CIRCE
Centro de Investigación de Recursos y Consumos Energéticos
Zaragoza, Spain

ABOUT

CIRCE is a research centre founded in 1993 with the support of the University of Zaragoza, the Aragon Government and ENDESA to create and develop innovative solutions and scientific/technical knowledge and transfer them to the business sector in the field of energy. Since 2009, it is also an Institute of the University of Zaragoza.

CIRCE's mission is to drive forward improvements in energy efficiency and to spread the use of renewable energy by means of the development of R+D+I (Research, Development and Innovation) activities and formative actions that respond to the needs of national and international producers, thereby contributing to sustainable development.

CIRCE is a member of several platforms and associations. In particular it belongs to SPIRE (Sustainable Process Industry through Resource and Energy Efficiency) and to the EIP on Raw Materials. It also offers several postgraduate courses, such as PhD studies, Master Programmes and Vocational Training on Energy Efficiency and Renewable Energies.

EXPERTISE

CIRCE's expertise, and especially the Industrial Ecology group expertise, focuses on:

At industrial level:

- helping the industry minimise the use of raw materials, increasing their efficiency and trying to close the materials cycle, particularly: simulation of extractive, metallurgical and chemical processes
- finding industrial symbiosis solutions
- MFA «Material Flow Analyses» of processes to determine the resource efficiency of industries and companies
- diagnosis of plants producing raw and secondary materials: chemicals, metals, industrial minerals and recycling.
- impact assessment associated with the use of certain raw materials at plant level and industrial systems
- development of indicators to determine the efficiency of companies and plants in the use of raw materials

At policy level:

- establishment of guidelines, indicators and relevant information at national, European and international level to improve the management in the use of raw materials. In particular development of indicators for defining methodologies and accounting systems, increase transparency and ultimately protect the mineral capital.
- material flow analyses at local, regional, national or international levels to identify «critical raw materials»
- impact assessment associated with extraction, use, recycling or substitution of certain raw materials at global level
- promote the use of multidisciplinary approaches to address the problem of shortage of raw materials; study the stock in-use and potential for recycling and «urban mines» for the recovery of critical materials

A distinguishing feature of the research undertaken by CIRCE is its second law approach. The group is specialised in exergy analysis and its application not only to energy systems, but also to materials.

FACILITIES & SERVICES

CIRCE's head office is a model of bioconstruction and sustainability, funded by the EU using FEDER funds, and a monument to state of the art technology and progress in the field of ecoefficiency and energy saving, constructed using building materials of low ecological impact. It is a Zero Emissions building throughout its Life Cycle, and the building itself is a R+D+I laboratory aiming to lay out the most advanced scientific-technological foundations worldwide in the development of Zero Emissions Constructions. It integrates techniques involving bioconstruction, energy saving, water, renewable energy and materials, thus obtaining the greatest possible efficiency with the resources available, without compromising thermal comfort. Additionally, it has several laboratories:

- Trigeneration laboratory
- Co-firing laboratory
- Oxi-firing and circulated fluidised bed laboratory
- Gasification laboratory

MORE INFORMATION

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