these types of quantification by category of impact.

Tableau 2 - Examples of indicators used by use

Use	Example of indicator used
Consumption monitoring	<ul style="list-style-type: none">• CO₂eq savings• % of consumption reduction
Reduction of water consumption	<ul style="list-style-type: none">• % of consumption reduction
Biodiversity protection	<ul style="list-style-type: none">• Poaching intensity• Number of species identified
Pollution reduction	<ul style="list-style-type: none">• CO₂eq avoided
Increase in energy efficiency	<ul style="list-style-type: none">• % of consumption reduction
Adoption of renewable energy	<ul style="list-style-type: none">• Quantity of renewable energy

It is worth noting that “predictive maintenance” is the only use among those studied for which no quantified environmental gain is put forward, as it is overshadowed by the more usual economic benefits. These findings are fairly unsurprising, as the field of predictive maintenance mainly concerns

heavy industries whose main priority is economic performance. It is also in the field of predictive maintenance that we find the most quantifications within our database, which is probably explained by the strong economic potential of this use of IoT.

Green IoT

Focus on 3 key projects

This last part of our analysis looks at the organizations referenced in the field of Green IoT, the eco-design of connected objects. This segment takes a different, more qualitative, approach. The field of Green IoT is much less prominent in public communications and data than IoT for Green, probably because the environmental and economic opportunities are less significant. That said, we have been able to identify several organizations that have communicated about their approach to this field. We have chosen to feature 3 projects that have particularly impressed us.

IoT solutions with eco-design



Eversensors have streamed 1.5B+ data points using the same amount of energy it takes to:



Bake 2 Batches of Cookies
in a household oven

Everactive is a California-based company founded in 2012. It now has about 100 employees and focuses on developing more energy-efficient IoT sensors. They are involved in optimizing the use of batteries for connected objects and in developing autonomous sensors without batteries. These autonomous sensors are equipped with systems for collecting ambient energy in different forms: thermal, light or mechanical (via vibrations). This company stands out from others we have identified in the Green IoT field for the quality of its communications and the prominence it gives to its environmental commitment.

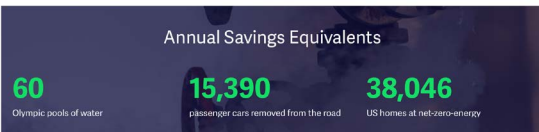
Its communications highlight quantified benefits in terms of electricity consumption and carbon footprint, and its ambition to contribute to the UN's Sustainable



What we liked:

Unlike other players in its sector, Everactive puts environmental performance at the heart of its communications. The company claims to have saved nearly 78,000 metric tons of CO₂eq through its business.

Development Goals appear on its website home page. It is one of the few companies to present a quantified carbon impact for its business. Unlike the other companies we looked at, Everactive emphasizes the environmental interest of its activities above their economic interest.



Altyor has developed its own recycling network with other French companies. This allows them to offer 100% recycled products.

Boucle REFURBISHING

La **boucle REFURBISHING** a pour objectif, après récupération du produit détérioré ou plus utilisé, de **réaliser sa mise à neuf par de la réparation**, du nettoyage ou du changement de pièces abîmées. Une fois que le produit est à nouveau fonctionnel, il **repart vers un nouveau cycle de vie**, soit sous forme de dons à des associations ou pour de la revente.



Altyor is a French company offering IoT solutions and expertise on connected object projects, and providing prototype manufacturing and production management as a service. It is mainly active in France, where it has several offices, but also has a branch in Valencia, Spain, a commercial office in the United States and a wholly owned production center in Shanghai, China. It has around 230 employees and earns revenue of 40 million euros, more than half of which is related to IoT.

The role of eco-design in connected objects is presented as important by Altyor. The company has placed considerable emphasis on Green IoT compared to other companies we have researched. The company has developed a "Design for tomorrow" initiative with commitments and quantified objectives for improving the environmental performance of its products. And it has already published results for eco-design: "In 2020, 26% of the plastic used on behalf of our customers

was recycled. Our objective for 2022 is to double this figure." In addition, Altyor has developed an environmental performance index for the manufacture of IoT objects. This "Design for tomorrow" index is based on 5 performance rankings for a connected object and takes into account 4 major areas of eco-design:

- Electronics: analysis of battery consumption, life span, firmware updates, etc.
- Mechanics: use of recycled plastic, ease of disassembly, etc.
- Packaging: recycled paper and cardboard, elimination of non-essential elements, etc.
- and bonuses: life cycle analysis (LCA) and other environmental recovery solutions for the product.

“Altyor has developed an environmental performance index for the manufacture of IoT objects.”



Our eco conception levers



Altyor's goal is to become a mission-driven company, meaning that the company is committed to ensuring that its activities are environmentally, socially, and economically aligned.

Quels sont les piliers de notre société à mission ?

Notre société à mission se basera sur 4 piliers : Responsabilité – Contribution – Exemplarité – Epanouissement.



Responsabilité: Nous voulons éco-concevoir et fabriquer des produits durables avec une stratégie d'économie circulaire, dans l'objectif d'un impact carbone minimisé.

Contribution: Devenir Société à Mission signifie pour Altyor changer notre approche du marché et pourquoi pas notre business model. La question pour chaque projet sera : Quel est le sens du projet ?

Exemplarité: Notre objectif suprême en voulant devenir Société à Mission est de créer un mouvement industriel responsable afin de changer les choses de l'intérieur : Inspirer – Fédérer – Former

Epanouissement: Il s'agit de permettre à chaque Altyormate de s'épanouir dans sa mission chez Altyor avec une politique inclusive.

 **What we liked:**

Autonomous IoT seems to be taking a real place in helping other companies in the sector to decarbonize. Many customers highlight the positive impact of Autonomous IoT on the decarbonization of their activities, and their satisfaction with the results obtained.



LIGHTING

Our customised LEDs utilise the latest long life, high luminosity technology as used in vehicle headlamps.



SURVEILLANCE

Optional, quick to install, customisable, 360 degree, thermal and optical CCTV surveillance and traffic monitoring.



DASHBOARD

Analytic sensor monitoring with intelligent sensors and a user customised dashboard and portal.



COMMUNICATION

Wireless SIM, LoRaWan and 4G technologies provide expandable hubs and networked infrastructure.

Autonomous IoT is a Scottish company selling IoT solutions based on solar and wind energy. Their flagship product is an energy autonomous outdoor lighting solution. It is also available for video surveillance, alarm systems, etc. It is a relatively small company with less than 50 employees.

Their energy autonomous IoT solution has the major advantage of not requiring any external energy supply, so it is easy to install and autonomous in terms of energy. To do this, solar panels and a small turbine

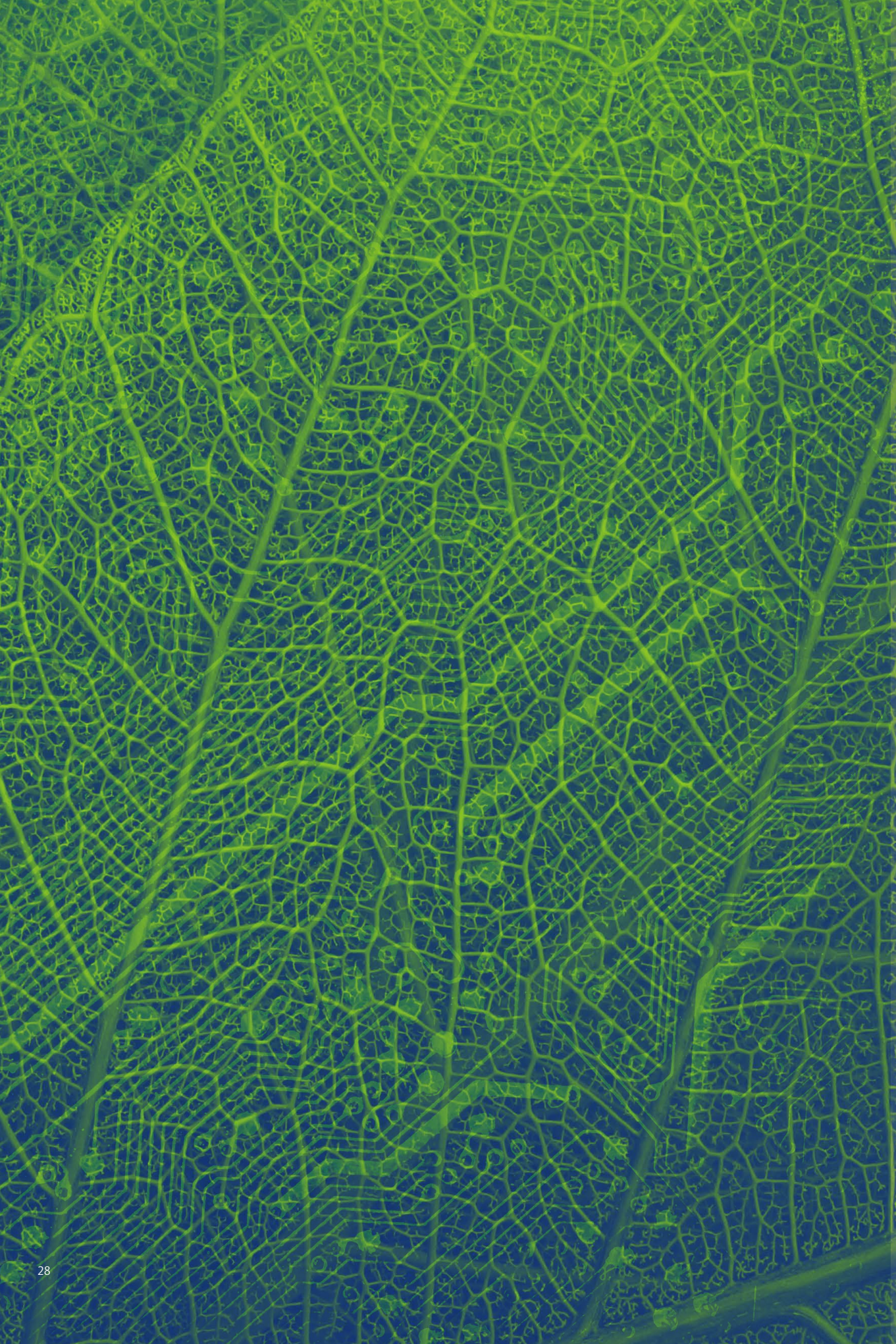
using wind energy are integrated into the product. In several customer cases highlighted on its website, Autonomous IoT explains that its solutions have been requested by customers cited by name for their ease of installation and their alignment with their commitments to reduce the carbon footprint.

“Autonomous IoT offers a solution for intelligent street lighting, autonomous in terms of energy”

Craig Doogan, Energy Team Leader, Renfrewshire Council.

**“Autonomous IoT’s
Smart City platform
has helped Renfrewshire
County to save money
and carbon. Their lighting
and video surveillance
solutions will help meet
our carbon neutrality goals.”**

**Craig Doogan,
Head of Energy
County of Renfrewshire**



IoT Business Hub 2022 Awards

**7 awards to recognize the most
successful IoT transformations of the year**



**Smart
lighting**



**Energy
efficiency**



**Operational
excellence**



**Health & safety
and environmental
monitoring**



**Infrastructure
security**



**The jury's
special
prize**



**IoT Business Hub
2022
Grand prize**

Members of the Jury

The IoT Business Hub 2022 jury is in charge of analyzing applications and awarding prizes at the event. Its diversity, expertise and experience make it the ideal team to examine and rate the candidates' IoT projects.

Bernardo CABRERA

Bernardo Cabrera is a graduate of the Institut Mines-Télécom and the Conservatoire National des Arts et Métiers who joined Bouygues Telecom in 2003. He has been involved in the development of the IoT from the beginning, helping develop M2M for more than 10 years and launch Bouygues' Objenious subsidiary in 2015, notably as a member of the LoRa Alliance Board. In 2019, Bouygues Telecom merged its M2M

and IoT activities under the Objenious brand and appointed Bernardo Cabrera to head it, with the ambition of providing a global IoT offer and ever more innovative and customized solutions thanks to the complementarity of its networks. Today, Objenious is the only IoT player in France to offer all the new cellular IoT technologies (4G, LTE-M, NB-IoT and 5G).

Chafika CHETTAOUI

Chafika Chettaoui is currently Chief Data Officer of Axa France. Previously, she was the Chief Data Officer of the Suez group, tasked with supporting the group's transformation by intensifying the use of data to improve performance and customer satisfaction and to create new business models. Her transformation strategy rests on technical, organizational and cultural pillars delivered using a collaborative & agile methodology that brings in a range of business, information systems and HR expertise. Ms. Chettaoui is a PhD/engineer in Mathematics and Computer Science. She started her career as a consultant on

projects around data governance and data science, working with major groups in the banking & insurance, retail and pharmaceutical industries. In 2010, she joined L'Oréal with a brief to build the strategy and the data organization of the Research & Innovation department. She set up a methodology focused on change management, which allowed researchers and evaluators to apply new analytics in order to increase productivity, boost the group's capacity for innovation and secure its decision-making. In 2017, she led the Analytics team of the Teradata group in France, a world leader in analytical solutions, to support major groups in their digital transformation.

Marie-Claude DUPUIS

Marie-Claude Dupuis is a graduate of the Ecole Polytechnique and a general engineer of the Ecole des Mines. She became head of the Nuclear Installations Division at the DRIRE Centre, then, successively, head of the Standardization and International Affairs Office and head of the SQUALPI at the General Directorate for Industrial Strategies in France's Ministry of Industry. In 1998, she was made head of the

Industrial Environment Department at the Ministry of the Environment, and in 2005, she became Director General of Andra. In 2014, she joined the RATP group as Director of the Bus Rolling Stock Department. In 2017, she was appointed member of the Executive Committee and Director of Strategy, Innovation and Development. She is now the Director of Development and Real Estate.



Célia GARCIA-MONTERO

Célia Garcia-Montero graduated in 2015 from the Centre universitaire d'enseignement du journalisme (CUEJ) in Strasbourg. She began her career in Alsace,

specializing in economic and digital news, before joining the editorial staff of the Journal du Net at the end of 2018 to take charge of the IoT section.

Franck WELTER

Franck Welter is currently the director for Europe, Middle East and Africa at AWS (Amazon Web Services), in charge of developing partnerships with service companies and software vendors. The AWS partner network develops innovative solutions to accelerate the customer journey to the cloud and help them create value by taking full advantage of the

AWS platform. Passionate about driving change and innovation, Franck has over 30 years of experience in strategy formalization, transformation, business development and direct and indirect sales, acquired at major players in new technologies.

Sylvain CHEVALLIER

Sylvain Chevallier is a partner at consultancy BearingPoint, responsible for the Telecoms and Media sector. For more than 20 years, he has been supporting major telecom operators in their transformation, particularly in the areas of fixed and mobile

broadband, convergence and IoT. He has developed particular expertise in strategy, marketing, business planning, customer relationship management, performance management, organization and IT transformation (CRM and billing). He co-founded the IoT Business Hub, a French think tank on IoT.

Ouassim DRIOUCHI

Ouassim Driouchi is a partner at BearingPoint, with responsibility for Telecoms and IoT activities. A graduate of the prestigious Télécom Paris school of engineering, he has been supporting telecom operators in their transformation for more than 15 years, particularly on issues of strategic marketing, product marketing, customer experience and operational excellence. Since 2018, Ouassim has

also been coaching public and private organizations in Europe and Africa to help them leverage the transformational opportunities offered by IoT. He co-founded and manages the IoT Business Hub, a leading think tank on IoT with over 850 IoT experts from more than 15 industries. Ouassim teaches at Télécom Paris, ESCP and Neoma Business School.

Presentation of the short-listed companies in alphabetical order

Competition calendar

March 21, 2022 June 30, 2022 July 5, 2022 July 12, 2022 October 20, 2022

OPENING OF APPLICATIONS

Candidates can download the application form, complete it and submit it on the website. They can also contact the organizational team if they have any questions.

DEADLINE FOR APPLICATIONS

Our IoT Center of Excellence reviews the applications received and may contact applicants for clarification on certain points. It then submits a recommendation of shortlisted candidates to the members of the jury.

ANNOUNCEMENT OF THE SHORTLIST

The candidates selected for the main presentation round are announced, and the panel of experts that make up the jury is revealed.

PRESENTATION OF SELECTED APPLICATIONS

The top-rated applicants are invited to present their project to our panel of experts, demonstrating its originality and environmental impact.

AWARDS CEREMONY

The various awards are presented by the jury at a gala evening. The annual white paper is also previewed.



Alrena Tech. develops secure transmission solutions that can reach connected medical devices in places that would otherwise be off-network. This makes it possible to treat patients, either in emergency medicine or scheduled care, wherever they are, including in digital and medical deserts.

2015

Founded

2016

3 years of technical experimentation on the 1st prototype connected suitcase in Dordogne. Used by the SDIS in collaboration with the SAMU ambulance service.

2020

Design of the connected backpack Medibag

2021

Industrial production of the Medibag
-> 50 Medibags produced

2022

Medibag goes onto the market, notching up 36 sales in 6 months without a sales force

€400 excl. VAT/month

Subscription with commitment, or €12,000 excl. VAT to buy + annual license of €2,220 excl. VAT.

IOT IN YOUR COMPANY

Alrena's technology aggregates medical devices and interfaces from different manufacturers, making them interoperable. At a time when manufacturers/developers often restrict the use of their connected objects to their own in-house platforms, we allow healthcare professionals using Medibag to work with their own equipment, keep their existing connected objects and choose the best devices on the market.

YOUR CANDIDATE PROJECT

At Alrena Technologies, we are striving to eliminate medical deserts so that everyone, wherever they live, can have access to the same quality of health care.

To achieve this, we developed first a case and then a connected backpack that create a secure Wi-Fi bubble in a digital desert, enabling remote consultation of medical professionals.

We then coupled it with portable and interoperable connected medical devices (from different manufacturers) so local nurses can perform paraclinical examinations in the field. Results are transmitted in real time to remote doctors, who may be general practitioners, specialists or emergency physicians.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

Alrena Tech has been endorsed and continues to be endorsed by all users of the case or backpack in the field. The one-year trial by the Medical IT Department of the Périgueux Hospital resulted in the SmartMedicase case being used 158 times, that is to say every other day. The figures speak for themselves: Thirty percent of patients, whatever the pathology at issue, were redirected to a care pathway without needing to go through accident and emergency; there was a 40% decrease in the number of times the SMUR (mobile emergency) doctor left the hospital, instead being able to assist a remote crew consisting of a nurse, driver and SmartMedicase. Finally, suspected heart attacks could be ruled out in only 20 minutes in 90% of cases, without the involvement of the SMUR doctor.



Electricity is invisible. Except for the lights, we do not see our appliances consume power. So, without us realizing it, some appliances malfunction. Others are badly adjusted. Still others could be used slightly differently and so consume much less.

This is what we want to correct. This is what Ecojoko is all about. Certified by the Solar Impulse Foundation, by the Greentech Innovation and the Ministry of Transition, and awarded by the French Design Institute, the connected assistant is a simple, fun tool for young and old to learn how to better consume electricity at home.

Over €3m
in funds raised

Over 10,000
clients

A growing team.

L'IOT CHEZ VOUS

Ecojoko is a major technological innovation that helps reduce electrical waste in French households. The solution consists of 3 parts:

- An electricity sensor
- A box that displays consumption in real time to detect waste and hidden standby usage.
- An application to monitor the consumption by different categories of appliances and break them down in order of priority

The innovative character of the solution lies in the breakdown by usage, which is measured by an AI solution that can segment the overall electrical signal of the house by being trained to recognize the electrical signatures of the different appliances. The idea is simple: A fridge does not have the same electrical signature as a dishwasher or a kettle. Its other innovation is in the electricity sensor: Very simple to install, it requires no electrician and no connection.

IoT means our customers can have a connected solution that shows their energy consumption in real time.

100%
of our revenue
is generated by
the solution

18%
average
reduction
in energy
consumption

YOUR CANDIDATE PROJECT

Our project aims to address the issues of optimizing the energy consumption of individuals in order to reduce their environmental impact and lower their electricity bill, and thus play a leading role in the energy transition.

Ecojoko gives households a tool that allows them to understand their electricity consumption thanks to real-time measurement and analysis of their usage. It includes the whole family. The potential savings are massive: If 5% of the French population got an Ecojoko, it would save the equivalent output of 4 coal-fired power plants. The device's impact is both financial and ecological, helping save money and the planet. Ecojoko means users can change their habits with no impact on their comfort and no need for construction works.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

The **18%** average decrease in our customers' consumption means:

- A reduction in consumption of **100 kg eq. of CO₂** per year
- **€300** in cost savings per year

A user who buys the product in France thus breaks even within **1.6 months** of their purchase.





FEELBAT was conceived to make monitoring the condition of built structures simple, fun and accessible to all. Recent building collapses in Marseille, Angers and Bordeaux, and disasters in civil engineering structures were wake-up calls, triggering a deep reflection on whether we could produce Plug & Play solutions.

The idea came to me while watching my 9-year-old daughter use my cell phone to choose a song and play it on our Bluetooth speaker. Meanwhile, design offices were struggling to come up with affordable ways to monitor more structures.

The result was the design of an easy-to-install solution for monitoring cracks and subsidence that can be set up with a smartphone and monitored remotely through our mobile app.

2 years

of R&D

5

5 divisions working on the project, specialized in computer science, electronics, injection, 3D design and civil engineering

50 kg

of plastic and 30 liters of resin for prototyping using a 3D printer

50

types of sensor tested

2

French production sites for our sensors.

IOT IN YOUR COMPANY

IoT is a huge part of the process; it is key to the information we collect and transform into value.

IoT is only a communication tool but, like a synapse in the body, it transmits information, and the resulting impulse is then transformed into action.

IoT is, in our opinion, a technological revolution that means we can foresee and reduce the impact of the construction industry. It allows electronic systems to communicate and, in some cases, to react. We rely on IoT for our analysis, research and diagnostic processes in the construction industry.

Our IoT solution saves experts and designers an average of 3 trips when monitoring a structure.

It helps foresee and reduce the deterioration of the structure, which means any repairs that do have to be done are more minor.

Remember, one cubic meter of reinforced concrete represents 450 kg of CO₂. Our solution can help prevent abnormal movements when working near buildings, considerably reducing the risks for the companies involved.

YOUR CANDIDATE PROJECT

Our project concerns a compact, discreet, autonomous crack sensor, connected to your smartphone.

Our sensor analyzes and tracks not only the changes in cracks but also the temperature at the time to plot curves for analysis.

Our sensor connected with a LPWAN chip (Sigfox) reports data at 10-minute to 24-hour intervals depending on the choice of the operator.

At the moment, many houses and other structures are affected by the drought and experiencing cracks.

Many organizations find it difficult to monitor their structures, and each investigation can take up a big slice of their budgets. It is imperative to track the work done so as to identify methods, define priorities and deal with urgent safety works when necessary.

In this context, we offer the only sensor in Europe that is easy to install, compact, and technically and financially affordable so organizations can monitor more areas and structures.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

500 sensors sold

€250 thousand revenue in 8 months

Around a hundred customers in mainland France and Reunion Island



FourData is an SME, manufacturer and publisher of IoT hardware solutions (sensors, gateways) and publisher of SaaS software for IoT supervision (Device Management, Data Management & Use Management) in France.

FourData has developed patents on level measurement sensors for professionals in bulk logistics of fuels, additives, chemicals or waste. These sensors are installed in containers (tanks, gas tanks, pellet silos, drums) to better manage deliveries vendor management inventory (VMI) contracts, where supply is automatically replenished at a certain threshold.

21

employees

3

sites in France (Dijon, Vannes, Niort)

Over 550

professional customers for our IoT solution

3

brands for 3 vertical markets (Fuel it => Energy, Agrilab Io => Farming, DataWaste => Cleaning & Waste)

2

patents

4

continents (our sensors are used in Europe, America, Africa and Asia)

Over €2m

in revenue

14%

of revenue is from international business

Over 15,000

sensors sold since December 2018

IOT IN YOUR COMPANY

IoT is the core of our business, as we design IoT sensors, manage IoT networks (private & gateway installation) and oversee implementation of the projects at our customers.

We have 5 hardware engineers and 9 software engineers.

Haulier customers who use the sensors to optimize operations can save up to 25% on their logistics costs (shorter routes, fewer trucks, optimization of rounds, etc.)

Real-time monitoring of fuel consumption and better management of resources (smaller carbon footprint)

95%

of our customers are satisfied with our 4 or 5 star solutions (source: internal study with questionnaire, Dec. 2021)

0

bio-fuel breakdowns observed, 0 delivery emergencies on a fleet of 1,000 tanks, in the Oleo100 Project

YOUR CANDIDATE PROJECT

Oleo100 project with Saipol.

Installation of level sensors (Sigfox/Lora/LTE-M) on B100 Colza biofuel tanks throughout France for 3,000 customers.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

- **1,000+** sensors on tanks already deployed
- **c. 2,000** sensors still to be deployed
- **0** bio-fuel breakdown for customers equipped with sensors
- Significant reduction of about **25%** in logistics costs
- Oleo100 first biofuel used in Europe
- 4 types of networks used to upload data depending on coverage (Sigfox, Lora Objenious, Lora Orange, LTE-M).



GoodFlow is a DeepTech company whose mission is to make industrial packaging 3x cheaper than single-use disposable cardboard.

The goal is to eliminate 500 million metric tons of CO2 per year in Europe.

GoodFlow is a fully eco-designed product to ensure that its environmental impact is lower than the solution it replaces, which has been audited by ADEME since the company's inception.

2020

Founded in Nantes

12

IoT researchers
in 4 laboratories

4

people developing the app
(Web and Mobile).

IOT IN YOUR COMPANY

- Provides reliable information;
- Lasts longer than reusable industrial packaging;
- Does not require additional infrastructure (Gateway).

3 to 10 years

Packaging life increases
from 3 to 10 years

A solution for the
circular economy

No more stress over new
regulations

YOUR CANDIDATE PROJECT

Tracking and management of reusable packaging in a 450 km logistic loop with 6 partners.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

- ROI in 1 year
- Identification of the responsible user
- Loss/theft and breakage reduced by 87
- Fourfold reduction in need for stock.



IoTerop provides innovative device security and management solutions for massive IoT deployments. IoTerop's software solutions are based on open standards and enable IoT device manufacturers and IoT service providers to remotely collect data, configure, secure, maintain and update their connected objects. Our solutions excel with constrained devices, regardless of the connectivity used.

IoTerop's products enable scalability and autonomy for IoT projects, which means organizations can manage hundreds, millions and billions of devices remotely, eliminating site visits and reducing operational costs.

More than 20

Employees of 8 different nationalities

Over 400%

revenue in H1 2022 compared to H2 2021.

10

customers from more than 10 countries

2

products offering end-to-end management of IoT devices: a cloud-based platform to manage devices throughout their lifecycle and an embedded software development kit (SDK) to accelerate IoT device design.

IOT IN YOUR COMPANY

We believe that, just as the Internet changed our lives, IoT is here to revolutionize our industries. From the beginning, IoTerop has written the future of IoT. Our vision is to enable businesses to adopt not just IoT, but massive IoT systems through our easy-to-use and affordable products. We believe that the move to massive IoT can only be achieved through open standards, which we are helping to develop as members of the OMA SpecWorks board.

Our solutions are key to deploying, operating and maintaining fleets of IoT devices for long-life projects in smart metering, smart cities or asset tracking, among others, without increasing operating costs. With our highly efficient energy footprint and data consumption, we enable our customers to save on hardware, data costs and the lifespan of their battery-powered devices.

Since both our products target connected objects and gateways, IoT accounts for 100% of our revenue.

YOUR CANDIDATE PROJECT

Alongside Urban Control, IoTerop has built an innovative, Plug & Play streetlight solution that instantly makes all streetlights in the city smart. IoTerop offers the ability to manage streetlights remotely through a cloud-based platform, while providing security and software updates in downtime. Urban Control offers the complete solution, including hardware, to clients such as city councils or regional authorities.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

IoTerop's expertise in device management saved Urban Control between 500 and 750 engineering hours, reducing their time to market by 5 months.

With the complete solution offered by IoTerop and Urban Control, cities can:

- Benefit immediately from **60%** savings in the electricity for lighting their streets.
- Reduce their CO₂ emissions: **2 million kg of CO₂** saved for **10,000** luminaires equipped, as most maintenance and updates are done "over-the-air."
- Reduce waste through sustainable solutions, thanks to hardware and software optimization and the ability to update lighting fixtures, ensuring many years of useful life.



Urban Control is a provider of smart outdoor solutions. We offer a wide range of connected products and services that work seamlessly in modern urban environments.

Urban Control creates smart devices based on open IoT standards, eliminating security issues and simplifying the mass roll-out of IoT technology by providing interoperable, reliable, secure and scalable street lighting management and sensing solutions that help cities save energy and become more sustainable.

We do all this through a portfolio of solutions built on proven, promising technologies. We are part of DW Windsor, a leading UK lighting manufacturer and innovator, recently acquired by the Luceco Plc Group.

IOT IN YOUR COMPANY

Urban Control was founded with the primary goal of helping cities provide better services to the local community using smart connected technologies.

IoT is at the heart of our vision and makes this journey possible.

We are dedicated to IoT that allows our customers to focus on what really matters to them, not IoT that adds more complexity and barriers to massive IoT adoption.

Within our organization, urban control is contributing an ever larger share of overall revenue, growing from **20%** in 2020 to a projected **50%** in 2023.

With over **200,000** smart IoT devices deployed, we contribute to overall average energy savings of **75%** of our customers' street lighting consumption and avoid the annual emission of **40,000,000 kg CO₂eq**. All this with a return on investment in less than 3 years.

YOUR CANDIDATE PROJECT

Urban Control and IoTerop have built an innovative, Plug & Play street lighting solution that makes any streetlight in the city instantly smart.

IoTerop offers the ability to manage streetlights remotely through a cloud-based platform, while providing security and software updates in downtime. Urban Control offers the complete solution, including hardware, to clients such as city councils or regional authorities. This project brings peace of mind to cities.

We want to provide a street lighting solution that works right out of the box and is easy to deploy because it uses existing cellular connectivity and open standards.

It is highly efficient and can generate savings of over 60% in consumption of energy and other resources.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

With the final solution proposed by IoTerop and Urban Control, cities can:

- Benefit immediately from **60%** savings in lighting electricity
- Reduce their CO₂ emissions: **2 million of kg de CO₂eq** saved for **10,000** equipped luminaires.
- Since most maintenance and upgrades are done over the air, the solution further reduces transportation and CO₂ emissions, as cities do not need to send crews on site as frequently.
- Reduce waste through sustainable solutions, by optimizing hardware and software and allowing lighting devices to be updated, ensuring many years of useful life.

IoTerop's device management expertise saved Urban Control between **500 and 750 hours** of engineering time, reducing its time to market by 5 months.





NRGYBox is a French start-up, committed to the ecological transition, which can transform a city's existing streetlights into a smart, low-cost and easily remotely controllable asset. Its goal is to reduce the ecological footprint of public lighting and the energy bill of local authorities, while maintaining a lighting ambience appropriate to how the streets are used.

The company has patented a process that combines an electronic module with an artificial intelligence module, so it can use telephone operator traffic data to automatically regulate public lighting.

400

light points managed.

IOT IN YOUR COMPANY

The IoT at NRGYBox currently comprises 400 supervised lighting points.

The IoT at NRGYBox is a scalable processing platform.

The IoT at NRGYBox is operator-neutral and runs on private networks as well as public ones.

The IoT at NRGYBox is a simple solution from the customer's point of view.

The IoT at NRGYBox runs on LoraWan.

227,000
messages per month

Over 96%
availability of the
objects each day

100%
of programs completed
on time

YOUR CANDIDATE PROJECT

The project aims to reduce energy consumption and light pollution from public lighting without sacrificing safety for nighttime street users.

The project can cope with the multiple types of lighting typically installed in a public network with no need to change the existing system.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

- **70%** savings on average on the managed lighting network.





Onet is a French family-owned group, an international player in engineering and services that deploys innovative and responsible solutions every day to create healthier, safer and more reliable environments. The group is active in various fields: Cleaning, Security, Hospitality, Logistics, Airport services, Nuclear engineering and services and Technical maintenance of buildings.

€1.9Bn
in revenue

160 years
trading

8
countries

23,000
clients

71,000
employees, 85% on permanent contracts.

L'IOT CHEZ VOUS

The Onet group took an early interest in IoT and its potential uses in its service businesses. As early as 2016, it had a subsidiary 100%-dedicated to developing connected solutions and, in early 2017, brought out a connected healthcare solution.

At the same time, the Group's Innovation unit was testing a number of connected object solutions, which were to form the basis for the Cleanconnect solution.

The range of objects has continued to grow, and we now have more than a dozen objects available.

This year we are also starting our first IoT deployments in the private security and intra-site logistics sectors.

11,000

IoT solutions deployed globally

4,500

client sites globally with at least 1 IoT device

100%

of programs completed on time

1

dedicated technical architecture managed by Onet's teams: Microsoft Azure Cloud + Thingworx IoT platform + Orbiwise LoRaWAN NS

1

internal team of 6 people + 1 external partner.

YOUR CANDIDATE PROJECT

Cleanconnect is a connected cleaning solution integrating IoT to adapt in real time to the needs of occupants and the use of their premises.

IoT devices allow us to retrieve data sent directly to the application so we can implement in real time the cleaning plans of our agents on their work smartphone. Cleanconnect is the brain, and IoT is the eyes.

The implementation is easy but requires a lot of work upstream to learn about uses and practices on the sites and to support the site occupants and our agents through the change.

It is a real revolution in the way we approach the organization of cleaning.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

- **16** active client sites after 1 year of deployment (including 1 outside France)
- **30** commercial offers in progress to date
- **c. 2,000** IoT devices installed
- **35** agents using the service for 3,300 hours a month
- **95%** average satisfaction rate on sites.



OPTIMIZ NETWORK is an operator of infrastructure and IoT services.

Expert in IoT technologies, we advise on and walk you through implementation of your connected objects project: from the choice of sensors to data recovery and covering connectivity, hosting and security.

Whatever your business, OPTIMIZ NETWORK frees you from the technical complexity of an IoT project to focus on your business.

04/2021

Founded

5

workforce

€150k

revenue in Year 1

25

clients (companies and local authorities)

Winner of Lyon Start-Up 2021

Winner of IoT Awards 2022
(Jury's Prize)

Innovation support systems:
Réseau Entreprendre - Saint-Etienne
Métropole (MIND) - French Tech -
Minalogic - Digital League - BPI France

IOT IN YOUR COMPANY

As an IoT specialist, connected objects are at the heart of our activities. The common point of all our projects is first to collect data from IoT.

We then work on the best technological choices to transmit, store and make the data more reliable for an exploitation platform, which can be either our platform or any of the digital tools already in use at our customers.

What makes us unique is our ability to offer "business-oriented" services by managing all the functional and technical components of the project.

Also, all our solutions run on standardized protocols and mainly Open Source tools, and guarantee data sovereignty and reversibility for our customers so they can continue to use their system once it is deployed.

Our technical team is composed of 4 IoT experts.

During our first year, we deployed about 500 sensors in 25 projects.

We have also deployed private LoRaWAN networks at several of our customers' sites using our LNS and IoT platform.

YOUR CANDIDATE PROJECT

After more than 10 years working on the installation of telecom infrastructure, most notably the roll-out of the France THD plan, we had to face the issue of managing all this infrastructure.

The street cabinets, telephone poles and telecom shelters in our network are sensitive bits of equipment and previously unmonitored. We therefore decided to implement an IoT-based solution that would allow network managers to monitor events affecting the infrastructure in real time.

What is more, by processing all the resulting data in our smart management platform, we would also be able to contribute to the sustainability of the networks.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

Our flagship project, "Intelligent supervision of network infrastructure", is currently being deployed in the Loire region with a potential of **250** IoT devices to monitor the main equipment on a dedicated platform.

The PoC currently in place concerns **20** devices.

It is planned to replicate the project in many other departments to support the owners and operators of public initiative networks (RIP).

From a sustainability point of view, we will contribute to preserving the integrity of the fiber optic network. Better monitoring of infrastructure means better maintenance.

Refurbishing the infrastructure also means scrapping a lot of equipment that should have had a much longer life cycle.

Sale and maintenance of solutions in the field of industrial transmissions (electric motors, geared motors, pumps, etc.)

€4m

20
people

Based in Annecy.

IOT IN YOUR COMPANY

The IoT is part of a global offer marketed as MATAKI® Services, which aims to help operational staff move towards zero downtime. As in Chinese medicine, the customer pays when he is healthy, and the doctor comes for free when he is not. IoT sensors pick up unusual behavior in a system so we can intervene before the breakdown happens. Moreover, this can avoid systematic maintenance, which is often useless and can cause defects. Finally, you can see that the maintenance has worked when indicators return to normal.

The service is global, which makes it hard to unpick the impact. However, the workshop's business has increased turnover fourfold in 8 years. We avoided a fire at a large industrial site and reduced breakdowns at a customer's site by a factor of 4.

YOUR CANDIDATE PROJECT

MATAKI® Dongle is an IoT Lora sensor that measures, when the machine is running, temperature, hygrometry, ATM pressure, vibration on 3 axes and magnetic fields on 3 axes.

The sensor also reports any sustained shocks allowing the source of the deterioration to be traced.

Data frames are sent to the cloud, presented in a supervision system with an alert system.

These alerts are based on both manually set thresholds and automatically calculated alerts without human intervention.

The sensor is a scalable platform with a processor that deploys AI to adapt to specific uses.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

- **120** sensors in service - 20 customers.
- The cheapest sensor on the market: not the sale of the sensors themselves but the associated service: the data delivered, visualized and its automatic alert system.
- In essence, this project helps reduce the ecological footprint of industrial resources by reducing breakdowns, improving yields and therefore reducing power consumption.



SNCF Réseau is the SNCF Group subsidiary dedicated to the operation, maintenance, modernization and safety of the 30,000 km of rail lines it manages.

It partners with national and regional authorities and guarantees neutral and equal access to rail infrastructure, which makes SNCF Réseau the linchpin of the French railway system, serving the transport companies and organizing authorities that are its main customers.

€34.8Bn

revenue in 2021 (SNCF Group)

+40%

increase in traffic over the last 10 years for all lines

54,000

employees.

IOT IN YOUR COMPANY

IoT has been accelerating at SNCF Réseau for nearly two years now. A dedicated program, 'Surveillance and Supervision', has been implemented to guide this transformation and nearly 40 IoT projects addressing maintenance and operations issues have been launched and are at different stages of maturity. Several thousand sensors have been deployed on the national rail network. The Rail Open Lab (an open innovation laboratory) is also spearheading the deployment of IoT within SNCF Réseau.

In addition to the challenges of industrialization and scaling up, SNCF Réseau is already preparing for the future of IoT, based on priorities including:

- Securing transmissions and data via proprietary protocols
- Integrating sensors, connectivity and IT architecture into its information system
- The interoperability of the various solutions and technologies available
- Increasing battery life

Within SNCF Réseau the impact of IoT is reflected in:

40

40 IoT projects in progress

Over 300

employees on IoT projects

1

IoTmonthly Hub (community for sharing on IoT across the whole SNCF Réseau)

All areas of the business (track, catenary, signaling, engineering structures, etc.)

Better knowledge of our assets (lift pumps, construction tools, turnouts, etc.)

YOUR CANDIDATE PROJECT

To guarantee the safety and smooth running of shunting operations for work trains in the Suite Rapide railyards via a sensor/user interface coupling.

The IoT devices make it possible to check that the route to be taken by the train is clear, that the switches work and that the receiving track has approved the arrival of the train.

This operational aid makes life easier for agents who work night and day in weather (cold, wind, fog, etc.) that can impact visibility.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

- **1** safety event avoided
- Loss of **€1m** per day of non-production
- **3** manufacturers (SCLE, VapéRail, Vossloh) and **7** SNCF Réseau entities
- A hundred sensors deployed
- **57,000** axles examined and **99.99%** reliability
- **4** infrastructure managers want to adopt the system

Tech4Gaia is a young start-up from Strasbourg, France, whose mission is to save the world by preserving bees and other pollinators (bumbees, butterflies...). Founded in October 2020 by 4 associates:

- Farid Maniani (president, teacher and amateur beekeeper)
- Armel Bahouka (PhD, in charge of innovation)
- Yannick Kuhn (Technical director)
- Lorenzo Altèse (professional beekeeper)

The genesis: a meeting between Farid, Armel and Lorenzo and the desire to raise public awareness about the preservation of pollinators in 2015.

2 years in existence

5 Employees (40% of which are women) **8** at the end of this year

€500,000

investment in 2 years

2021

10 clients for 15 NOEHMI devices
Around 500,000 bees monitored

2022

20 academic, institutional or industrial clients for 60 devices
More than 2 million bees monitored

2023

500 devices deployed
More than 20 million bees monitored

1 billion

bees (not to mention other pollinators) monitored: target 2025

22

institutional, academic and private partners.

IOT IN YOUR COMPANY

IoT and Artificial Intelligence have a central and essential place.

Any decision is based on tangible data. The IoT allows the collection of dynamic and location-specific data objective data from sensors.

The collection of data on bees through the IoT, coupled with a set of environmental data can support decision-making by public authorities, researchers generating knowledge and private entities in their green policies.

The challenge: to produce "green" data to support biodiversity.

150,000

in revenue for 2022

600,000

in revenue for 2023

60%

of investments linked to IoT and R&D

Impact of NOEHMI:

30% to 10%

reduction of mortality

20%

reduction of beekeeping trips

20% to 30%

increase in honey production

15% to 40%

increase in agricultural production through better pollination

100% of employees

are aware of the importance of preserving pollinators

At least 10%

additional melliferous spaces with committed partners.

YOUR CANDIDATE PROJECT

Our NOEHMI connected solution makes pollinator data available to local stakeholders to improve beekeeping and farming practices and the quality of the environment: bees/farmers, local authorities, researchers, committed companies, eco-citizens.

Our innovation is "100 million years old": the bee as a natural biomarker of the environment. Coupled with IoT and Artificial Intelligence, NOEHMI is a formidable tool for decision support and environmental monitoring. By monitoring the activity of honey bees, we can help 100% of pollinators and underpin our food security.

Bees pollinate 80% of flowering plants and are the source of one third of our food. In total, pollinators provide nearly \$577 billion in ecological and economic services.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

NOEHMI being our only project to date, the figures for the project are those for the company.





Wx Solutions supports the transformation of commercial offices to meet the challenges of hybrid work and the reduction in the carbon footprint of office buildings.

Our offers allow real estate and/or work environment managers to take concrete action in 3 areas.

1. Adapting office layouts to new ways of working by measuring occupancy.
2. Optimizing the real estate footprint by analyzing how work and retail spaces are used.
3. Controlling energy costs through accurate knowledge of usage and attendance.

2017

Founded

28

employees: developers, IoT engineers, project managers, etc.

85

customers (large and medium-sized companies)

18

countries deployed in Europe and North America

244

buildings deployed, i.e., more than 2 million m² analyzed:

47,554 wireless sensors

2,122 wired sensors

303 users of the platform
Workplace Analytics

IOT IN YOUR COMPANY

We develop IoT solutions to offer companies a tool for analyzing their workspaces and adjusting to new modes of collaboration.

ROOM+: the only wireless sensor that can count people in a room, not just detecting presence.

MOOVDOT: thermal wire sensors with an embedded system incorporating self-learning algorithms. Visualize in real time the movements of users in collective spaces.

ANALYTICS: platform for analyzing the work environment to:

- understand how work and living spaces are used,
- measure daily usage,
- anticipate the necessary changes in terms of real estate strategy.

Some examples of ROI on client's projects:

Auditing firm

500,000 m²

1 building

3,000

wireless sensors

+25%

occupants, or 500 additional employees, housed in existing offices.

Real estate company

140,000 m²

2 buildings

1,200

wired and wireless sensors

-44%

Reduction of the building footprint by 44% without reducing the number of people served.

YOUR CANDIDATE PROJECT

The Sodexo Group's headquarters in Issy-les-Moulineaux conducted a profound transformation between 2018 and 2020 with the following goals:

- To facilitate exchanges between teams
- To diversify types of working and living spaces
- To improve management of energy expenses
- To digitize work methods
- To increase the attractiveness of offices.

THE QUANTIFIED RESULTS OF YOUR CANDIDATE PROJECT

Here is the CO₂ impact measured based on the 1st year after the transformation:

- Space reduction of **-16%** from **9,500 m² to 8,000 m²** ; while still coping with peaks in traffic
- Office furniture and supplies: reuse of equipment (chairs, desks, etc.) during the redevelopment
- Energy consumption (heating and air conditioning): **31% reduction per year**
 - Rationalization of surfaces
 - Better management of systems
 - Partial closure of areas on days with low attendance.



ZEWAY was born out of the desire to bring low-carbon, accessible and green urban mobility solutions to as many people as possible. ZEWAY reinvents urban mobility with a unique solution of battery exchange stations and personal electric scooters that can recharge a scooter in 50 seconds. Dedicated stations everywhere in the city (Paris and suburbs so far, deployment in 4 other cities in France in 2023).

ZEWAY removes the two main obstacles to the expansion of electric vehicles by eliminating the constraints of recharging and range. This green solution meets both personal and professional travel needs. Simple and competitive, it is marketed as an all-inclusive subscription (rental, km, unlimited access to stations, insurance and maintenance) starting at €130/month.

Discussions with other manufacturers are underway to integrate the ZEWAY battery into their vehicles and allow them access to ZEWAY stations.

ZEWAY, a solution with no polluting emissions or noise for a better city.

IOT IN YOUR COMPANY

Zeway electric scooters have entrusted their connectivity to Objenious.

Thanks to the LTE-M network, Zeway scooters can communicate with the central server and send back the data required for services. Charging stations link to the Bouygues Telecom network using 4G.

2GM perfectly meets our business needs and constraints. It is an LPWA network, which means that it requires little energy, with excellent performance even below ground. In addition, 4G is able to send ever higher data rates.

IoT enables an enhanced customer experience. The electrification of our vehicles makes them de facto connected.

Our nearly 500 customers are keen to receive information such as the vehicle's battery charge, location, etc. This information feed is only possible thanks to IoT.

IoT also allows us to control our stations. It gives us a real-time view of the SOC (state of charge) of each battery in the network so we can speed up the recharge if necessary. But we can also route customers to stations where batteries are available and maximize customer satisfaction.

400

clean scooters on the street

+20%

market share in our segment

140 kg CO₂

savings/year/scooter put on the road
(source: Aktio study)

2030

300,000 vehicles (scooters, cargo bikes, mini cars) swapped in 450 ZEWAY stations deployed in 25 cities in Europe.

1,500

swaps per week

41

battery exchange stations in Paris and its inner suburbs

2023 Target

160 Zeway stations in 5 cities in France, and a fleet of 4,000 scooters

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About BearingPoint

BearingPoint is an independent management and technology consulting firm with European roots and global coverage.

The firm is structured around three entities. The first provides consultancy services with a clear focus on developing the firm's key areas of expertise worldwide. The second provides advanced technology solutions combining consultancy and software, and offers high value-added managed services to clients. The third focuses on innovative investments; for example in niche software solutions to meet regulatory requirements or to support digital transformation. It also aims to explore innovative business models with clients and partners, promoting the creation of ecosystems and the financing and development of start-ups.

BearingPoint's clients include some of the world's largest public and private sector organizations. With a global network of over 10,000 people, BearingPoint supports clients in more than 75 countries, helping them achieve measurable and sustainable outcomes.

BearingPoint's IoT Center of Excellence consists of 30 consultants with a wide range of industry, business and technical expertise.

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