LEADING CIRCULAR ECONOMY SOLUTIONS IN CATALONIA

ACCIÓ

Catalonia Trade & Investment

Generalitat de Catalunya
Government of Catalonia

Index

EXPLORE CIRCULAR ECONOMY USE CASES

BY VERTICALS

BY SECTORS

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1. ABOUT

The present document is a Catalogue of Circular Economy use cases implemented by the Catalan ecosystem aimed to share and highlight innovative experiences, exchange knowledge and inspire cities and territories worldwide.

The Catalogue showcases different use cases, covering all the verticals and industrial sectors of the circular economy, highlighting in each case the challenge it tackles, the solution implemented as well as the companies that are making it possible.

In which vertical or industry sector you look for a circular economy solution?

Check the different topics in which the Catalan companies offer innovative circular economy solutions.

Want to know more about the companies behind each use case?

Per every use case there is a detailed file about the company that has implemented the solution as well as a link to the company's website and a channel to contact the company.

Definition of the Circular Economy

The Circular Economy is restorative and regenerative and aims for products, components and resources in general to keep their usefulness and value at all times. This concept distinguishes between technical and biological cycles.

The following three principles are the foundations of a new system:

DESIGN OUT WASTE AND **POLLUTION**

Did you know that waste and pollution are largely a result of the way we design things?

Waste and pollution are not accidents, but the consequences of decisions made at the design stage, where around 80% of environmental impacts are determined. By changing our mindset to view waste as a design flaw and harnessing new materials and technologies, we can ensure that waste and pollution are not created in the first place.

KEEP PRODUCTS AND MATERIALS IN **USE**

What if we could build an economy that uses things, rather than uses them up?

We can't keep wasting resources. Products and materials must be kept in the economy. We can design some products and components so they can be reused, repaired, and remanufactured. But making things last forever is not the only solution. When it comes to products like food or packaging, we should be able to get the materials back so they don't end up in landfill.

REGENERATE NATURAL **SYSTEMS**

What if we could not only protect, but actively improve the environment?

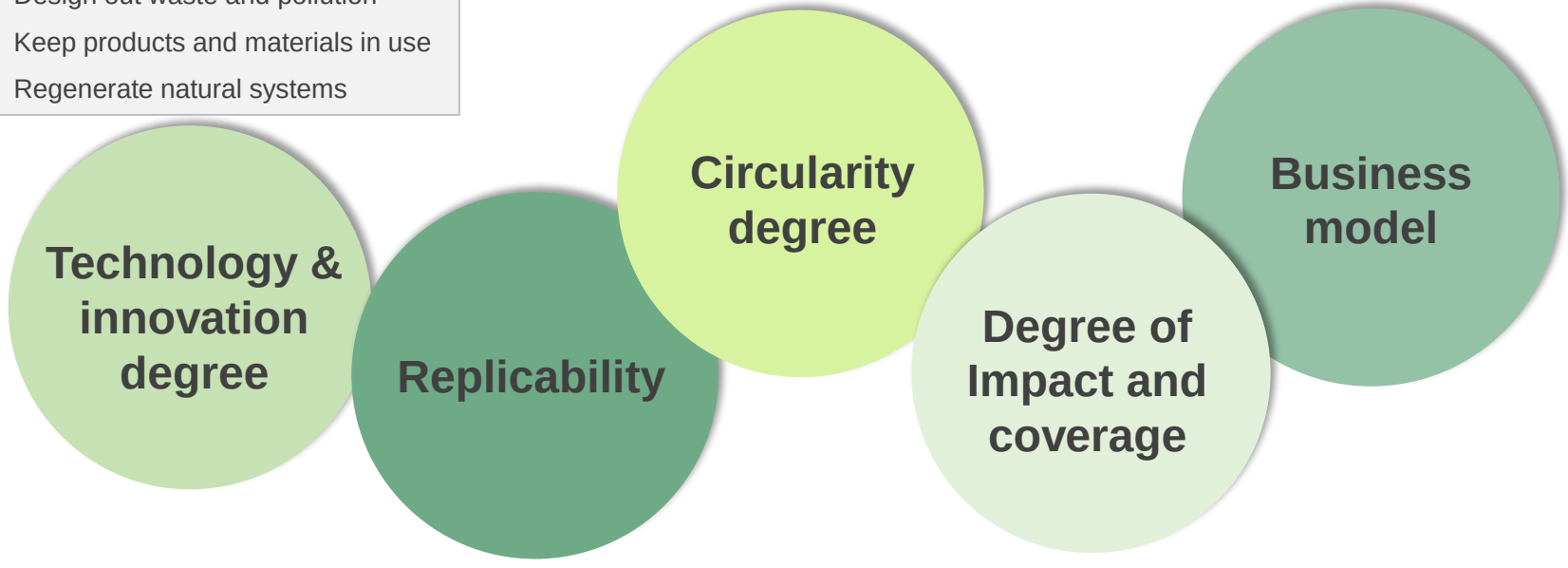
In nature, there is no concept of waste. Everything is food for something else - a leaf that falls from a tree feeds the forest. Instead of simply trying to do less harm, we should aim to do good. By returning valuable nutrients to the soil and other ecosystems, we can enhance our natural resources.

Source: Ellen MacArthur Foundation

Criteria

The Use cases included in this Catalogue have been selected according the following criteria. However, all are also committed to the three Circular economy values:

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems



The catalog is not exhaustive of all the solutions applied in the circular economy in Catalonia. The most innovative and / or illustrative of possible differential actions in the most relevant economic sectors for the Catalan economy have been highlighted

2. CATALAN ECOSYSTEM

Mapping of the Circular Economy in Catalonia

In Catalonia there are **a number of initiatives and organizations related to the Circular Economy**: public authorities that drive projects and initiatives, organized clusters, universities, technology centres and other stakeholders, trade shows and International networks.

391
COMPANIES (2014)

- **91%** of the companies identified **are SMEs** (under 250 employees) and **83% are companies incorporated before 2007** (companies over 10 years of age).
- **52.2%** of the companies in the sector **export** and **12.2% have a subsidiary abroad**.
- **76%** of companies are **concentrated in Barcelona**.
- **Waste** includes **67.3% of companies**.

70,419
EMPLOYEES (2014)

- **Waste** includes **76.4% of employees**, and of these, 82.5% are involved in the **waste management subsector**.

€4,090 M
of TURNOVER (2015)

- The 391 companies identified **have an aggregate turnover of €11,038 M**, of which **€4,090 M is exclusively linked to the Circular Economy**.
- The €4,090 M accounts for **2% of the total Catalan GDP** (2014).
- **6 major operators** of waste concentrate **more than a third of the total estimated business volume** in Circular Economy.

IMPORTANT NOTE: The Circular Economy includes segments that make up part of the industries referred to in the Chemicals, Energy and Resources Promotion Programme (PIQER). Sectors such as chemicals (with an associated turnover of €14,000M) or companies that carry out activities related to energy or resources not linked to the Circular Economy are not included in this quantification and therefore the figures presented do not coincide with those of the PIQER.

Source: Cluster Development, having first identified the companies on the basis of information taken from interviews, a search by codes of reference and previous directories and databases provided by sector stakeholders and ACCIÓ, later recovering the information available in the SABI Online database

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Main institutions and organizations committed to a Circular Economy

Note: The use of these trademarks is for informative purposes only. Trademarks mentioned in this document are the registered trademarks of the companies to which they belong and are not owned by ACCIÓ. This is an illustrative representation of companies and organization that form part of the ecosystem in Catalonia; however, there may exist other that have not been included in the study. All of them are cooperating with ACCIO in specific initiatives of circular economy and sustainability projects.

Hotspot Catalonia

The Circular Economy Hotspot is an event with the participation of experts, both from companies and governments from over the world in the field of Circular Economy, with the aim to know the strategies, business initiatives and successful partnerships of the main stakeholders responsible of leading the economy of Catalonia in order to make a more circular territory.

The event will offer meeting points for companies, governments and others showing Use cases about circular economy around the different sectors of the industry in the Catalan ecosystem. Actually, the Catalogue highlight some of the innovative circular solutions that will take a key role in the coming event.

The Circular Economy Hotspot Catalonia 2021 edition is built on a framework of 6 tracks, which together will provide a comprehensive view of the current state of circular economy solutions in both Catalonia and Europe: Circular design: Dematerializing the Economy, Closing the circle of materials, components, and products: re-making the economy, Bioeconomy: A Regenerative System, Industry 4.0: Enabling Technologies, Research and innovation: Connecting Actors and Inclusive circularity: Creating Social Value.

The guided tours will be structured around the following 9 economic sectors: Agrifood, Fashion & Textile, Energy, Mobility, Building, Packaging, Water cycle, Chemical, Public Initiatives.

For more information visit this website.

3. CATALONIA TRADE & INVESTMENT

Catalan government's agency for business competitiveness

Catalonia Trade & Investment

Generalitat de Catalunya
Gobierno de Cataluña

The Catalan Government's agency for business competitiveness. Attached to the Ministry of Business and Knowledge, it specializes in promoting business innovation and internationalization and has a network of 40 offices worldwide.

fDi EUROPEAN CITIES & REGIONS OF THE FUTURE 2020/21
OVERALL SOUTHERN REGIONS WINNER
CATALONIA

Best European FDI Strategy
fDi Magazine Awards by Financial Times

INVESTMENT TRADE INNOVATION

Catalonia Trade & Investment's success lies in **offering** a **pro-business approach** and **tailor-made solutions.**

The institution offers services for international companies considering Catalonia and Barcelona as an investment location in Europe. It also offers services for expansion or for new projects for already established firms in Catalonia.

It's multidisciplinary teams work in the fields of investment and **international commerce**, and **technological innovation and cooperation**.

Source: EIC (DGI – ACCIÓ)

4. SUSTAINABLE DEVELOPMENT GOALS

EXPLORE THE CIRCULAR ECONOMY USE CASES THAT IMPACT EACH OF THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

GOAL 1: NO POVERTY

The decline of global extreme poverty continues but has slowed. The deceleration indicates that the world is not on track to achieve the target of less than 3 per cent of the world living in extreme poverty by 2030. People who continue to live in extreme poverty face deep, entrenched deprivation often exacerbated by violent conflicts and vulnerability to disasters. Strong social protection systems and government spending on key services often help those left behind get back on their feet and escape poverty, but these services need to be brought to scale

- **POVERTY REDUCTION**
- **SOCIAL PROTECTION**
- **INCLUSION**
- **PEOPLE'S RESILIENCE**

Reuse your jeans!

Optimization of textile waste management

Reuse and recycling of clothing, accessories and footwear

GOAL 2: ZERO HUNGER

Hunger is on the rise again globally and undernutrition continues to affect millions of children. Public investment in agriculture globally is declining, small scale food producers and family farmers require much greater support and increased investment in infrastructure and technology for sustainable agriculture is urgently needed.

- **AGRICULTURAL PRODUCTIVITY**
- **NEW PRODUCTION SYSTEMS**
- **RESOURCES ACCESS**

Transforming imperfect products into opportunities

Processing plant for optimal production of Protein

Circular Agronomics

Circular Agronomics

Nutrient2Cycle

Nutri2Cycle
Nurturing the Circular Economy

Edible Insects as Sustainable Food Alternative

In situ soil and aquifer remediation of TPH and metals

Advanced Decision Support System for Optimal Irrigation

GOAL 3: GOOD HEALTH AND WELL-BEING

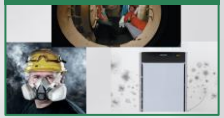
Major progress has been made in improving the health of millions of people, increasing life expectancy, reducing maternal and child mortality and fighting against leading communicable diseases. However, progress has stalled or is not happening fast enough in regards to addressing major diseases, such as malaria and tuberculosis, while at least half the global population does not have access to essential health services and many of those who do suffer undue financial hardship, potentially pushing them into extreme poverty

- **HEALTH ACCESS AND COVERAGE**
- **INFORMATION AND EDUCATION**
- **SOCIAL INCLUSION**

Eco-efficient solution for nitrate/ammonia polluted water treatment

Transforming imperfect products into opportunities

Highly efficient catalysts for air filtration systems



Sustainable extraction of microalgae to develop skincare active ingredients

Development of advanced functional absorbent products

An ecological solar textile that purifies the air

Optimization of textile waste management

Reuse and recycling of clothing, accessories and footwear

Cleaning products in a tablet

Hygienic perfume based on biotechnological synthesis ingredients

From the almond skin to a cholesterol reduction

Solar HUB

GOAL 4: QUALITY EDUCATION

Despite the considerable progress on education access and participation over the past years, 262 million children and youth aged 6 to 17 were still out of school in 2017, and more than half of children and adolescents are not meeting minimum proficiency standards in reading and mathematics. Rapid technological changes present opportunities and challenges, but the learning environment, the capacities of teachers and the quality of education have not kept pace. Refocused efforts are needed to improve learning outcomes for the full life cycle.

- **EDUCATION ACCESS AND QUALITY**
- **GENDER EQUALITY**
- **EDUCATION DEVELOPMENT**
- **CULTURAL DIVERSITY**

Go Zero Waste APP

Methodologies for the practical implementation of Circular Economics

Circular Economics Training Course

Circular Economy Chair

Professional Training in Circular Economy

GOAL 6: CLEAN WATER AND SANITATION

Despite progress, billions of people still lack safe water, sanitation and handwashing facilities. Data suggests that achieving universal access to even basic sanitation service by 2030 would require doubling the current annual rate of progress. More efficient use and management of water are critical to addressing the growing demand for water, threats to water security and the increasing frequency and severity of droughts and floods resulting from climate change. As of the time of writing, most countries are unlikely to reach full implementation of integrated water resources management by 2030.

- **WATER POLLUTION**
- **NEW WATER MANAGEMENT SYSTEMS**
- **WATER REUSE**
- **WATER QUALITY**

Filled of ditches with reused aggregate

Sant Feliu Reuse

Public- private collaboration for implementing circularity

Cost effective bacterial for industrial wastewater treatment

In situ soil and aquifer remediation of TPH and metals

Next generation water systems

Re-designing the value and supply chain of water and minerals

Moving bed biofilm reactor–membrane bioreactor

SIM4NEXUS

New electro purification techniques for industrial effluents

Eco-efficient solution for nitrate/ammonia polluted water treatment

Hybrid technology coupling green walls and microbial fuel cells (MFC)

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- **WATER QUALITY**

Hybrid electro-oxidation and ozonation for wastewaters

Bioremediation of contaminated aquifers

Sustainable water filter to purify and analyze tap water

Compact and modular tertiary water reclamation system

New valorization alternatives for WWTP waste

Liquid waste treatment by Zero Liquid Discharge (ZLD) systems

Evaporation solar System for treatment of manure

Shift towards a circular economy for the housing sector

Continuous filament production of synthetic yarn

Cleaning products in a tablet

Innovating in Construction Market by Using Recyclable Materials

Edible, flavored and 100% biodegradable straw

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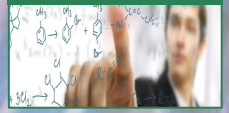
- **NEW WATER MANAGEMENT SYSTEMS**
- **WATER REUSE**
- **WATER QUALITY**

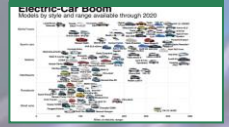
OIMO

Sanitizing detergents based on biological ingredients



Traceability system with blockchain technology for the circular economy

All in one electric vehicle charger



GOAL 7: AFFORDABLE AND CLEAN ENERGY

Access to electricity in the poorest countries has begun to accelerate, energy efficiency continues to improve and renewable energy is making gains in electricity sector. Despite this progress, some 800 million people remain without electricity while access to clean cooking fuels and technologies needs dedicated attention. In addition, if Sustainable Development Goals 7, 13 and related Goals are to be met, much higher levels of ambition are required with regard to renewable energy, including transportation and heating.

- **RENEWABLE ENERGY**
- **ENERGY EFFICIENCY**
- **NON-POLLUTING TECHNOLOGIES**
- **MOBILITY DEMAND**

SIM4NEXUS

Modular thermoelectric system for industrial waste heat

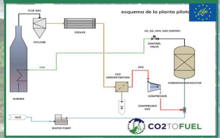
Turning sewage sludge into fuels and hydrogen

Sustainable Jet fuel from flexible waste biomass

Smart Plant Manager for Utility Scale Photovoltaic Plants

Green electricity from plants' photosynthesis

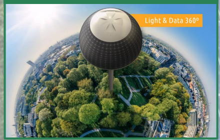
Life co2 to fuel



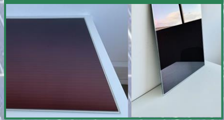
Hydrogen-powered vehicle

Fast charging high performing battery solutions

Solar HUB



Photovoltaic panels that work without sunlight



5G network platforms and research for circular economy applications

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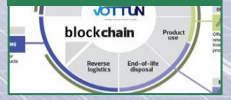
- **RENEWABLE ENERGY**
- **ENERGY EFFICIENCY**
- **NON-POLLUTING TECHNOLOGIES**
- **MOBILITY DEMAND**

Longer life for transparent organic PV cells

Eco-friendly batteries for single-use applications

Traceability system with blockchain technology for the circular economy



Edible Insects as Sustainable Food Alternative

Technology to reduce printers' impact on the environment

CoSin (Combustibles Sintètics)

GOAL 8: DECENT WORK AND ECONOMIC GROWTH

Inclusive and sustainable economic growth can drive progress and generate the means to implement the Sustainable Development Goals. Globally, labour productivity has increased and unemployment is back to pre-financial crisis levels. However, the global economy is growing at a slower rate. More progress is needed to increase employment opportunities, particularly for young people, reduce informal employment and the gender pay gap and promote safe and secure working environments to create decent work for all.

- **SUSTAINABLE ECONOMIC GROWTH**
- **SAFE WORKPLACES**
- **QUALITY PROFESSIONS**
- **PROMOTE AID-FOR-TRADE**

Transforming imperfect products into opportunities

Obtaining high value products for metal companies

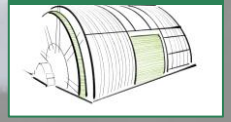
From the almond skin to a cholesterol reduction

Reuse and recycling of clothing, accessories and footwear

Sustainable retanning agents

Sustainable fatliquoring agents

Sustainable unhairing with enzymes



Sustainable tanning process

A bio-based recyclable packaging

Methodologies for the practical implementation of Circular Economics

Technology to reduce printers' impact on the environment

Circular Economics Training Course

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Circular Economy Chair

Professional Training in Circular Economy

5G network platforms and research for circular economy applications

GOAL 9: INDUSTRY, INNOVATION AND INFRAESTRUCTURE

Aspects of the prevailing global economic environment have not been conducive to rapid progress on Sustainable Development Goal 9. While financing for economic infrastructure has increased in developing countries and impressive progress has been made in mobile connectivity, countries that are lagging behind, such as least developed countries, face serious challenges in doubling the manufacturing industry's share of GDP by 2030, and investment in scientific research and innovation remains below the global average.

- **EFFICIENT TRANSPORTATION SERVICES**
- **MANUFACTURING INDUSTRIES EMISSIONS**
- **RESEARCH IN INVESTMENT**
- **TELECOM ACCESS**

Filled of ditches with reused aggregate

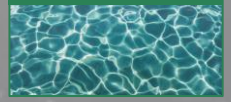
Sant Feliu Reuse

In situ soil and aquifer remediation of TPH and metals

Re-designing the value and supply chain of water and minerals

Moving bed biofilm reactor–membrane bioreactor

New electro purification techniques for industrial effluents



Eco-efficient solution for nitrate/ammonia polluted water treatment

Ecoplanta: Green Chemical Industry

Hybrid electro-oxidation and ozonation for wastewaters

Compact and modular tertiary water reclamation system

Bioremediation of contaminated aquifers

Sustainable water filter to purify and analyze tap water

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Modular thermoelectric system for industrial waste heat

New valorization alternatives for WWTP waste

Manufacture of recycled products with the contribution of renewable energy

Circular Tuva towels

Surgical clothing reuse

Processing plant for optimal production of Protein

Solid State Fermentation

Transformation of EAF slag into high security asphalts

Recycled plastics from end of life vehicles waste

Recyclable waste selection

Optimization of textile waste management

PET waste recycling

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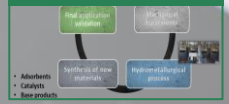
Smart packaging to ensure quality and cut down food waste.

Liquid waste treatment by Zero Liquid Discharge (ZLD) systems

Obtaining high value products for metal companies



Design of Enzyme Technologies from Plant by-Products

Bio-based polymers for high-performance applications

Circular Agronomics

Nutrient2Cycle

Turning sewage sludge into fuels and hydrogen

Sustainable Jet fuel from flexible waste biomass

Automated glass recovery for waste treatment plants

Glass Recovering Revolution

Materials recovery processes

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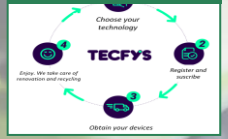
TECFYS

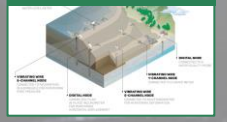


Thermowaste, the complete solution to end landfills

Reuse and recycling of clothing, accessories and footwear

Sun protection, for curtains and blinds

The connected infrastructure solution



Smart Plant Manager for Utility Scale Photovoltaic Plants

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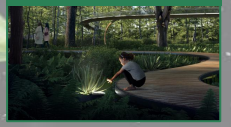
Green electricity from plants' photosynthesis



Life co2 to fuel

Electric motorcycle rental

Hydrogen-powered vehicle

Second Life of Electric Vehicle Batteries

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Catalyst Development for Synthetic Natural Gas Production

Environmental Life Cycle Assessment of Li-Sulphur Batteries

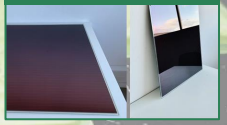
Fast charging high performing battery solutions

Power battery pack

Solar HUB

Evaporation solar System for treatment of manure

Photovoltaic panels that work without sunlight



Shift towards a circular economy for the housing sector

Substitution of halogenated flame retardants

Substitution of fluorinated chemistries in water and oil repellent products

Continuous filament production of synthetic yarn

Recycling carbon fiber composites

GOAL 9: INDUSTRY, INNOVATION AND INFRAESTRUCTURE

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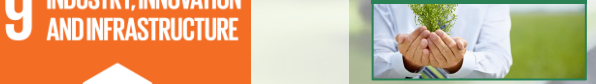
Sustainable extraction of microalgae to develop skincare active ingredients



Reuse of byproducts of the cork industry for cosmetics

Research and development of innovative greases

Hygienic perfume based on biotechnological synthesis ingredients

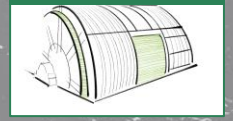
Technology to reduce printers' impact on the environment

Longer life for ballast in rail

Sustainable retanning agents

Sustainable fatliquoring agents

Sustainable unhairing with enzymes



Sustainable tanning process

5G network platforms and research for circular economy applications

Development of advanced functional absorbent products

GOAL 9: INDUSTRY, INNOVATION AND INFRAESTRUCTURE

Aspects of the prevailing global economic environment have not been conducive to rapid progress on Sustainable Development Goal 9. While financing for economic infrastructure has increased in developing countries and impressive progress has been made in mobile connectivity, countries that are lagging behind, such as least developed countries, face serious challenges in doubling the manufacturing industry's share of GDP by 2030, and investment in scientific research and innovation remains below the global average.

- **EFFICIENT TRANSPORTATION SERVICES**
- **MANUFACTURING INDUSTRIES EMISSIONS**
- **RESEARCH IN INVESTMENT**
- **TELECOM ACCESS**

Bioplastics for the industry growth

Biomass recovery

Reduction of the concentration of N-ammonia from livestock manure

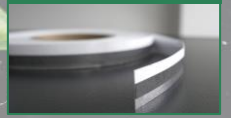
New material formulated with electric-arc furnace dust (EAFD)

New Materials formulated from residues for the construction sector

Longer life for transparent organic PV cells

Advanced photocatalytic textiles to mitigate air pollution in cities

Eco-friendly batteries for single-use applications



Sustainable plastic solutions

An environmentally friendly plastic solution

Manufacture of recycled high-quality yarns

Manufacture of recycled colored yarns

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Innovating in Construction Market by Using Recyclable Materials

Advanced Decision Support System for Optimal Irrigation

A bio-based recyclable packaging

The Greenest Tissue paper in the world

Compostable coffee capsules

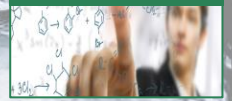
OIMO

Edible, flavored and 100% biodegradable straw

Generation of activated carbon from waste products

A more circular plastic packaging value chain

Sanitizing detergents based on biological ingredients



Edible Insects as Sustainable Food Alternative

Sustainable Packaging

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Methodologies for the practical implementation of Circular Economics

All in one electric vehicle charger

TERRARI

Circular Economics Training Course

Circular Economy Chair

Professional Training in Circular Economy

GOAL 10: REDUCED INEQUALITIES

Inequality within and among nations continues to be a significant concern despite progress in and efforts at narrowing disparities of opportunity, income and power. Income inequality continues to rise in many parts of the world, even as the bottom 40 per cent of the population in many countries has experienced positive growth rates. Greater emphasis will need to be placed on reducing inequalities in income as well as those based on other factors. Additional efforts are needed to increase zero-tariff access for exports from least developed countries and developing countries, and assistance to least developed countries and small island developing States.

- **GUARANTEE EQUAL OPPORTUNITIES**
- **IMPROVE REGULATION AND OVERSIGHT OF GLOBAL FINANCIAL MARKETS AND INSTITUTIONS**

Transforming imperfect products into opportunities

Optimization of textile waste management

Reuse and recycling of clothing, accessories and footwear

Reuse your jeans!

GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES

Substantial progress has been made in reducing the proportion of the global urban population living in slums, though more than 1 billion people continue to live in such situations. Urgent action is needed to reverse the current situation, which sees the vast majority of urban residents breathing poor-quality air and having limited access to transport and open public spaces. With the areas occupied by cities growing faster than their populations, there are profound repercussions for sustainability.

- **PUBLIC TRANSPORT ACCESS**
- **URBAN GROWTH MANAGEMENT**
- **WASTE COLLECTION**
- **OPEN PUBLIC SPACES**
- **AIR POLLUTION**

Filled of ditches with reused aggregate

Sant Feliu Reuse

Public- private collaboration for implementing circularity

Next generation water systems

New electro purification techniques for industrial effluents

Surgical clothing reuse

Recyclable waste selection

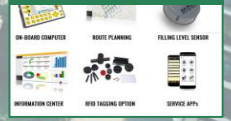
Optimization of textile waste management

PET waste recycling

Go Zero Waste APP

Pay-as-you-throw (PAYT) schemes for waste generation

Technology for Waste Collection Optimization



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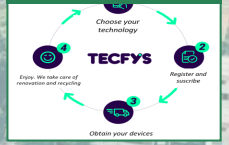
Automated glass recovery for waste treatment plants

TECFYS



Organic waste transformation into bioplastics using bacteria

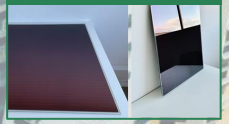
Smart Plant Manager for Utility Scale Photovoltaic Plants

Life co2 to fuel

Hydrogen-powered vehicle

Solar HUB

Photovoltaic panels that work without sunlight



Research and development of innovative greases

Hygienic perfume based on biotechnological synthesis ingredients

Longer life for ballast in rail

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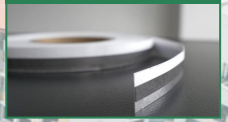
Eco-friendly batteries for single-use applications

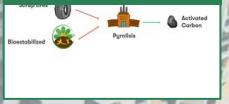


Innovating in Construction Market by Using Recyclable Materials

The Greenest Tissue paper in the world

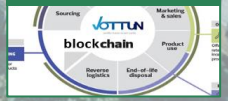
Compostable coffee capsules

Generation of activated carbon from waste products



A more circular plastic packaging value chain

Traceability system with blockchain technology for the circular economy



Hybrid technology coupling green walls and microbial fuel cells (MFC)

Shift towards a circular economy for the housing sector

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Methodologies for the practical implementation of Circular Economics

CoSin (Combustibles Sintètics)

New valorization alternatives for WWTP waste

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Advanced Decision Support System for Optimal Irrigation

GOAL 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

Worldwide material consumption has expanded rapidly, as has material footprint per capita, seriously jeopardizing the achievement of Sustainable Development Goal 12 and the Goals more broadly. Urgent action is needed to ensure that current material needs do not lead to the overextraction of resources or to the degradation of environmental resources, and should include policies that improve resource efficiency, reduce waste and mainstream sustainability practices across all sectors of the economy.

- **RESOURCE EFFIENCY**
- **MATERIAL FOOTPRINT**
- **SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS**

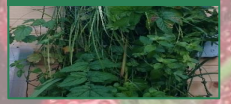
Public- private collaboration for implementing circularity

In situ soil and aquifer remediation of TPH and metals

Re-designing the value and supply chain of water and minerals

Moving bed biofilm reactor–membrane bioreactor

Hybrid technology coupling green walls and microbial fuel cells (MFC)



Hybrid electro-oxidation and ozonation for wastewaters

Bioremediation of contaminated aquifers

Sustainable water filter to purify and analyze tap water

Compact and modular tertiary water reclamation system

Manufacture of recycled products with the contribution of renewable energy

Circular Tuva towels

Surgical clothing reuse

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- **SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS**

Processing plant for optimal production of Protein

Solid State Fermentation

Recycled plastics from end of life vehicles waste

Optimization of textile waste management

PET waste recycling

Smart packaging to ensure quality and cut down food waste.

Liquid waste treatment by Zero Liquid Discharge (ZLD) systems

Transforming imperfect products into opportunities

Obtaining high value products for metal companies

Go Zero Waste APP

Design of Enzyme Technologies from Plant by-Products

Bio-based polymers for high-performance applications

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Circular Agronomics

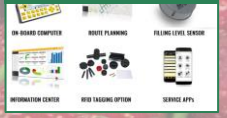
Nutrient2Cycle

Turning sewage sludge into fuels and hydrogen

Sustainable Jet fuel from flexible waste biomass

Pay-as-you-throw (PAYT) schemes for waste generation

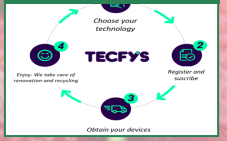
Technology for Waste Collection Optimization



Glass Recovering Revolution

Materials recovery processes

TECFYS



Thermowaste, the complete solution to end landfills

A mobile app to reduce food waste from stores and establishment

From the almond skin to a cholesterol reduction

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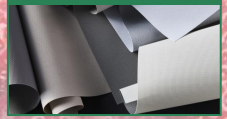
Reuse and recycling of clothing, accessories and footwear

Sun protection, for curtains and blinds



The connected infrastructure solution

Second Life of Electric Vehicle Batteries

Catalyst Development for Synthetic Natural Gas Production

Environmental Life Cycle Assessment of Li-Sulphur Batteries

Fast charging high performing battery solutions

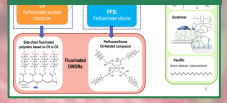
Power battery pack

Evaporation solar System for treatment of manure

Shift towards a circular economy for the housing sector

Substitution of halogenated flame retardants

Substitution of fluorinated chemistries in water and oil repellent products



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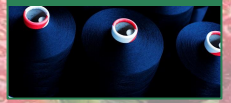
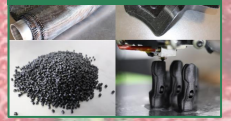
- **SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS**

Continuous filament production of synthetic yarn



Cleaning products in a tablet

Recycling carbon fiber composites



Sustainable extraction of microalgae to develop skincare active ingredients

Reuse of byproducts of the cork industry for cosmetics

Technology to reduce printers' impact on the environment

Longer life for ballast in rail

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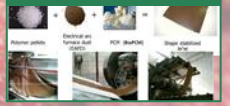

New Materials formulated from residues for the construction sector

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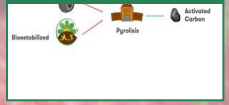

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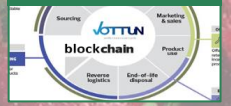
A more circular plastic packaging value chain

Sanitizing detergents based on biological ingredients

Ecoplanta: Green Chemical Industry

Traceability system with blockchain technology for the circular economy



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Electric motorcycle rental

5G network platforms and research for circular economy applications

All in one electric vehicle charger

GOAL 13: CLIMATE ACTION

With rising greenhouse gas emissions, climate change is occurring at rates much faster than anticipated and its effects are clearly felt worldwide. While there are positive steps in terms of the climate finance flows and the development of nationally determined contributions, far more ambitious plans and accelerated action are needed on mitigation and adaptation. Access to finance and strengthened capacities need to be scaled up at a much faster rate, particularly for least developed countries and small island developing States.

- **CLIMATE CHANGE MANAGEMENT**
- **EDUCATION, AWARENESS RAISING AND HUMAN AND INSTITUTIONAL CAPACITY REGARDING CLIMATE CHANGE MITIGATION.**

SIM4NEXUS

Modular thermoelectric system for industrial waste heat

Optimization of textile waste management

PET waste recycling

Smart packaging to ensure quality and cut down food waste.

Transforming imperfect products into opportunities

Circular Agronomics

Nutrient2Cycle

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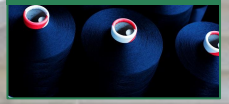
Solar HUB

Continuous filament production of synthetic yarn



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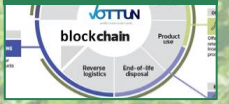

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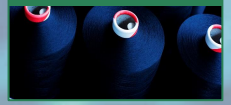
GOAL 14: LIFE BELOW WATER

The expansion of protected areas for marine biodiversity and existing policies and treaties that encourage responsible use of ocean resources are still insufficient to combat the adverse effects of overfishing, growing ocean acidification due to climate change and worsening coastal eutrophication. As billions of people depend on oceans for their livelihood and food source and on the transboundary nature of oceans, increased efforts and interventions are needed to conserve and sustainably use ocean resources at all levels.

- **REPONSIBLE OCEAN USE RESOURCES**
- **SUSTAINABLE FISHERIES DEVELOPMENT**
- **MARINE BIODIVERISTY PROTECTION**

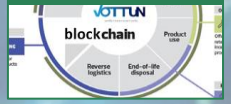
Continuous filament production of synthetic yarn



OIMO

Edible, flavored and 100% biodegradable straw

Traceability system with blockchain technology for the circular economy



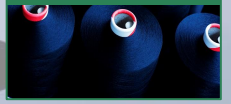
GOAL 15: LIFE ON LAND

There are some encouraging global trends in protecting terrestrial ecosystems and biodiversity. Forest loss is slowing down, more key biodiversity areas are protected and more financial assistance is flowing towards biodiversity protection. Yet, the 2020 targets of Sustainable Development Goal 15 are unlikely to be met, land degradation continues, biodiversity loss is occurring at an alarming rate, and invasive species and the illicit poaching and trafficking of wildlife continue to thwart efforts to protect and restore vital ecosystems and species.

- **HEALTHY MOUNTAIN ECOSYSTEM**
- **BIODIVERSITY PROTECTION**
- **SPECIES EXTINCTION**
- **LAND USE PRODUCTIVITY**
- **NATURE RESILIENCE**

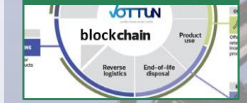
Longer life for ballast in rail

Continuous filament production of synthetic yarn



OIMO

Traceability system with blockchain technology for the circular economy



In situ soil and aquifer remediation of TPH and metals

Bioremediation of contaminated aquifers

GOAL 16: PEACE, JUSTICE AND STRONG INSTITUTIONS

Advances in ending violence, promoting the rule of law, strengthening institutions and increasing access to justice are uneven and continue to deprive millions of their security, rights and opportunities and undermine the delivery of public services and broader economic development. Attacks on civil society are also holding back development progress. Renewed efforts are essential to move towards the achievement of Sustainable Development Goal 16.

- **CIBERSEGURITY AND DATA PROTECTION**
- **TRANSPARENCY POLICIES**
- **CITIZENS PARTICIPATION**
- **DIGITAL ADMINISTRATION**

SIM4NEXUS

Shift towards a circular economy for the housing sector

Traceability system with blockchain technology for the circular economy

Pay-as-you-throw (PAYT) schemes for waste generation

GOAL 17: PARTNERSHIPS FOR THE GOALS

Progress on some means of implementation targets is moving rapidly: personal remittances are at an all-time high, an increasing proportion of the global population has access to the Internet and the Technology Bank for the Least Developed Countries has been established. Yet, significant challenges remain: ODA is declining, private investment flows are not well aligned with sustainable development, there continues to be a significant digital divide and there are ongoing trade tensions. Enhanced international cooperation is needed to ensure that sufficient means of implementation exist to provide countries the opportunity to achieve the Sustainable Development Goals.

- **PUBLIC-PRIVATE PARTNESHIPS**
- **SHARE KNOWLEDGE WITH FOREIGN INSTITUTIONS**
- **SUSTAINABLE POLICIES DEVELOPMENT**

Next generation water systems

Ecoplanta: Green Chemical Industry

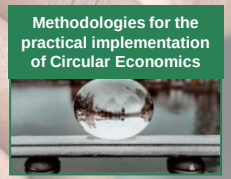
Public- private collaboration for implementing circularity

Re-designing the value and supply chain of water and minerals

Sant Feliu Reuse

Pay-as-you-throw (PAYT) schemes for waste generation

Methodologies for the practical implementation of Circular Economics



Circular Economics Training Course

Circular Economy Chair

Professional Training in Circular Economy

Food industries & agriculture

Sustainable water filter to purify and analyze tap water

Advanced Decision Support System for Optimal Irrigation

Processing plant for optimal production of Protein

Go Zero Waste APP

Design of Enzyme Technologies from Plant by-Products

bio-based polymers for high-performance applications

Edible Insects as Sustainable Food Alternative

Circular Agronomics

Biomass recovery

A mobile app to reduce food waste from stores and establishment

Evaporation solar System for treatment of manure

Compostable coffee capsules

Edible, flavored and 100% biodegradable straw

Nutrient2Cycle

From the almond skin to a cholesterol reduction

Solid State Fermentation

Reduction of the concentration of N-ammonia from livestock manure

Transforming imperfect products into opportunities

TERRARI

HOME ◄ SDGs

Chemical, Energy & Water industries

Filled of ditches with reused aggregate

Sant Feliu Reuse

Public- private collaboration for implementing circularity

TERRARI

Catalyst Development for Synthetic Natural Gas Production

Eco-friendly batteries for single-use applications

Second Life of Electric Vehicle Batteries

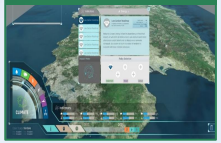
Cost effective bacterial for industrial wastewater treatment

In situ soil and aquifer remediation of TPH and metals

Next generation water systems

Moving bed biofilm reactor–membrane bioreactor

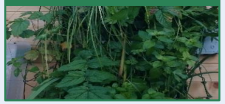
SIM4NEXUS



New electro purification techniques for industrial effluents

Eco-efficient solution for nitrate/ammonia polluted water treatment

Hybrid technology coupling green walls and microbial fuel cells (MFC)



Hybrid electro-oxidation and ozonation for wastewaters

Bioremediation of contaminated aquifers

Compact and modular tertiary water reclamation system

Modular thermoelectric system for industrial waste heat

New valorization alternatives for WWTP waste

Manufacture of recycled products with the contribution of renewable energy

Surgical clothing reuse

Solid State Fermentation

Transformation of EAF slag into high security asphalts

Recycled plastics from end of life vehicles waste

Liquid waste treatment by Zero Liquid Discharge (ZLD) systems

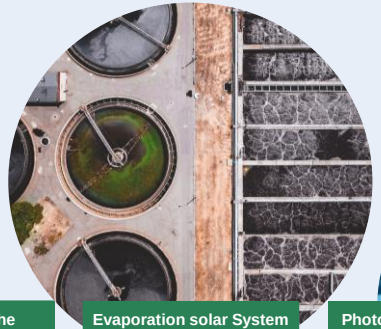
Obtaining high value products for metal companies

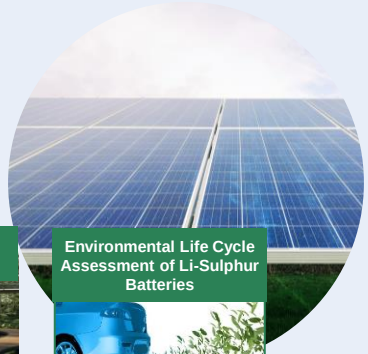
Turning sewage sludge into fuels and hydrogen

ACCIÓ Catalonia Trade & Investment

Generalitat de Catalunya Government of Catalonia

Chemical, Energy & Water industries





Sustainable Jet fuel from flexible waste biomass

Materials recovery processes

Thermowaste, the complete solution to end landfills

Evaporation solar System for treatment of manure

Photovoltaic panels that work without sunlight

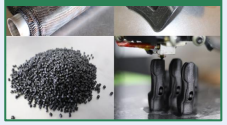
Green electricity from plants' photosynthesis

Environmental Life Cycle Assessment of Li-Sulphur Batteries

Organic waste transformation into bioplastics using bacteria

Cleaning products in a tablet

Recycling carbon fiber composites



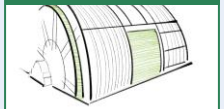
Longer life for ballast in rail

Hygienic perfume based on biotechnological synthesis ingredients

Sustainable retanning agents

Sustainable fatliquoring agents

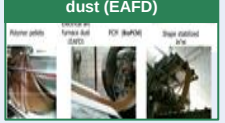
Sustainable unhairing with enzymes



Sustainable tanning process

Reduction of the concentration of N-ammonia from livestock manure

New material formulated with electric-arc furnace dust (EAFD)



New Materials formulated from residues for the construction sector

Longer life for transparent organic PV cells

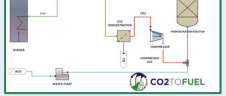
Eco-friendly batteries for single-use applications

Generation of activated carbon from waste products

Sanitizing detergents based on biological ingredients

Ecoplanta: Green Chemical Industry

Life co2 to fuel



An environmentally friendly plastic solution

Sustainable plastic solutions

Solar HUB

HOME ◄ SDGs

Health, well-being & Life Scienes Industries

Highly efficient catalysts for air filtration systems

Sustainable extraction of microalgae to develop skincare active ingredients

Reuse of byproducts of the cork industry for cosmetics

Development of advanced functional absorbent products

An ecological solar textile that purifies the air

Surgical clothing reuse

From the almond skin to a cholesterol reduction

Sustainable mobility

All in one electric vehicle charger

Electric motorcycle rental

Hydrogen-powered vehicle

Fast charging high performing battery solutions

Power battery pack

Recycled plastics from end of life vehicles waste

Turning sewage sludge into fuels and hydrogen

CoSin (Combustibles Sintètics)

Sutainable Jet fuel from flexible waste biomass

Second Life of Electric Vehicle Batteries

Environmental Life Cycle Assessment of Li-Sulphur Batteries

Recycling carbon fiber composites

Research and development of innovative greases

Industry 4.0 & Industrials Systems

Re-designing the value and supply chain of water and minerals

Modular thermoelectric system for industrial waste heat

Recyclable waste selection

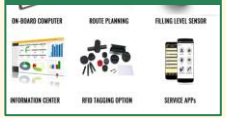
Optimization of textile waste management

PET waste recycling

SIM4NEXUS

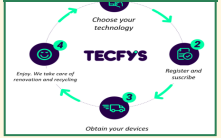
Pay-as-you-throw (PAYT) schemes for waste generation

Technology for Waste Collection Optimization



Automated glass recovery for waste treatment plants

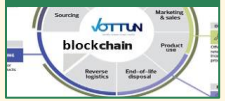
TECFYS



The connected infrastructure solution

Smart Plant Manager for Utility Scale Photovoltaic Plants

Traceability system with blockchain technology for the circular economy



Research and development of innovative greases

5G network platforms and research for circular economy applications

Bioplastics for the industry growth

The Greenest Tissue paper in the world

Generation of activated carbon from waste products

Circular Agronomics

Nutrient2Cycle

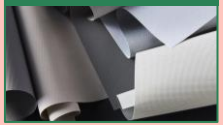
HOME ◄ SDGs

Design industries

Circular Tuva towels

Reuse and recycling of clothing, accessories and footwear

Sun protection, for curtains and blinds



Substitution of halogenated flame retardants

Substitution of fluorinated chemistries in water and oil repellent products

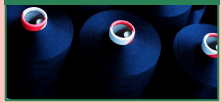
Advanced photocatalytic textiles to mitigate air pollution in cities

Manufacture of recycled high-quality yarns

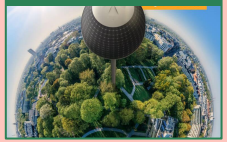
Manufacture of recycled colored yarns

Reuse your jeans!

Continuous filament production of synthetic yarn



Solar HUB



Optimization of textile waste management

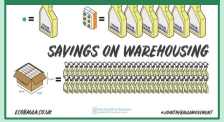
HOME ◄ SDGs

Packaging

Smart packaging to ensure quality and cut down food waste.

Glass Recovering Revolution

Cleaning products in a tablet



Compostable coffee capsules

Technology to reduce printers' impact on the environment

A bio-based recyclable packaging

OIMO

A more circular plastic packaging value chain

Sustainable Packaging

Continuous filament production of synthetic yarn

Build environment

Innovating in Construction Market by Using Recyclable Materials

Shift towards a circular economy for the housing sector

New material formulated with electric-arc furnace

New Materials formulated from residues for the construction sector

Filled of ditches with reused aggregate

Photovoltaic panels that work without sunlight

New valorization alternatives for WWTP waste

Solar HUB

Education

Methodologies for the practical implementation of Circular Economics

Circular Economics Training Course

Circular Economy Chair

Professional Training in Circular Economy

Methodologies for the practical implementation of Circular Economics

Circular Economy in the productive model

The Challenge

✓ Recovering PET waste in order to reintroduce it into a new production cycle as raw material.

Innovation/Solution

✓ Train professionals in the field of circular economy, a broad topic in which all socio-economic sectors are interrelated.

✓ Explore possibilities to apply the concept of circular economy in a practical way in different sectors of activity.

✓ Show methodologies for applying the circular economy to both industrial and consulting businesses.

✓ Give the tools to show the competitive and economic advantages of applying circular economy measures.

✓ Show real experiences that bring us closer to the circularity of the economy. Plastic waste reduction, avoiding ecosystem damages

Partner

COAMB
Col·legi d'Ambientòlegs de Catalunya

Barcelona, Online Course

KPIs

To explore the possibilities to apply the concept in different sectors of activity, such as:

✓ Industrial symbiosis and life cycle analysis.
✓ Eco-labeling and Eco-design.
✓ Sustainable logistics, digitalization, and new business models.
✓ Waste prevention, recycling and upcycling.
✓ Economic incentives and financing.
✓ Perspectives of this change in the paradigm of the current production model.

SDGs impact

+ INFO

Circular Economics Training Course

How to transform waste into resources

The Challenge

- ✓ Industrial companies and society in general need to change the way they work to go from a linear to a circular economy, following the guidelines set by the European Union.

Innovation/Solution

✓A postgraduate degree was created to teach engineers and technicians the latest updates, regulations and technologies to make possible the circularity. Sustainability, energy, innovation in new materials and waste are the bases of the program. The methodology is based on real exercises and the participants can also visit industries with best practices in circular economy.

Benefits

- ✓ The participants of the program can apply immediately their new knowledge in their companies, and they can accelerate the transformation to a new economy.

Partner

Enginyers Industrials de Catalunya Barcelona

KPIs

Different studies areas:

- ✓ Industry
- ✓ Energy
- ✓ New materials
- ✓ Construction

- ✓ **168 h**
- ✓ **43 specialized teachers**
- ✓ **6 technical visits**

SDGs impact

+ INFO

Circular Economy Chair

Tecnocampus Mataró Chair

The Challenge

- ✓ To provide technical support to the local bodies in their way towards the circular economy
- ✓ To train and empower change makers that will lead the transition to a circular economy.
- ✓ To become a shared space for academy, industry, public sector and society to set and share goals for action.
- ✓ To generate new knowledge, methodologies and technologies to enable the needed change

Innovation/Solution

Research and Training activities considering the Circular Economy challenge, in the main areas of:

- Business, economy and social science
- Engineering and technology

In company courses to incorporate circular economy strategies and tools.

Transfer services to define specific solutions to companies and public bodies.

Integration of a university campus and a business and technology park to enable business activities.

+ INFO

Partner

Càtedra d'Economia Circular i Sostenibilitat

TecnoCampus

Universitat Pompeu Fabra Barcelona

Mataró

KPIs

- ✓ TCM graduated students are trained on sustainability and embedded in the new paradigm
- ✓ TCM is intended to foster the move towards a local more sustainable model
- ✓ As a living lab, will provide scalable lessons to other bigger and complex territories

SDGs impact

Professional Training in Circular Economy

Postgraduate in Circular Economy: Tools, Strategies & industrial Innovation

The Challenge

✓ To train and empower managers and other change makers, with the ability to incorporate strategic, technological and managerial visions in the new paradigm of Circular Economy.

Innovation/Solution

The postgraduate degree in Circular Economy aims to train professionals to give concrete and measurable answers and circular solutions to companies and institutions, considering the sustainable development as an opportunity. It gives a general and strategic overview, as well as implementation tools and best practices and networking channels with most relevant circularity practitioners.

Its is a 19 ECTS program.

Benefits

✓Empower the new role of *Chief of Sustainability Officer* as an strategic advisor for competitiveness trough Circular Economy

Partner

UNIVERSITAT POLITÈCNICA DE CATALUNYA
BARCELONATECH
School of Professional & Executive Development

Barcelona

KPIs

✓ Provides knowledge, tools and strategies to professionals who need to lead innovation processes in companies under the new context of Circular Economy.

✓ Provides the guidelines to turn current challenges (scarcity of resources, emerging regulations, etc.) into new opportunities (cost reduction, business positioning, innovation in business models, competitiveness and resilience, etc.).

SDGs impact

+ INFO

EXPLORE CIRCULAR ECONOMY USE CASES

CIRCULAR ECONOMY VERTICALS

1. WATER

Water is essential to life and considering the current trends in population growth and urbanization, it is critical to develop ways to use it more efficiently to reduce consumption as well as mechanisms to reuse and recycle such an important resource.

A holistic approach to the water cycle management together with real time information and intelligent automation provided by ICTs and the Internet of Things can enable a better use of water, reducing losses and consumption as well as ensuring the quality of the water. Although we are making steps forward in treating water and safely returning it to the system, the creation of a truly circular economy will eventually require even more radical solutions

Filled of ditches with reused aggregate

Sant Feliu Reuse

Public- private collaboration for implementing circularity

Cost-effective industrial wastewater treatment

In situ soil and aquifer remediation of TPH and metals

Next generation water systems

Re-designing the value and supply chain of water and minerals

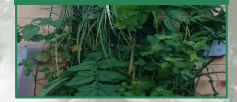
Moving bed biofilm reactor–membrane bioreactor

SIM4NEXUS

New electro purification techniques for industrial effluents

Eco-efficient solution for nitrate/ammonia polluted water treatment

Hybrid technology coupling green walls and microbial fuel cells (MFC)



1. WATER

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Hybrid electro-oxidation and ozonation for wastewaters

Bioremediation of contaminated aquifers

Sustainable water filter to purify and analyze tap water

Compact and modular tertiary water reclamation system

Advanced Decision Support System for Optimal Irrigation

Chemical, Energy and Water Industries / Build Environment

Filled of ditches with reused aggregate

Circular economy: encourages reuse criteria

The Challenge

- ✓ Reuse with earth extracted from the works for the filling of the ditches, avoiding the environmental impacts in the landfills and in the quarries.

Innovation/Solution

Obtain the Environmental Quality Assurance badge from the Department of Territory and Sustainability that recognizes products and services that meet environmental requirements beyond the regulations, from a rejection from street works.

Benefits

- ✓ Decreased environmental impact
- ✓ Saving energy resources
- ✓ Reduction of the carbon footprint

Partner

Aigües de Barcelona

City Case: Barcelona

KPIs

- ✓ **84.17% of the soil** used at Aigües de Barcelona street works has been reused
- ✓ **Minimization** of landfill disposal.

SDGs impact

+ INFO

Sant Feliu Reuse

Boosting new reclaimed water uses in the city of Sant Feliu de Llobregat

The Challenge

- ✓ Benchmarking of two alternative reclamation technologies to the existing treatment train, in order to promote new water uses for municipal and industrial applications in the area.

Innovation/Solution

Based on a theoretical evaluation of circular economy opportunities in the area of Sant Feliu, high potential in water reuse was identified for municipal and industrial water demands. The existing reclamation train is composed by a gravity media filter followed by UV lamps, nevertheless it presents limitations in terms of turbidity and suspended solids removal, both key parameters. During one year, a pilot plant was operated and monitored in the WWTP to demonstrate the benefits of two alternative technologies: ultrafiltration and pressure media filter, and assess them from a technical and economic point of view.

Benefits

- ✓ To meet water quality regulations.
- ✓ Cost-efficient treatment. Does not generate any waste or intermediate products.

+ INFO

Partner

Aigües de Barcelona
La gestió responsable

Ajuntament de Sant Feliu de Llobregat

CETAQUA
WATER TECHNOLOGY CENTER

City Case:

Sant Feliu de Llobregat (Barcelona)

KPIs

- ✓ Removal of **>95%** of suspended solids and turbidity, and **total removal** of microbiological load.
- ✓ **Inclusion of new water uses**: toilet flushing, private gardens irrigation and industrial reuse
- ✓ Pressure media filter presents **45-50% lower** CAPEX and **50% lower** OPEX than ultrafiltration.

SDGs impact

Public- private collaboration for implementing circularity

Circular economy territorial model fostering water reuse for non-potable uses

The Challenge

- ✓ Achieving sustainable water management through the implementation of a circular resource model in the context of climatic emergency.

Innovation/Solution

Development of a co-designed Circular Economy Territorial model for Gavà between the City Council, the Water Utility and the Water Technology Centre.

The innovative methodology is based on the analysis of water, energy and materials input and output flows of different territorial actors: the City Council, the utilities, 15 different industries, natural and agricultural areas and other administrations with competences at regional level. It uses active participation and consultation as a crucial point to achieve the required engagement.

Benefits

- ✓ 10 circular economy opportunities for closing the resource loops and achieving resource efficiency.
- ✓ Opportunities for water reuse from the local Wastewater Treatment Plant as an alternative source of water supply.

+ INFO

Partner

Aigües de Barcelona · Ajuntament de Gavà · CETAQUA WATER TECHNOLOGY CENTER

City Case: Gavà

KPIs

- ✓ Potential for reusing a minimum of **3.287.167 m^3 a year** of treated waste water for urban, industrial and agricultural uses.
- ✓ Potential for **substituting 50% of potable water** used in the urban context.
- ✓ Measurement of the value driven innovations through a **specific set of indicators for assessing the transition to a circular model** in Gavà.

SDGs impact

6 CLEAN WATER AND SANITATION

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

17 PARTNERSHIPS FOR THE GOALS

Cost effective bacterial for industrial wastewater treatment

Radically innovative bacterial treatment for recalcitrant industrial wastewater

The Challenge

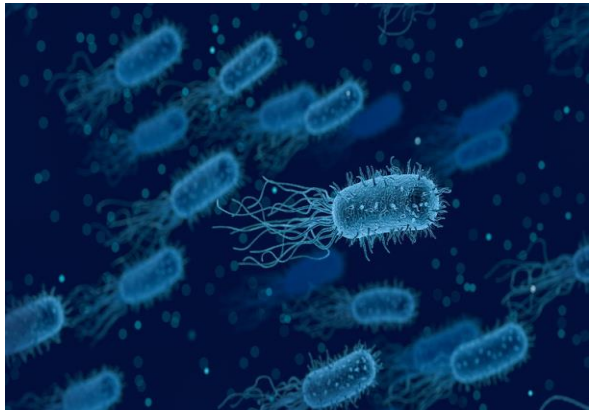
- ✓ Develop a cost-effective wastewater treatment that can decompose the hazardous products present in heavily contaminated industrial waters.

Innovation/Solution

(Project RIBATI GA 945638) biotechnological system that eliminates the pollutants contained in industrial wastewater at a cost significantly lower than the methods currently used. The innovative solution allows the activation, dosing and intelligent monitoring of the entire industrial process. At the end of the process we obtain up to 90% clean water that can be reused in the production process or discharged directly into the public water network without the need for additional treatments. The treatment is compatible with others and it can be incorporated in any phase of the current treatment system.

Benefits

- ✓ Reduce the expenses dedicated to the treatment of industrial wastewater from production processes



Partner

Amapex
smart enviro treatments

KPIs

- ✓ The treatment can provide **savings of up to 59%** in treatment and/or consumption expenses.
- ✓ **Highly compatible,** it can be incorporated in any phase of **the current treatment system.**

SDGs impact

6 CLEAN WATER AND SANITATION

+ INFO

In situ soil and aquifer remediation of TPH and metals

A combination of techniques that optimizes time, energy and water consumption

The Challenge

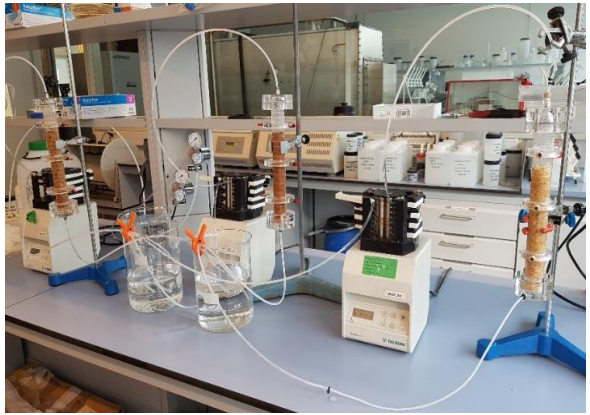
- ✓ The on-site remediation of soils contaminated by hydrocarbons and metals and thus reduce waste and optimize the use of water.

Innovation/Solution

The Ribas project develops a technology for in situ treatment of soils contaminated with TPH and metals. It aims at treating groundwater and reduces energy and attemps to recycle all water invoved. The project is now in a prototyping phase and aims to be implemented in heavily polluted sites, with particular emphasis in areas where soil excavation needs to be minimized.

Benefits

- ✓ Reduces chemical discharges in the environment
- ✓ Minimizes air emissions of volatile compounds
- ✓ Optimizes energy consumption
- ✓ Reduces overall project budget



Partner

AMPHOS 21
SCIENTIFIC AND STRATEGIC ENVIRONMENTAL CONSULTING

eurecat
Centre Tecnològic de Catalunya

KPIs

- ✓ Treats **TPH and metals** combined.
- ✓ **Minimizes** site surveillance
- ✓ Applicable to **multiple contaminants sources**

SDGs impact

+ INFO

Next generation water systems

Challenging embedded thinking in the water sector

The Challenge

- ✓ Include water in important circular economic cycles, R&D and innovation projects.

Innovation/Solution

NextGen project aims at accelerating, transfer and upscale circular economy practices worldwide by sharing our collective experiences and insights in citizen and stakeholder engagement, business models and services. A marketplace and targeted development of spin off activities will commercialize effective solutions. The project comprises a strong partnership of water companies, industry, specialized SMEs, applied research institutes, technology platforms, city and regional authorities. For each of them, NextGen builds on an impressive portfolio of research and innovation projects.

Benefits

- ✓ Optimize water resources
- ✓ Manages and recovers energy more efficiently.

Partner

eurecat
Centre Tecnològic de Catalunya

Agència Catalana de l'Aigua

KPIs

- ✓ **40%** decrease in membrane cost.
- ✓ **30%** increase in permeability
- ✓ **Increase** in available resources (water, nutrients, energy)
- ✓ **Decrease** in wastewater treatment cost

SDGs impact

+ INFO

Re-designing the value and supply chain of water and minerals

Wastewater Recovery Economy

The Challenge

- ✓ Recover high quality and sufficient purity end products with good market value

Innovation/Solution

This project aims to facilitate the implementation of the Circular Economy package and the SPIRE Roadmap in various process industries by developing the necessary concepts, technological solutions and business models to re-design the value and supply chains of minerals (including magnesium) and water, while dealing with present organic compounds in a way that allows their subsequent recovery. To achieve this, technologies such as nanofiltration using regenerated membranes, eutectic freeze crystallization, forward feed evaporation and electrodialysis with bipolar membranes are being evaluated.

Benefits

- ✓ Minimizes the environmental impact of industrial operations through brines (ZERO BRINE).
- ✓ Higher resource availability.
- ✓ New Business models.

+ INFO

Partner

eurecat
Centre Tecnològic de Catalunya

KPIs

- ✓ Includes **22 partners from research institutes**, construction companies, **and end-users from 10 countries.**
- ✓ **50%** decrease in water consumption
- ✓ **80%** decrease in salt discharge

SDGs impact

Moving bed biofilm reactor–membrane bioreactor

MBR-MBBR Hybrid System for Water Regeneration

The Challenge

✓ More efficient water regeneration.

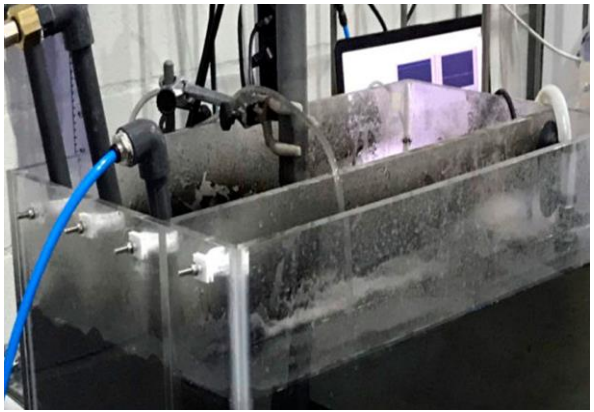
Innovation/Solution

The system combines the advantages of attached biomass reactors and membrane separation processes, including decrease of suspended solids due to the attached biomass growth, potentially decreasing membrane fouling in the MBR. Moreover, the growth of the biomass in biofilm instead of suspended flocs enables the decrease of the reactor volume creating a very compact technology. In general, fixed-film processes are less sensitive to environmental variations and, thus, to toxic compounds. The long sludge age in biofilms permits the growth of slow-growing bacteria and the removal of recalcitrant compounds such as micro-pollutans or coloured molecules.

Benefits

✓ Improve sustainability

✓ Reduce water fouling and optimize operating costs



Partner

eurecat
Centre Tecnològic de Catalunya

KPIs

✓ **80%** increase in recalcitrant contaminants removal.

✓ Less fouling tendency

✓ **Less cost** for wastewater treatment

SDGs impact

+ INFO

SIM4NEXUS

Towards a sustainable management of the Nexus, with a digital perspective

The Challenge

✓ New scientific evidence on cross domain sustainable, integrated and circular governance of recourses at different spatial scales (regional, national, European, Global).

Innovation/Solution

Shift from silos to systemic approach, to help understand complex and dynamic interrelationships between sectors.

Anticipation towards potential trade-offs and synergies supporting viable options across different sectors by promoting circularity paths among them.

Systematic process to understand circular interlinkages between resources (i.e. water, energy, food and land) under climate change.

Benefits

✓ Test the potential benefits of existing policies and near-term policy initiatives and how they relate to sustainability goals.

Partner

eurecat
Centre Tecnològic de Catalunya

KPIs

✓ Deployed as a **Serious Game tool** for testing and evaluating policy decisions. It integrates complexity science**, 7 thematic models and AI engines.** It is operable in 12 case studies across Europe.

SDGs impact

+ INFO

New electro purification techniques for industrial effluents

Efficiency for paper, chemical and tanning industries

The Challenge

- ✓ Innovative technologies based on electro purification techniques to reduce the costs associated with the management and treatment of residual effluents from the paper, chemical and tanning industries.

Innovation/Solution

The electro-purification techniques includes process that employ the electricity for the separation of ions and/or for the generation of chemical reagents able to purify wastewaters: electro-oxidation in situ (EOS), oxidation of electro-generated compounds (OEG), electro-coagulation (EC) and electro-dialysis (ED).

Benefits

- ✓ Reduce energy consumption of electro-purification systems
- ✓ Decrease water consumption in the paper, chemical and tanning industry

Partner

eurecat Centre Tecnològic de Catalunya

ELDE COMUNITAT AIGUA

UPC

KPIs

- ✓ Improving the quality of the treated effluents: **Up to 50% of organic matter removal. Colour removal up to 100%.**
- ✓ Depending on the productive process, reuse of the treated effluent.
- ✓ Development of a more efficient power supply: **10%** reduction in energy consumption.
- ✓ Reduction of the carbon footprint by **50%** in comparison to the technologies currently used.

SDGs impact

+ INFO

Eco-efficient solution for nitrate/ammonia polluted water treatment

Up-scaling, demonstrations and market applications

The Challenge

- ✓ Provide access to clean water for everybody at an adequate cost.
- ✓ Wastewater depuration without waste stream.

Innovation/Solution

Hydrokemos demonstrated in 2018 and commercialized the first fully clean equipment to purify nitrate/ammonia polluted water.

In the EU +20% of groundwater is contaminated by nitrates due to the use of fertilizers that have been and still are extensively applied in agriculture. On the other hand, demand for freshwater is increasing by 64 billion cubic meters every year. Groundwater is essential for meeting this increasing demand and existing solutions to purify it are highly inefficient and/or produce dangerous residues.

Benefits

- ✓ No waste production, Zero Drop technology.
- ✓ 99 % energetical cost.
- ✓ Fully automated plants

Partner

HYK

VICTORIA Venture Capital

SMEs in HORIZON 2020

FINANCIADA POR ENISA

MINISTERIO DE INDUSTRIA, ENERGIA Y TURISMO

cimaigua

KPIs

- ✓ Simple **electrochemical patented process.**
- ✓ **100% conversion** from nitrate/ammonia to nitrogen gas.
- ✓ **Over 10 years of investigation** to develop this technology

SDGs impact

3 GOOD HEALTH AND WELL-BEING

6 CLEAN WATER AND SANITATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

+ INFO

Hybrid technology coupling green walls and microbial fuel cells (MFC)

Mild wastewater treatment and energy producing technology

The Challenge

✓ Natural wastewater treatment and renewable energy supply.

Innovation/Solution

The electro green wall technology focuses on putting together plants and electroactive microorganisms to treat wastewater and to harvest renewable energy. Wastewater treatment and energy recovery are the dual outcomes of this coupled technology.

Organic matter removal is similar or higher to a conventional green wall, and can decrease the surface treatment area, reduce greenhouse gases emission, avoid clogging. In terms of energy output, the obtained electricity allows feeding water quality sensors for process monitoring

Benefits

✓ The use of greywater allows reducing tap water for irrigating the green wall, and reclaimed water can be obtained.

COMUNITAT AIGUA

WATERTUR
COMUNITAT AIGUA

Partner

LEITAT Technological Center
managing your technologies
member of TECNIO

KPIs

✓ The integration of MFC allows a **50% increase on organic matter removal**

✓ Power supplied by MFC can achieve up to **3,2 W·m-2**

✓ Hydraulic retention time can be reduced up to **3 days**

SDGs impact

6 CLEAN WATER AND SANITATION

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Hybrid electro-oxidation and ozonation for wastewaters

Removal of emerging compounds in hospital wastewater

The Challenge

- ✓ Presence of recalcitrant contaminants of emerging concern in wastewaters, such as pharmaceuticals in hospital wasteawater.

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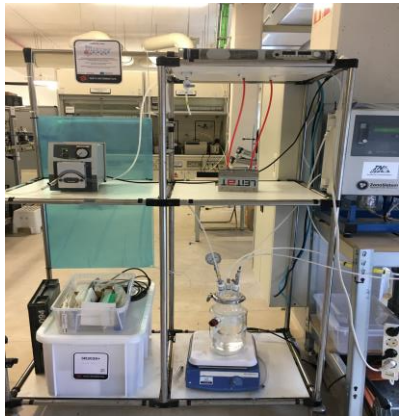
Innovation/Solution

Electro-oxidation is based on the electro-generation of non-chlorinated oxidant species, which can disinfect the water while also removing recalcitrant compounds. Its combination with ozonation allows increasing the treatment efficiency while reducing the appearance of chlorinated byproducts.

Benefits

- ✓ The combination of electro-oxidation and ozonation could be applied not only to hospitals wastewater but also as tertiary treatment in urban wastewater treatment plants, allowing the removal of emerging compounds for sale effluent discharge.



COMUNITAT AIGUA

EFLUCOMP

COMUNITAT AIGUA

Partner

LEITAT Technological Center

managing your technologies

member of TECNIO

KPIs

- ✓ **> 95% removal of pharmaceuticals** present in hospital wastewater
- ✓ **50% reduction of chemical reagents** in the wastewater treatment process

SDGs impact

+ INFO

Bioremediation of contaminated aquifers

Sustainable solutions

The Challenge

- ✓ Use of innovative isotopic techniques and sustainable solutions for the decontamination of aquifers

Innovation/Solution

The research group of the University of Barcelona provides two solutions:

- ✓ Circular economy in the remediation of contaminated aquifers: Use of by-products of the food and construction industry in contaminant remediation. We have published studies on nitrates and chlorinated solvents.
- ✓ Bioremediation assessment: diagnosis and quantification of natural attenuation, and induced bioremediation in contaminated aquifers.

Benefits

- ✓ Bioremediation amplifies natural biological actions to remediate pollution.
- ✓ Lower costs, maintenance, operational costs and less disruption of the contaminated environment.
- ✓ Increased remediation cost-benefit.

+ INFO

Scientific and Technological Centres for the University of Barcelona

Partner

MAiMA ISÒTOPS ESTABLES I MINERALOGIA

KPIs

- ✓ More than **200 scientific publications 50 R&D&** projects with companies.
- ✓ Different **contaminant classes amenable**: nitrates, sulfates, pesticides, chlorinated organic solvents, BTEX, PAHs, oxygenated fuels, etc.
- ✓ More than 20 years experience in isotope geochemistry.
- ✓ Analytical methods for δ13C, δ2H, δ15N, δ34S, δ18O, δ37Cl.

SDGs impact

Food Industries & Agriculture

Sustainable water filter to purify and analyze tap water

Purify and analyze tap water

The Challenge

- ✓ Reduce the environmental and economic impact of drinking bottled water.

Innovation/Solution

After 2 successful product launches, TAPP Water is developing a new filter system that provides the cleanest and best tasting tap water in the world: TAPP X, combining the best of Scandinavian design, German engineering and Spanish water filtration expertise

With this innovative product, the company intends to alter consumers' behaviour once and for all by taking away prejudices about (filtered) tap water in the form of an evidence-based approach. In addition, we will use this data to inform water providers and municipalities about tap water quality in their area.

Benefits

- ✓ Providing affordable, clean drinking water to all.
- ✓ Creating awareness about water consumption and battling harmful plastic waste

Partner

TAPP WATER

KPIs

- ✓ The initially target about **62 million households in** Europe and North America.
- ✓ The short-term goal is to replace at least **10 billion bottles** by 2023.

SDGs impact

+ INFO

Compact and modular tertiary water reclamation system

Innovative and highly efficient system with low OPEX&footprint

The Challenge

- ✓ To develop a solution to produce high quality reclaimed water as alternative resource for non-drinking purposes with low operational costs and infrastructure needed

Innovation/Solution

The main innovation is the efficient combination of high performance, resilient and proven technology with low OPEX filtration (Cloth media filtration) with robust and advanced design UV disinfection step on a single and compact unit.

The solution is flexible in terms of effluent quality requirements with different system configuration (customization) depending on the necessary reclaimed quality according to the intended use (E.g. agricultural irrigation, golf course irrigation, environmental use or firefighting).

Benefits

- ✓ Safe reclaimed water at a maximum yield
- ✓ Minimum operational costs (OPEX)
- ✓ Minimum infrastructure needed

Partner

KPIs

- ✓ Demonstrated concept in urban and industrial effluents with mid-size pilot plant. **Firsts systems in operation**
- ✓ Integration time is dramatically reduced. Plug and play-like concept. **Reclaimed water in weeks to months**
- ✓ No need for pre-treatment or chemicals. Compared to conventional systems, **OPEX reduction from 30% to 50%**

SDGs impact

+ INFO

Advanced Decision Support System for Optimal Irrigation

Saturas' precision irrigation systems: efficient water use to address the need

The Challenge

- ✓ Cutting-edge technologies to maximize crop yields and minimize the use of resources

Innovation/Solution

Current Solutions Are Limited: Climate-based Measures basic water needs only, need to base on local empirical data; Solutions Soil-based have high variability and limited accuracy; and the solutions Plant-based present indirect indicators, difficult interpretation, high variability and are expensive.

Stem Water Potential (SWP) technology Is better because have direct measurement from inside plant, physical parameter considered best indication of water status in many crops. This is possible through of a Sensor embedded into the trunk of trees in direct contact with the water tissues

Benefits

- ✓ Water savings estimated at 20% - 50% due to not over-watering. This also leads to a reduction in CO2 emissions from energy savings in the pumping process and an increase in crop profitability
- ✓ Control Fruit Size Apples, citrus, nectarine
- ✓ Control Wine quality - Monitoring quality of grapes
- ✓ Prevent Disease - Hull Rot in Almonds,, Fire Blight in Pear and more

+ INFO

Partner

TORRES 1870

Saturas
Decision Support System for Precision Irrigation

KPIs

- ✓ Won **1.5M Euro** grant from the European Commission, Horizon 2020 SME INSTRUMENT
- ✓ Water savings estimated at **20% - 50%** due to not over-watering.
- ✓ Demonstrated the technology in **Spain, California, Israel & South Africa**
- ✓ **Main crops:** Apple, Almond, Citrus, Walnuts, Wine Grapes.
- ✓ **New Crops in trials:** Pear, Cherry, Peach, Prune, Avocado.

SDGs impact

2. WASTE

Waste management is part of the transition towards a circular economy. Reducing the amount of waste generated and revaluing it, will ensure that waste is managed effectively. Poor quality and poorly designed products with unnecessary packaging result in higher volumes of material ending up in the waste stream. Improving the design of products to be reusable, repairable and recyclable, and optimizing packaging can make a significant contribution to waste avoidance, which is, of course, at the top of the waste hierarchy, above recycling and re-use.

For instance, the use of sensor information to improve management of collection systems, increasing efficiency of recycling patterns or using waste as a means of obtaining energy are some of the existing mechanisms to achieve a more sustainable waste cycle.

Modular thermoelectric system for industrial waste heat

New valorization alternatives for WWTP waste

Manufacture of recycled products with the contribution of renewable energy

Circular Tuva towels

Surgical clothing reuse

Processing plant for optimal production of Protein

Solid State Fermentation

Transformation of EAF slag into high security asphalts

Recycled plastics from end of life vehicles waste

Recyclable waste selection

Optimization of textile waste management

PET waste recycling

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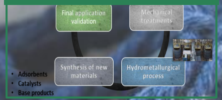
Smart packaging to ensure quality and cut down food waste.

Liquid waste treatment by Zero Liquid Discharge (ZLD) systems

Transforming imperfect products into opportunities

Obtaining high value products for metal companies



Go Zero Waste APP

Design of Enzyme Technologies from Plant by-Products

Bio-based polymers for high-performace applications

Circular Agronomics

Nutrient2Cycle

Turning sewage sludge into fuels and hydrogen

Sutainable Jet fuel from flexible waste biomass

Pay-as-you-throw (PAYT) schemes for waste generation

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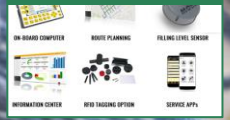
Technology for Waste Collection Optimization



Automated glass recovery for waste treatment plants

Glass Recovering Revolution

Materials recovery processes

TECFYS

Thermowaste, the complete solution to end landfills

A mobile app to reduce food waste from stores and establishment

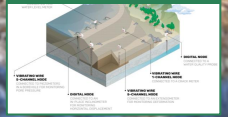
From the almond skin to a cholesterol reduction

Organic waste transformation into bioplastics using bacteria

Reuse and recycling of clothing, accessories and footwear

Sun protection, for curtains and blinds

The connected infrastructure solution



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Edible Insects as Sustainable Food Alternative

Sustainable Packaging

TERRARI

Modular thermoelectric system for industrial waste heat

Convert "Waste Heat" into useful electrical energy

The Challenge

✓ Reduce the waste heat (WH) as a pollutant for the atmosphere.

Innovation/Solution

HEAT-R proposes a new solution allowing the direct conversion of WH into electricity. This solution is aimed to improve energy efficiency and reducing the CO^2 footprint of the industry, as well as expansion of the Industry 4.0 paradigm, converting waste heat into electrical energy. It is a modular unit using multiple Thermo Electrical Generation cells associated and controlled through a programmable control unit based on System-on Chip technology, overcoming actual limitations.

Current prototypes have been validated in relevant environments and one of the main objectives is now to scale up and adapt them to specific industrial requirements.

Benefits

✓ Convert waste into electricity, making companies processes as circular as possible, saving money and contributing to the environment

+ INFO

Partner

AEInnova
Alternative
Energy Innovations

KPIs

✓ **Large power** generation **capacity**

✓ **Fully scalable system** and **reliable**

✓ Industry EU Consumption **3200 TW/year**

✓ Industry EU Waste Heat **1820 TW/year** (≈ 60%)

✓ Economical Impact **2100 M€**

✓ Ecological Impact **7200 TCOe**

SDGs impact

Chemical, Energy and Water Industries / Build Environment

New valorization alternatives for WWTP waste

Characterization of waste generated in WWTP and valorization proposal in Barcelona area

The Challenge

- ✓ New waste management model towards its valorisation and circular economy.

Innovation/Solution

Take advantage of the characteristics of waste in order to convert it into a valuable product. Screeenings contain mostly organic matter that can be valorized by:

- ✓ Thermal treatment for energy production.
- ✓ Anaerobic digestion producing biogas and energy.
- ✓ Sands are mostly inorganic material that can be valorized as:
- ✓ Construction material
- ✓ Structuring material in compost or technosols

The conditioning needs to adequate the waste for the valorization process have been determined and taken into consideration selecting the most feasible one.

Benefits

- ✓ Transforming a waste into a valuable product or energy.
- ✓ Reduce landfill disposal.

+ INFO

Partner

Aigües de Barcelona

CETAQUA WATER TECHNOLOGY CENTRE

City Case: Barcelona

KPIs

- ✓ Reduction of waste management costs up to **50%**
- ✓ Minimization of landfill disposal

SDGs impact

6 CLEAN WATER AND SANITATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

Chemical, Energy and Water Industries / Food Industries & Agriculture

TERRARI

Recovery of critical materials from waste

The Challenge

- ✓ Design and optimize a process for the extraction and geochemical recovery of scandium from shells from the food industry and other waste from other sectors.

Innovation/Solution

The TERRARI Project wants to achieve the:

- ✓ Characterization of the presence of scandium and other materials in industrial wastes.
- ✓ Design and implementation of techniques for the recovery of scandium, TRs and calcium-rich compounds from these wastes.
- ✓ Evaluation the environmental and economic impact of the recovery processes.

Benefits

- ✓ The use of scandium, as well as all the elements of the Rare Earth group, has taken on great relevance in recent decades due to the rise of new technologies, as well as in many other industrial fields.

Partner

AMPHOS 21

SCIENTIFIC AND STRATEGIC ENVIRONMENTAL CONSULTING

KPIs

- ✓ It is expected to **model the experimental** results geochemically.

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Manufacture of recycled products with the contribution of renewable energy

Paper, fruit of a great passion for recycling

The Challenge

- ✓ Not only to continue being manufacturers of 100% recycled, recyclable and reusable products from waste but also helping the end users of our products to be more sustainable.

Innovation/Solution

- ✓ Alier developed a technology to obtain paper pulp from recovered paper and cardboard, including some types that are very difficult to recycle, such as moisture resistant papers, cardboard for liquids, plasticized, complexes with aluminum, glued papers and other materials.
- ✓ Our technology and way of working have the endorsement of the following certifications: ISO 9001/2015, ISO 14001, PEFC, FSC® and Isega Certifications.

Benefits

- ✓ Use of the biogas generated in the treatment plant as a new energy source.
- ✓ Recovery of the waste generated through agricultural application.

+ INFO

Partner

Alier/sa

KPIs

- ✓ More than **300.000 tons of paper and cardboard** are recycled. They are working to recycle 12.000 tons of plastic per year.
- ✓ To produce **24 thousands tons of healthy paper** (antifungical paper) for construction industry.
- ✓ Production of **15.000 tons of 100% recycled paper** for bags, so as to replace in the market the consumption of plastic bags.

SDGs impact

Circular Tuva towels

Collecting the disused towels and turn them into industrial cloths.

The Challenge

✓ Manufacture of towels incorporating recycled raw materials (polyethylene terephthalate, or PET).

Innovation/Solution

Gyms throw out about 80% of their towels annually, representing a huge amount of waste. Arpe Barcelona, a manufacturer of technical fabrics, has developed an alternative microfiber towels that include a repurchase option at the end of their useful life.

With collaboration with DIR gym chain for the recovery of its disused towels, ARPE transforms into eco-designed cloths approved for industrial cleaning. And I agree with the cleaning company SIRSA to use these rags.

Benefits

✓ Apart from using recycled raw materials, many more can be used in a wash towels, with the consequent saving of soap, electricity and water.

Partner

Arpe®

KPIs

With this system can **save 168 tons of CO2,** 1,722 m2 / year of textile waste and **300kg / year of fabric** with the new packaging between 2018 and 2020.

SDGs impact

+ INFO

Health, Well-being and Life Sciences Industries / Chemical, Energy and Water Industries

Surgical clothing reuse

Eco-friendly integral health care solutions

The Challenge

✓ Achieve sustainability reducing waste in the healthcare system.

Innovation/Solution

With the aim to face the new EU regulation to comply surgical coverage with specific properties to be more aseptic, AXIOMA has developed the STERIPAK, a reusable fabric that substitutes disposable products in the OR. It is an eco-innovative, circular, reusable and sustainable solution. Once the reusable surgical coverage reaches the end of its cycle, it is reused as a raw material for other functions.

The company has the license, modern facilities and highly automated machinery that allow them to offer both standardized and personalized solutions.

Benefits

✓ Less waste in every surgical procedure

✓ Highest quality textiles used in every surgical cloth

Partner

AXIOMA

www.axiomasolucions.com

KPIs

✓ Environmental impaction **reduction of 3-6 times less than a single use material**

SDGs impact

+ INFO

Processing plant for optimal production of Protein

New Decolourised Hydrolysed protein, completely natural and with a high nutritional value

The Challenge

- ✓ Our overall objective is to bring to the market a new solution which will not only reduce the environmental impact of produced in slaughterhouses but optimize the protein production process for animal and human feed purposes too, in a reliable and cost-effective way.

Innovation/Solution

- ✓ Our innovative HYDROBLOOD processing plant will make a difference within the current market worldwide, since it does not include cold nor heating treatments for the process of obtaining a new high-quality protein from slaughtered animal's blood.

Benefits

- ✓ With our innovative processing plant, the 100% of protein content can be recovered from animal's blood, and converted into a high added-value product

Partner

TALLERES AZUARA, S.L.

KPIs

- ✓ The treatment of a high polluting waste (and its associated costs) convert it into a high added value product that will suppose an **increase by around 5% in their annual turnover**
- ✓ Lower production costs: **(<1 €/kg)** and higher efficiency (19%) product obtained per liter of blood.
- ✓ Annual energy savings: Plant of **8 m3 blood / day → saving 70,000 kg CO2/year.**

SDGs impact

+ INFO

Chemical, Energy and Water Industries / Food Industries & Agriculture

Solid State Fermentation

Potentially sustainable technology

The Challenge

✓ Transform organic matter into value-added products

Innovation/Solution

The use of solid-state fermentation has been focused on obtaining different value-added products of substantial industrial interest, such as hydrolytic enzymes, polysaccharides, and biodegradable bioplastics as an alternative to that conventional petroleum-derived. These processes use agro-industrial wastes as low-cost raw materials, such as beer and grape bagasse or the olive-mill solid waste, from local industries requiring innovative solutions for the management of these solid wastes. This technology has also been used as an economical alternative to obtain compounds with biostimulant activity from underexploited sources such as sewage sludge, which would serve as a complement to the nutrients recovered from the same sewage facilities.

Benefits

✓ Low cost processing of a wide variety of waste with limited water consumption

+ INFO

Partner

Beta
BIODIVERSITAT, ECOLOGIA I TECNOLOGIA AMBIENTAL I ALIMENTÀRIA

KPIs

✓ **Energy savings up to 50%** (compared to liquid processes).

✓ **Water needs up to 70% lower** than in liquid phase.

✓ **Ability** to process a **wide range of solid organic wastes** (Versatility).

✓ **Easy integration** with existing technologies

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Transformation of EAF slag into high security asphalts

Generation of co-products for their high intrinsic value

The Challenge

✓ Return products to their lifecycle.

Innovation/Solution

Develop new techniques for the valorization and transformation of white slag in products with high added value and promote a sustainable and circular economy approach for use in other industrial sectors.

The valorization of white slag for the manufacture of new components or tools will help advance the reinvention of the Spanish steel sector as well as make Celsa Barcelona more competitive.

Benefits

✓ Recycling steel and transform it into a value-added product

Partner

CELSA GROUP

KPIs

✓ **240.000 tn** aggregates/year avoided extraction from natural sources

✓ **30%** waste avoided to send to landfill

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

+ INFO

Sustainable Mobility / Chemical, Energy and Water Industries

Recycled plastics from end of life vehicles waste

Innovative technologies from waste transformation into by-products

The Challenge

✓ Return products to their lifecycle.

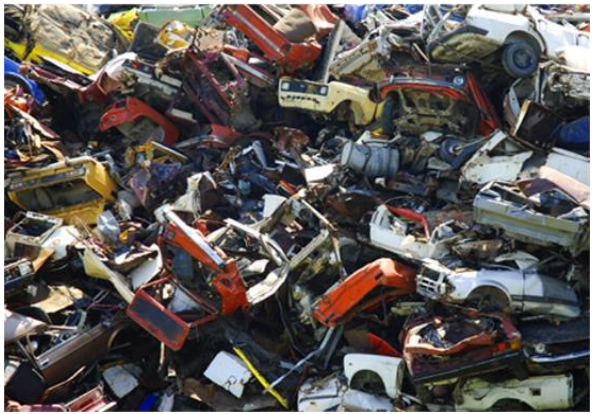
Innovation/Solution

Develop new techniques for the valorization of plastics from end of life vehicles waste.

Implementation of IR technology for visible plastic separation by type of plastics (PP, PE, PS, ABS) with more tha 85% accuracy.

Benefits

✓ Recycling end of life vehicles waste.



Partner

ferimet

CELSA GROUP

KPIs

✓ **15%** recycled waste from end life vehicles

✓ More than **85%** visible plàstics separation

SDGs impact

+ INFO

Recyclable waste selection

With advanced robotics

The Challenge

✓ Automating valuable waste sorting tasks

Innovation/Solution

Despite of the high automation level of sorting facilities, they still include some tasks where workers need to manipulate waste.

Aiming to improve health and safety as well as working conditions of our personnel, the WISE project seeks to develop and validate an innovative recyclable waste selection technology based on a robot equipped with artificial vision and artificial intelligence.

The project includes the design and development of the different components of the robotic prototype, such as the machine vision system, the machine learning and deep learning modules robotic grasping system and its supports..

Benefits

✓ Improving health and safety conditions in sorting tasks

✓ Increasing of valuable material recovery ratios

✓ Targetting “zero waste to landfill”

+ INFO

Partner

cespa

PICVISA OPTICAL SORTING

KPIs

✓ Production **50-60 picks/minute**

✓ **95 % availability**

✓ **Easily coupled** to existing processes, it works **24/7** in a large range of waste flows

✓ It boosts **efficiency, productivity and safety**- directly improving customers bottom line with higher product purity

SDGs impact

Optimization of textile waste management

From waste to resource that enters the cycle of the circular economy

The Challenge

- ✓ To classify and conditioning textile waste to obtain new fibers fulfilling the requirements of textile manufacturers in Catalonia.
- ✓ Establish an economic model and the bases of a framework agreement between the agents of the value chain.

Innovation/Solution

It is a demonstrative project of industrial symbiosis aimed to design a process that optimizes the recycling and recovery at a regional level (Catalonia) of the flow of clothing that the social economy company HUMANA currently allocates for recycling in Southeast Asian countries.

Textile waste has been separated by color and fibers. After non-textile elements removal and a crushing process, a recycled yarn in three different colors has been obtained.

Benefits

- ✓ A step towards sustainability and circular economy
- ✓ Reduction of CO_2 emissions thanks to the shift to a local approach.

+ INFO

Partner

cespa

HUMANA
Fundación Pueblo para Pueblo

Supported by Agència de Residus de Catalunya

KPIs

- ✓ **Upcycling** locally, within the same territory that generates the textile waste
- ✓ **Technical feasibility** of the obtained **secondary raw materials** within current textile facilities
- ✓ **Economic feasibility** under a **framework agreement** between the value chain stakeholders

SDGs impact

PET waste recycling

New secondary raw materials from PET packaging waste recovered in sorting plants

The Challenge

- ✓ Recovering PET waste in order to reintroduce it into a new production cycle as raw material.

Innovation/Solution

The factory has been designed to transform PET plastic waste bales, coming form sorting facilities, into a new secondary raw material called Ciklapet, wich is suitable for packaging and bottle2botlle applications in the food industry.

To achieve this goal the facility includes highly specialized equipment and cutting edge technology for classifying, conditioning and producing 8 mm flakes of different colour. Obtained Cicklapet has a suitable quality to be used as raw material for the production of new bottles and packaging for the food industry.

Benefits

- ✓ Reduction of GHG emissions and Carbon footprint
- ✓ Reduction on pressure on natural resources as well as promoting respect for the environment.
- ✓ Plastic waste reduction, avoiding ecosystem damages

+ INFO

Partner

circularis

cespa

KPIs

- ✓ Throughput production of **30,000 tons of rPET flake per year.**
- ✓ Circularis applies cutting edge technologies for an efficient consumption of water and energy.

SDGs impact

Smart packaging to ensure quality and cut down food waste

Quantitative and cost-effective mobile based solution

The Challenge

✓ Reduce food waste due to expiry date estimations, invasive quality control and cold chain breaks.

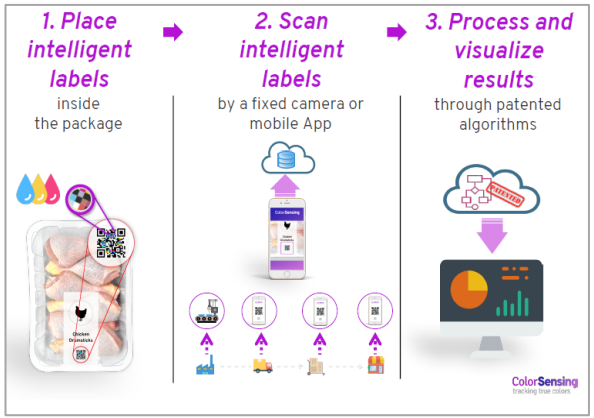
Innovation/Solution

An intelligent label for food packaging with QR code shape with only a few pixels containing smart inks, that change their color depending on parameters inside the food packaging to monitor freshness. The patented algorithms measure those parameters just taking a picture with a smartphone, been able to correct any color distortion that might occur. The solution is based in an innovative technology (TRL6) of a quantitative, multifunctional, cost-effective and non-invasive food freshness indicator to reduce food waste. In addition, The company has already found an ecosystem of industrial partners interested in the technology asking to develop prototypes up to a market-ready solution.

Benefits

✓ Better estimate expiration of packaged food, increasing in many cases the consumption period and reducing food waste

+ INFO



Partner

Color Sensing
tracking true colors

KPIs

✓ **Values** 100% controlled, non-invasive control, Packaging analysis, Avoid returns, Real info vs expiry date, cold chain break control.

✓ **Measuring** Packaging gases (CO_2 , O_2, Ripening gases (CO_2, O_2, amines, H_2S, ethylene, etc.) and Temperature.

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

Chemical, Energy and Water Industries

Liquid waste treatment by Zero Liquid Discharge (ZLD) systems

Treatment of liquid waste generated in all types of industrial activities

The Challenge

- ✓ To optimize the use of water in industry, promoting its reuse, and to recover primary resources contained in the wastewater thanks to the use of zero-discharge technologies.

Innovation/Solution

Our Zero Liquid Discharge solutions are designed for the treatment of industrial wastewater. The implementation of a ZLD system allows the companies to reuse the wastewater that they produce and to recover valuable resources that are dissolved in this liquid waste.

Benefits

- ✓ Elimination of a hazardous liquid waste.
- ✓ Water reuse.
- ✓ Recovery of valuable resources for its reuse or commercialization.
- ✓ Reduction of operational costs.
- ✓ Valuable resources can be recovered for its reuse or commercialization.

Partner

condorchem envitech
smart ideas for wastewater & air treatment

KPIs

- ✓ More than **95% of water is recovered** and can be reused.
- ✓ **Waste management costs** are practically eliminated.
- ✓ **Higher ROI** than conventional wastewater treatments.

SDGs impact

+ INFO

Transforming imperfect products into opportunities

Giving the fight for better food usage

The Challenge

- ✓ Reducing food loss and waste; guaranteeing the right to a healthy diet and creating job opportunities for collectives at risk of social exclusion

Innovation/Solution

Fundació Espigoladors is a non-profit organisation that contribute to reducing the food waste and losses while making the task of the primary sector visible, as well as raising awareness about the value of food.

Most of the fruits and vegetables that they collect are distributed to social entities in order to reach people who do not have access to them. They transform the other recovered produce in preserves while giving job opportunities to people at risk of social exclusion.

Benefits

- ✓ Empowerment of hundreds of committed farmers.
- ✓ Tons of food saved from going to waste.
- ✓ High awareness achieved in local communities.
- ✓ Provide access to healthy, nutritious food to people in vulnerable situations.

+ INFO

Partner

espigoladors

City Case: El Prat de Llobregat

KPIs

- ✓ **2.525.516 portions served** (300 gr.)
- ✓ **816 tons** of food saved
- ✓ **431 tons of CO2** avoided emissions
- ✓ **503 millions** of litters of water saved

SDGs impact

Obtaining high value products for metal companies

Increasing the environmental and economic benefits through innovative technological schemes

The Challenge

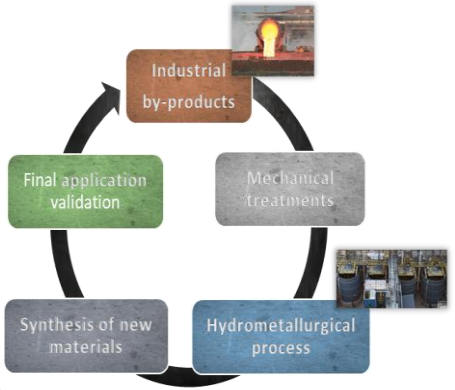
- ✓ Develop new processes to transform waste into new products, adding new fluxes to the circular economy, avoiding waste management costs (economical and environmental) and considering waste as a secondary raw material.

Innovation/Solution

Inorganic waste rich in metal silicates is landfilled or valorized in low valued applications. Using an innovative hydrometallurgical process, it is possible to obtain high value materials such as adsorbents or catalysts from the residue in a zero waste scheme. The process is applied to industrial metal companies for the valorization of their by-products.

Benefits

- ✓ Reduce waste management cost and impact.
- ✓ Synthetize new commercial products.
- ✓ Opportunity for new business models.
- ✓ Contribute to the circular economy. Reduce the need of primary raw materials.



- Adsorbents
- Catalysts
- Base products

Partner

eurecat
Centre Tecnològic de Catalunya

KPIs

- ✓ Up to **90%** metal fraction separation
- ✓ Synthesis of adsorbents with more tan **90%** purity
- ✓ Turn waste management costs in net profits with payback time **3-7 years**
- ✓ **10-30% reduction** on environmental impact associated with current practices

SDGs impact

+ INFO

Sustainable Packaging

GC Tissue Range

The Challenge

- ✓ Increase product sustainability focusing on packaging and package for our tissue products, both for mass market and professional sector:
- ✓ Solution applicable to all product ranges and current manufacturing process.
- ✓ 100% raw material renewable, recyclable or compostable.
- ✓ 100% containers and packaging plastic / materials recyclable / compostable.
- ✓ Target: 47% reduction in virgin plastic 2020 (680 tons)

Innovation/Solution

4 solutions implemented:

- ✓ New generation of stretch film that thanks to its high number of layers increases performance
- ✓ Recycled plastic with different % (between 50%-70%) for different product applications
- ✓ 100% home compost film.
- ✓ 100% recyclable kraft boxes.

Benefits

- ✓ Reduction of virgin plastic, Increase plastic circularity (the recycled plastic comes from supermarkers and hypermarkets) ,Compost, Reduction of the whitening of the carton boxes (less inks)

+ INFO

Home compost film.
Brand: mytissue ecologic+.
100% recycled tissue paper for mass market

Recycled plastic packaging.
Brands: GC ecologic+ and Nature.
100% recycled tissue paper for professional sector

Home compost film.
Brand: GCClass
100% compostable airlaid napkin for professional sector

Partner

GC GOMA-CAMPS

City: La Riba, Tarragona

KPIs

- ✓ New compostable film
- ✓ Recycled plastic from 50-70%
- ✓ New generation of stretch film

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Go Zero Waste APP

Enabling local, sustainable and waste-free consumption

The Challenge

- ✓ Facilitate the way for a more sustainable and local consumption

Innovation/Solution

Go Zero Waste is a mobile app that helps you find local bulk stores and plastic-free products around you thanks to a collaborative map. It also provides simple challenges to promote new habits and actions towards a more sustainable lifestyle.

Benefits

- ✓ Reduction of plastic consumption.
- ✓ Support for local trade and local products.
- ✓ More responsible food system.
- ✓ Sustainable consumer behavioural change through gamification.

Partner

go zero waste

City case: Barcelona

KPIs

- ✓ More than **2,000 local business** involved.
- ✓ **International scale** (Europe and Latin America).
- ✓ **+100 challenges** for a more sustainable life.

SDGs impact

+ INFO

Design of enzyme technologies from plant by-products

Technological and product innovation in the sector

The Challenge

✓ Reduce the use of conventional pesticides and chemical fertilizers

Innovation/Solution

The aim of the project is to design the basis for the development of a Biotechnology Process to obtain bioactive Molecules with biostimulating action and/or Phytosanitary low-risk, from the protein fraction of different local plant sources.

The raw materials used in the processes will be local sourced (by-products from the Agri-Food industry-circular theory) which will allow, beforehand, stability both in term of productivity and costs

Benefits

✓ Using products of natural (plant) origin, promotes the sustainable development of crops

Partner

FUTURECO bioscience

KPIs

✓ **29 plant sources and by-products of** the agri-food industry were studied.

✓ M3-M7-and M11 were the best prototypes to control root-knot nematodes (soil pest).

✓ M3, M7, M11: **73% - 74% reduction of penetration of nematodes** in cucumber crops.

✓ M7: **89% reduction on reproduction** in cucumber crops and **82% for M11.**

SDGs impact

+ INFO

Bio-based polymers for high-performance applications

Polycarbonates and polyesters from agroalimentary (citrus) waste

The Challenge

- ✓ Substitute oil-based polymers for bio-based polymers for high added-value applications, such as functionalized coatings.

Innovation/Solution

ICIQ has developed a catalytic technology compatible with other terpenes extracted from biomass, besides limonene, to generate polycarbonates and polyesters, a commercial compound extracted from orange peels (waste from orange juice industry). The chemical structure of limonene allows to functionalize these polymers, generating a range of products, including coatings. ICIQ collaborates with companies and universities to develop new applications for these products.

Benefits

- ✓ Bio-based, non-food source. Carbonates incorporate CO_2
- ✓ Resulting coatings offer excellent functionalization opportunities
- ✓ Non-toxic and biocompatible

+ INFO

Partner

ICIQ
Institut Català d'Investigació Química

KPIs

- ✓ Currently developing **new product applications** alongside industrial and academic partners.
- ✓ Technology in development, production of **hundreds of grams** is possible, paving the way for pilot scale.
- ✓ **Wide range** of possible applications including coatings, composites, additives, compatible with biomedical applications.

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Food Industries & Agriculture / Industry 4.0 & Industrials Systems

Circular Agronomics

Efficient Carbon, Nitrogen and Phosphorus cycling in the European Agri-food System

The Challenge

- ✓ Sustainable circular management of carbon, nitrogen and phosphorus in the European agri-food system

Innovation/Solution

- ✓ Novel soil organic amendments from agricultural and industrial byproducts to decouple C, N and P streams and facilitate soil C sequestration.
- ✓ Cropland and grassland management practices to optimize N&P nutrient cycling and minimize losses.
- ✓ Livestock management to minimize GHG emissions and optimize manure characteristics.
- ✓ Food-industry wastewater treatment for recovery of C-rich compounds for reuse on farms, towards the circular economy.

Benefits

- ✓ Reduction of environmental impacts at farm level
- ✓ Improvement of soil fertility and increase of nutrient use efficiency
- ✓ Increase sustainability of food industry

+ INFO

Circular Agronomics

Grant Agreement 773649

Partner

IRTA
RECERCA | TECNOLOGIA AGROALIMENTÀRIES

+ 18 project partners

KPIs

- ✓ **Reduced nutrient surplus per agricultural area** (-20% for N and P) and increased nutrient efficiency on a yield-scaled basis.
- ✓ **Reduced direct emissions to air and water** (-10-15% for N) and reduced indirect emissions.
- ✓ **Increase net stabilizable carbon stocks** in cropland by at least 0.4 ‰ per annum.
- ✓ **Reduction of carbon-and nutrient-rich waste** (-10%)

SDGs impact

Nutrient2Cycle

Transition towards a more carbon & nutrient efficient agriculture in Europe

The Challenge

- ✓ Assess the current Nitrogen, Phosphorus and Carbon flows looking into existing management techniques in different farms across Europe and analyzing their related environmental problems.

Innovation/Solution

- ✓ Map the current flows and gaps in C, N and P cycles over three major agricultural pillars: livestock, plants and processing systems
- ✓ Implement a toolbox with indicators to measure sustainability & evaluate trade-offs between the current practice and innovative farming systems.
- ✓ Impact calculation at regional & EU level.
- ✓ Evaluate how agro-products obtained via more sustainable processes can aim for ecolabelling, and how this could affect consumer behavior (willingness to pay).

Benefits

- ✓ Tackling the existing nutrient flow gaps in Europe will help decrease greenhouse gas emissions, reduce soil degradation and improve EU independence for energy and nutrients.

+ INFO

Nutri2Cycle

Nurturing the Circular Economy

Partners:

IRTA

RECERCA | TECNOLOGIA AGROALIMENTÀRIES

+ 18 project partners

KPIs

- ✓ Create more **efficient and sustainable farm** business models for **nutrient recovery and recycling.**
- ✓ Assess how the products obtained can aim for **labelling and reach end-users.**
- ✓ **Reduce emissions and increase self-resliance of Europe** for food, energy and nutrients

SDGs impact

Turning sewage sludge into fuels and hydrogen

The conversion of organic waste biomass into synthetic fuels and green hydrogen

The Challenge

✓ The processing of organic industrial waste biomass directly into transportation grade biofuels.

Innovation/Solution

The project implements a new integrated process combining Thermo-Catalytic Reforming (TCR©), with hydrogen separation through pressure swing adsorption (PSA), and hydro deoxygenation (HDO), to produce a fully equivalent gasoline and diesel substitute (compliant with EN228 and EN590 European Standards) and green hydrogen for use in transport.

This will be the first of its kind to be built anywhere in the world, processing organic industrial wastes directly into transportation grade biofuels fuels which will be a demonstration showcase for future sustainable investment and economic growth across Europe.

Benefits

✓ Addressing environmental and social needs with sustainable energy development.

Partner

LEITAT
managing technologies

KPIs

✓ It will process **2,100 tonnes** per year of dried sewage sludge into **210,000 litres** per year of liquid biofuels and up to **30,000 kg** of green hydrogen.

✓ **> 80% GHG gas saving**.

✓ Production of fully **equivalent gasoline and diesel substitute**.

SDGs impact

+ INFO

Sustainable Mobility / Chemical, Energy and Water Industries

Sustainable Jet fuel from flexible waste biomass

FlexJet will build a pre-commercial demonstration plant to produce advanced aviation biofuel

The Challenge

- ✓ Produce sustainable and cost-competitive aviation fuel (SAF) from waste vegetable oil.

Innovation/Solution

The process combines the production of SAF through biofuel refining (SABR technology) for the upgrading of biodiesel from organic waste fats, with the Thermo-Catalytic-Reforming (TCR) providing green hydrogen for the process. The project will deliver respective environmental and social sustainability mapping and it will validate a comprehensive exploitation business plan, building on already established end user interest with existing offtake agreements already in place with British Airways. In a combined, committed and dedicated research effort the project has leading researchers, industrial technology providers, including airline takers and renewable energy experts from across Europe.

Benefits

- ✓ It facilitates the medium- and long-term carbon reduction.
- ✓ Development and growth of SAF.

+ INFO

Partner

LEITAT
managing technologies

KPIs

- ✓ Production of **1,200 tonnes of jet fuel** from 3,600 tonnes of waste vegetable oil per year and 3,482 tonnes of dried organic waste.
- ✓ **First pre-commercial demonstration plant** for the production of **25,000 tonnes per year of SAF**.
- ✓ **fully equivalent jet fuel** → compliant with ASTM D7566 Standards.

SDGs impact

Edible Insects as Sustainable Food Alternative

The conversion of food by-products in a sustainable and high-quality protein

The Challenge

✓ The use of insects as alternative sources of protein addresses the nutritional needs of the growing population, offering a sustainable alternative to the food of the future based on circular economy strategies.

Innovation/Solution

The proposal covers everything from the breeding of insects to their processing for protein, and their subsequent formulation into products for animal and human food. Specifically, it seeks to overcome production barriers throughout the value chain of insect breeding, studying innovative technologies and valuing by-products of the agri-food sector as substrates for the breeding itself. This reduces the environmental impact of both protein food production and waste management.

Benefits

✓ Insect breeding is more sustainable, because it has a higher degree of food conversion, requires less water and land for breeding and produces less greenhouse gases.

+ INFO

Partner

LEITAT
managing technologies

KPIs

✓ **3485 litres** (compared with pork) and 30985 litres (compared with beef) of water saved per kg of protein produced

✓ **4 kg (compared with pork) and 43 kg** (compared with beef) of feed saved per kg of protein produced

SDGs impact

Pay-as-you-throw (PAYT) schemes for waste generation

Moving towards a European recycling society with a high level of resource efficiency

The Challenge

- ✓ Residual waste reduction improving the waste separation at source and recycling.

Innovation/Solution

PAYT asks households to pay when they dispose of (mixed) waste. Implementation of technology in the municipal waste collection allows identify individualized bins in door-to-door collections or the waste producer, citizens or economic activities, with smart street containers with controlled access devices that will only unlock after identification by a personalized card.

Benefits

- ✓ This economic instrument encourages participation in the waste separation at source
- ✓ PAYT helps raise awareness to improve selective collection and recycling
- ✓ Economic savings in mixed waste treatment and increase revenues in recyclables
- ✓ Co-responsibility and citizen satisfaction with a fair waste rate.

+ INFO

Partner

MOBA MOBILE AUTOMATION

VALLÈS CIRCULAR

LEITAT Technological Center member of TECNIO
managing your technologies

KPIs

- ✓ **Increase separate collection** rates of waste and recycling **up to 80%** achieving EU targets.
- ✓ Application of the **polluter-pays principle:** Fairer Municipal Waste Taxation for citizens and economic activities, rewarding those who have less waste generation.
- ✓ Reduce costs of **adverse environmental and health impacts** of mixed waste collection and treatment.

SDGs impact

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

Technology for Waste Collection Optimization

Better route management, the solution for small to medium sized waste haulers

The Challenge

✓ Improve efficiency of waste collection services

Innovation/Solution

Whether for only a small truck operation or for a large fleet, data obtained with on-board technology is vital for tracking all aspects of daily recycling and waste collections.

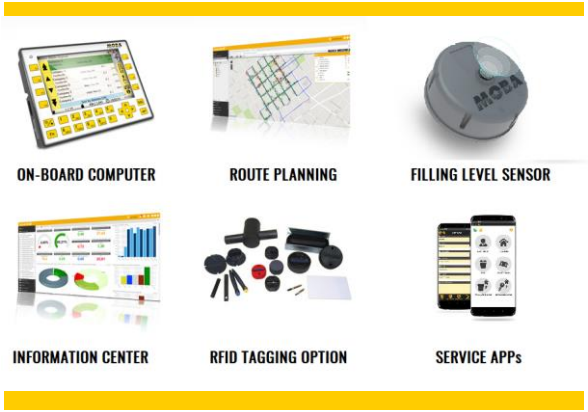
RFID, telematics and weighting solutions give easy to use features such as container management, filling level, route planning and optimization, vehicle tracking, etc., all of them strategic for the sustainable management of the waste collection services.

Benefits

✓ Optimized routes with less Km driven, decreasing fuel consumption, gas emissions and improving efficiency

✓ More transparency about all processes during the collection

✓ Continuous quality improvement service due to prompt access to information



Partner

MOBA MOBILE AUTOMATION

VALLÈS CIRCULAR

LEITAT Technological Center member of TECNIO
managing your technologies

+ INFO

KPIs

✓ **Rugged components:** Thanks to the hermetically sealed weight sensors, the system resists the harshest environments.

✓ **Cost efficiency:** To not underload material or avoid unnecessary trips

✓ **Increasing Competition:** Continuous need to improve efficiency and increase profitability

SDGs impact

Automated glass recovery for waste treatment plants

Highly Innovative solution based on artificial vision techniques

The Challenge

✓ Attain a high percentage of glass recycling effectiveness in waste energy plants.

Innovation/Solution

The aim of the VidReBuig project is to develop a technology based on artificial vision techniques for automated glass retrieval in waste treatment plans from solid waste flows. It is able to recover up to 75% of glass in waste incineration plants. It could recover about 4 million tones of glass a year in the European Union environment, that otherwise would end in a landfill.

Benefits

✓ More effective glass recycling for waste plants

✓ Reduce waste in landfills

Partner

PICVISA OPTICAL SORTING

KPIs

✓ The project would allow to **recover about 4 million tonnes of glass per year**

✓ **More than 75% glass extraction performance**

✓ Increases the obtaining of **other recyclable materials and fuels** derived from waste

SDGs impact

+ INFO

Glass recovering revolution

High performance Optical Sorter for glass collection from Waste

The Challenge

✓ Recover the glass fraction in refined MSW.

Innovation/Solution

40% of all the glass waste ends up in mixed MSW plants (which typically contain 7% of glass). Instead of being disposed of in selective-waste collection, it ends up in landfills or is composted/incinerated with the remnant waste. SEEGLASS has developed a high-performance optical sorter based on computer vision and a pneumatic rejection system.

This project will build the preconditioning process line, optimize the current computer vision system, as well as its mechanical and pneumatic design, integrate both the process line and the glass sorting solution into a system of and validate its internal viability with real MSW from different countries

Benefits

✓ Will allow the treatment plants to significantly reduce costs from waste disposal fees

✓ offers end-users additional revenue from recovered material

+ INFO

Partner

PICVISA OPTICAL SORTING

KPIs

✓ Will allow the treatment plants to significantly reduce **costs from waste disposal fees (50€/Tonne EU average and rising)**

✓ The goal is to achieve **80% glass recovery, with 99% purity**

SDGs impact

Materials recovery processes

Managing resources in a sustainable way

The Challenge

- ✓ Transform the flow of production processes that promote the prevention of waste generation

Innovation/Solution

From the SSR-UPC, two projects are being carried out that seek to transform process flows to improve resource management:

- ✓ Recovery of precious metals from electronic waste using biotechnological systems, is based on the design, construction and installation of valuable metal extraction plants contained in disused electrical and electronic equipment, as well as on the advice and maintenance of the facilities.
- ✓ Recovery of raw materials from residual gaseous effluents.

Benefits

- ✓ Natural resource management in a sustainable way
- ✓ A cheaper and less polluting alternative
- ✓ Low energy cost (room temperature)
- ✓ Technology extensible to other valuable metals

Partner

SSR
SMART SUSTAINABLE RESOURCES

KPIs

- ✓ Of the proposal for the **recovery of electronic waste metals** is expected to reach an international market in 5 to 6 years
- ✓ The return on investment required is estimated at **2.8 years**.
- ✓ **85%** copper recovery in only 48 h

SDGs impact

+ INFO

Tecfys

Where your technology flows

The Challenge

✓ The increasing awareness in sustainable models brings the necessity to develop global strategies that include the complete life cycle of products, from the acquisition, renovation, second life, recycling and disposal

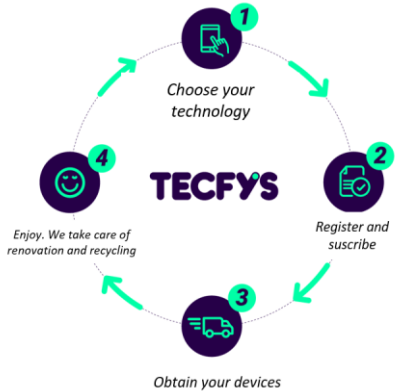
Innovation/Solution

Tecfys starts a new connection between technology and people. Tecfys provides all the technology of your life -from you phone to your fridge- with a monthly subscription. We remove your old devices, bring the new ones and will replace them in their optimal time of renewal. The new approach to technology is by flexible and smart use, not ownership.

We believe in a world where managing the flow of technology is easy and sustainable.

Benefits

✓ Optimize the use of your cash flow: moving from buying to using (pay per use).



Partner

TECFYS
where your technology flows.

KPIs

✓ Minimize the **total cost of the technology cycle**: mastering product offering and price, manage depreciation curves, residual values, refurbishing and recycling processes.

✓ **Reduce friction** in the access to technology: simplifying customer experience, seamless integration of several parties.

SDGs impact

+ INFO

Thermowaste, the complete solution to end landfills

Technology for complete recycling and giving value to the recovered materials.

The Challenge

- ✓ To recover 100% of the materials contained in the waste in just 30 min.

Innovation/Solution

A sustainable and definitive solution that accelerates social transformation towards a Circular Economy. They convert municipal solid waste into clean materials and recover them in their entirety to give them a second use, at the same time that they provide decent work to many families.

The project is aimed at administrations and organizations, public or private, that somehow influence or participate in waste management and seek a sustainable solution with short-term results.

Benefits

- ✓ Robust technology that allows you to quickly process large volumes of waste, taking up very little ground space.
- ✓ Low methane gas emissions from their plants.

Partner

THERMOWASTE technology for circular economy

KPIs

- ✓ A Thermowaste plant with 5 process lines (a total of 10 reactors), prevents **1,200 tons** of urban solid waste per day from being thrown into the landfill.
- ✓ **A 1000Tn/day** plant prevents more than **3.000.000m3** of methane go to the atmosphere

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

+ INFO

A mobile app to reduce food waste from stores and establishment

Users can purchase edible food that otherwise would be thrown out at the end of the day

The Challenge

- ✓ Reduce waste of unsold food from establishments.
- ✓ Reduce the 8% of greenhouse gas emissions generated from wasted food.

Innovation/Solution

Too Good To Go is an app that provides a marketplace to connect businesses who have surplus food with members of the public who want to rescue this food.

Customers order a “magic bag” full of perfectly edible food that stores, and restaurants have to throw out at the end of the day. This surplus food is obtained by a discount on the retail price and then is collected it from the stores.

Benefits

- ✓ Inspire and empower everyone to take action against food waste.
- ✓ Attract customers to consume surplus food by offering a discount.

Partner

Too Good To Go

KPIs

- ✓ **1/3 of all food** produced worldwide **is wasted**
- ✓ **+40,000,000 meals saved** globally since the company started on 2016
- ✓ Equivalent to **100,000 tonnes of Co2** saved
- ✓ App available in **15 countries**

SDGs impact

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Food Industries & Agriculture /
Health, Well-being and Life Sciences Industries

From the almond skin to a cholesterol reduction

An antioxidant fiber of almonds and hazelnuts as a natural medicine

The Challenge

- ✓ Maximise the value of agricultural products.
- ✓ Increase jobs in rural areas.

Innovation/Solution

Unió Nuts is a Spanish leader cooperative of nuts that seeks demographic balance in the rural field with a commitment to the territory, to the environment and to collaborating with our associated cooperatives to offer the markets natural products of the highest quality.

Focused on innovation, it has developed new applications of the products in order to create more functional, healthier, highest-quality food. One of their known patents is the obtainment of a natural, anti-oxidant fibre that reduces cholesterol. This fibre is named Fiberox.

Benefits

- ✓ Promote rural development.
- ✓ New natural products to reduce cholesterol.

Partner

unió nuts

KPIs

- ✓ **Almond and hazelnut skin are** byproducts **without commercial value.**
- ✓ Between **4,5-6%** of almond skin is obtained in blanched process
- ✓ About **2% of hazelnut** skin is obtained in roasted process.
- ✓ **Fiberox** help to **increase the final price** that farmers receive for their crops

SDGs impact

+ INFO

Organic waste transformation into bioplastics using bacteria

First test in bioplastic bags in industrial scale

The Challenge

✓ Transform organic waste into bioplastic.

Innovation/Solution

Venvirotech has developed a process for bioplastic production using bacteria. The system turns organic matter, such as food waste, into a product that can be used as a biodegradable alternative to single-use plastic.

The biotech startup began its pilot phase near Barcelona, at a BonArea supermarket plant, where they were able to develop a technology test based on bioplastic bags on an industrial scale with a potential customer. It is currently developing new pilots, including waste from Nestlé coffee production.

Benefits

✓ Provide an alternative bioplastic bags and other plastic products.

✓ Reduction of greenhouse emissions.

Partner

VEnvirotech

KPIs

✓ **4 tons** of organic waste management per day in each VE-Box.

✓ **One day process.**

✓ **3%-25% Yields** of conversion to bioplastic.

✓ **5%-40%Savings** in organic waste management.

SDGs impact

11 SUSTAINABLE CITIES AND COMMUNITIES

+ INFO

Reuse and recycling of clothing, accessories and footwear

Recover, reuse and recycle!

The Challenge

- ✓ Offer a service that allows to recover and gives a second life to clothes that are no longer used

Innovation/Solution

The Veritas Textile project consists of offering customers through the online shopping service the possibility of donating clothes they no longer use, once the collection is made, it is taken to the Humana warehouses, where the recovery, reuse and recycling process begins to give it a new use, the textile that can be reused will be treated and managed to take it to its sustainable fashion stores (generating resources for development cooperation projects). The textile is in a state that does not allow its reuse, it is sold to recycling companies so that they can make other products.

Benefits

- ✓ Contribute to saving resources and protecting the environment
- ✓ Generate green employment and contribute to the social economy.

+ INFO

Partner

SUPERMERCADOS veritas ALIMENTOS DE VERDAD

HUMANA Fundación Pueblo para Pueblo

aravinc SMART DELIVERY

KPIs

- ✓ Only in Catalonia, around **20 kg of textile waste** per inhabitant is generated each year.
- ✓ The objective is **5000 Kg** of textile waste collected / year, **15 tons of CO2** saved per year.

SDGs impact

Sun protection, for curtains and blinds

Semi-translucent technical fabrics made of 100% recycled polyester

The Challenge

✓ The use of recycled PET yarns

Innovation/Solution

The recycled polyester yarns used in manufacturing have quality and characteristics identical to those produced with raw materials virgins. Planet FR and Ecoplanet FR avoid glare and They offer good visual comfort while maintaining privacy. Both have a good absorption coefficient acoustic and Greenguard certified as low emission fabrics.

The company that supplies the recycled polyester raw material, provides the Global Recycled Standard (GRS) certificate, a standard for the traceability and verification of the content of recycled material in a product.

Benefits

✓ Reduces consumption of energy and resources associated with the manufacture of raw materials

✓ Provide a second life to the bottles and prevent their cremation

Partner

vertisol

contemporary weavers

KPIs

✓ Planet FR is made from **recovered PET bottles** (one square meter **equals 6 bottles**)

✓ Other characteristics of the tissue are: One square meter is made from **4/6 thrown away bottles,** Significant level of acoustic absorption (Planet FR), that contribute to indoor **air quality**.

SDGs impact

+ INFO

The connected infrastructure solution

Improving waste management operations for a more unstainable world

The Challenge

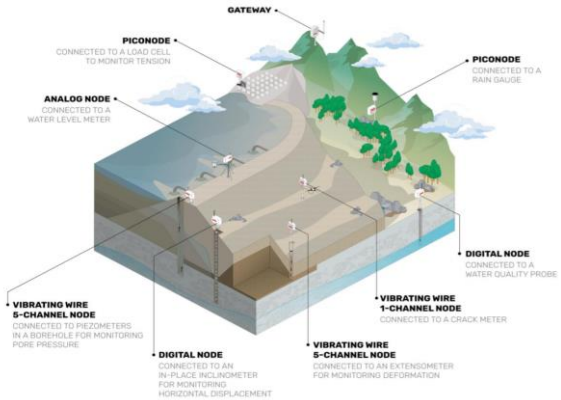
- ✓ Allowing mining operators to manage their critical assets in efficiency and safety fashion

Innovation/Solution

Loadsensing is the global leader for connecting and wirelessly monitoring infrastructures in remote locations. Mining companies can now monitor waste and tailings facility with reliable data. Having access to this information and real-time insights enables operators to anticipate needs, manage their workforce, diminish risks, and even prevent disasters.

Benefits

- ✓ Monitoring of remote location
- ✓ Wireless network management and operator capability
- ✓ Real-time insight regarding physical structure state
- ✓ Increase safety
- ✓ Optimize maintenance cycle



Partner

WORLD SENSING

KPIs

- ✓ More than **500 wireless networks** worldwide.
- ✓ Deployments in over **60 countries.**
- ✓ More than **50K sensors** connected**.**
- ✓ Provide services to more than **200 costumers.**
- ✓ Introduce **30% of cost and energy** saving.

SDGs impact

+ INFO

2. ENERGY

With the need to reduce atmospheric emissions becoming ever more urgent, there are two main goals to achieve: renewable and efficient energy system. Cities consume about 75 per cent of global primary energy and emit between 50 and 60 per cent of the world's total greenhouse gases. Therefore, reducing energy consumption and transitioning to green sources in cities is paramount, and will have a positive global impact.

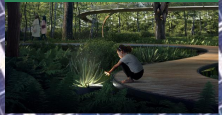
Additionally, dependency from external energy sources is a resiliency challenge for urban areas, because a cut in energy supply or a spike in prices can cause big disruptions in the city.

For this reason, evolving to scenarios of energy self-sufficiency will provide cities with huge environmental, economic and public health benefits.

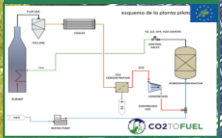
Smart Plant Manager for Utility Scale Photovoltaic Plants

Shift towards a circular economy for the housing sector

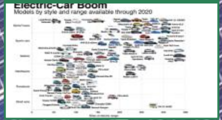
Green electricity from plants' photosynthesis



Life co2 to fuel



All in one electric vehicle charger



Electric motorcycle rental

Hydrogen-powered vehicle

Second Life of Electric Vehicle Batteries

Catalyst Development for Synthetic Natural Gas Production

Environmental Life Cycle Assessment of Li-Sulphur Batteries

Fast charging high performing battery solutions

Power battery pack

2. ENERGY

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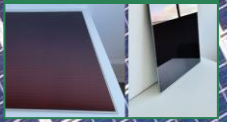
Solar HUB

Evaporation solar System for treatment of manure

Photovoltaic panels that works with no sunlight



Smart Plant Manager for Utility Scale Photovoltaic Plants

Store energy for higher functioning of PV plants

The Challenge

✓ Give more electric stability to renewable energy power plants through the development of effective power storage technologies.

Innovation/Solution

ÀLITER introduces in this proposal the STORM device: a Smart Plant Manager for Utility Scale PV Plants with Storage Systems. Storm, plus storage, gives a higher degree of flexibility and balance to the grid not only providing back-up power to the intermittence of the renewable sources but also complete ancillary services. All this factors combined together will easy the growth in penetration of PV and accelerate the decarbonization of the electrical system

Benefits

✓ Power stability and sustainable prices for the community.

Partner

àliter group

KPIs

✓ More than **250** projects

✓ More than **3,2 GW PV** engineered

✓ **42 MW** of PV plants constructed

✓ **20 million** CO2 tons avoided

✓ **Clustering:** capability to group some small/medium PV plants and manage them as a large one.

✓ **Internet of electricity:** sharing grid information through a cloud server

SDGs impact

+ INFO

Green electricity from plants' photosynthesis

Microbial fuel cells as an alternative energy source

The Challenge

- ✓ To develop an integrally unique way of generating electricity, from plants, without damaging them, with applications in numerous industries, at the moment focusing on agriculture replacing the use of chemical batteries in sensor powering.

Innovation/Solution

A small reactor based on microbial fuel cells applied to plant environments. Electricity is produced from the decomposition of organic substances obtained from living beings naturally found in the earth. This technology uses materials abundant on the planet, such as graphite, and which extraction is clean and provides water savings as compared to other types of energy sources.

Benefits

- ✓ The greenest electricity in the world
- ✓ Lower cost energy for localized applications

Partner

Bioo

KPIs

- ✓ **2.5M €** in R&D grants (EU H2020)
- ✓ **50+ national & international awards**, including "The Most Innovative Company of the Year" by the European Parliament
- ✓ A target market of **2.1B+ €**

SDGs impact

+ INFO

Life co2 to fuel

CO2 cost-effective capture, hydrogenation and conversion to fuel in energy-intensive industries

The Challenge

✓ Capture CO2 and transform it into hydrocarbons.

Innovation/Solution

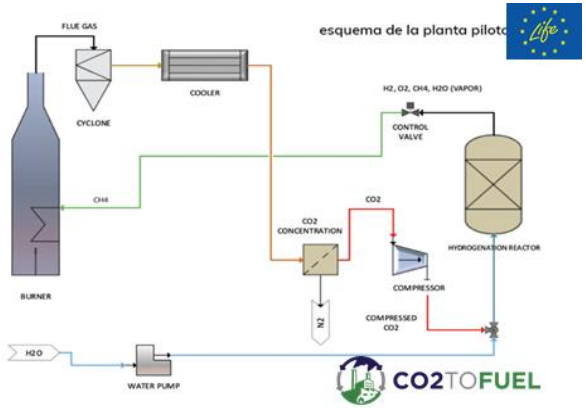
The solution proposed is an innovative technology comprising a thermochemical process under hydrothermal conditions. The process breaks the water molecule with the help of a catalyst releasing H* free radicals that quickly react with carbon compounds (CO2) to form new linear hydrocarbons (synthetic fuels).

The synthetic fuel formed is reinjected in the reheating furnace replacing the gas needed for combustión.

Benefits

✓ Reduction of CO2 emissions

✓ Reduction of fossil fuels consumed in the reheating furnace replaced by synthetic fuels



Partner

CELSA GROUP™

KPIs

✓ **800-ton CO2/year** captured and processed (avoided emissions)

✓ **496 Kg NO2/year** reduction emissions

✓ **6,472,000 kW/year** energy from renewable sources

✓ **5,996,000 kW/year** reduced energy consumption

SDGs impact

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

+ INFO

All in one electric vehicle charger

A solution where Fast and Low charging needs are linked

The Challenge

Provide an EV charging product range suitable for locations where several EVs need to be charged with different charging speeds. This platform must provide simultaneous DC and AC charging, must be able to escalate its fast charging power to meet with the higher battery capacity used in the brand new EV's, and must be able to increase the number of AC sockets (aside to the DC socket) to increase the number of sessions charging at once (to meet with the current EV uptake growth).

Innovation/Solution

Design an Electric Vehicle Fast Charger using modular technology, ready to escalate its output from 50 kW to 100 kW, so even new EV's with higher battery capacity can reach at least 80% of total range in just 30min. Include a Slow charging output to be able to simultaneously charge fast and slow in a single product.

Implement a "Master/Slave" functionality assigning the fast charger as "Master" to control several "slave" products (slow AC chargers), which includes access control and dynamic energy balancing in remote. This configuration shall be scalable in order to increase the number of "slaves" charges as the EV uptake growth. DC available power must remain fix unless commanded remotely in order to keep a hierarchy of fast charging priority over slow charging.

Benefits

✓Mixing in a sole installation fast and slow chargers to adapt charging hubs in the most optimized manner.

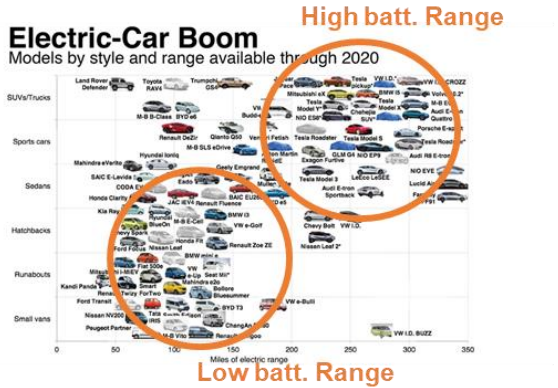
✓Centralized user control access

✓Hardware scalability to be ready for the EV uptake

✓AC Dynamic Load Management to adapt power to demand

✓Simultaneous Fast Charing (DC) and Slow Charing (AC)

+ INFO



Partner

CIRCONTROL
Mobility & eMobility

City: Viladecavalls (Terrassa)

KPIs

✓ This product range will represent a **substantial improvement in terms of boosting the EV uptake**, since improvements will be obtained focused on increasing the power as battery capacity does, and the number of slow chargers as EV uptake current growth does.

SDGs impact

6 CLEAN WATER AND SANITATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Electric motorcycle rental

Electric motorcycles, a commitment to sustainable mobility

The Challenge

- ✓ To improve our environment and people's quality of life through more efficient and responsible mobility.

Innovation/Solution

The Cooltra Group is the leading company in sustainable mobility solutions on two wheels in Europe for individuals, companies and institutions. Created in Barcelona 14 years ago, it is present in six countries in Europe (Spain, Austria, France, Italy, Portugal, and the Czech Republic), and has a workforce of 1,000 employees. It currently has a fleet of 17,000 vehicles, of which more than 56% are zero-emission electric scooters.

Benefits

- ✓ Promote sustainable mobility and decrease the use of private cars
- ✓ Environmentally friendly ecological vehicles.
- ✓ Consumption is minimal compared to refueling with fossil fuel

Partner

Cooltra RENT A SCOOTER ©

KPIs

- ✓ **+ 20 cities** and **+100 rental points** around Europe
- ✓ **+ 4,500 motorbikes rented** to companies in different sectors: food at home, security, courier, AAPP (police and municipalities)
- ✓ **1M users** in eCooltra, de motosharing service of Cooltra
- ✓ Saving more than **3,000 tons of CO2.**

SDGs impact

+ INFO

Hydrogen-powered vehicle

Prototype vehicle that runs on hydrogen obtained from bio-renewable LNG

The Challenge

- ✓ Explore new alternatives to the use of fossil and renewables fuels in the automotive sector to decarbonise the surface transport

Innovation/Solution

Vehicle that incorporates technology to use Hydrogen obtained from a LNG to H2 reformed station. The station converts natural gas into hydrogen. In this way, the Co2 emissions can be reduced by 90% if all sourcs are bio in the vehicle. During the 2020, EVARM will present the final prototype and by the end of the year it plans to carry out the first tests in Catalonia. This project is also taking part of the research how to obtain liquefied natural biomethane that will be transformed into hydrogen from sustainable sources to provide H2 locally whenever needed.

Benefits

- ✓ Ultra low carbon emissions produced

Partner

EVARM

KIST
Korea Institute of Science and Technology

KPIs

- ✓ Reduce **90% Co2 emissions**

SDGs impact

+ INFO

Sustainable Mobility / Chemical, Energy and Water Industries

Second Life of Electric Vehicle Batteries

An affordable and reliable alternative for stationary applications

The Challenge

- ✓ Respond to the increase in electricity consumption by the expansion of electric mobility.

Innovation/Solution

The electricity market considers energy storage systems a solution to face new challenges regarding the expected electricity consumption increase caused by, for instance, the electro-mobility expansion an uncontrolled production caused by the entrance of distributed electricity generation systems. The solution to re-use the electric vehicle battery in residential, tertiary, industrial and in any part of the electricity transmission and distribution network needs to find the technical capabilities, requirements, costs and benefits to estimate where is it more interesting to participate in.

Benefits

- ✓ It is a lower cost alternative

Partner

IREC
Shaping Energy for a Sustainable Future

KPIs

- ✓ First demonstrator in Catalonia: **Sunbatt**
- ✓ **5 research projects** (two of them H2020) re-using or considering 2nd life of batteries.
- ✓ **Several private** partnerships

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Catalyst Development for Synthetic Natural Gas Production

The circular carbon dioxide economy is a field in constant growth

The Challenge

- ✓ Offering suitable catalysts for advanced methanation reactors. The innovation supports the valorization of carbon dioxide to renewable natural gas by increasing the efficiency of catalytic chemical reactors.

Innovation/Solution

The conversion of carbon dioxide into renewable natural gas allows: i) the chemical storage of renewable energies in which production cannot be adjusted to demand (wind, photovoltaic), ii) the contribution to a circular economy of CO2 (CCU) with reduction of GHGs, and iii) less dependence on fossil fuel imports, specifically natural gas.

Benefits

- ✓ Development of advanced materials that meet the standards of novel methanation reactors.
- ✓ Production of synthetic natural gas of quality for use as vehicle fuel or for injection to the natural gas grid.
- ✓ Improved activity & selectivity

Partner

IREC

Shaping Energy for a Sustainable Future

KPIs

- ✓ **60% of CO_2** avoided emissions
- ✓ Pilot to demo plant **(up to 5 kg batches)**
- ✓ Adapted to reactor design
- ✓ **40%** extended lifespan
- ✓ **4 times volume reduction vs. commercial reference**: For direct gas grid injection purposes, at 5 bar·g, the process worked successfully at 31,500 h-1 using CO2 and 37,500 h-1 using biogas.

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Sustainable Mobility / Chemical, Energy and Water Industries

Environmental Life Cycle Assessment of Li-Sulphur Batteries

High energy lithium Sulphur cells and batteries

The Challenge

- ✓ Lithium-ion batteries for electric vehicles (EVs) are thought to have achieved their theoretical specific energy, and thus alternative battery chemistries, such as Lithium-Sulphur (Li-S), are being researched to achieve higher values. Life Cycle Assessment (LCA) is used to compare the environmental impact of Li-S batteries with that of alternative batteries.

Innovation/Solution

Data collection for the composition and performance of a Li-S battery in an EV. Establishing an appropriate scaling method for data obtained from the laboratory production of coin cells to data estimations for the production of batteries.

Benefits

- ✓ Key outcomes include production of Li-S cells on a laboratory scale, testing the effect of the ageing of these cells under various conditions, and estimating their cycle life.

Partner

IREC

Shaping Energy for a Sustainable Future

KPIs

- ✓ The practical energy density (Wh/kg) of the Li-S battery is almost **higher 3 times** than the average of Lithium-ion batteries.
- ✓ Li-S batteries could **reduce the CO2 eq emissions around 20%** when compared with NMC Li-ion batteries
- ✓ Li-S batteries could achieve important benefits as decrease the use of mineral resources and human toxicity concerns in **70% and 85%** respectively

SDGs impact

+ INFO

CoSin (Combustibles Sintètics)

Renewable gas production through biogas upgrading and catalytic methanation

The Challenge

- ✓ Producing high-quality renewable gas generated from organic waste as an alternative to the standard production of electrical and thermal energy at WWTPs. This biomethane or synthetic gas is of sufficient quality for use as fuel for vehicles or for direct injection into the natural gas grid.

Innovation/Solution

An interesting, often undervalued renewable energy source is biogas generated by anaerobic digestion of organic waste, such as sewage sludge, agricultural or livestock waste. Biogas can be valorized by converting it to renewable gas of sufficient quality for use as fuel in vehicles or for injection into the natural gas grid. The production of biomethane represents a clear example of the circular economy, since it allows producing fuel from organic waste, such as wastewater treatment sludge. The process of converting biogas into renewable gas was optimized using membrane technology as well by chemical reaction with hydrogen. Biomethane allows the substitution of fossil natural gas at competitive prices.

Benefits

- ✓ Validation of membrane technology for biogas upgrading.
- ✓ Production of synthetic fuels from carbon of biogenic origin or by reusing carbon dioxide and/or water.
- ✓ Production of biomethane and synthetic natural gas of sufficient quality for use as vehicle fuel or for injection into the natural gas grid.

+ INFO

Partner

IREC — Shaping Energy for a Sustainable Future

LABAQUA

ENERGIA RIS3CAT

Naturgy

CETAQUA — WATER TECHNOLOGY CENTRE

KPIs

- ✓ Use these synthetic fuels as large-scale energy storage that allows **increasing the share of non-fossil-source energies**.
- ✓ Development of a circular economy around **CO_2 emissions contributing to their effective reduction** through the use of a closed loop of carbon of biogenic origin allowing the **decarbonization of the natural gas grid**.
- ✓ Energy interconnection between the electricity and gas networks and promotion of new options and opportunities for the **development of new energy models**.
- ✓ Use of biomass and other sources of waste with organic content such as sewage sludge and/or slurry **contributing to environmental improvements**.

SDGs impact

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

11 SUSTAINABLE CITIES AND COMMUNITIES

Fast charging high performing battery solutions

For Light and Heavy-Duty Electric Vehicles

The Challenge

- ✓ Developing batteries that allows longer vehicle range, longer life and faster charge of electric vehicles.

Innovation/Solution

The project will develop higher energy density (leading to more range), an accurate battery state-of-charge (SoC) monitoring system (reducing range anxiety/enlarging the battery life), and lightweight construction (improving maneuverability/weight capacity). There is also an app for remote battery health monitoring, diagnostics and predictive maintenance. The batteries are designed for 2nd life applications and the use of an App for the remote battery health monitoring, diagnostics, & predictive maintenance, which is new in the HDEVs and LEVs application area, enhances market uptake.

Benefits

- ✓ Lower cost of batteries for users.
- ✓ Faster charge of electric vehicles

Partner

MILLOR
www.millorbattery.com

KPIs

- ✓ The batteries will be on average **50% more durable**
- ✓ It will generate **129 million euros** accumulated income in 3 years
- ✓ Structure growth **from 17 to 84 employees after 3 years** of project completion

SDGs impact

+ INFO

Power battery pack

Autonomy and usability

The Challenge

- ✓ Offer a portable battery of sustainable energy and with multiple uses

Innovation/Solution

- ✓ The Li-Ion portable battery stores energy that can be used for many things, gives energy to your home (DC to AC converter for domestic use), work, camping, boat, motorcycle.
- ✓ It is charged with solar energy.
- ✓ Fully portable trolley type, which makes it fast and comfortable. Patent 2848456.
- ✓ It can be connected to the APP.
- ✓ Battery SWAP for companies.

Benefits

- ✓ Less environmental impact thanks to the use of sustainable energy
- ✓ EU Quality: Own development and assembly at Silence factory, Molins de Rei (Barcelona)

Partner

SILENCE
URBAN ECOMOBILITY

KPIs

- ✓ **15.385** scooters + battery packs sold since 2014
- ✓ **76.925.000 km** traveled
- ✓ **8.000 tons of C02** avoided emissions **Gei calculation.*
- ✓ **Catalan Industry** 2 factories + R&D Center. 150 employees and more than 1.000 indirect jobs

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Build Environment / Design Industries / Chemical, Energy and Water Industries

Solar HUB

A disruptive solar smart infrastructure enabling light & data as a service

The Challenge

- ✓ Cities commit to reduce their local emissions, but very few could monitor air quality precisely as the urban monitoring stations are costly and require high maintenance & installations expenses.

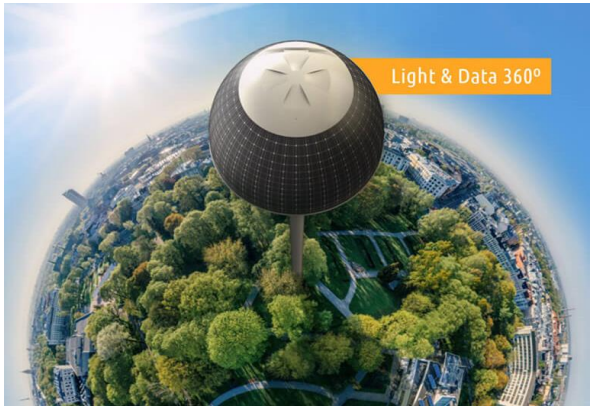
Innovation/Solution

Solar HUB is a compact environmental monitoring hub, fully powered by sunlight that integrates environmental sensors to measure PM2.5, PM10, CO, O3, NO2, SO2 & noise among other parameters. Its patented dome-shaped photovoltaic module, houses in a single element the sensors and devices. It also has LED modules and offers free light to everyone. It is connected to the Urban Brain, a digital interoperable platform that sends data of the sensors to the Cloud and let the users monitor remotely air pollution, get environmental reports, alerts & data analytics.

Benefits

- ✓ Real-time environmental data of the city.
- ✓ Information to take quick actions, improve environmental measures and benefit citizen's health.

+ INFO



Partner

SOLAR HUB

SIARQ
Advanced Solar Design

KPIs

- ✓ **0.5 tons** of CO2 avoided emissions annually
- ✓ Increase **15%** the quantity of cities with less than **100.000** inhabitants that could measure main air pollutants to implement environmental policies
- ✓ **200k Wh** of clean energy to power sensors, IoT devices & recharging other devices

SDGs impact

Chemical, Energy and Water Industries / Food Industries & Agriculture

Evaporation solar System for treatment of manure

Balance between pig hut and environmental sustainability

The Challenge

- ✓ Improve the price of treatments and the use of energies in the processes applied

Innovation/Solution

The general objective of this project is to investigate the confinement and control of slurry evaporation pools for solar thermal and photovoltaic supply, to reduce their volume while the emissions are controlled, and the use of surplus of the Photovoltaic production for self-consumption

Benefits

- ✓ The reduction of volume or drying total by solar evaporation of the purine in porcine farms where it is not possible.
- ✓ Lower the cost of transportation for processing plants or distant fields.

Partner

sud Energies Renovables

KPIs

- ✓ Treatment price of Puri to be carried at less than **6 euros/m3**
- ✓ The return on Investment of **less than 10 years**

SDGs impact

+ INFO

Chemical, Energy and Water Industries / Build Environment

Photovoltaic panels that work without sunlight

The same protein that humans need to see in the darkness, used to generate electricity

The Challenge

- ✓ Promote renewable electricity
- ✓ Look for better solar panels performance

Innovation/Solution

Proton has been able to prove that there is a protein found at the bottom of the sea that generates electricity in the same way that the protein in human eyes captures the low light and transforms it into electrical impulses that reach our brain. This protein generates electricity, and thanks to this function, their smart panel do not stop working when there is no sun.

The idea is born from the question that if it was possible to separate the electrons from protons through a membrane that do not let the electrons pass, it could generate a potential differential and thus generate electricity.

Benefits

- ✓ Clean and circular economy
- ✓ Panels can be installed in the middle of urban areas and in shadowed spaces.

Partner

PROTON
Turnin' ON the Sun

KPIs

- ✓ **100%** recyclable and **75%** reusable.
- ✓ **209,324** tonnes of CO_2 eq avoided
- ✓ **+25%** Energy efficiency of the buildings

SDGs impact

+ INFO

Shift towards a circular economy for the housing sector

Innovative circular solutions and services for new business opportunities

The Challenge

- ✓ Develop solutions to make resources more efficient during the life cycle of buildings.

Innovation/Solution

The project proposes an innovative paradigm shift towards a circular economy for the housing sector by demonstrating the feasibility of an integrated systemic service composed of 11 circular solutions co-created by stakeholders in current housing value chain. The HOUSEFUL Service will aim at the circular management and efficient use of water, waste, energy and material resources for all stages of European building's life-cycle. The results obtained will be used to define an integrated HOUSEFUL service which will be driven and promoted through a SaaS (Software as a Service).

Benefits

- ✓ Reduction in the use of resources (materials, energy and water) in the housing sector

Partner

WE & B Water, Environment and Business for Development

AIGUASOL

Agència de l'Habitatge de Catalunya

LEITAT Technological Center member of TECNIO — managing your technologies

ITeC

KPIs

- ✓ Recovery of **>95% of food waste** at home level.
- ✓ Recycling of **>90% of rainwater, greywater and blackwater** for production of reclaimed water and biogas.
- ✓ Production of high-quality biogas and efficient valorisation **(>90% conversion yield)**

SDGs impact

+ INFO

4. NEW MATERIALS

The circular economy pursues a harmonious intergrowth and sustainable development of both the economic and the social system without harming the natural ecosystem. By improving the productivity of materials and products (as shown in the graph below), not only the extraction of virgin resources but also the generation of waste can be reduced.

The new product design plays a key role for extending product life-span and closing material loops, as new design strategies are thought to address durability, maintenance and repairability, as well as upgradability or compatibility.

Substitution of halogenated flame retardants

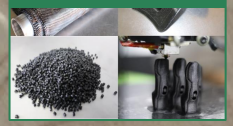
Substitution of fluorinated chemistries in water and oil repellent products

Continuous filament production of synthetic yarn

Highly efficient catalysts for air filtration systems

Cleaning products in a tablet

Recycling carbon fiber composites



Sustainable extraction of microalgae to develop skincare active ingredients

Reuse of byproducts of the cork industry for cosmetics

Research and development of innovative greases

Hygienic perfume based on biotechnological synthesis ingredients

Technology to reduce printers' impact on the environment

Longer life for ballast in rail

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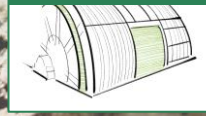
Sustainable retanning agents

Sustainable fatliquoring agents

Sustainable unhairing with enzymes



Sustainable tanning process

5G network platforms and research for circular economy applications

Development of advanced functional absorbent products

Bioplastics for the industry growth

Biomass recovery

Reduction of the concentration of N-ammonia from livestock manure

New material formulated with electric-arc furnace

New Materials formulated from residues for the construction sector

Longer life for transparent organic PV cells

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Advanced photocatalytic textiles to mitigate air pollution in cities

Eco-friendly batteries for single-use applications

Sustainable plastic solutions

An environmentally friendly plastic solution

Manufacture of recycled high-quality yarns

Manufacture of recycled colored yarns

Innovating in Construction Market by Using Recyclable Materials

Reuse your jeans!

A bio-based recycle packaging

The Greenest Tissue paper in the world

Compostable coffee capsules

OIMO

4. NEW MATERIALS

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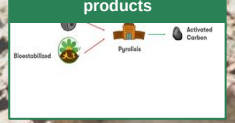
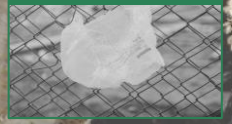
An ecological solar textile that purifies the air

Edible, flavored and 100% biodegradable straw

Generation of activated carbon from waste products



A more circular plastic packaging value chain



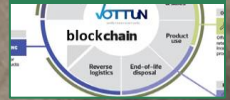
Sanitizing detergents based on biological ingredients

Ecoplanta: Green Chemical Industry

Organic waste transformation into bioplastics using bacteria

Sun protection, for curtains and blinds

Traceability system with blockchain technology for the circular economy



Substitution of halogenated flame retardants

FLAREX - Promotion of the circular economy in the technical textile sector

The Challenge

- ✓ Reduction of the environmental impact generated for textile finishing products flame retardants, through the study of non-toxic alternatives.

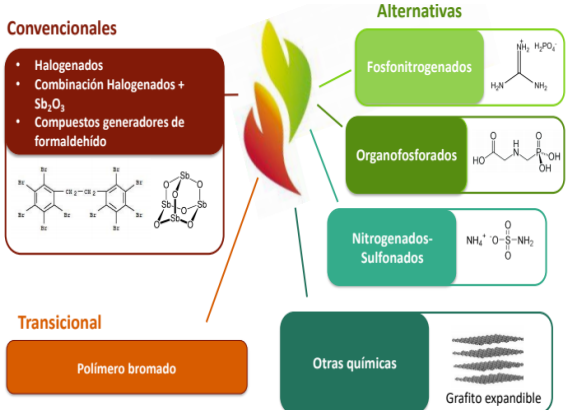
Innovation/Solution

FR compounds are currently used in the textile industry and are persistent in the environment and toxic for health human, associated with release of furans and dioxins and carcinogens.

From Leitat and AEI Tèxtils, have discovered alternatives based on phosphonitrogen compounds and on sulfonated nitrogenous, viable for textile applications that do not require durability to washes. Considering the results of the LCA study, the proposed halogen-free alternatives have less impact compared to conventional products.

Benefits

- ✓ The proposed halogen-free alternatives have less impact compared to conventional products
- ✓ Reducing the use of substances of concern.
- ✓ Cleaner and more efficient production



Partner

AEI Tèxtils.cat

Co-funded by:

Life

KPIs

- ✓ Up to **60% impact reduction** can be achieved by substituting halogenated FRs
- ✓ **Alternative flame retardants match** the technical performance of conventional products with lower environmental impact.
- ✓ Alternatives can be **cheaper** than conventional products

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Substitution of fluorinated chemistries in water and oil repellent products

MIDWOR - Promotion of the circular economy in the technical textile sector

The Challenge

✓ Reduction of the environmental impact generated by repellent textile finishing products to water and oil, through the study of non-toxic alternatives..

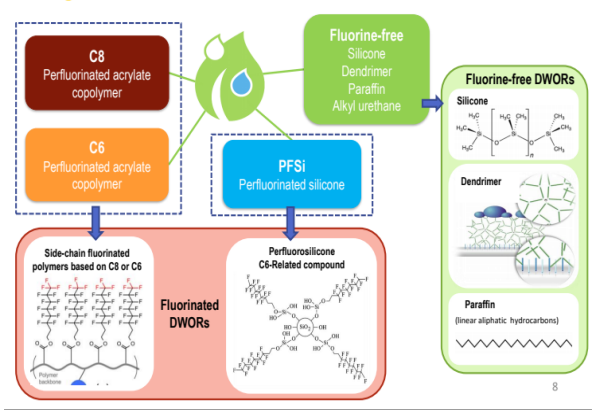
Innovation/Solution

DWOR compounds are currently used in the textile industry to provide Durable oil and water repellent fabrics, which have a greater environmental impact than alternatives fluorine free. The impact of fluorine-free compounds is 30-50 times less. From AEI Tèxtils compounds are studied for applications where water repellency is required, found alternatives with good technical performance and less environmental impact. The best results have been obtained by the dendrimer. In the case of the compound you provide oil repellency, a fluorine-free one has not yet been found, but if perfluorosilicone was found to be the option with the lowest associated environmental impact.

Benefits

✓ According to the occupational risk analysis, the majority of alternatives are safer than conventional products.

+ INFO



Partner

Co-funded by:

KPIs

✓ Mon-fluorinated chemistries **can substitute** the fluorinated DWOR products for water repellency with similar performance than conventional products

✓ Non-fluorinated products have up to **10 times** lower environmental impact

✓ In terms of risk analysis environmental, most alternatives are **less dangerous** than Conventional C8 products, and C6 polymers are similar to C8.

SDGs impact

Design industries / Packaging

Continuous filament production of synthetic yarn

Use of post-industrial waste from the textile chain and material from PET packaging

The Challenge

✓ More sustainable yarn production.

Innovation/Solution

Compact production plant equipped with cutting-edge technological facilities that focuses on the production of synthetic yarn by extrusion and spinning of polymer pellets. With the goal of protecting our environment, in Antex we recycle our internal waste as well as waste generated in other stages of the textile chain. We also have a wide range of yarns based on recycled polymers obtained from the selective collection of packaging waste. We are also part of Seaqual Initiative, a collaborative community fighting plastic pollution.

The products can contain special additives such as antimicrobial, flame retardant, UV protection, IR absorption, thermo absorption, biodegradation,...

Benefits

✓ Reduce raw material consumption

✓ Reuse post-industrial waste material from the textile chain and packaging

+ INFO

Partner

ANTEX Anglès Textil, S.A.

KPIs

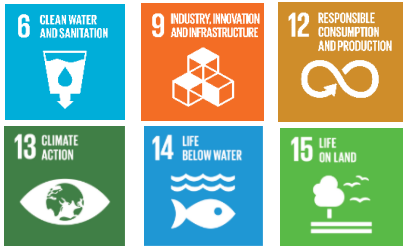
Reduction of:

✓ **36%** of CO_2 emission (Global warming)

✓ **34%** of water consumption

✓ **39%** of energy demand

SDGs impact



Highly efficient catalysts for air filtration systems

Nanomaterials capable of removing toxic air contaminants at room temperature

The Challenge

- ✓ Eliminate carbon monoxide and volatile organic compounds of industrial and domestic indoor environments that can be harmful for human health.

Innovation/Solution

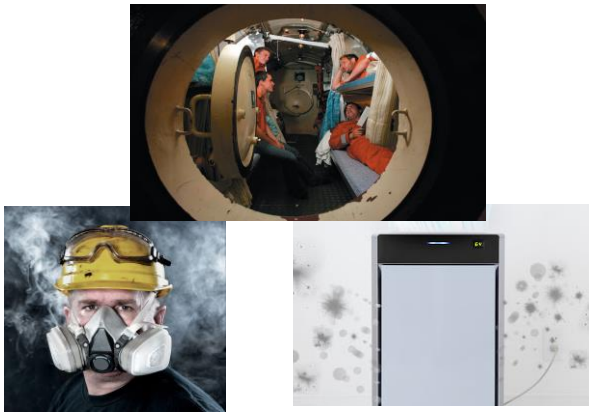
Astrea Materials is a company devoted to the development and supply of most novel and high efficiency products to safely abate CO (carbon monoxide) or VOCs (i.e. formaldehyde) in most demanding technical applications:

- ✓ Marine (O&G and professional diving)
- ✓ Mining and tunneling (refuge chambers)
- ✓ Industrial (i.e. fire fighting), gas and escape hoods
- ✓ Aerospace and Defense (life support systems and soldier protection)
- ✓ Domestic air filtration

Benefits

- ✓ Importantly, their technology does not produce noxious byproducts but converts those to carbon dioxide and water

+ INFO



Partner

Astrea materials

City Case: Sabadell (Barcelona)

KPIs

- ✓ Nanotechnology for **air purification**
- ✓ **Increased efficiency** compared to Pd/Pt and transition metal catalysts (Hopcalite and Carulite)

SDGs impact

3 GOOD HEALTH AND WELL-BEING

Packaging / Chemical, Energy and Water Industries

Cleaning products in a tablet

A single-dose effervescent tablet in a reusable bottle

The Challenge

✓ Reduce the plastic waste and environmental impact by making efficient and sustainable cleaning products.

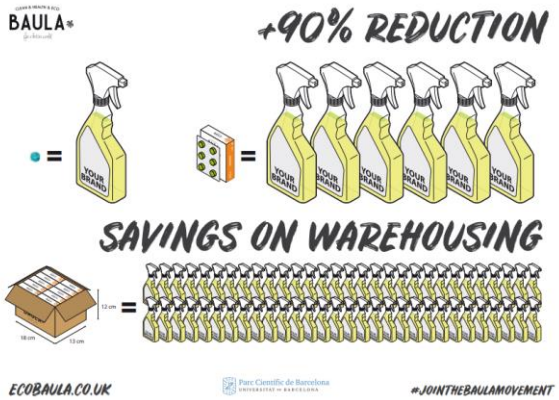
Innovation/Solution

Worldwide patented research, based on manufacture and distribution of cleaning products in individual effervescent capsules.

Ecobaula is a single-dose effervescent compressed tablet made of natural ingredients, easy to use in an empty bottle, filling it up with water followed by inserting an effervescent tablet from the blister pack. After a few minutes, the tablet is fully dissolved, and the product is ready to be applied to any surface.

Benefits

✓ Plastic packaging reduction above 90%.
✓ 0% organic residue in its deterioration.
✓ Water soluble product.
✓ Storage space reduction, reduction in logistics distribution and reduction of energy consumption and CO_2 emissions



Partner

BAULA
for a cleaner world

KPIs

✓ Up to **95% weight** reduction
✓ Up to **90%** reduction on **packaging materials**
✓ Reducing the **CO2 emissions x8** (production and transportation)
✓ **Natural ingredients**

SDGs impact

+ INFO

Sustainable Mobility / Chemical, Energy and Water Industries

Recycling carbon fiber composites

Production of advanced materials from composite waste

The Challenge

- ✓ Solve the global problem derived from the management of fiber reinforced plastic.

Innovation/Solution

Carbon fiber-reinforced plastics are widely used in several sectors and are considered one of the materials of the future. But at the end of their lifespan, composites are dumped in landfills causing a global problem. Through its own disruptive technology, BCIRCULAR obtains high quality carbon fiber from composite waste (airplanes, competition vehicles, wind blades, bicycles, etc.). Recycled fibers are used to produce new composites, reinforced pellets or 3D printed products.

Benefits

- ✓ Development of new advanced materials and high-performance sustainable products from recycled carbon fiber.
- ✓ Aimed at multiple sectors

Partner

bcircular sustainability & advanced materials

clustermoto clúster para el avance de la tecnología de la moto

Clúster Mav Materials Avançats de Catalunya

KPIs

- ✓ **100%** Clean and efficient technology
- ✓ **0% waste**
- ✓ Landfill volume reduction
- ✓ Carbon footprint reduction
- ✓ Conservation of **87-93%** quality of the recovered fibers (compared to original fibers)
- ✓ Recycled fiber **multiplies by 9 the strength** in thermoplastic products
- ✓ Recycled fiber **multiplies resistance by 3** in thermoplastic products

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Health, Well-being and Life Sciences Industries

Sustainable extraction of microalgae to develop skincare active ingredients

Natural origin, free of pollutants and zero waste

The Challenge

- ✓ Attain a sustainable extraction process for Omega3 and Astaxanthin for human use to incorporate into an eco-friendly skin delivery technology.

Innovation/Solution

The SME Bicosome has developed advanced skincare ingredients incorporating microalgae extract from a new eco-innovative and sustainable industrial bioprocess designed by Neoalgae Company. These microalgae are incorporated in lipid nanostructures, called bicosomes, which is 100% natural technology, produced in an ecological process that neither uses organic solvents nor produces toxic wastes and is a zero waste product.

Both microalgae extract and skincare ingredients are free of pollutants, without fishy aftertaste and odour free, apt for vegans, and with competitive and stable production costs.

Benefits

- ✓ A process that does not affect the environment and is sustainable in the long run.

+ INFO

Partner

bicosome®

KPIs

- ✓ New ecological products for the **treatment of skin diseases.**
- ✓ Both products will be **free of pollutants,** and with **competitive and stable production costs**

SDGs impact

Reuse of byproducts of the cork industry for cosmetics

Extraction of polyphenols from cork for cosmetic uses

The Challenge

- ✓ Extraction of polyphenols, antioxidant substances present in by-products of cork stopper fabrication, to incorporate them into creams and other beauty products with anti-aging properties within the circular economy concept.

Innovation/Solution

Pioneering project in Catalonia based on the extraction of polyphenols, antioxidant substances present in cork, to incorporate them into cosmetics and take advantage of their anti-aging properties.

The idea is to reuse by-products from the cork industry that until now were not considered of value, through a more sustainable extraction methodology since other similar studies used petroleum derivatives.

Benefits

- ✓ To reuse different elements of the cork industry, which currently have a very low value.
- ✓ Circular Economy that mitigates environmental impact and irreversible damage to climate and biodiversity and reduces greenhouse gas emissions.

+ INFO

Partner

biogründl

R+D partner

INSTITUT CATALÀ DEL SURO

KPIs

- ✓ Cork extracts have **antioxidant** and **anti-aging** properties.
- ✓ Cork material is closely related to the maintenance of **biodiversity**, the heart of sustainable development, and the **reduction of emissions and sequestration of CO2** through the cork forest.
- ✓ Each cork stopper contributes to fix up to **562 g CO2.**

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Sustainable Mobility / Industry 4.0 & Industrials Systems

Research and development of Innovative greases

Biodegradable, self-extinguishing and anti-vibration lubricating greases

The Challenge

- ✓ Create and develop more efficient and eco-friendly lubricants for railway lubrication processes.

Innovation/Solution

Brugarolas has developed lubricating greases based on high performance biodegradable esters that provide high added value properties such as: biodegradability, self-extinguishing and anti-vibratory properties that prevent soil contamination by migration of mineral oil based lubricating greases used previously, and generation of noise by friction. These greases have been validated in the railway sector, but they might open niches for markets such as foundries, hot mills, hot extruders, stained glass and cement plants due to their auto-extinguishing properties.

Benefits

- ✓ New lubricants has been proven to be more efficient than previous lubricants (less wear in the rail/wheel flange system), in addition to being eco-friendly and non flammable.

Partner

Brugarolas

KPIs

- ✓ Only one Railway Company of a small Country like Catalonia throwed to the environment **10 tons of mineral** oil based lubricant per year, that remains in the soil for many years. With the developed biodegradable lubricating grease, it is degraded in few months.
- ✓ Reduction of the wear of the Wheel Flange leads to a savings of **15% of Wheel** consumption and decreases maintenance costs.

SDGs impact

+ INFO

Chemical, Energy and Water Industries

Hygienic perfume based on biotechnological synthesis ingredients

Dual-purpose perfume with odor neutralizers and antimicrobial properties

The Challenge

- ✓ Develop a perfume for use in cleaning products, which is environmentally sustainable, antimicrobial and with perfume characteristics suitable for domestic and industrial use.

Innovation/Solution

The main objective of the project is to develop a perfume that has antimicrobial properties to be used in cleaning products. This perfume has a double functionality: one, optimal olfactory perception and second, to improve hygiene in industrial and domestic areas. The focus is to develop a perfume with antimicrobial properties, while taking account environmental and social aspects, applying green processes to obtain biodegradable active compounds.

Benefits

- ✓ More sustainable antimicrobial ingredients which are not harmful for humans in comparison to existing cleaning products.

Partner

GRUPO CARINSA®

KPIs

- ✓ **5%** reduction of organic content in waste water during the washing step
- ✓ **100%** bio-based functional ingredients
- ✓ **Cost effective**
- ✓ and high performance product.

SDGs impact

+ INFO

Technology to reduce printers' impact on the environment

Printer for the packaging sector

The Challenge

- ✓ Develop a technology with an innovative design and environmental benefits

Innovation/Solution

The press OFFSET CI8 (SOLVENT FREE) combines two processes: flexo printing using a central drum and offset printing.

The technology applied works with finer and thinner materials due to the compression to which the machine is subjected, its replacement of inks is solvent-based by electron beam technology and does not need ink drying system.

Benefits

- ✓ The printing process consumes less energy, which contributes to reducing greenhouse gas emissions
- ✓ Avoids emissions of volatile organic compounds (VOCs)
- ✓ Improves recyclability using electron beam coatings instead of additional layer/s of film/s

Partner

COMEXI

KPIs

- ✓ Consumes **40% less energy**
- ✓ Reduces the amount of **ink up to 0.9 g / m2**
- ✓ Economic activities related to the packaging sector represents in Catalonia **4% of GDP**, with about € **7.1 billion of turnover**

SDGs impact

+ INFO

Longer life for ballast in rail

Improving the properties of rail track ballast to reduce vibration and increase the lifespan

The Challenge

- ✓ Degradation of ballast aggregates which lead to a descent of track quality.

Innovation/Solution

Ballast is a crucial element of the track superstructure given that it fulfils key functional as drainage, load distribution or proving lateral resistant which govern the stability and performance of railway tracks. Due to the importance of the material Neoballast appears an innovative sustainable and cost-efficient solution to improve the economic and environmental performance of railway tracks.

This step forward is achieved through an advanced coating that comprises a bespoke binder component and recycled rubber coming from an of life vehicles tyres.

Benefits

- ✓ Increase the lifespan of ballast layer as well as the overall track service life.
- ✓ Allows the use of poor-quality aggregates which can compensate the lack of high-quality aggregates in certain regions.

+ INFO

Partner

COMSA CORPORACIÓN

City Case: Rail Track in Metro Barcelona

KPIs

Results of the technology

- ✓ Track stiffness reduced by 30%
- ✓ Vibration reduction by 10 dB
- ✓ Noise reduction by 0.6 dB
- ✓ Estimated ballast lifespan increase by 100%
- ✓ Reduction of LCC by 20%
- ✓ Reduction of carbon footprint by 30% (11.32 kg CO2 eq. per ton)
- ✓ Recycling of used tyres
- ✓ Potential recycling of existing ballast
- ✓ Enlarging of quarries' life
- ✓ Patented technology
- ✓ Certification on process

SDGs impact

Sustainable retanning agents

New eco-friendly retanning products

The Challenge

- ✓ Replacement of acrylic, sulfone and phenolic based retanning agents by renewable raw materials

Innovation/Solution

The majority of the retanning agents used in the leather industry com from the organic chemistry of petroleum, a nonrenewable resource and an important contributor to GHG.

Benefits

- ✓ New retanning products have same properties as the standard products, but they have higher biodegradability, they are originated from a renewable or residual raw material, they are environment, health-friendly and do not contain restricted substances.

Partner

Developing Sustainability
CROMOGENIA UNITS

KPIs

- ✓ **Biobased carbon** content has been analysed according to ASTM D6866-18, obtaining the following results:

RETANAL ST-AA	46%
RETANAL ST-AP	23%
RETANAL ST-A2P	50%
RETANAL ST-MS	75%
RETANAL ST-MP	74%

- ✓ **Low COD.**
- ✓ **Low or zero** formaldehyde content.

SDGs impact

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

+ INFO

Sustainable fatliquoring agents

New eco-friendly fatliquoring agents

The Challenge

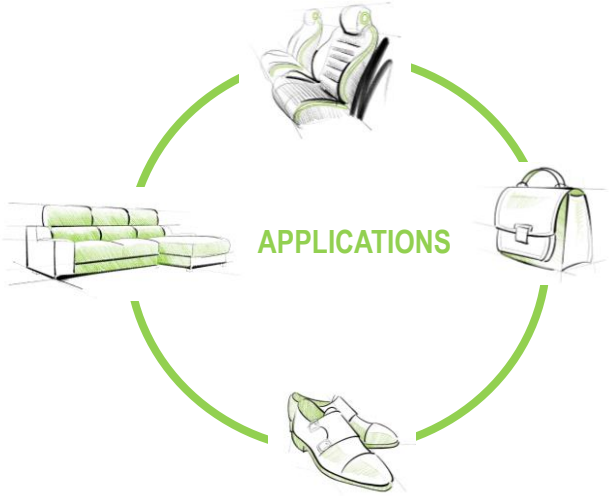
✓ Development of fatliquoring agents from renewable raw materials.

Innovation/Solution

Fatliquoring agents used in the leather industry are synthetic or natural origin. Even if they are of natural origin, it is not indicative that they come from renewable or residual raw material.

Benefits

✓ New fatliquoring products have same properties as the standard products but they have higher biodegradability, they originate from a renewable or residual raw material, they are environment, health-friendly and do not contain restricted substances.



Partner

Developing Sustainability
CROMOGENIA UNITS

KPIs

✓ **Biobased carbon** content has been analysed according to ASTM D6866-18, obtaining the following results:
RETANAL ST-AW 88%
RETANAL ST-AF 86%

✓ **Low COD.**

✓ **Low or zero** formaldehyde content.

SDGs impact

+ INFO

Sustainable unhairing with enzymes

Unhairing process eco-friendly

The Challenge

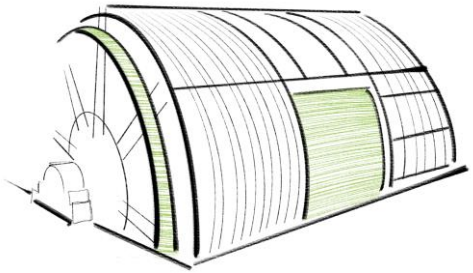
✓ Replacement of sodium sulfide as unhairing agent by enzyme based products.

Innovation/Solution

Unhairing is the most polluting stage of the tanning process, providing waste water with high BOD, COD, SS, sulfide, and TKN. Sodium sulfide is used as a standard unhairing agent, and this product can form hydrogen sulfide which is toxic, irritating and may cause death at very low concentration.

Benefits

✓ Cromogenia Units developed an enzyme-based process for unhairing with hair recovery using keratinase enzymes. This process allows reducing sodium sulfide and polluting loads.



Partner

Developing Sustainability
CROMOGENIA UNITS

KPIs

✓ **Reduction of polluting loads** when compared to standard process with sodium sulfide, obtaining the following results:

COD	-50%
BOD	-50%
SS	-70%
TKN	-50%
Sulfide	-50%

✓ **The risk of H_2S emissions is reduced.**

✓ **Less odor** in the plant.

SDGs impact

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

+ INFO

Sustainable tanning process

New process with a sulphonic acid derivative

The Challenge

✓ Tanning process with less salt and no sulfuric acid with a sulphonic acid derivative.

Innovation/Solution

The major polluting loads related to the tanning stage are chromium, chlorides and sulfates. During the tanning process, sulfuric acid is used to reduce sulfates from the residual bath. This product is extremely corrosive and hazardous during handling.

Benefits

✓ Cromogenia Units developed a new process with a sulphonic acid derivative which decreases the pollution load by reducing sodium chloride and chrome salts in the bath and eliminate sulfuric acid on account of its hazardousness during handling.

Partner

Developing Sustainability
CROMOGENIA UNITS

KPIs

✓ **Reduction of polluting loads** when compared to standard process, obtaining the following results:

Chloride	-68 %
Sulfates	-54 %
Chromium in bath	-60%

✓ **Greater chromium oxide fixation** onto hide.

✓ **Lower collagen degradation,** thus providing a tighter, fuller leather with improved resistances.

SDGs impact

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

+ INFO

Industry 4.0 & Industrials Systems

5G network platforms and research for circular economy applications

Innovate and create new markets

The Challenge

- ✓ To increase the energy efficiency of the ICT sector and vertical industries, resulting from the adoption of 5G technologies as well as research and innovation activities in communication networks.

Innovation/Solution

- ✓ A portfolio of experimental platforms (testbeds) made available to vertical industries for exploring the benefits of 5G and advanced communication technologies in terms of reduced energy consumption. It includes fully virtualized (NFV) 5G access and core network, a satellite segment for backhauling and massive coverage, and an Internet of Things (IoT) testbed allowing to collect, store, analyze and visualize in real time data collected by e.g., temperature, humidity CO2 sensors.
- ✓ Advanced AI/ML research activities to minimize the energy associated to communications and computation in radio access and edge computing.

Benefits

- ✓ Reduced energy consumption, enhanced mobility management, improved air quality.

+ INFO

Partner

CTTC

KPIs

- ✓ R&D center in Spain with the highest participation in **5G-PPP projects** (2nd in Europe)
- ✓ **+30 technology transfer contracts** with companies per year
- ✓ **CTTC** holds a TECNIO accreditation

SDGs impact

Health, Well-being and Life Sciences Industries

Development of advanced functional absorbent products

Pioneers in the production and development of organic cotton feminine hygiene

The Challenge

- ✓ To offer a healthier, organic and eco-friendly product range for Intimate Feminine Hygiene products

Innovation/Solution

Present a full range of Intimate Feminine Hygiene products (Tampons, Pads, Pantyliners and other related products) made with Certified Organic Cotton and Biodegradable materials which take care of Women Health and our Environment.

Benefits

- ✓ Hypoallergenic 'non-irritant' products, which helps to prevent the risks of itching, irritations and / or allergies.
- ✓ Environmentally friendly products made with certified organic cotton and the most biodegradable materials.
- ✓ Social responsibility policy. guarantee all workers rights and cooperate with ONG / social companies to help to get access to these products

Partner

COHITECH
Cotton High Tech S.L.

KPIs

- ✓ Currently present in more than **40 countries** all around the world.
- ✓ **76%** of the sales are outside Spain.
- ✓ **100%** Eco-friendly and Organic products.
- ✓ Sales increases 2019: **43%**

SDGs impact

+ INFO

Bioplastics for the industry growth

Valorization of organic waste to produce bioplastics for the cutting-edge technological

The Challenge

- ✓ Improve physical properties of bioplastics in the industry field.

Innovation/Solution

Dan*nas develops the Recovery of organic waste to develop functionalized bioplastics with high added value for the organic electronics, regenerative biomedicine or multifunctional packaging sectors. Controlling the degree of biodegradation in the medium or long term, its physical and mechanical properties. The development is 100% bio-based through the use of green chemistry.

Benefits

Improvements in

- ✓ Thermal or conductive properties.
- ✓ Strength, stiffness or flexibility.
- ✓ Fire retardant property.
- ✓ Hydrophobic or gas barrier properties.
- ✓ Ability to be transformed by injection, blown, extrusion or 3D Printing.

Partner

Dan*nas
artificial nature

KPIs

- ✓ Organic waste: Recovery of **70%** in a bioproduct.
- ✓ **80%** reduction in e-waste
- ✓ **82%** reduction in energy use in substitution of metal processing

SDGs impact

+ INFO

Biomass recovery

Transformation and use for new materials

The Challenge

- ✓ Transformation of by-products and wastes from various sources into added value products.

Innovation/Solution

With the main objective of making an integral use of biomass, new solutions and processes are developed and proposed by DBA:

- ✓ Valorisation of lignocellulosic biomass: separation of lignin, cellulose and hemicellulose using sustainable processes and environmentally friendly solvents.
- ✓ Recovery of biomass of greasy nature: Obtaining plastic precursors, lubricants, and also phase exchange materials (PCM) for energy storage.
- ✓ Recovery of biomass of protein nature: Obtaining culture media for the growth of microorganisms and plants.

Benefits

- ✓ Adding value to wastes from the agro-food industry
- ✓ Generation of commercial products
- ✓ Contribution to mitigate climate change

+ INFO

Partner

dbA
Centre de Desenvolupaments Biotecnològics Agroalimentaris

KPIs

- ✓ **Recirculation of feedstock** lost during the production (10%).
- ✓ **Less water and raw wood fibre** (up to 900Tm/year) consumed.
- ✓ Increased productivity.
- ✓ **Reduction in the CO_2** emissions (**180 ton/year**) due to less waste incineration.
- ✓ **Market value** (2020) of the **obtained lignin: 800 k€**

SDGs impact

Reduction of the concentration of N-ammonia from livestock manure

New low-cost alternative process

The Challenge

✓ Reduction of the concentration of N-ammonia based on the needs and costs of treatment required

Innovation/Solution

A technology patented by the University of Barcelona (ES2332300B1 / WO2010 / 018260A1) has been developed for the use of low-content magnesium oxide by-products for the formulation of a reagent that is easy to handle and to add during the treatment of pig droppings in a physical-chemical source.

A demonstration installation of a pilot plan for the elimination of N-ammonia has been carried out, which allows determining the technical specifications at this scale of work.

Benefits

✓ Obtaining N-NH3 slow release fertilizers.

Partner

Diopma

KPIs

✓ **70-75%** reduction of N ammoniacal concentration

✓ **4-5€/m3**

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

New material formulated with electric-arc furnace dust (EAFD)

Developed with thermo-acoustic better properties for buildings

The Challenge

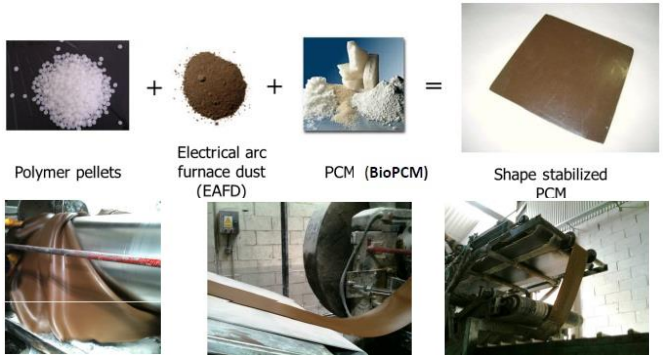
- ✓ Reduction of EAFD costs and develop a value added product

Innovation/Solution

A technology patented by the University of Barcelona (ES2450765B1 / WO 2013/014318 A1) recycles EAFD into a shape stabilized acoustic insulation with thermal inertia provided by embedded phase change materials (PCM). The material is non-hazardous, flexible, durable, highly dense, and offers compelling value for the product cost at the same time it solves the environmental challenges associated with treating EAFD. It is the first acoustic membrane in the world offering also thermal inertia with its high density and PCM (phase change material). The product helps (to reduce the energy consumption for cooling summer periods improving thermal and acoustic comfort.

Benefits

- ✓ Recycling steel making solid wastes for added value energy efficiency building products



Partner

KPIs

- ✓ Encapsulating **0.7 kg** of waste material, which up to 70% in mass would probably end landfilled
- ✓ Material of 5 mm thickness and mass per unit area **9.5 kg/m2**

SDGs impact

+ INFO

New materials formulated from residues for the construction sector

Sustainable construction materials

The Challenge

- ✓ Reuse different by-products to develop new materials for the construction sector

Innovation/Solution

Chemically bonded phosphate ceramics (CBPC)

✓*Magnesium phosphate cements (MPC):* repairing materials (cements, mortars), and for radioactive waste stabilization and solidification

✓*Calcium phosphate cements (CPC) and Al/Fe/Zn phosphate cements:* application as dental cements and bioceramics.

Alkali Activated Cements (AAC) applications for construction materials (cements, mortars and concrete) and stabilization and immobilization of radioactive by-products.

- ✓ *Aggregates* made of MSWI bottom ash and air pollution control ash for road sub-base
- ✓ *Lightweight aggregates* from municipal solid waste and weathered bottom ash, for light cements application

Benefits

- ✓ Valorization residues and sustainable construction materials

Partner

KPIs

- ✓ Alternative Materials to OPC reducing **40% CO2**
- ✓ **CBPC rapid setting and durability**
- ✓ **CBPC** is a non temperature require setting
- ✓ **The AACs** involves energy and resources-savings
- ✓ **AACs** are sustainable cements following the zero waste principle

SDGs impact

+ INFO

Longer life for transparent organic PV cells

New material that adds value to PV cells

The Challenge

✓ Protect photovoltaic cells and extend their useful life.

Innovation/Solution

The aim of the project is to research on advanced nanostructured polymeric materials that act as a protective barrier for organic photovoltaic cells to extend their useful life. The expected results would include the development of a polymeric material that acts as a barrier to different types of gases and environmental vapors in organic photovoltaic cells, extending their service life. While in the other hand obtaining a material that does not degrade organic PV cells, either physically or chemically, during their deposition process.

Benefits

✓ Economically viable material that adds value to organic PV modules and facilitates their commercialization.

Partner

ECOPOL TECH

KPIs

✓ Two-component solvent based polyurethane preparation designed to obtain **great barrier properties against moisture and oxygen in environments with high relative humidity.**

SDGs impact

+ INFO

Advanced photocatalytic textiles to mitigate air pollution in cities

Innovative textiles that capture pollutants to improve air quality

The Challenge

✓ Capture pollutants in the air to improve air quality in congested cities.

Innovation/Solution

ETISILK has developed an innovative textile fabric coated with a nano-photocatalysts that can mitigate urban pollution. The treated fabrics can degrade air pollutants like NOx, organic fractions in the suspended particles (PM10 and PM2.5) and other volatile organic compounds (VOCs) into harmless substances. CLEAN-Photo-TEX This maintenance-free and low-cost solution is a complete game-changer to reduce air pollution in cities and improve the quality of life of humanity. ETISILK advanced textiles with photocatalytic technology can be used for architecture and decoration in cities merging both design and sustainability thanks to its double functionality as an air cleaning solution.

Benefits

✓ Reduce pollution in cities with a cost efficient, maintenance free and design friendly solution.

Partner

ETISILK woven fabrics

KPIs

✓ Clean tech and environment protection are international focus. The **EU has budgeted over 300 billion € for the next financial period**.

✓ **Addressable market** for CLEAN-Photo-TEX is of at **least of 3 billion €/year** for new buildings plus the potential for refurbishing existing buildings with textile panels

SDGs impact

+ INFO

Chemical, Energy and Water Industries / Health, Well-being and Life Sciences Industries

Eco-friendly batteries for single-use applications

Batteries made of paper, carbon and small quantities of non-toxic metals

The Challenge

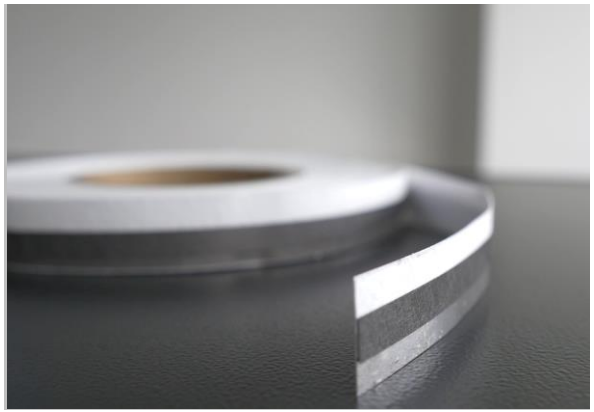
- ✓ Develop a technology to make batteries more sustainable and friendly with the environment.

Innovation/Solution

Eco-friendly paper-based battery technology to power portable electronic devices. Fuelium technology offers a sustainable alternative to pollutant coin cell and printed batteries, standard energy sources that require long and complex recycling processes. Fuelium batteries can be made in a tailor-made basis since specifications (such as voltage, power, size and duration) are scalable to the specific energy requirements of each application.

Benefits

- ✓ Affordable, eco-friendly and powerful batteries for single-use electronic devices.
- ✓ Sustainable power source.



Partner

Fuelium

KPIs

- ✓ Particularly suitable to **power in-vitro diagnostics applications**
- ✓ **Easily integrable** into devices improving user experience
- ✓ **Reduce manufacturing costs** on devices
- ✓ **Voltage 1-6 V / Power 1-250 mW / Power delivery > 1 h**

SDGs impact

+ INFO

Sustainable plastic solutions

High quality recycled polyolefins as a sustainable solution to replace virgin polymer

The Challenge

- ✓ To design, produce and commercialize innovative and environmentally friendly recycled compounds, suitable for high end and demanding applications traditionally fed by virgin polymers.

Innovation/Solution

GCR Group's CICLIC is a leading brand in the production of mechanically recycled PP and PE compounds.

In-house optimization and development of recycling technology.

Cutting edge production and laboratory equipment combined with quality control management and assurance.

Benefits

- ✓ LCA performed on all recycled products with certified CO2 emissions reduction.
- ✓ Certification on origin and traceability of Post-Consumer (PCR) and Post-Industrial (PIR) raw materials

Partner

ciclic | GCR GROUP

City Case: La Bisbal del Penedès

KPIs

- ✓ **CICLIC** recycled production capacity of **50,000 mT/year.**
- ✓ **GCR Group**'s overall capacity to reach **500,000 mT/year** by 2021.
- ✓ **90% of CO2 emissions savings** as compared to equivalent virgin polymer.
- ✓ In 2020 we will **prevent 36,500 mT of CO2** from being emitted into the atmosphere.

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

An environmentally friendly plastic solution

Carbon footprint reduction

The Challenge

- ✓ Reduce heavy metals, non-abrasive plastic and suitable for a range of uses, including those coming food.

Innovation/Solution

Granic is leading brand of mineral plastic concentrates with calcium carbonate, talc, silicon derivatives and other mineral specialties for the processing industry.

Granic masterbatches are compatible will al kinds of great consumption polymers such as polyethylene (PE), polypropylene (PP) , polystyrene (PS) and ABS.

Benefits

- ✓ Improving the Life-cycle assessment by using more environmentally friendly raw materials
- ✓ Reduction of energy consumption during the production process
- ✓ Reduction of clients' energy consumption due to its thermal conductivity decrease the need for energy consume.

+ INFO

Partner

GCR GROUP

Granic

City Case: Cerdanyola del Vallés

KPIs

- ✓ Production of 275,000 Tn/year

SDGs impact

Manufacture of recycled high-quality yarns

Sustainable and innovative

The Challenge

- ✓ Cover the growing demand for socially and environmentally responsible products

Innovation/Solution

This business project and its own business model is developed with the aim of creating value in a sustainable way for society, consumers, and customers. Produce yarns by recycling and using recycled textiles from other production centers: spinning mills, fiber manufacturers, weavers, clothing manufacturers, recycling plants. The destination of the different recycled yarns is the manufacture of recycled fabrics for clothing ,decoration, technical, industrial and personal protection. The company has opted for the GRS certificate, under the supervision of Textile Industry Research Association, AITEX.

Benefits

- ✓ Less impact on ecosystems and their natural resources.
- ✓ Savings in the production of raw materials and in their dyed, water and energy.

Partner

HILATURAS ARNAU

KPIs

- ✓ Savings in drinking water**, 95% with recycled fibers**
- ✓ Less impact on ecosystems**, 90% CO2**
- ✓ **Studies reveal: 89% of consumers** plan to buy more organic products in the next 12 months **and 35%** would be willing to pay more for an organic product.

SDGs impact

+ INFO

Manufacture of recycled colored yarns

Innovation applied to the manufacture of ecological yarn with various features and finishing qualities.

The Challenge

- ✓ Incorporate technology into the production of recycled yarn to achieve high-quality products.

Innovation/Solution

YES® was born with the desire to be a leader in the production of recycled colored yarns. HILOSA has created an exclusive ecological and sustainable manufacturing process that provides its products with a great variety and high performance.

They work based on a system devised exclusively in their color laboratory, achieving surprising, unique, exclusive results created on demand, based on concepts of sustainability and environmental respect

Benefits

- ✓ So ecological and sustainable manufacturing.
- ✓ Greatly reduce water and energy consumption in the fashion industry.
- ✓ Reduce the volume of solid waste in landfills.
- ✓ Save virgin raw material.

Partner

HILOSA®
HILADOS OLOTENSES, S.A.

KPIs

- ✓ **Less 55%** wàter consumption compared to conventional Cotton.
- ✓ **Less 62%** energy consumption than conventional Cotton.
- ✓ **Less 35%** in Greenhouse gas and CO2 emissions.
- ✓ **16%** insecticides and **7%** pesticides are used in conventional Cotton.

SDGs impact

+ INFO

Innovating in construction market by using recyclable materials

High-end reclaimed material for circular living, all made from cellulose waste

The Challenge

- ✓ Upcycle cellulose waste generated by the Paper Mills

Innovation/Solution

MDF and drywall are widely used by the construction industry. Both are made from virgin raw materials and are currently unrecyclable. We have developed a healthy and functional material called Honext boards, that can be used as a direct substitute for MDF and drywall. Honext is made from cellulosic waste generated by the paper industry that would otherwise be sent to landfill or burnt. Our growth strategy is based on collaborating with local industrials who have a waste problem to transform it into a material for the regional market, thus reducing the environmental impact of transportation.

Benefits

- ✓ Healthy material (recyclable, no VOCs emissions)
- ✓ Competitive price and technical properties: water resistant, fire reaction and sound absorption.
- ✓ Same transformation methods

+ INFO

Partner

HONEXT

KPIs

- ✓ **100%** of the production energy from renewable sources.
- ✓ **Closed process water loop.**
- ✓ **2020 goal: 2.000 tons** of waste transformed. **2025 goal**: transform **72.000 tons** of waste per year.

SDGs impact

Reuse your jeans!

Repair your jeans and find out the new eco-designed products

The Challenge

- ✓ Reduce clothes consumption
- ✓ Reuse discarded jeans for new fashion products

Innovation/Solution

InfinitDenim has developed a circular economy around unwanted jeans and according to ethic, social and sustainable production. Their main actions include:

- ✓ Repair and collect jeans at the end of their product life in exchange for a shopping discount
- ✓ Re-manufacture of jeans in new eco-designed and quality products
- ✓ Local textile recycling of denim scarps, but making these part of new yarns and fabrics and at new fashion collection.

Benefits

- ✓ Facilitate citizens and companies on the transition towards a circular economy by offering them new eco-designed products with reused materials.

Partner

infinitdenim

KPIs

- ✓ **20.000 kg** de texans recuperats.
- ✓ **4.800 kg** de texans convertits en productes upcycling
- ✓ **1.200 kg** de texà convertits en nou teixit. Producció de 4000 m de teixit InfinitDenim.
- ✓ **36.691.200,00** litres d'aigua
- ✓ **37.895.040,00 kg** de CO2

SDGs impact

+ INFO

A bio-based recyclable packaging

Milk protein and potato waste to replace plastic packaging

The Challenge

✓ Reduce reliance on fossil fuels for food packaging

Innovation/Solution

Paper and cardboard are preferred packaging options for many types of food, including milk. To obtain the desired properties, the packaging has to be coated with polyethylene which is synthesized from crude oil that negatively impacts the recyclability. The Bioboard project has developed a packaging material made from whey protein and potato waste. An environmentally friendly solution with affordable production costs, al well as maintaining the quality of the packed product. At the same time, it contributes to reuse the tonnes of whey that are annually rejected by the agro-food industry.

Benefits

✓ Reuse of the massive amount of whey available

✓ A more environmentally friendly and recyclable packaging.

Partner

IRIS

LLET NOSTRA
LA LLET DE COOPERATIVES CATALANES

KPIs

✓ About **7 million tons of coated paper, paperboard, and carboard** are currently manufactured

✓ Related job creation on average capital intensity in the industrial sector of € 120,000 per job per annum.

✓ **20millions tons of whey** are generated by the agroindustry

SDGs impact

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

+ INFO

The greenest tissue paper in the world

The OnePly paper technology allows up to 80% reduction in energy consumption

The Challenge

- ✓ Embrace sustainability in the tissue industry, developing technology to better use resources and maintain a high-quality product.

Innovation/Solution

Traditionally, tissue paper (for toilet rolls and hand towels) has multiple layers that are joined after drying each of them. This has a high energy consumption as there are 4 surfaces to dry. LC Paper developed a technology called OnePly that joins two layers in wet conditions, so the surfaces to dry are reduced from 4 to 2, thus using 80% less energy. The reduction in energy consumption allows 100% renewable sourcing that wouldn't be possible otherwise.

Benefits

- ✓ Reduced consumption of raw material, energy and water in the production process.
- ✓ Resulting product is more compact: more meters in the same roll diameter, so it uses less shipping space

Partner

LC Paper

KPIs

- ✓ The OnePly technology **costs 30% less than conventional tissue**
- ✓ **80% less energy consumption** in the production
- ✓ **2,56x less water used** in the production

SDGs impact

+ INFO

Food Industries & Agriculture / Packaging

Compostable Coffee Capsules

Compatible with Nespresso coffee machines

The Challenge

- ✓ Develop daily use products to be eco-friendly and environmentally sustainable.

Innovation/Solution

Coffee capsules are one of the great releases of recent times, and their use continues to rise. However, this new product has also led to an increase in waste produced by coffee consumption. Until now there was no solution for these capsules, beyond the recycling offered by some brands. Cafés Novell has found a solution: after investing one million euros for its development, it launched the first compostable coffee capsules compatible with Nespresso coffee machines

Benefits

- ✓ Zero waste produced utilizing Novell coffee capsules, by composting them after using.
- ✓ Compatible with Nespresso machines, the most widespread capsule model.

Partner

NOVELL

KPIs

- ✓ **Full degradation** over a period **of 12 to 20 weeks**
- ✓ **Certified organic coffee** in each compostable capsule

SDGs impact

+ INFO

Oimo

Packaging Nature Can Handle

The Challenge

- ✓ To tackle the 8 million tonnes of plastic which end up in the oceans every year we found a material alternative for plastic in packaging.

Innovation/Solution

- ✓ Marine biodegradable
- ✓ Water Solublle
- ✓ No need to be Industrially Composted

Benefits

- ✓ Microplastics Free
- ✓ Competitive price
- ✓ Pellet compatible with current plastic processing
- ✓ machinery

Partner

Oimo

KPIs

- ✓ **Food and beverage**
- ✓ **Cosmetics**
- ✓ **Electro domestics**

SDGs impact

+ INFO

An ecological solar textile that purifies the air

First fabric that cleans and purifies the air by means of photocatalysis

The Challenge

- ✓ Eliminate toxic particles in suspension purifying the air.

Innovation/Solution

Through solar action, toxic particles in suspension, such as dust, smoke, mold or nitrogen dioxide are eliminated . It is estimated that 4m2 of this type of fabric is equivalent to removing a car that has been travelling for a whole year. The fabrics are sprayed with a mineral preparation based on titanium dioxide capable of removing dirt and toxic particles in suspension through the use of sunlight, like photosynthesis. The fabric eliminates common pollutants in the atmosphere though an oxidation process activated by sunlight, and it is carried out continuously, staying cleaner with half of the maintenance of a normal one.

Benefits

- ✓ Improve people's air quality through air purification.

Partner

Sauleda

KPIs

- ✓ 4m2 of fabric is equivalent to **removing a car travelling for a year**
- ✓ Through the use of sunlight, **the textile acts like photosynthesis**
- ✓ Self-cleaning effect around **70%**
- ✓ Reduction of molds by **60%**

* This data is indicative and may vary depending on the environment conditions.

SDGs impact

3 GOOD HEALTH AND WELL-BEING

+ INFO

Edible, flavored and 100% biodegradable straw

Using and innovative complex production process first in class

The Challenge

✓ Reducing the amount of single use plastic

Innovation/Solution

SORBO MJV SL has developed a unique biodegradable, edible and flavored straw to fight single use plastic and especially plastic straws that generates huge pollutions in the oceans and on land around the world. SORBOS sustainable straws do not modify the taste or color of the drink. SORBOS straws are an added value for the customers and gives them a unique experience.

Benefits

✓ SORBOS is 100% biodegradable.

✓ SORBOS is edible and flavored

✓ SORBOS is an added value and unique experience for the customers

Partner

SORBOS® edible straws

KPIs

✓ The first and unique edible, flavored and **100% biodegradable** straw in the world.

✓ More than **40 millions** of plastic straws reduced.

✓ More than **30 countries** in the world follows us in the fight against single use plastics.

✓ **800 tones** of plastic less in our oceans

✓ **10 awards** as an innovative and eco-friendly product.

SDGs impact

+ INFO

Industry 4.0 & Industrials Systems / Chemical, Energy and Water Industries

Generation of activated carbon from waste products

Use in adsorbent filters in the treatment of water and gas

The Challenge

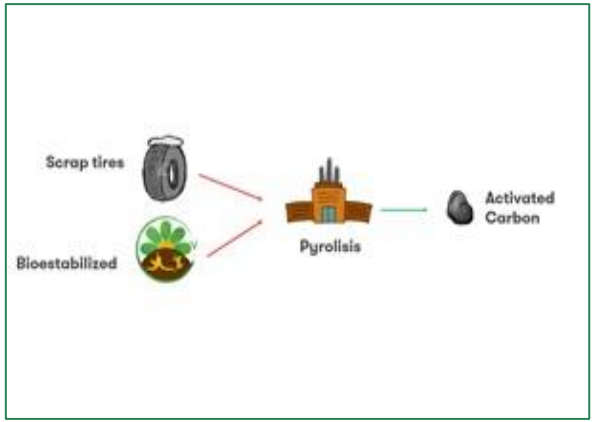
- ✓ To obtain an adsorbent material from different wastes for water or gas treatment in a sustainable and eco-friendly manner.

Innovation/Solution

Sorigué, through its project called ResActiv, developed a technology that transforms scrap tires and bio stabilized material (not studied with new technologies so far) into a new activated carbon filter (AC) that can adsorb bad smells, heavy metals, organic matter and emerging pollutants in water and gas treatment.

Benefits

- ✓ Usage of a waste product to produce an added value material (Carbon filters)
- ✓ Produce a high value-added product that also contributes to circularity. Is generated for water management, thus closing the cycle of materials
- ✓ Way out of the landfill for pneumatic/bioestabilized waste until now could not be valued materially or energy



Partner

sorigué

KPIs

- ✓ Scrap tires and bioestabilized transformed into an add value AC **with a high specific surface > 500 m2/g**
- ✓ Price of AC can achieve up **to 2,000€ per ton**.
- ✓ **40,000 tons of scrap tires and 288,500 tons** of bio stabilized per year will avoid to landfills, only in Catalonia.

SDGs impact

+ INFO

Packaging

A more circular plastic packaging value chain

Sustainable, efficient, competitive, less fossil fuel dependent and interconnected value chain

The Challenge

- ✓ Develop a plastic packaging that is more sustainable and eco-friendlier, while maintaining its cost-efficiency.

Innovation/Solution

The CIRC-PACK project will develop three case to develop, and test better system-wide economic and environmental outcomes by i) decoupling the chain from fossil feedstocks, (ii) reducing the negative environmental impact of plastic packaging; and (iii) creating an effective after-use plastics economy. All in all, the work will be supported by non-technological analysis and advanced methodological analysis which will trigger a broadly deployment of the tested solutions.

Benefits

- ✓ Improve sustainability of the packaging value chain
- ✓ Development of breakthrough biodegradable plastics using alternative biobased raw materials

Partner

PICVISA OPTICAL SORTING

KPIs

- ✓ A common EU target for recycling **65%** of municipal waste and **75%** of packaging waste **by 2030**
- ✓ A binding landfill target to reduce landfills to a maximum of **10%** of municipal waste **by 2030**
- ✓ Increase in recovery rate to **48% by 2020** and reduction of landfill rate by up to **15% by 2020**

SDGs impact

+ INFO

Chemical, Energy and Water Industries

Sanitizing detergents based on biological ingredients

A positive environmental impact

The Challenge

- ✓ Maintain the hygienic properties of detergents while having a low environmental impact

Innovation/Solution

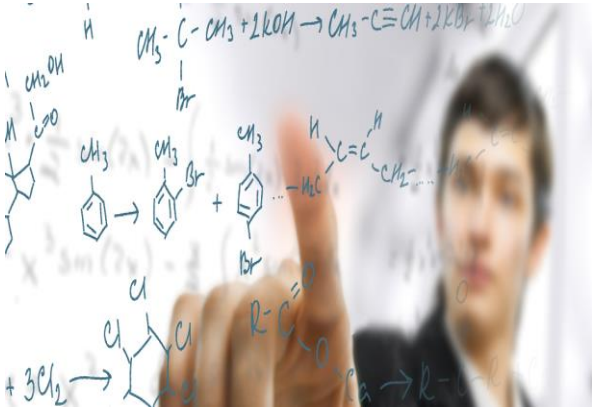
Increasingly focused on generating less environmental damage and being more sustainable, washing habits are changing worldwide: low-temperature washing, liquid products, neutral detergents as substitutes for alkaline and oxidizing components, short washing cycles.

The purpose of the HYGIENZYM project is to develop ecological enzyme-based detergents, with dual detergent and sanitizing functionality, without the need to resort to biocidal assets that pose a risk to users and the environment.

Benefits

- ✓ Quality product with low environmental impact
- ✓ With wooden pallets (PEFC-certified) and new boxes (FSC-certified), new and more sustainable materials were introduced into the company's storage and production process.

+ INFO



Partner

PROQUIMIA
www.proquimia.com

KPIs

PROQUIMIA has carried out a reconditioning of containers in 2019 which saved the following:

- ✓ **36.7 tons** of steel
- ✓ **14.1 tons** of plastic
- ✓ -**00.6 tons** of CO2 emissions

SDGs impact

6 CLEAN WATER AND SANITATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Ecoplanta: Green Chemical Industry

Innovative clean technology for a responsible and sustainable production

The Challenge

- ✓ Ecoplanta produces green methanol without using hydrocarbons.

Innovation/Solution

EcoPlanta Molecular Recycling Solutions has the aim to boost new circular economy and a responsible and sustainable business & production.

Methanol is the most used basic product in chemical industry and is used in multiple manufacturing processes. Ecoplanta will be the first green methanol factory in Spain. Today, methanol production comes mainly from fossil fuels (natural gas & coal). Green methanol produced from molecular recycling in Ecoplanta means savings in import & hydrocarbons consumption.

Benefits

- ✓ To reduce waste problematics.
- ✓ To minimize climate change causes

Partners

suez

Enerkem

ecoplanta
MOLECULAR RECYCLING SOLUTIONS
An Enerkem & SUEZ Company

KPIs

- ✓ **Ecoplanta** will contribute to **improve indexes of material valorization in Catalonia,** planned in PRECAT 20 program and **European objectives 2035,** that fix 10% for landfill, 25% for waste treatment and energy recovery and 65% for recycling and material recovery.

SDGs impact

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

17 PARTNERSHIPS FOR THE GOALS

+ INFO

Chemical, Energy and Water Industries

Organic waste transformation into bioplastics using bacteria

First test in bioplastic bags in industrial scale

The Challenge

✓ Transform organic waste into bioplastic.

Innovation/Solution

Venvirotech has developed a process for bioplastic production using bacteria. The system turns organic matter, such as food waste, into a product that can be used as a biodegradable alternative to single-use plastic.

The biotech startup began its pilot phase near Barcelona, at a BonArea supermarket plant, where they were able to develop a technology test based on bioplastic bags on an industrial scale with a potential customer. It is currently developing new pilots, including waste from Nestlé coffee production.

Benefits

✓ Provide an alternative bioplastic bags and other plastic products.

✓ Reduction of greenhouse emissions.

Partner

VEnvirotech

KPIs

✓ **4 tons** of organic waste management per day in each VE-Box.

✓ **One day process.**

✓ **3%-25% Yields** of conversion to bioplastic.

✓ **5%-40%Savings** in organic waste management.

SDGs impact

11 SUSTAINABLE CITIES AND COMMUNITIES

+ INFO

Sun protection, for curtains and blinds

Semi-translucent technical fabrics made of 100% recycled polyester

The Challenge

✓ The use of recycled PET yarns

Innovation/Solution

The recycled polyester yarns used in manufacturing have quality and characteristics identical to those produced with raw materials virgins. Planet FR and Ecoplanet FR avoid glare and They offer good visual comfort while maintaining privacy. Both have a good absorption coefficient acoustic and Greenguard certified as low emission fabrics.

The company that supplies the recycled polyester raw material, provides the Global Recycled Standard (GRS) certificate, a standard for the traceability and verification of the content of recycled material in a product.

Benefits

✓ Reduces consumption of energy and resources associated with the manufacture of raw materials

✓ Provide a second life to the bottles and prevent their cremation

Partner

vertisol

contemporary weavers

KPIs

✓ Planet FR is made from **recovered PET bottles** (one square meter **equals 6 bottles**)

✓ Other characteristics of the tissue are: One square meter is made from **4/6 thrown away bottles,** Significant level of acoustic absorption (Planet FR), that contribute to indoor **air quality**.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

+ INFO

Traceability system with blockchain technology for the circular economy

Blockchain, bringing data transparency to product lifecycle traceability to support the circular economy

The Challenge

✓ Improve the performance of the circular economy through blockchain technology

Innovation/Solution

This system keeps track of what products really are, how they are used and what happens during their life cycle in an effective and transparent way. With this technology is possible to implement intelligent audit systems from the records generated by all those involved in the reverse supply chain and certified circular economy processes.

Therefore, blockchain technology will help both corporations and governments meet their environmental commitments in terms of environmental management with certified data and transparency, thus generating a system of environmental control as well as tracking of the reputation of the participants, as an important ally for sustainability and environmental support.

Benefits

✓ To get the real carbon impact of materials throughout their life cycle.

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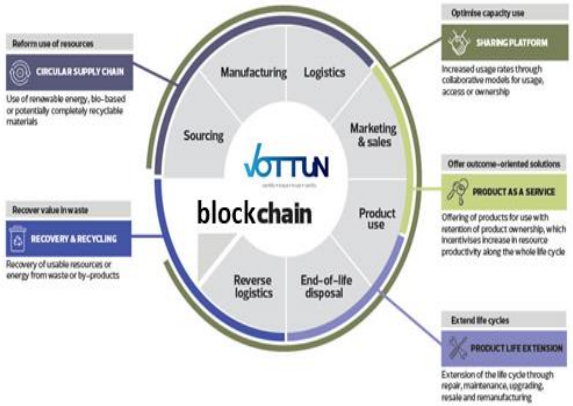


Partner

VOTTUN

find it • link it • trace it • use it!

KPIs

✓ **Use of product life:**

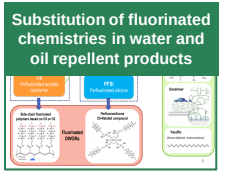
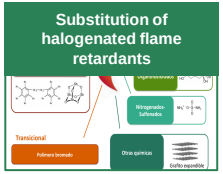
Product Reuse – up 20%
Renew. & recycled materials- up 26%
Take-back Systems - new
Product efficiency and durability- new
Leasing – up 145%
Substance phase-out – new

✓ **End of product life:**

Waste recyclying – down 17%
Product End of Use - new
Donations - new

SDGs impact

5. COMPANIES & RESEARCH CENTERS

Company	Logo	Description	Contact	Use Cases
AEI Tèxtils		The cluster AEI TÈXTILS is a non-profit association, which has the aim to join all Catalan companies and organizations related directly or indirectly to the technical textiles sector and which form a specialized productive area with competitive advantages.	https://textils.cat/es/	Substitution of fluorinated chemistries in water and oil repellent products  Substitution of halogenated flame retardants 
AGÈNCIA CATALANA DE L'AIGUA		The Catalan Water Agency (ACA) is the public company of the Generalitat de Catalunya that is responsible for the planning and management of the water cycle in accordance with the basic principles of the Framework Directive of the 'water.	www.aca-web.gencat.cat	Next generation water systems 
AGÈNCIA DE L'HABITATGE DE CATALUNYA		A citizen service space where everything the Government offers in terms of housing is centralized.	www.agenciahabitatge.gencat.cat	Shift towards a circular economy for the housing sector 
AGENCIA DE RESIDUS DE CATALUNYA		The waste generated in Catalonia and those managed within its territory are the responsibility of the Agència de Residus de Catalunya. Radioactive waste is excluded from its competence; waste resulting from the exploration, extraction, treatment and storage of mineral resources and the exploitation of quarries	www.agenciahabitatge.gencat.cat	Optimization of textile waste management 

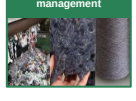
Company	Logo	Description	Contact	Use Cases
AIGÜES DE BARCELONA	Aigües de Barcelona La gestió responsable	Company that manages the metropolitan public service of the water integral cycle, which includes the three branches referred above: water supply, sewerage and wastewater treatment and reclamation of treated water.	wwww.aiguesdebarcelona.cat/	   
AIGUASOL	AIGUASOL	Aiguasol has become a state benchmark in dynamic simulation of thermal systems, being, at the same time, exclusive distributor of programs such as TRNSYS and developer of TRANSOL, reference programs worldwide and state.	www.aliersa.com	
ALIER SA	Alier/sa	Alier SA is an internationally recognized waste manager for the collection, transport and treatment of waste. .	https://aiguasol.coop/	
ALITER GRUP RENOVABLES	aliter group	Specialized PV engineering. Activities of consultancy, promotion, design, construction and exploitation of PV plants, both self consumption and utility scale.	www.alitergroup.com	

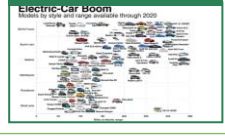
Company	Logo	Description	Contact	Use Cases
ALTERNATIVE ENERGY INNOVATIONS	AEInnova Alternative Energy Innovations	Its main objective is the development of technologies for the production of electrical energy through the recovery of residual heat (energy harvesting).	www.aeinnova.com	Modular thermoelectric system for industrial waste heat 
AMAPEX	Amapex smart enviro treatments	Company expert in the application of biotechnology to industrial wastewater treatments. Extensive research has been conducted through its own lab to find specific strains of bacteria that can decompose the hazardous products present in heavily contaminated industrial waters	www.amapex.net	Cost effective bacterial for industrial wastewater treatment 
AMPHOS 21 CONSULTING S.L	AMPHOS 21	Technical and environmental consultant focused on toxic and hazardous waste management, water resource assessment, environmental management, and soil and water pollution.	www.amphos21.com	In situ soil and aquifer remediation of TPH and metals  TERRARI 
ANGLÈS TEXTIL	ANTEX Anglès Textil, S.A.	They produce a wide range of special filament yarns with an important focus on sustainable polymers and processes. Their products can meet requirements of different sectors and applications such as automotive, home textiles, sportswear, workwear, medical, fashion	www.antex.net	Continuous filament production of synthetic yarn 

Company	Logo	Description	Contact	Use Cases
ARAVINC	aravinc SMART DELIVERY	Ara Vinc is the leading urban messaging company in Barcelona, which also offers Courier and Transport, Logistics, document custody and confidential destruction, access control and business outsourcing services.	https://www.aravinc.com/	Reuse and recycling of clothing, accessories and footwear 
ARPE	Arpe®	The company is a leader in Spain in the manufacture and customization of suede and microfiber towels with images, through print-based systems in digital technology, with an environmental awareness.	https://arpe.es/	Circular Tuva towels 
ASTREA MATERIALS	Astrea materials	Astrea Materials is a company located in Barcelona specialized in advanced materials for critical air filtration in life support systems and personal protective equipment.	www.astreamaterials.com	Highly efficient catalysts for air filtration systems 
AXIOMA	AXIOMA www.axiomasolucions.com	Company specialized in implementing comprehensive solutions and health support services to organizations in the field of health. Our external management solutions cover a range of services and products designed with maximum reliability, guaranteeing our social commitment and respect for the environment.	www.axiomasolucions.com	Surgical clothing reuse 

Company	Logo	Description	Contact	Use Cases
AZUARA		Talleres Azuara is a Spanish company with more than 30 years of experience providing services to the industry and construction. Their activity is focused in chemical industries, manufacturing and handling of tissue paper, compound animal feed, human feed, and waste treatment and management.	www.talleresazuara.net	Processing plant for optimal production of Protein 
BAULA		Baula was created in 2015. In 2018, after an intense I+D, the product development was finished. A year later, Baula started selling at national and international level and it is always working on innovation and product improvement.	www.ecobaula.com/	Cleaning products in a tablet 
CENTRE TECNOLÒGIC BETA - UVic-UCC		BETA Tech. Centre, at the UVic-UCC, aims to improve and promote competitiveness and technological capacities of the society, through the development of R&D&I collaborative projects with private companies and public bodies.	www.betatechcenter.com Info.beta@uvic.cat	Solid State Fermentation 
BCIRCULAR MOTOS		It was created in the IQAC, part of the Spanish National Research Council (CSIC). The company is dedicated to developing and commercialise highly innovative lipid ingredients for the cosmetic and dermopharmaceutical industry using proprietary technology.	www.clustermoto.org/noticias/bcircular-nuevo-socio-de-clustermoto/	Recycling carbon fiber composites 

Company	Logo	Description	Contact	Use Cases
BICOSOME	bicosome®	Company created in the Institute of Advanced Chemistry of Catalonia (IQAC) part of the Spanish National Research Council (CSIC). The company is dedicated to developing and commercialise highly innovative lipid ingredients for the cosmetic and dermopharmaceutical industry using proprietary technology	www.bicosome.com	Sustainable extraction of microalgae to develop skincare active ingredients 
BIOGRÜNDL	biogründl	Biogründl, S.L. is currently occupying a prominent place in the active matter sector for the Cosmetology and Dermopharmacy industries. Biogründl, S.L. activity is R+D in the field of active materials through a new conception and dynamic focus.	https://www.biogrundl.es/	Reuse of byproducts of the cork industry for cosmetics 
BIOO (ARKYNE TECHNOLOGIES SL)		Green electricity from plants' photosynthesis.	www.biootech.com	Green electricity from plants' photosynthesis 
BRUGAROLAS, SA	Brugarolas	Large experience in lubricant sector, being one of the oldest grease producers in Europe. It has one of the most largest portfolios in the sector. It has participated in many R&D projects under the cover of EU R&D programs.	www.brugarolas.com lmuntada@brugarolas.com	Research and development of innovative greases 

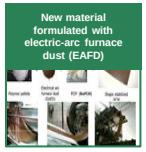
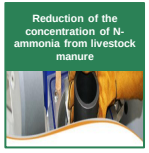
Company	Logo	Description	Contact	Use Cases
CAFÈS NOVELL		The company was founded in 1958 by Mr Ramon Novell Vivó. The passion for the sector and the eagerness to innovate has led Cafés Novell to continue producing quality coffee and to strive everyday towards seducing with the best cup of coffee	www.cafesnovell.com info@cafesnovell.com	Compostable coffee capsules 
CARINSA		Creates, manufactures and markets of all kinds of flavours, fragrances and prepared additives for the food, The customer service is one of the key values in the organization which allows us to obtain a high degree of satisfaction and loyalty form our customers.	www.carinsa.com	Hygienic perfume based on biotechnological synthesis ingredients 
CELSA GROUP		Celsa GroupTM is one of the leading European multinationals in long steel products, the most diversified and vertically integrated. We are based on a circular economy model, recycling more than 8 million tons of scrap annually.	www.celsa.com anna.casals@gcelsa.com	Transformation of EAF slag into high security asphalts  Recycled plastics from end of life vehicles waste 
CESPA GESTIÓN DE RESIDUOS SA		Provides circular solutions to transform cities, industry and the planet, and applies them locally to contribute to people's well-being and progress, in a fair, sustainable and responsible way with society, and connects the present with the future through our environmental solutions.	www.cespa.es	Recyclable waste selection  Optimization of textile waste management  PET waste recycling 

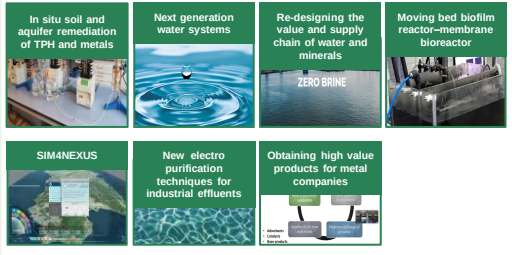
Company	Logo	Description	Contact	Use Cases
CETAQUA WATER TECHNOLOGY CENTER	CETAQUA CENTRO TECNOLÓGICO DEL AGUA	Cetaqua integrates, manages and executes projects in research, technological development, and innovation in the integral cycle of water in order to propose innovative solutions for companies, public administration, and society	www.cetaqua.com	New valorization alternatives for WWTP waste  Sant Feliu Reuse  Public- private collaboration for implementing circularity  Catalyst Development for Synthetic Natural Gas Production 
CIRCULARIS	circularis	Circularis was born with the desire to provide its clients with innovative, sustainable and efficient solutions in the materials recycling sector.king its offer to high-tech solutions.	www.circularis.es/es/	PET waste recycling 
CIRCONTROL	CIRCONTROL Mobility & eMobility	Development of innovation and technology to offer the electric vehicle parking and recharging markets, comprehensive solutions and competitive products.	www.circontrol.com/es/nosotros/	All in one electric vehicle charger 
CLUSTER MOTO	clustermoto	Non-profit association, open to companies representing the entire value chain of two-wheeled vehicles industry and Urban Mobility, based in Spain. It currently brings together 72 associated companies, promoting innovation and access to newer technologies to boost competitiveness and internationalization.	www.clustermoto.org	Recycling carbon fiber composites 

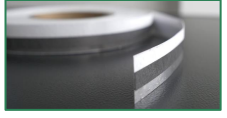
Company	Logo	Description	Contact	Use Cases
COAMB	COAMB Col·legi d'Ambientòlegs de Catalunya	The COAMB's mission is to represent, defend and promote the role of environmental scientists, as well as environmental professionals and students, order the exercise of their profession, ensure professional ethics, and promote respect for the environment among society.	www.coamb.cat	Methodologies for the practical implementation of Circular Economics 
Col·legi d'Enginyers Industrials de Catalunya	Enginyers Industrials de Catalunya	Association of Industrial Engineers of Catalonia. Provides services, resources, networking, training courses and conferences to their 10.000 associates.	www.eic.cat	Circular Economics Training Course 
COLORSENSING	Color Sensing tracking true colors	ColorSensing is a technology-based company that develops applications based on color correction and measurement in digital images. Its solutions help manufacturers and distributors of packaged foods to reduce food waste and ensure the quality and safety of their products. thanks to a smart tag	www.color-sensing.com	Smart packaging to ensure quality and cut down food waste. 
COMEXI GROUP INDUSTRIES SAU	COMEXI	Manufacturer of machines for flexible packaging industry. Machines lines: - Printing: Flexo, Offset and digital - Laminating: SB and SL - Slitting	www.comexi.com	Technology to reduce printers' impact on the environment 

Company	Logo	Description	Contact	Use Cases
COMSA	COMSA EMTE	COMSA Corporación is a leading Spanish group in infrastructure and engineering. Committed to sustainability, responsible growth and the territorial structure of the countries in which it operates.	www.comsa.com	Longer life for ballast in rail 
CONCDORCHEM ENVITECH S.L	condorchem envitech smart ideas for wastewater & air treatment	Condorchem Envitech is an environmental engineering company offering water, effluent and air emission treatment solutions for a wide range of industrial activities.	www.condorchem.com/	Liquid waste treatment by Zero Liquid Discharge (ZLD) systems 
COOLTRA	Cooltra RENT A SCOOTER	Offers a wide range of two-wheeled mobility solutions: short-term motorcycle rental (for days), long-term (for months), rental with option to buy, motorcycle rental or leasing for companies, fleet management and sale both private and public companies and administrations.	www.cooltra.com	Electric motorcycle rental 
CROMOGENIA	Developing Sustainability CROMOGENIA UNITS	Cromogenia is committed to the most effective technology and R&D to improve chemical processes and products, as well as in the research and promotion of clean and environmentally friendly technologies.	www.cromogenia.com	Sustainable retanning agents  Sustainable fatliquoring agents  Sustainable unhairing with enzymes  Sustainable tanning process 

Company	Logo	Description	Contact	Use Cases
COTTON HIGH TECH SL	COHITECH Cotton High Tech S.L.	Spanish Company specialized in the production of a full range of products for the Intimate Feminine Hygiene (tampons, pads, pantyliners and other related products) characterized for being made with Certified Organic Cotton and Biodegradable materials.	www.cohitech.net	Development of advanced functional absorbent products 
CTTC - Centre Tecnològic de Telecomunicacions de Catalunya	CTTC	CTTC's core activity is the conception, design and implementation of research and development projects, which have to produce innovative results in all their development phases, in both scientific and engineering terms.	www.cttc.es	5G network platforms and research for circular economy applications 
CICLIC	ciclic	Ciclic is the brand of the GCR Group that leads the manufacturing of industrial polyethylene (PE) and polypropylene (PP) compounds in Western Europe.	www.gcrgroup.es	Sustainable plastic solutions 
DAN*NA	Dan*na artificial nature	Valorization of organic waste to produce bioplastics for the cutting-edge technological.	www.artificialnature.com	Bioplastics for the industry growth 
dbA - Centre de desenvolupaments biotecnològics i agroalimentaris	dbA Centre de Desenvolupaments Biotecnològics Agroalimentaris	Specialized in biomass valorization using physical, chemical and enzymatic methods. Obtained products applies to different sectors: food, chemical building blocks, agriculture, tanning, textile, energy storage, plastics or lubricants.	www.dba.udl.cat	Biomass recovery 

Company	Logo	Description	Contact	Use Cases
Centre de Disseny i Optimització de Processos i Materials (DIOPMA)		DIOPMA is a research group of the Department of Materials Science and Physical Chemistry at UB. Researchers at DIOPMA have long experience in Materials Engineering, Energy materials and Environmental technologies	www.ub.edu/diopma/	  
ECOPOL TECH SL		Company focused in research, development and manufacturing of advanced polymers with a special focus in polyurethanes and polyureas colloidal science and nanotechnology.	www.ecopoltech.com	
ECO SILENCE		Silence is a Spanish company founded in 2011 that designs, develops and produces highly efficient 100% electric scooters with its own R&D&I. The company also develops its own rechargeable battery technology, manufactured in Barcelona, providing proximity and safety to their clients.	www.silence.eco/	
ELDE		The RIS3CAT Aigua community is a community of 56 entities between companies, technology and research centers, universities and associations, with the objective of promoting the economic transformation of companies linked to the management and consumption of l'Aigua.	www.comunitataigua.cat/	

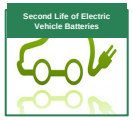
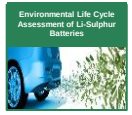
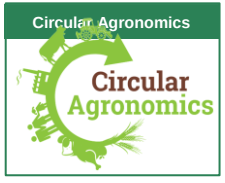
Company	Logo	Description	Contact	Use Cases
ENERKEM	Enerkem	The first company in the world to produce renewable methanol and ethanol from non-recyclable, non-compostable municipal solid waste at full commercial scale.	https://enerkem.com/	
ESPIGOLADORS	espigoladors	We recover fruits and vegetables from the primary sector and companies, and we channel 90% to food distribution points and the remaining 10% produce high-quality products that are marketed under the brand "es im-perfect".	www.espigoladors.cat	
ETISILK SA	ETISILK woven fabrics	ETISILK, S.A., a manufacturer of outdoor fabrics, is working on the approval of its fabrics so that they can be used in sanitary applications (gowns and masks).	www.etisilk.com	
EURECAT	eurecat Centre Tecnològic de Catalunya	It is the main technology center in Catalonia and the second private organization in Spain in raising funds for H2020. It brings together the experience of more than 650 professionals who generate a revenue volume of 50 million euros per year and serves more than 1,600 companies.	www.eurecat.org	

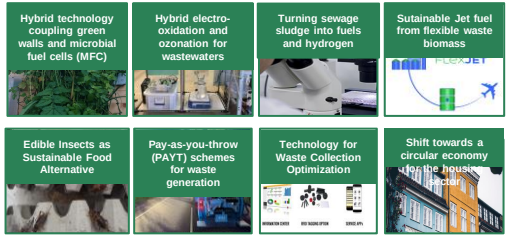
Company	Logo	Description	Contact	Use Cases
EVARM	EVARM	Dedicated to the professional preparation of heavy and light vehicles (Dual Fuel). They make "tailor-made suits" so that you have the best possible conversion of your fleets in terms of performance, reliability and safety.	www.evarm.com/	Hydrogen-powered vehicle 
FUELIUM SL	Fuelium	Eco-friendly energy solutions for single-use applications. Paper-based batteries.	www.fuelium.tech	Eco-friendly batteries for single-use applications 
FUTURECO BIOSCIENCE SA	FUTURECO bioscience	SME agro-biotechnology company, founded in 1993, dedicated to the research, development, production and commercialization of environment friendly products for the protection and nutrition of agriculture. One of their main assets is the investment in research.	www.futurecobioscience.com	Design of Enzyme Technologies from Plant by-Products 
Gavà Ajuntament	Ajuntament de Gavà	Government administration, Municipality of Gavà	www.gavaciutat.cat/	Public- private collaboration for implementing circularity 

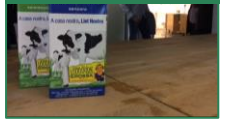
Company	Logo	Description	Contact	Use Cases
GCR GROUP		GCR Group is a European company with a worldwide presence and is now the leader in the development of high-quality and environmentally efficient recycled compounds and mineral masterbatches for the plastics industry. It has the business units CICLIC, GRANIC, AUTENO and IRTIO	www.gcrgroup.es	An environmentally friendly plastic solution  Sustainable plastic solutions 
GC GOMA CAMPS		Business group dedicated to the manufacture, transformation and sale of tissue paper and other related solutions. They have been committed to the quality and diversity of products, following a commitment to constant innovation and respect for the environment	www.gomacamps.com	Sustainable Packaging 
GO ZERO WASTE		App for a waste-free life	https://gozerowaste.app/	Go Zero Waste APP 
GRANIC		Granic is a European leader and a world reference in the development of mineral concentrates of calcium carbonate, talc, other derivatives of silicon and other mineral specialties for the plastic sector.	www.gcrgroup.es/es/granic/home	An environmentally friendly plastic solution 

Company	Logo	Description	Contact	Use Cases
HILATURAS ARNAU	HILATURAS ARNAU	A leading company in the manufacture of recycled yarns, committed to its participation in environmental sustainability by producing a complete range of yarns made with 100% recycled materials	www.hilaturasarnau.com	Manufacture of recycled high-quality yarns 
HILOSA	HILOSA HILADOS OLOTENSES, S.A.	HILOSA, a company founded in 1947, was a pioneer in the recycling of cotton threads.	www.hilosa.com	Manufacture of recycled colored yarns 
HONEXT MATERIAL	HONEXT	At Honext are an innovative company focused on the development of production technologies to upcycle cellulose based waste. Their first material is a natural and completely circular material for internal partitions in construction, with excellent properties, made from paper mill sludge.	www.honextmaterial.com	Innovating in Construction Market by Using Recyclable Materials 
HUMANA	HUMANA Fundación Pueblo para Pueblo	Humana promotes since 1987 environmental protection through second hand textile management by circular economy premises.	ww.humana-spain.org	Optimization of textile waste management  Reuse and recycling of clothing, accessories and footwear 

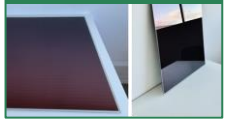
Company	Logo	Description	Contact	Use Cases
HYDROKEMOS		Electrochemical patented technology to remove nitra-te, ammonia, cyanide, sul-phide or other compounds, without waste production, in any type of water (industrial or municipal).	www.hydrokemos.com	Eco-efficient solution for nitrate/ammonia polluted water treatment 
INSTITUT CATALÀ D'INVESTIGACIÓ QUÍ-MICA		Founded in 2000 by the Government of Catalonia, is committed to performing excellent research at the frontier of knowledge in two main areas: Catalysis and Renewable Energy.	www.iciq.es ipunti@ICIQ.ES	Bio-based polymers for high-performance applications 
INFINIT DENIM		Circular fashion Ethically by women in Barcelona. They are a sustainable fashion brand dedicated to extending the life cycle of post-consumer denim. We repair, design and produce, creating new ethical and sustainable products.	www.infinitdenim.com	Reuse your jeans! 
Institut Català del Suro Foundation		The Catalan Cork Institute Foundation (Institut Català del Suro) is a non-profit and scientific foundation whose mission is the promotion of the cork sector through investigation and research.	www.icsuro.com/	Reuse of byproducts of the cork industry for cosmetics 

Company	Logo	Description	Contact	Use Cases
IREC	IREC Shaping Energy for a Sustainable Future	Technology Research center on all the fields of energy since basic research to energy power control devices and management.	www.irec.cat	   
IRIS	IRIS	Advanced engineering focused on Circular and Bio-based Economy: digitalization and waste valorization.	www.iristechnologygroup.com/	
IRTA – Institut de recerca i tecnologia agroalimentàries	IRTA RECERCA I TECNOLOGIA AGROALIMENTÀRIES	IRTA is a research institute owned by the Government of Catalonia. Its general objectives are to promote research and technological development in the area of agri-food, to facilitate the transfer of scientific advances and to evaluate its own technological advances whilst.	www.irta.es	 
ITEC	ITeC	The ITeC is a private foundation at the service of society that works in the field of the construction sector, with the generation and transfer of information and knowledge and the provision of technological services for the improvement of the competitiveness of the agents of the sector.	www.itec.es	

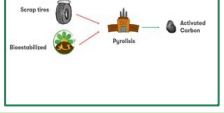
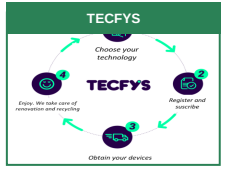
Company	Logo	Description	Contact	Use Cases
Korea Institute of Science and Technology (KIST)		Its main goal is to lead Korea's science and technology infrastructure in research, development, and transfer of creative, original technologies. Research areas include brain science, biomedical science, materials/devices, robotics/systems, energy, environment, and life/health.	www.kist.re.kr	
LABAQUA		LABAQUA S.A., was established in 1991 as a service company that offers environmental consulting solutions and analysis laboratory to industry and the administration	www.labaqua.com/sobre-nosotros/	
LC PAPER		LC Paper manufactures various kinds of paper for converting companies from all over the world, with a product portfolio which has become a referent in terms of sustainability and innovation.	www.lcpaper.net	
LEITAT		Leitat, founded in 1906, has the mission of managing technologies to create and transfer sustainable social, environmental, economic and industrial value to companies and entities, through research and technological processes.	www.leitat.org	

Company	Logo	Description	Contact	Use Cases
LLET NOSTRA		Llet Nostra Alimentària, SL, a company dedicated to dairy farming based in Barcelona. It sells milk under the motto "the milk of Catalan cooperatives" . Les granges de Llet Nostra són petites i mitjanes explotacions ramaderes d'unes 200 vaques de mitjana que treballen sota criteris de producció sostenible i benestar animal. Un projecte ramader que és líder en el mercat de llet bàsica a Catalunya, aglutinant més del 25% dels ramaders de Catalunya	www.lletnostra.cat	A bio-based recyclable packaging 
MAiMA		MAiMA is a research group from the University of Barcelona that applies the latest technology in stable isotope analysis, mineralogy and geochemistry for environmental pollution, food authentication and mineral durability studies	www.ub.edu/maima	Bioremediation of contaminated aquifers 
MILLOR ENERGY SOLUTIONS		High-tech company specialized in the design, development and manufacturing of class battery packs for hybrid and electric vehicles in medium series productions with very high added value, based on its Smart BMS.	www.millorbattery.com	Fast charging high performing battery solutions 
MOBA-ISE MOBILE AUTOMATION		MOBA Mobile Automation experts in automation since 1972. Leaders in pioneering technology, applications & software related to the construction and environmental sectors.	MOBA Group Website MOBA Spain Website Moba-ise@moba.de MOBA Community - Facebook – LinkedIn – Twitter – Youtube	Pay-as-you-throw (PAYT) schemes for waste generation  Technology for Waste Collection Optimization 

Company	Logo	Description	Contact	Use Cases
NATURGY	Naturgy	Its objective is to serve society and offer intelligent and innovative solutions, betting on the technological vanguard. Naturgy is the first group to integrate gas and electricity in Spain.	www.naturgy.com/inicio	CoSin (Combustibles Sintètics) 
OIMO	Oimo	OIMO is an Eco-Design and New Materials Start Up specialised in the development, creation, testing and implementation of Sustainable Marine Degradable Packaging.	http://oimo.co/	OIMO 
PICVISA	PICVISA OPTICAL SORTING	PICVISA is an innovating technology company that provides industrial solutions based on image processing and machine vision. We design, develop and produce selection and sorting equipment for recycling materials	www.picvisa.com	Recyclable waste selection  A more circular plastic packaging value chain  Glass Recovering Revolution  Automated glass recovery for waste treatment plants 
PROQUIMIA	PROQUIMIA	Manufacture and marketing of chemical specialties. products designed to be used safely and effectively, guaranteeing a sustainable future thanks to the utmost care for environmental impact.	www.proquimia.com/	Sanitizing detergents based on biological ingredients 

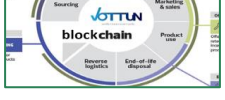
Company	Logo	Description	Contact	Use Cases
PROTON NEW ENERGY FUTURE	PROTON Turnin' ON the Sun	The mission is accelerate the energy transition towards energy through the development of innovative solutions in the fields of biotechnology, nanotechnology and photochemistry. Providing adapted solutions	www.protonfuture.com/	Photovoltaic panels that works with no sunlight 
Sant Feliu de Llobregat Municipality	Ajuntament de Sant Feliu de Llobregat	Municipality of Sant Feliu de Llobregat	www.santfeliu.cat	Sant Feliu Reuse 
SATURAS	Saturas Decision Support System for Precision Irrigation	Founded in 2013 by Dr Moshe Meron and Ms. Anat Halgoa-Solomon Today- 20 employees – Including agronomists, engineers, technicians and mathematician Raised 9 million dollars from private investors & governmental grants	www.saturas-ag.com//	Advanced Decision Support System for Optimal Irrigation 
SAULEDA	Sauleda	Business group manufacturer of technical fabrics for sun protection, nautical, outdoor upholstery and industry, with more than 100 years of experience. Since Sauleda was born in 1897, it has had one goal: to produce high quality and design fabrics to protect people.	www.sauleda.com	An ecological solar textile that purifies the air 

Company	Logo	Description	Contact	Use Cases
SIARQ	SIARQ Advanced Solar Design	Clean Tech for Climate company specialized in the design, production and implementation of solar urban infrastructures for Smart Cities that connect solutions through IoT.	www.solarurbanhub.com	Solar HUB 
SORBO MJV	SORBOS® edible straws	Sorbos is the first edible, flavored and 100% biodegradable straw in the world. Follow us in the ecotasting movement. .	wearesorbos.com	Edible, flavored and 100% biodegradable straw 
SMART RESOURCES UPC	SSR SMART SUSTAINABLE RESOURCES	The aim of Smart Sustainable Resources Research Center is to create, innovate and transfer knowledge in the field of natural resources, and urban, industrial and mining waste, through technologies for the location, processing, optimization and reuse of these resources.	www.smartresources.upc.edu	Materials recovery processes 
SUD ENERGIES RENOVABLES	sud Energies Renovables	SUD Renovables is an independent group based in Vic that has a proven experience in the industrial, energy and environmental sector and offers comprehensive services in the field of engineering, construction and exploitation of renewable energy.	www.sud.es	Evaporation solar System for treatment of manure 

Company	Logo	Description	Contact	Use Cases
SUEZ		SUEZ uses innovation and collaboration to develop smart and sustainable resource management solutions: optimizing the way water is used thanks to information technologies, creating alternative water resources and recovering energy or new materials from waste.	http://www.suez.es/	Ecoplanta: Green Chemical Industry 
SORIGUÉ – ACSA GROUP		Dynamic group of leading companies in the technology and water engineering, services, construction and materials sector with a clear commitment to innovate and improve society	www.sorigue.com	Generation of activated carbon from waste products 
TAPP WATER		We are a Barcelona-based company that develops convenient, sustainable and affordable plug & play water filters. Our ultimate mission is to empower people to easily get clean and healthy water from tap, with a minimum environmental impact.	www.tappwater.co	Sustainable water filter to purify and analyze tap water 
TECFYS		New technological startup that foster a new connection between technology and people. The solution based on circular economy principles was designed with the aim of managing the end-to-end life cycle of technology by a monthly subscription.	www.tecfys.com	TECFYS 

Company	Logo	Description	Contact	Use Cases
TECNOCAMPUS	Càtedra d'Economia Circular i Sostenibilitat TecnoCampus	The Tecnocampus Mataró-Maresme Foundation is a non-profit organization promoted by the Mataró City Council and the Maresme County Council to manage and develop university studies and the TecnoCampus business and entrepreneurship park	www.tecnocampus.cat/	Circular Economy Chair 
TEQMA	teqma	Experts in innovative technological applications to improve water quality and the environment. The company is made up of technicians from Industrial Engineering, Chemical Engineering and Biology with extensive and extensive experience in processes of adaptation, reduction and reuse of effluents.	http://www.teqma.com	Compact and modular tertiary water reclamation system 
THERMOWASTE	THERMOWASTE technology for circular economy	They provide an effective solution to the problem of municipal waste. We recover 100% of the materials contained in the garbage without prior classification or selective collection.	ww.thermowaste.com	Thermowaste, the complete solution to end landfills 
TOO GOOD TO GO	Too Good To Go	Social Impact company fighting food waste across Europe and in New York through an app that connects customers with food businesses that have unsold surplus food at the end of the day and sell it at a reduced price to prevent it from going to waste.	www.toogoodtogo.es/	A mobile app to reduce food waste from stores and establishment 

Company	Logo	Description	Contact	Use Cases
TORRES	TORRES	The company remains firm in its environmental commitment, investing in the Torres & Earth program that it launched in 2008 to minimize the effects of climate change.	www.torres.es/es/torres-and-earth-entrada	Advanced Decision Support System for Optimal Irrigation 
UNIÓ NUTS	unio nuts	Unió nuts is a leading nuts cooperative, specializing in almonds, hazelnuts and carob pods which take part of an entity of 186 cooperative which goal is improving living conditions for farmers and encouraging rural development.	www.unio-nuts.coop	From the almond skin to a cholesterol reduction 
UPC – UNIVERSITAT POLITÈCNICA DE CATALUNYA	UPC	The Universitat Politècnica de Catalunya is a public university of research and higher education, is an agent and engine of economic and social change, valuing research and transferring their knowledge and technology to society.	www.upc.edu	New electro purification techniques for industrial effluents  Professional Training in Circular Economy 
VALLÈS CIRCULAR	VALLÈS CIRCULAR	Territorial initiative shared between administrations, social, environmental and economic agents with the aim of promoting the circular economy in the Vallès Occidental	http://vallescircular.com/	Pay-as-you-throw (PAYT) schemes for waste generation  Technology for Waste Collection Optimization 

Company	Logo	Description	Contact	Use Cases
VENVIROTECH	VEnvirotech	VEnvirotech is a biotechnology start-up dedicated to the transformation of organic waste into polyhydroxyalkanoate (PHA) bioplastics by bacteria which are biodegradable in the environment and compatible with the human body.	www.venvirotech.com	Organic waste transformation into bioplastics using bacteria 
VERITAS	SUPERMERCADOS veritas ALIMENTOS DE VERDAD	Veritas is the first supermarket in Europe to generate a positive impact on society and the environment. This is confirmed by the international BCorp certification, which recognizes good practices and compliance with high standards of transparency and accountability.	www.veritas.es	Reuse and recycling of clothing, accessories and footwear 
VERTISOL INTERNACIONAL SRL	vertisol contemporary weavers	Technical fabrics for window covering industry, wall and floor covering and upholstery. Focused on healthy fabrics. All of our products are manufactured in EU with all the certifications required.	www.vertisol.com/es	Sun protection, for curtains and blinds 
VOTTUN	VOTTUN certify • trace • trust • verify	Vottun is traceability platform focusing on using blockchain technology to improve the way the certified data can be used in the economy circular processes.	www.vottun.com	Traceability system with blockchain technology for the circular economy 

Company	Logo	Description	Contact	Use Cases
WATER, ENVIRONMENT AND BUSINESS FOR DEVELOPMENT (WE&B)		WE&B is a consulting company focused on the Water and Environment sectors, offering services in Social and Business Innovation.	www.weandb.org	Shift towards a circular economy for the housing sector 
WORLDSENSING		Worldsensing is a widely recognized global IoT pioneer. We provide customers with the tools to make the right operational decisions based on real-time intelligence.	www.worldsensing.com	The connected infrastructure solution 

LEADING CIRCULAR ECONOMY SOLUTIONS IN CATALONIA

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Catalonia Trade & Investment

Generalitat de Catalunya
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