



WHITEPAPER

Leadership in collaborative research: European RFCS Programme

(Research Fund For Coal
And Steel)

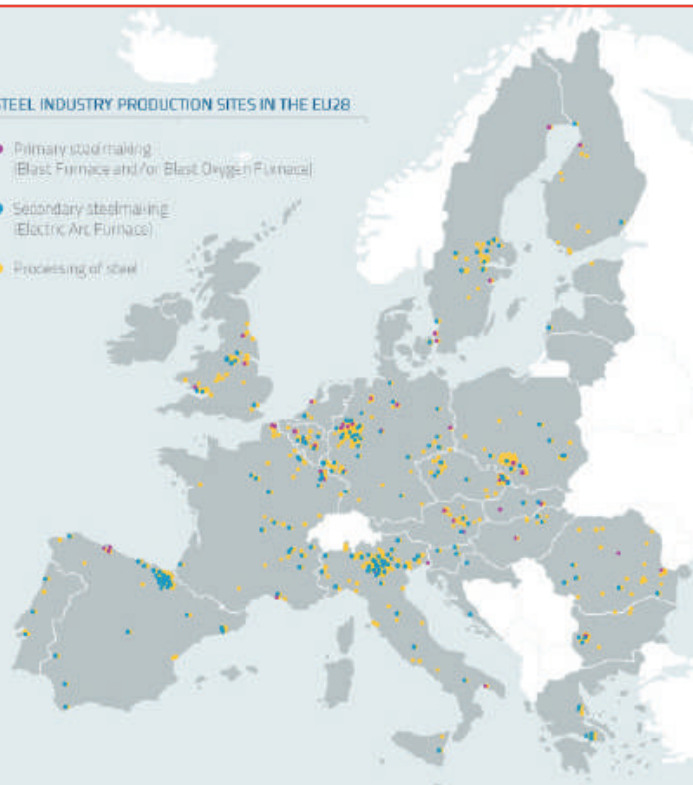


The RFCS is the international collaborative research programme in which SIDENOR R&D most



STEEL INDUSTRY PRODUCTION SITES IN THE EU28

- Primary steelmaking (Blast Furnace and/or Basic Oxygen Furnace)
- Secondary steelmaking (Electric Arc Furnace)
- Processing of steel



Description of the RFCS collaborative research projects

The RFCS programme mainly supports research projects related to steel manufacturing and transformation processes, the development of new steels and the improvement of their service performances.

Steel challenges and recommendations

Steel challenges for the next decade	Climate change Carbon footprint	Carbon lean, fossil-free processes; CCU, CCS CDA: use of electricity, H2 steelmaking, biomass
	Cost-effectiveness Energy efficiency	Sustainable, high performing processes; Process integration
	Resource efficiency Circular economy	Recycling scrap, waste; use of secondary raw materials; use of waste heat
	Competitiveness of steel and solutions for demanding markets	AHSS for automotive and construction; lightweight design; structural safety; new steel solutions for renewables
	New processing technologies	New forming and assembling technologies; Emerging processing technologies like nano-metallurgy additive manufacturing
	Industry 4.0	Digital strategies; big data; AI; Through-process instrumentation and modelling; Dynamic quality management along the production chain
	Work force development	Skills; Knowledge management; Lifelong learning education; Working conditions

The most outstanding European steel companies (in addition to SIDENOR: ArcelorMittal, Tata, ThyssenKrupp, VoestAlpine, SSAB, Salzgitter, Acerinox, etc.), prestigious research centres (Fraunhofer Institute, VDEh-BFI, MPI, SWERIM, RINA, OCAS,...), universities of reference (RWTH Aachen, Delft, Leuven, Coimbra, Pisa,...), suppliers and end users (FIAT, VW, BOSCH, ZF, Schaeffler, CAF, CIE,...) participate in these projects. The EU finances 60% of each partner's research, regardless of whether it belongs to the industrial or academic sector.

Thus, SIDENOR R&D contributes to the RFCS programme together with the main specialised research centres and universities in Europe, but also with other steel companies and end users. On average, an RFCS project is carried out by a consortium of 4 to 9 partners from various European countries. It may last 36 or 42 months, and its average budget varies from 1.5 M€ to 2.5 M€.

SIDENOR R&D currently participates in 19 European RFCS programmes and coordinates 3 of them.

In order to receive funding, a project must compete with other proposals submitted by other candidates. Each proposal is assessed by three independent experts and its score is included in a ranking list (from the highest to the lowest scoring). Although their number has slightly decreased in the past few years, the total amount of proposals SIDENOR R&D competes with is around 150, out of which approximately 20-25 are approved and financed.

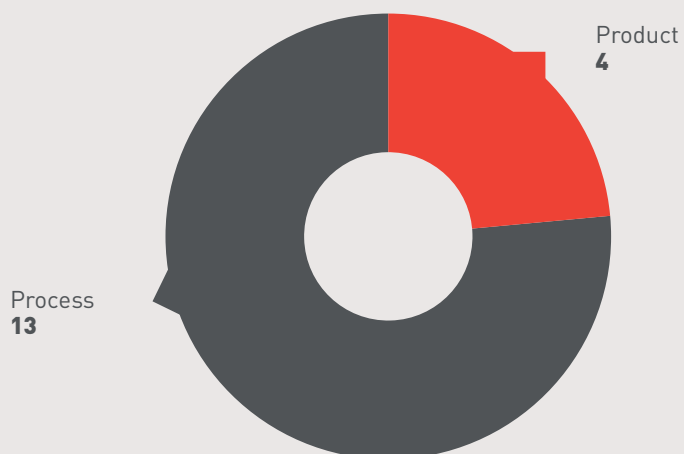
European Projects Internal Management System

With the aim of increasing the approval rate of the proposals it submits within the framework of this programme, **SIDENOR R&D has implemented an internal management system which monitors the process of idea generation, contact with potential partners, setting-up of consortia and preparation of proposals.** The system assesses the priority of the project as to its technological or economic interest for SIDENOR, the identification of its main actors, considering their level of participation and success percentage, the factors which prevail in the evaluation and structuring of the proposals, among others.

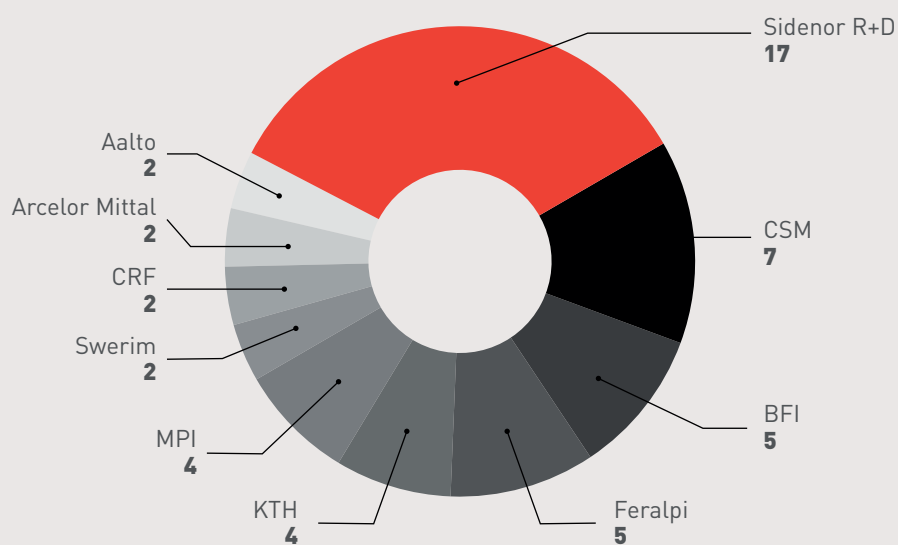
Thanks to this internal management system, the approval rate of the proposals submitted by SIDENOR R&D in the last three years has increased by 200% with respect to the previous three years. This has produced an average grant per ongoing project of 1M€ in each call. Likewise, the technological interest of the projects submitted has increased, enhancing their technical and economic impact on the processes and products of SIDENOR ACEROS ESPECIALES.

SIDENOR R&D has submitted 17 proposals within the framework of the 2019 RFCS programme call, 3 of which are coordination proposals. This means that 14 partners, among which the most prestigious European research centres, but also major direct and indirect customers of SIDENOR, have placed their trust in SIDENOR R&D for the management and monitoring of their work teams.

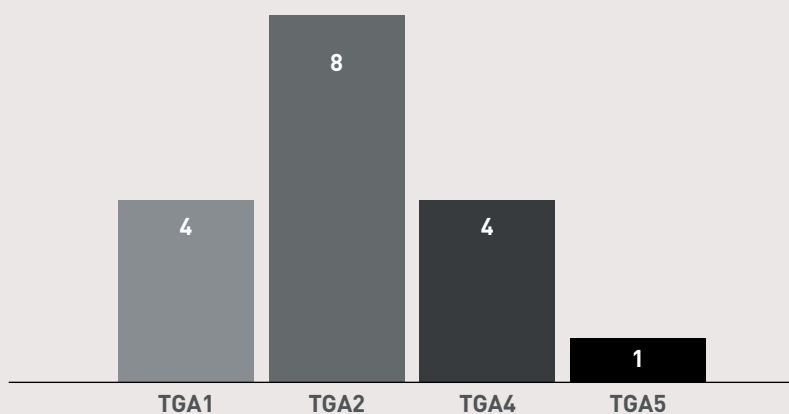
Proposals by department



Partners



Committee



Background of the ECSC / RFCS programme

RFCS stands for “Research Fund for Coal and Steel”, heir to the European Coal and Steel Community (ECSC), the embryo of the European Union from its foundation in 1951, with the Treaty of Paris, to its expiration in 2002.

On the date of its creation, the European coal and Steel companies gave funds which were deposited in a bank entity in a neutral country. The interests yielded by this money were dedicated to the research and development of coal and steel products and manufacturing processes as a means to promote cooperation between European companies and nations and to flourish in a common project.



Since its own foundation in 1985, SIDENOR R&D has participated in research projects supported through this fund.

From 2002 on, once the 1951 Treaty of Paris was no longer in force, the fund was due to go back into private hands (~1600 M€), but it was decided that it would be maintained and managed by the European Commission, which is assisted by various technical committees.

Until this year (2019), 3 committees had been in charge of coal, while 9 committees, which were specialised in the various manufacturing processes (melting, secondary metallurgy, casting, hot forming, finishes and coatings), physical metallurgy and steel applications (products for the automotive sector, construction and industry, etc.), as well as safety, environment and other related topics, had been dealing with steel. Since 2019, the steel technical committees (technical groups steel: TCS) have been reduced to five and are clustered around the following thematic areas:

- **TGA1: Iron- and steelmaking**
- **TGA2: Downstream steel processing**
- **TGA3: Conception of steel products**
- **TGA4: Steel applications and solutions for existing and new markets**
- **TGA5: Steel factories - smart and human**

The RFCS programme is the natural area for collaborative research between outstanding academic institutions and steel-manufacturing and steel-consuming companies for the development of products with superior performance as well as processes with increased efficiency and environmental friendliness.

SIDENOR R&D is a reference partner in the RFCS programme, with a significant and continuous participation and a success rate which has been, since the implementation of the new internal management system, 20% higher than the programme average, and twice the average in the proposals it leads.