



Tech for green

TRANSFORMATION HANDBOOK
2022



Transformation is in our DNA

The public health and economic crisis triggered by COVID-19 has focused our minds on the need for **a swifter economic and social transformation** – the only way we can count on a full recovery and get back on track for growth.

We believe that **digitalisation is key** to making this transformation possible. Technologies such as 5G, cloud storage, cybersecurity, AI, big data and IoT will be game-changing – as demonstrated by our extensive catalogue of solutions, applications and use cases. Our capacities and experience make us the perfect partner for businesses and local authorities as they take on the digital challenge.

We stand for a **fair, inclusive and sustainable digital transformation**. Our mission is to harness technology for people and planet, lightening the environmental load and offering our clients solutions that get them working more efficiently and sustainably.



Sustainability:

key to moving forward

Digitalisation plays a major role in solving the environmental challenges our society faces today. Here at Telefónica, our goal is therefore to help build a world in which technology plays a part in achieving a greener planet.

We provide our clients with digital solutions that as well as improving their competitiveness, also help them to reduce their carbon emissions and the resources they use.

We are well on the road to becoming a net zero emissions and zero waste company, rolling out state-of-the-art networks, using renewable energies and actively promoting the circular economy.

Decarbonising

the world through digitalisation

WE ARE REDUCING OUR ENVIRONMENTAL IMPACT

Our goal is to have **the most efficient and lowest emitting telecoms network in the sector**, so as to ensure the **connectivity** we offer our customers is **green**.

We are committed to achieving net zero emissions by 2025 in our core markets and by 2040 for the remainder of our operations, including our value chain.

100% of our electrical consumption comes from renewable sources in Europe, Brazil and Peru.



WE ARE HELPING TO DECARBONISE THE ECONOMY

We offer our customers **digital solutions** that help reduce their **environmental impact**.

We have created the [Eco Smart solutions](#). Solutions that guarantee the various environmental benefits brought by our products and services: **energy savings, reductions in water consumption and CO₂ emissions and contribution to the circular economy**.

Through the use of our products and services, our goal is to help our customers to avoid the emission of 12 million tonnes of CO₂ by 2025.



How we are helping to care for our planet

ONUBAFRUIT

VERTICAL GREEN CROPS

This is an indoor smart agro project for growing strawberries based on Vertical Green's aeroponic technology which uses IoT, 5G communication, cybersecurity and machine learning to digitally control the environment in which the produce is grown.



ECOSMART
SERVICES



LANZAROTE AND LA PALMA

A SMART AND SUSTAINABLE ISLAND

The aim of the "La Palma Smart Island" project is to build a territory that manages its resources more efficiently and sustainably to improve the lives of its people through improved connectivity and IoT and big data solutions.



ECOSMART
SERVICES



GLOBAL OMNIUM

DIGITAL TRANSFORMATION OF WATER MANAGEMENT

A telemetry project aimed at water management, which uses NB-IoT technology to help the environment: we're reducing usage by more than 5 cubic hectometres, while offering the same service and reducing carbon emissions by more than 1,400 tonnes.



ECOSMART
SERVICES



How we are **helping** to care for our planet

VALENCIA MARINA

SMART WATER AND ELECTRICITY POINTS FOR BOATS

This is a pilot scheme to turn traditional supply points for electricity and water into smart points. These points are managed remotely by Valencia Marina and use 5G, cybersecurity, innovative identity and blockchain technology. The scheme is optimising the use of natural resources and reducing the environmental impact.



ECOSMART
SERVICES



ECOEMBS

SMART RECYCLING BINS

This project attaches a connected 5G device to people's recycling bins, which identifies what kind of waste they are putting in and rewarding them with tokens for separating their waste correctly.



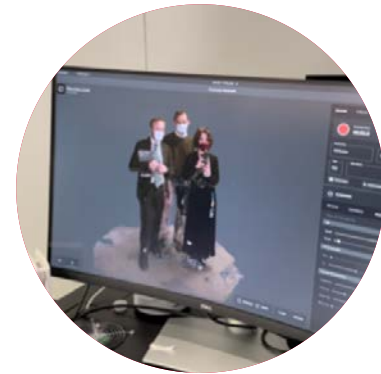
ECOSMART
SERVICES



HOLOGRAPHIC TELEPRESENCE

THE FUTURE OF TELEPRESENCE

This is a pilot scheme to test out holographic telepresence technology, supported by 5G and edge computing. The aim is to enhance and improve remote meetings, with a wide range of possible applications in various sectors.



ECOSMART
SERVICES





Testimonials

What our clients say...



Francisco Sánchez | **Onubafruit**
Chairman of Onubafruit

"Agriculture will be key going forwards: we are going to have to produce more in less space and that is where technology is going to be a game changer."

Víctor González Carbonell | **Global Omnium**
Head of Telereading and Metering

"The launch of the NB-IoT network to transform our water management will really help the environment, because we're reducing usage by more than 5 cubic hectometres every year, while offering the same service and reducing carbon emissions by more than 1,400 tonnes."



Gonzalo Pascual | **La Palma Island Council**
Regional Minister for Innovation, Territorial Planning and New Technology

"The 'La Palma Smart Island' project is a proposal targeting sustainability and self sufficiency that – by applying new technologies – will allow for a more efficient management of our resources, services and infrastructure to create spaces which favour the interaction between people, businesses and public authorities."



Testimonials

What our clients say...



Manuel de Arocha | **Ecoembes**
Director of Technology

"With the smart recycling bin, we are using tech to revolutionise the current reward-based recycling system, taking a leap forward so we can rise to the new challenges and legislative goals set across Spain and Europe, in order to move towards the much-needed circular economy."

José Frasquet | **Valencia Consortium**
Head of Strategy

"For us here at the Valencia Marina project, sustainability is key. In this type of Marina, fresh water leakage is a common issue. By digitalising supply points, this allows us to resolve this type of issue, providing an optimised and efficient way of protecting essential and scarce natural resources such as fresh water."



Eduardo Navarrete | **15Segundos**
Designer and Founder

"For designers, the fitting process is a really critical part of any fashion show or event. This holographic telepresence solution that Telefónica has come up with makes our job so much easier: we're saving time, reducing our carbon footprint and working much more efficiently."

@ Pablo Paniagua Photo

Onubafruit:

Vertical Green crops

5G

IoT

CYBER
SECURITY

MACHINE
LEARNING

RHPA

Agriculture 4.0 is synonymous with efficient, sustainable and smart agriculture which also uses sensorisation, connectivity, data analysis and traceability and brings a whole new dimension to how we physically grow crops. As part of our smart agro proposal, at Telefónica we incorporate Vertical Green solutions for growing crops indoors in digitally controlled environments that are accessed remotely thanks to RHPA aeroponics (Rotating High Pressure Aeroponic Irrigation) technology. Onubafruit, one of Europe's leading strawberry growers, is using this technology to grow strawberries in high density indoor spaces that are digitally controlled via IoT, 5G communications, cybersecurity and machine learning.

TECH SOLUTION

Interconnected modular production in a 40-foot enclosure with automated remote management of variables such as fertigation, carbon pressure and photoperiods controlled via algorithms, sensors and digital actuator systems. Implement a crop-growing plan specifically tailored to each variety, significantly reducing the consumption of water and nutrients and avoiding the need for pesticides.

BENEFITS

- 95% drop in water consumption.
- 64% drop in energy consumption (renewable sources).
- Farming of organic produce, free from pesticides and agrochemicals.
- Higher-density production in smaller spaces (vertical farming).
- Specialist technical work (creating skilled employment).



FURTHER INFORMATION

Videos: [Vertical Green: a smart agro solution for a more sustainable agriculture.](#)
[Vertical Green](#)

La Palma:

rebuilding a smart and sustainable island



Telefónica is committed to the recovery of La Palma and we have been right by their side as they grappled with the volcanic eruption, sending out specialist personnel and deploying technical resources, such as mobile units and emergency equipment, to ensure the island's telecommunications remained up and running.

We will continue to help the island as it rebuilds, heading up a major **sustainable digital transition project** called **"La Palma Smart Island"**, which aims to promote social and economic well-being for citizens on the island. Thanks to the application of smart technology, we hope to build a region where resources are managed more efficiently and sustainably, while providing people with better services than ever.

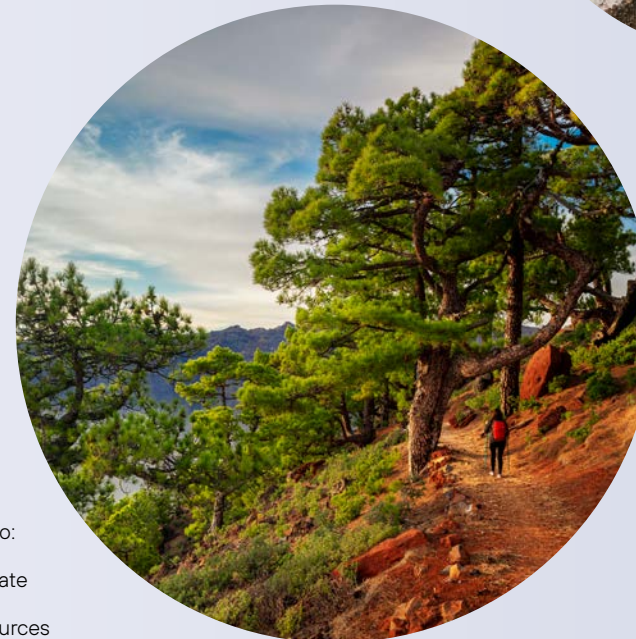
TECH SOLUTION

This is a smart management platform that uses sensors with IoT solutions (weather and air quality stations, smart waste management, smart agro, vehicle tracking, integrated energy resource management, travel information points...) to capture and manage data on the island, relaying it to the regional government, companies and citizens in real time.

BENEFITS

We're rebuilding the island in a sustainable way, by applying innovative digital solutions that will enable us to:

- Measure environmental parameters and adapt to climate change.
- Cut energy consumption and optimise the use of resources and infrastructure.
- Reduce water scarcity by applying smart management systems to water resources.
- Implement sustainable mobility through vehicle monitoring.
- Move towards a waste-free region with a circular economy, through waste logistics management.
- Encourage a transition to alternative, sustainable and responsible tourism.
- Foster social inclusion, education, citizen empowerment, job creation and innovation in the local community.



Global Omnium:

digital transformation of water management



The main challenge for this project is working on water telemetry, as it takes NB-IoT technology to the extreme. This solution requires a high concentration of devices, along with underground locations beneath a wrought iron slab and sealed in with concrete.

The battery life also needs to last for at least 12 years, and each reading needs to be 100% legible during the day.

TECH SOLUTION

This is an end-to-end solution that enables water utility companies to carry out their customers' meter readings remotely. The solution also allows them to remotely track and manage each smart meter, detect any technical faults and alter the display setup according to the customer's needs.

BENEFITS

Client benefits:

- Optimal management of water meters.
- Ensure water balance.
- Leak and fraud detection.

Benefits for the public:

- Helping the environment: we're reducing usage by more than 5 cubic hectometres, while offering the same service and reducing carbon emissions by more than 1,400 tonnes.
- Accurate billing and fewer disputes.
- Warning of potential leaks.

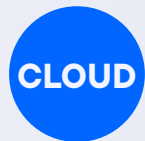


FURTHER INFORMATION

Video: [Deployment of NB-IoT network to digitally transform water management.](#)

Valencia Marina:

smart supply points for boats



This pilot scheme at Valencia Marina aims to convert traditional electricity and water supply points into advanced and intelligent 5G points, which can be managed remotely with full cybersecurity protection, providing consumption metrics and analysis. It will reduce the usage of these resources and be able to detect water leaks and anomalies in energy usage, helping to protect the environment in this particularly vulnerable area.

There is also a plan to open a Living Lab, an open space where companies and startups can suggest new ways to improve and work more efficiently using data published in the blockchain, bringing greater transparency to the Smart Port environment.

TECH SOLUTION

The service leverages the IDoT solution, a combination of Telefónica Tech solutions applied to service digitalisation, which is built on:

- Cybersecurity from the design phase, via cryptographic hardware and E2E.
- Secure 5G M2M communications.
- Identity for users and devices.
- Monitoring, tracking, immutability and non-repudiation of operations.
- A public Living Lab, open to the community.

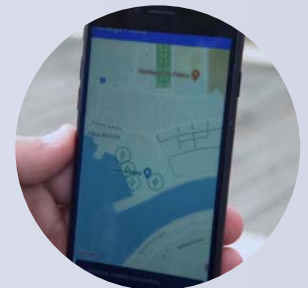
BENEFITS

Benefits for Valencia Marina:

- A new platform to manage the provision of water and electricity, ensuring greater efficiency in the usage of these resources.
- Water leakage and anomaly detection.
- Reduced water and carbon footprint.
- Metrics and indicators for SDG compliance.

Benefits for boat users:

- The app gives them precise data so they can use resources responsibly
- They receive alerts and can contact the Marina directly.

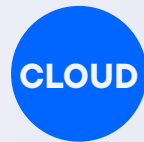


FURTHER INFORMATION

Press release: [The Valencia 2007 Consortium and Telefónica Tech launch the world's first cybersecurity Living Lab for the nautical industry.](#)

Video: [The Marina of Valencia: towards a port 4.0.](#)

ECOEMBES: smart recycling bins



This project focuses on smart recycling bins. They are fitted with a hoop device, which scans the barcode on each container and identifies what type of waste is being thrown in the bin, in order to promote more efficient and sustainable waste collection.

Each hoop is connected via Narrow Band 5G from Telefónica Tech, which enables the data to be read and sent to platforms to be managed. This solution has been integrated in collaboration with "The Thinx", a Telefónica Tech laboratory where companies can test out their own production models based on IoT.

TECH SOLUTION

Recycling bins are fitted with hoop devices that are connected via 5G. These provide data on the containers being thrown in the bin, to improve tracking and recycling standards. The hoops run on solar batteries and 5G Narrow Band (NB-IoT) technology, making them highly durable and significantly reducing the amount of energy used to transfer data. This entire process, from waste tracking to token rewards, is certified using blockchain technology.

BENEFITS

Ecoembes benefits:

- Improved waste tracking, collecting data such as the type of waste deposited, where the bins are and how often they are used, helping to improve its subsequent management and recycling.
- Solar batteries and 5G Narrow Band (NB-IoT) technology makes the batteries highly durable and significantly reduces the amount of energy used to transfer data.

Benefits for the public:

- Citizens are rewarded for recycling cans and plastic drinks bottles, under the RECICLOS Return and Reward Scheme (SDR) run by Ecoembes.



FURTHER INFORMATION

Press release: [Telefónica Tech and Ecoembes collaborate on a pioneering project in the recycling sector](#)

Holographic telepresence: the future of telepresence

5G

EDGE
COMPUTING

AR

Holographic telepresence is a major breakthrough in communications and is one of the most compelling use cases for volumetric capture over 5G. This pilot scheme uses holographic telepresence technology enabled by the 5G uplink – which supports the bandwidth needed for the video stream – and edge computing to host Evercoast's software, which creates the 3D image or hologram. The volumetric content is then displayed to attendees in a virtual meeting, who can view it using augmented reality devices such as the HoloLens 2 headset. Another option is to interact directly with the volumetric figure via a PC screen.

The entire process occurs in real time and with minimal latency, thanks to the combination of 5G with image processing at the edge. It therefore has multiple applications for remote meetings, which help to reduce carbon footprints and fuel consumption by removing the need for people to travel.

TECH SOLUTION

The solution consists of a recording or capture room, where the person or object is placed. The room is equipped with Intel RealSense volumetric depth cameras and LED spotlighting. Specific software is also deployed at the edge for two purposes: first, to compose the hologram using video signals from the cameras, and second, to prepare the 3D content to be displayed in the augmented reality headset. Lastly, thanks to 5G connectivity, we can guarantee both bandwidth and minimum latency for seamless real-time communication.

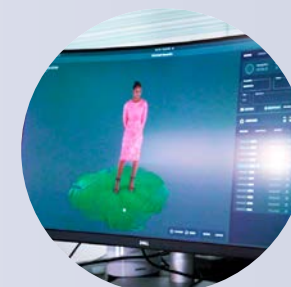
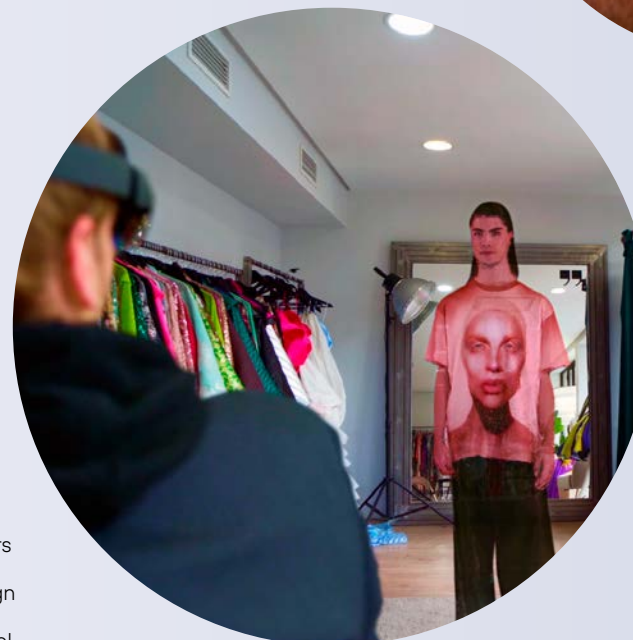
BENEFITS

Client benefits:

- Realistic telepresence experience and ability for participants to interact with the volumetric figure.

It can be applied in areas such as:

- Fashion shows requiring interaction between designers and models.
- Presentations of new products, highlighting their design or shape.
- Remote training, such as learning how to use a new tool.
- Applicable to medical rehabilitation exercises with interaction between therapist and patient.
- Removes the need for travel, reducing fuel usage and carbon emissions.
- Helps to reduce material waste and saves on resources.



FURTHER INFORMATION

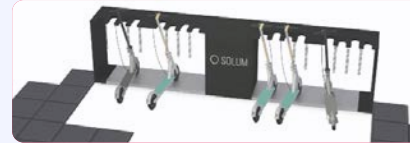
Video: [Holographic telepresence: the telepresence of the future.](#)

Other cases

from the sector

Digital solutions for our clients that help them reduce their environmental impact and achieve more efficient and sustainable businesses.

ELECTRIC SCOOTER CHARGERS



Installation and maintenance of solar charging points for micromobility vehicles. This innovative solution came from an Andalusian company working in Telefónica's startup ecosystem.

FLEET MANAGEMENT



Solution that uses advanced telematics to enable a fleet of vehicles to be managed in real time, providing a strategic view that helps make better-informed decisions.



SMART CITIES

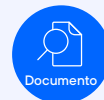


Optimised waste collection by sensorisation of bins, sustainable gardening with remote irrigation to reduce water usage, consumption and street lighting controlled remotely, environmental parameters processed to measure air quality and noise levels.

SMART BUILDING MANAGEMENT



Centralised control, monitoring and management to optimise and reduce the building's energy consumption (electricity, water...) and reduce its CO₂ emissions; we remotely supervise facilities via AI and predictive maintenance to maximise the useful life of equipment and help contribute to the circular economy.

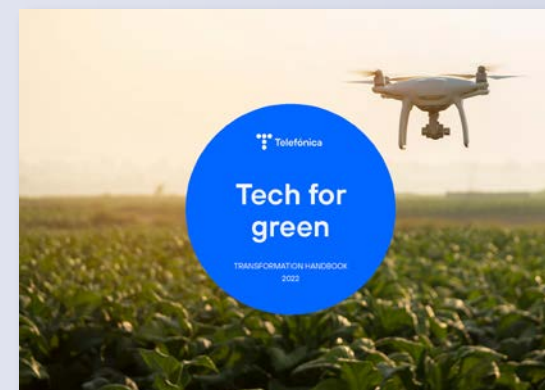
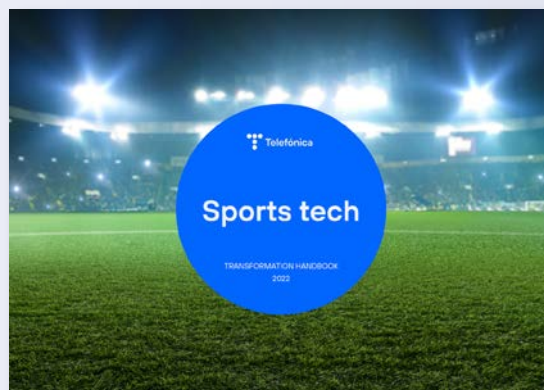
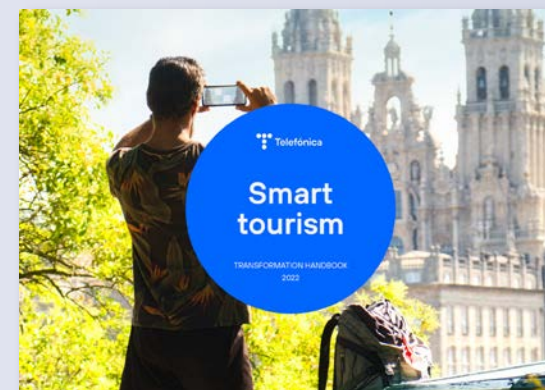


REMOTE WORKING AND VIDEO CONFERENCING

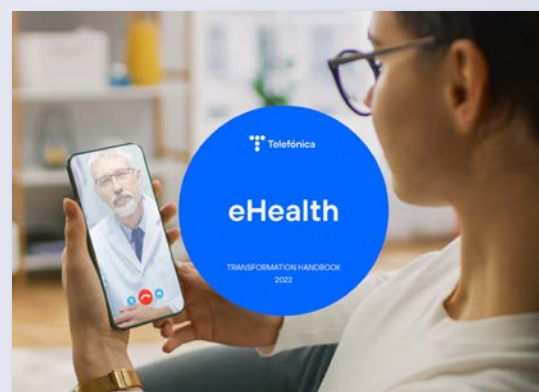


Connectivity and digital productivity and collaboration solutions allow people to work remotely, reducing the amount they need to travel and avoiding around 1.4 tonnes of CO₂ being released into the atmosphere per person per year.

Transformation handbook collection



Transformation handbook collection





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