

# SALES NOTEBOOK

19. March. 2024. Elaborated by SEKUENS

## INNOVATION CIRCULAR ECOSYSTEM IN ASTURIAS

The Principality of Asturias, or Asturias, is an area on Spain's northern coast with a population of one million. The Asturias region is highly specialised in process industries, with the basic materials sector accounting for 40% of regional industrial employment. Unique companies producing commodities such as steel, zinc, pulp, fibre, cement, or glass are all located in the region's centre area, separated by only a few kilometres, as are two large ports in Avilés and Gijón.

Besides this urban agglomeration, "the wings of the territory" have a particularly elderly population living in rural areas of high natural value, with nearly one-third of the territory protected. As a result, the region has significant challenges in balancing industrial and ecological models.

The Process Industries play a critical role (cornerstone) in promoting circularity and reducing green gas emissions. Similarly, the process industry links together world-leading industries, whose future lies in deeper collaboration and synergies. They are energy-intensive industries and circular economy is a key pillar of their value chains.<sup>1</sup> In recent years, Asturias has seen some industrial spontaneous *sympiosis efforts*<sup>2</sup> took place.

COGERSA, the public company in charge of all regional, urban, and industrial waste management, is likewise located in the region's centre and is now working on an ambitious project to find alternatives to landfills. In this sense, Asturias must confront society's outright rejection of waste incineration (160,000tn of CSR per year) finding a technologically and commercially viable solution for material recovery, focusing on public-private partnerships through Urban Industrial Symbiosis initiatives.

Furthermore, Asturias has a significant R&D, engineering, and technology industry that employs 4,000 people and maintains strong ties and collaboration with process industries. In addition, ICT is rapidly expanding, with 7,000 people. This *circular innovation ecosystem* is completed by stakeholders such as the University of Oviedo and the Carbon Science and Technology Institute INCAR, which is part of the Spanish Council for Scientific Research (CSIC).

Asturias businesses and researchers have been extremely active in H2020, particularly in SPIRE calls linked to resource, material, and energy efficiency. Most of the important R&D initiatives focus on carbon capture, with pilots of interest in the steel, cement, and energy sectors, as well as water efficiency and waste heat recovery. Finally, two pilot plants stand out in the region: Pereda CO<sub>2</sub> Capture plant and ArcelorMittal's GASLAB. Together with them, Asturias government is promoting the creation of an OpenLab in COGERSA.

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<sup>1</sup> <https://www.investinasturias.es>

<sup>2</sup> [AsPH4C. Casos de Simbiosis Industrial en Asturias - IDEPA](#)

## ASTURIAS PARADISE HUB 4 CIRCULARITY

[The Asturias smart specialization strategy \(S3 Asturias\) \(2021-2027\)](#) identified five areas of specialization, one of which combines energy and circularity and is thus clearly associated with the European Green Deal. Likewise, its challenges are centered on circular and carbon-neutral industries, which are consistent with the recently authorized [Asturian Circular Economy Strategy 2023-2030](#).

More precisely, the region confronts significant issues in circularity: 52% of all created trash ends up in landfills. Industrial trash accounts for 61% of total generated waste. Consequently, the aim for the region is to double the Circular Material Use Rate, which is now at 9%. Additionally, only 6.7% of wastewater is reused, thus actions are planned to recover this water. Finally, CO<sub>2</sub> industrial emissions total 11 kton by 2021.<sup>3</sup>

S3 Asturias will have an average annual budget of €43 million and is projected to devote 25% of its resources to Energy and Circularity, thanks to support from the ERDF and the Just Transition Fund.

The regional strategy aims to promote technologies to develop future circular value chains and business models. It will assess their influence to determine eco-innovative strategies that meet society's expectations.

The challenges ahead are, therefore, to ensure sustainability of process industry, preventing waste generation and GHG emissions. In order to achieve those goals, three regional development targets were set: to lower the amount of waste going to landfill, the amount of primary raw materials in industry and, finally, the GHG emissions.

The new S3 has benefited [Asturias Paradise Hub 4 Circularity \(ASPH4C\)](#), the regional knowledge hub that will enable the mastery of waste recovery technologies and the development of residue-technology-market (industry) value chains. ASPH4C is a work programme that Agency SEKUENS has been carrying out since 2016 following the EU concept as a tool for place-based innovation<sup>4</sup>.

The initiatives designed to support the Hub's goals are:

- [Inventory of R&D infrastructures](#)

A catalogue of public and private pilot plants for the utilisation of material residues has been compiled. It presently has 39 units that replicate waste recovery processes or sections of processes (including CCU), which can work together to construct Comprehensive Valorisation Circuits through various synergies.<sup>5</sup>

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<sup>3</sup> [https://edgar.jrc.ec.europa.eu/dataset\\_ghg70\\_nuts2](https://edgar.jrc.ec.europa.eu/dataset_ghg70_nuts2)

<sup>4</sup> Hoja de ruta de los Materiales Sostenibles de Asturias  
[https://www.idepa.es/documents/20147/1278492/Hoja\\_Ruta\\_MAT\\_SOST\\_ASTRIS3.pdf/1a775197-7f0a-395b-d747-106fd8632014](https://www.idepa.es/documents/20147/1278492/Hoja_Ruta_MAT_SOST_ASTRIS3.pdf/1a775197-7f0a-395b-d747-106fd8632014)


<sup>5</sup> Through a search engine, each pilot plant is identified and described in terms of its equipment, tested applications, input and output streams, capacity and usage models, and contact details are provided.

Since 2023, a program of [study trips](#) to the network's pilot facilities has been introduced to supplement teaching activities in university master's degree programs.

- [R&D grants for Circular and Carbon Neutral Industry](#)

The regional R&D funding programme supports [technology development and scale-up of processes](#) to address circularity and decarbonisation of industry by prioritising initiatives involving pilot plants from the inventory.

For the first time in 2021, a Circularity subprogram was separated from this program, with a financial reserve to fund R&D projects primarily in regional cooperation to create [value chains](#) based on valorisation technology.

CHALLENGES		AREAS
 <p>CIRCULAR AND CARBON NEUTRAL INDUSTRY</p>	<p><a href="#">DECARBONISATION OF INDUSTRIAL PROCESSES</a> (portfolio)</p>	<ul style="list-style-type: none"> <li>• Energy efficiency in industry</li> <li>• Renewable sources and alternatives to the use of C in industrial processes</li> <li>• Hydrogen as a vector for the decarbonisation of the productive sector</li> <li>• CCUS. Carbon capture, use and storage</li> </ul>
	<p><a href="#">USE OF WASTE FLOWS IN INDUSTRY. CIRCULARITY MODELS</a> (portfolio)</p>	<ul style="list-style-type: none"> <li>• Ecodesign of products and processes</li> <li>• Sustainable materials and industrial symbiosis</li> <li>• Urban industrial symbiosis</li> </ul>

- [A new investment aid programme to support the implementation of circular economy in industry](#)

The program, launched in 2022, aims to provide competitive circumstances for the application of innovative measures in industrial processes, with a particular emphasis on initiatives deriving from collaborative models of [industrial symbiosis](#) or [urban-industrial symbiosis](#). In this program, BATs are regarded the cutting-edge threshold.

## EU INTERREGIONAL COLLABORATION




Asturias is an active member of different EU networks and associations, looking for synergies and complementariness with other EU regions such as SPIRE, Vanguard Initiative and Partnership for Regional Innovation.

In March 2019, Agency SEKUENS (formerly IDEPA) and JRC co-organized an Innovation Camp titled *Science for the transition to a circular economy of the process industry of the Natural Paradise*<sup>6</sup> as part of the Science Meets Regions Initiative. It took place in the Covadonga National Park in Asturias. More than thirty professionals, including up to ten profiles from various stakeholders, gathered to debate policies and initiatives to help the transition to a circular economy.

Later, in June 2023, SEKUENS and the Joint Research Centre co-organized again an event [\*Connecting regional innovation valleys through circular industries held in Gijón\*](#), as part of the pilot project Partnerships for Regional Innovation, which aims to deliver on the New European Innovation Agenda by developing Regional Innovation Valleys across Europe.

To deploy industrial circularity, Asturias considers projects of interest such as: FOAK (projects to produce for first new feedstock at industrial scale or/and test the use of new feedstock by the market); DEMO (focussed on scaling up (deep) valorisation technologies); and LIGHTHOUSE (Innovative solutions to overcome complex barriers).

Finally, at the event, Asturias has identified the following circular value chains to promote interregional collaboration.

VALUE CHAINS	WASTE	TECHNOLOGY	MARKETS
 <p>MINERAL RAW MATERIALS</p>	<ul style="list-style-type: none"> <li>• Reduction of metallic or mineral industrial waste to landfill</li> <li>• Reduction of construction and demolition waste, CDW, to landfill</li> </ul>	Mechanical and physico-chemical technologies	Increasing the autonomy of the European industry regarding RAW MATERIALS
 <p>CARBON FEEDSTOCK</p>	<ul style="list-style-type: none"> <li>• Reduction of municipal or industrial organic waste streams, including sludge</li> <li>• Reduction of industrial CO<sub>2</sub> emissions</li> </ul>	Carbon conversion technologies and CCUS	Alternative sources to the fossil CARBON FEEDSTOCK for the process industries: steel, fertilizers, cement, chemicals, and fuels
 <p>INDUSTRIAL WATER CYCLE</p>	Reduction of municipal or industrial waste water	Water management and water recirculation technologies	Water and heat efficiency in industry

<sup>6</sup> <https://sciencemeetsasturias.idepa.es/>