



REPORT ON FUNDING OPPORTUNITIES TO DECARBONISE THE EU STEEL INDUSTRY

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List of abbreviations

AI	Artificial intelligence
AMF	Asylum and Migration Fund
CCS	Carbon capture and storage
CCU	Carbon capture and use
CCUS	Carbon capture and usage or storage
CDA	Carbon direct avoidance
CDTI	Centre for Industrial Technological Development
CEF	Connecting Europe Facility
CF	Cohesion Fund
CSP	Clean Steel Partnership
DE	Digital Europe
EAFRD	European Agricultural Fund for Rural Development
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECSC	European Coal and Steel Community
EFSI	European Fund for Strategic Investments
EGD	European Green Deal
EGDIP	European Green Deal Investment Plan
EIB	European Investment Bank
EIC	European Innovation Council
EIF	European Investment Fund
EII	Energy-intensive industries
EMFF	European Maritime and Fisheries Fund
ERDF	European Regional Development Fund
ESF	European Social Fund
ESIF	European Structural and Investment Funds
ESSC	European Sectoral Skills Council
ESTEP	European Steel Technology Platform
EU ETS	European Union Emissions Trading System
EU	European Union
EUROFER	European Steel Association
FFG	Austrian Research Promotion Agency
FTA	Free trade agreement
FWF	Austrian Science Fund
GDP	Gross domestic product
GHG	Greenhouse gas
GNI	Gross national income
GREENSTEEL	Green Steel for Europe

H2020	Horizon 2020
HEU	Horizon Europe
IA	Innovation action
IBMF	Integrated Border Management Fund
ICT	Information and communication technology
IF	Innovation Fund
InnovFin	EU Finance for Innovators
IPCEI	Important project of common European interest
ISF	Internal Security Fund
JTF	Just Transition Fund
JTM	Just Transition Mechanism
MF	Modernisation Fund
MFF	Multiannual financial framework
MS	Member state
NER300	New Entrance Reserve 300
NGEU	Next Generation EU
PI	Process Integration
PNIEC	Plan national integre energie-climat
PPE	Programmation Pluriannuelle de l'Énergie
PPP	Public and private partnership
P4P	Process4Planet
R&D	Research and development
R&D&I	Research, development and innovation
R&I	Research and innovation
RF	Recovery Fund
RFCS	Research Fund for Coal and Steel
RIA	Research and innovation action
RIES	Research Initiative for European Steelmaking
RIS3	Research and Innovation Strategies for Smart Specialisation
RP	Recovery Plan
RTO	Research & Technology Organization
SEIP	Sustainable Europe Investment Plan
SET-Plan	Strategic Energy Technology Plan
SME	Small and medium-sized enterprise
SPIRE	Sustainable process industry through resource and energy efficiency
SSDCS	Sector Social Dialogue Committee Steel
SVC	Strategic value chain
t	Tonne
TRL	Technology readiness level
UN	United Nations
VET	Vocational education and training

Executive summary

Climate neutrality by 2050 is one of the main policy priorities of the European Union (EU), as outlined in the December 2019 European Commission (EC) communication on the **European Green Deal** (EGD). In addition to being the EU's response to challenges related to climate and the environment, the EGD is also a growth strategy that aims to **transform the EU into a fair and prosperous society**, with a modern, resource-efficient and competitive economy.

The transition to a climate-neutral society is not only an urgent challenge but hence also an **opportunity to build a better future for all economic sectors**. By aligning actions in critical industrial areas through policy, the EC can lead the way to achieving climate neutrality while continuing to drive new business models, guiding private investment, especially in new technological solutions. Developing such solutions, however, will not be easy.

In recent months, the **Covid-19 health crisis** has hit the European economy hard, causing a sharp technological slowdown, a fall in the EU's gross domestic product (GDP) and an unprecedented situation of uncertainty. The severe lockdown restrictions imposed to contain the spread of the virus have slowed down the EU's industry, supply chains and production lines, with serious economic implications. In particular, consumption has dropped as jobs have been lost, income has fallen and the public's appetite for buying has declined because of confinement measures closing shops.

Energy-intensive industries (EIs), among others, the steel sector (European Commission, 2013), provide materials and goods that are necessary for the European way of life, and significantly contribute to GDP and employment. EIs require a considerable amount of energy, directly or indirectly producing greenhouse gases (GHGs), and are responsible for at least 15% of the EU's emissions. Carbon dioxide (CO₂), the GHG most relevant to the steel industry, is difficult to mitigate with conventional technologies.

Consequently, **research and innovation** (R&I) are fundamental for the development of 'breakthrough technologies' that would allow for compliance with the climate change targets of the EGD while maintaining global competitiveness. Creating the conditions for such innovations at the industrial and commercial scale, however, requires political support and important investments by industry. In other words, a **coordinated approach** is needed to change production routes, trade and consumption. This implies an unprecedented technological transformation and substantial funding.

To bolster this effort and foster innovative approaches, at the end of May 2020, the EC presented a wide-ranging package for the period 2021-27 combining the future **multiannual financial framework** (MFF, €1,074.3 B) and a specific recovery effort under **Next Generation EU** (NGEU, €750 B).

The purpose of this report is to analyse all main, relevant financial instruments for an **overview of the funding available to reach the zero GHG emissions target in the steel sector set by the EU for 2050**.

In particular, this Green Steel for Europe (GREENSTEEL) report considers a wide range of programmes relevant to the steel sector, both public and private: **25 EU programmes** (19 public and 6 private), **24 private funding opportunities** (mainly from banks, including both conventional instruments and green bonds), and **81 national and regional instruments** (from 11 countries).

The member states (MSs) involved in this research and mapping exercise (Austria, Belgium, Finland, France, Germany, Italy, Luxembourg, the Netherlands, Poland, Spain and Sweden) account for **at least 90% of the EU steel production and 80% of CO₂ emissions** from all EU steel plants.

EU public funding opportunities

Of all the public funding instruments available at European level, the following are significant:

- **Horizon Europe (HEU, €100 B)**, the EU's main funding programme for R&I;
- the **Clean Steel Partnership (CSP)**, the key alliance for CO₂ emission reduction in the steel sector, supported by the EU with funding from HEU;
- the **Research Fund for Coal and Steel (RFCS)**, providing funding for generally smaller R&I breakthrough projects in clean steelmaking;
- the **LIFE programme**, an environment and climate initiative that may provide additional support to the transformation of EU production and distribution, including the steel sector, into a clean, circular, energy-efficient, low-carbon and climate-resilient economy;
- the **Innovation Fund (IF)**, the funding programme for the demonstration of innovative low-carbon technologies; and
- the **European Green Deal Investment Plan (EGDIP)**, the **Just Transition Mechanism (JTM)** and various other EU instruments, not only for research, development and innovation (R&D&I) but also for first-of-a-kind and infrastructure and skills projects.

The **funding programmes dedicated to the specific investment needs of the EU steel industry** (GREENSTEEL D1.2 and D2.2) are not sufficient. Overall, only about €2 B of available EU public funding would be usable for activities aiming to reduce CO₂ emissions in the steel sector for the period 2021-30.

The above-mentioned estimate does not take into account the possible implementation of an **important project of common European interest (IPCEI)** in the steel sector, which is still under discussion. Based on the existing IPCEIs (microelectronics and batteries), additional funding could total around **€2 B**.

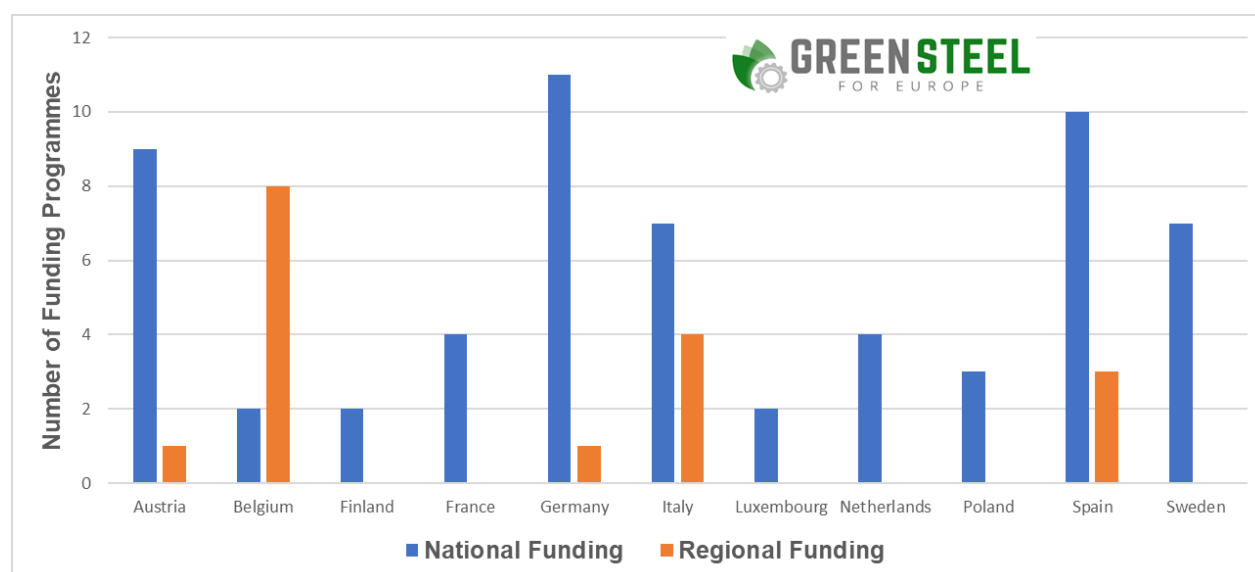
Moreover, additional funds could come from initiatives that are either new or under development, such as the **EGDIP**, the **JTM** and **InvestEU**. The **EGDIP** has a total budget of **€503 B** (of which **InvestEU** amounts to **€279 B**).

National and regional public funding opportunities

A similar analysis has been carried out for public policy instruments available at the national and regional levels, focusing on the MSs where iron and steel production is highly intensive and CO₂ emission reduction key.

Figure 1 below shows the distribution of the 81 national and regional public instruments analysed by MS and region. The figures demonstrate the **interest of MSs and regions in supporting industrial transformation**. The number of national instruments is consistently higher than that of regional ones. However, regions also are demonstrating growing support. That said, **rules tend to differ significantly**.

Figure 1: National and regional funding programmes supporting the decarbonisation of the steel industry



Source: authors' own calculation.

Quite often, national and regional programmes are insufficiently coordinated in terms of scope, timeline and funding availability. Long-term visibility and stability must also be ensured to allow for blending with the new set of EU initiatives, in order properly to support CO₂ emission reduction in the steel sector.

Based on the information currently available on national and regional funds, **approximately €400 M** per year would be available for CO₂ emission reduction in the steel sector for all 11 European countries considered in the analysis for the period 2021-22. This amount is in addition to the amount cited above for EU instruments.

Private funding opportunities

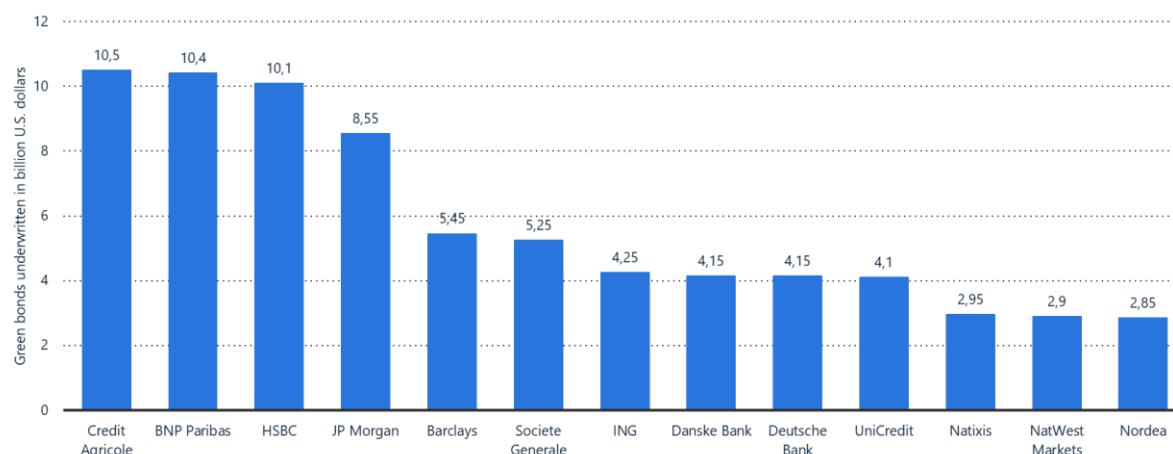
This study also analyses **private** instruments available at **the European, national and regional levels**, including from banks, highlighting, whenever possible, **synergies** such as:

- involvement of public and private investors, increasing the total amount of financing available to projects compared with support through grants only;
- greater and more extensive support to beneficiaries that may not be supported by a single grant at EU or national level, also taking into consideration state aid rules;
- risk reduction and bridging the so-called “innovation valley of death” (the gap between academic-based innovations and their commercial application in the marketplace); and
- better alignment of company interests with the successful outcome of the project.

In this context, every year all main **development banks** (World Bank, International Finance Corporation, European Bank for Reconstruction and Development, European Investment Bank, Asian Development Bank and African Development Bank) **renew their commitment to**

sustainability by launching new green bond emission plans.¹ In 2019, Crédit Agricole (\$10.6 B) was the largest green bond underwriter in the global market, winning a close race with BNP Paribas (\$10.5 B) and HSBC (\$10.1 B). The top three underwriters accounted for 17% of the total. The top three green bonds underwritten by Crédit Agricole included deals from Enel (\$1.3 B), Crédit Agricole (\$1.1 B) and the Republic of Chile (\$972 M). In 2019, Morgan Stanley was the largest US green municipal bond deal underwriter (\$1.96 B), followed closely by Bank of America's BofA Securities (\$1.82 B).

Figure 2: Leading European banks for green bond underwriting in 2019, by value of bonds (B \$)



Source: Climate Bonds Initiative – Statista.

Blending and sequencing

This report has investigated synergies at EU level (considering the main EU instruments, i.e., HEU, CSP, RFCS, IF, LIFE and IPCEI) and at the MS and regional levels. Vertical and horizontal project synergies have also been analysed.

Findings for blending are summarised in Table 13, showing the possible synergies existing between the main European funding programmes as well as those between European funding instruments, on the one hand, and MS and regional funding opportunities, on the other. While at European level the various programmatic resources can generally be combined (left side of the table), synergies between EU and national/regional instruments are generally not allowed, except for a small number of cases (right side of the table).

Sequencing is the possibility to continue sustaining an ongoing project through the same or a similar funding mechanism. Based on the information collected here, sequencing has not generally been highlighted as a key bottleneck to be addressed in the rules, either at the EU level or at national/regional levels.

In very few cases is sequencing regulated by rules associated with the funding source. Consequently, even though sequencing is important for supporting long-term technological

¹ For further details, please see <https://www.borsaitaliana.it/notizie/sotto-la-lente/green-bond-definizione.htm>.

development, the use of the tool depends much more on the specific technical nature of the project and its own evolution than on the detailed definition of rules for the funding instrument.


Guidelines

The report also includes a guideline aimed at navigating the different European programmes related to CO₂ emission reduction in the steel sector. In particular, Table 1 below provides information on the main European funding instruments based on size: small scale (€<7.5 M), medium scale (between €7.5 M and €100 M) and large scale (€>100 M) demonstrator. The €7.5 M delineation (CAPEX) was set by the IF to separate small-scale from larger-scale demonstration projects for limiting GHG emissions. The €100 M limit is the expected upper bound of the CSP instrument.

The different colours mean the following:

- green: the project size is within the scope of the instrument;
- red: the project size is outside the scope of the instrument; and
- yellow: the instrument is still under discussion at the political level.

Table 1: Guidelines on the main financial instruments available to the steel sector by project size

	Project with funding <7.5 M€	Project funding between 7.5 and 100 M€	Project funding between 100 M€ and 250 M€	Projects with funding > 250 M€
Horizon Europe (HEU) and related relevant PPPs (P4P, Clean Hydrogen)	Pillar 2 calls to be published at the beginning of 2021.			
Clean Steel Partnership (CSP)	Expected calls in April/May 2021;			
Research Fund for Coal and Steel (RFCS)	Usual call every year; Average project dimension 1.5 M€ funding.			
Innovation Fund (IF)	IF small-scale instrument (no calls currently open. Calls expected to be launched on beginning 2021).		<ul style="list-style-type: none"> - Budget up to 150 M€ - Calls published on 3rd of July 2020. Deadline 29th October - At least 7.5 M€ CAPEX. - A single legal entity, as well as consortium, can apply. - Breakthrough projects; it is funded the innovation gap respect to conventional plant. - Maximum grant 60% of the relevant costs. - Payments against GHG emissions avoidance. - Cost incurred prior of the signature of the GA are not included in the calculation of the relevant cost. - IF grant is not considered to be State aid - A project that has received the IF support may also receive a contribution from any other Union programme. 	

European Green Deal (EGD) Calls	CSA projects starts from 2 M€	Topic Area 3 (of interest of the Steel Sector). Work Programme available. 10 -40 M€ project dimension. Deadline on January 2021	
InvestEU	The InvestEU Fund is expected to mobilise more than 372 B€ of public and private investment through an EU budget guarantee of 26,2 B€ that backs the investment of financial partners such as the EIB Group and others.		
Important Projects of Common European Interest (IPCEI)	<ul style="list-style-type: none"> - Two types of IPCEI actions interesting for the GREENSTEEL project: <ol style="list-style-type: none"> 1. IPCEI - Hydrogen for climate action 2. IPCEI – Low carbon industries (still in preparation) - Currently the maximum amount for a single MS, based on the two already active IPCEI (Microelectronics and Batteries), amount to 400 M€. - Funding up to 100% of the relevant cost, even if industry co-financing is highly expected. - IPCEI follows the State aid rules (2014/C 188/02). 		
National and Regional	Considering the wide variety of rules, these instruments have to be specifically verified on a case-by-case base.		
EIB		Loans > 25M€	No defined upper limit
ERBD	Loans available in the range 3-250 M€ (average amount €25 M). Full details are negotiated with the client on a case-by-case basis-		
Banks	Conventional instruments and green bonds		

Source: authors' own composition. Note: green = funding available; yellow = funding rules under definition; red = funding not available.

GREENSTEEL database

Exhaustive information for each instrument, from European to national and regional, is provided in Table 17 (Annex 6) in order to compare all correctly. The table in Annex 6 serves as the GREENSTEEL database of financing programmes for CO₂ emission reduction in the steel industry.

Conclusions

The 2050 climate stabilisation challenge can be met only if private capital is sufficiently supported by a consistent and coordinated framework of public funding opportunities at the EU, MS and regional levels. Both EU and national/regional financial support schemes for the decarbonisation of industrial installations must be made available at sufficient scale for the entire transition period from 2021 to 2050. In addition, the steel industry and other stakeholders will need to cooperate to overcome the technological and economic challenges they face with regard to the implementation of low-carbon production technologies.

The EU steel industry produces a basic material that is essential and will continue to be so for modern societies. The most significant GHG in the steel industry is CO₂, and the steel industry is one of the biggest industrial CO₂ emitters. In addition, global steel production is forecast to grow from 1.7 B tonnes (t) in 2018 to 2.8 B t in 2050, with the EU being the second-largest producer of steel in the world after China. Therefore, CO₂ emissions from the steel industry need to be significantly reduced.

New low-carbon production technologies will require investments amounting to €50-60 B (EUROFER, 2019) and will result in capital and operating costs ranging between €80 and €120 B per year. The price per t of primary steel will increase by an estimate ranging from 35% up to 100%. In other words, large investments in innovation and integrated breakthrough technologies for the European steel industry are critical to achieve the EU's climate and energy targets and to boost the competitiveness of the sector whilst giving it a first-mover advantage on the global stage. Since the effort to combat climate change carries policy, technology and market risks, the steel industry, which generally operates with low profit margins in competitive markets and, to add insult to injury, has now been hit hard by the Covid-19 pandemic, needs financial support for the implementation of low-carbon production technologies.

However, the analysis of EU financial support conducted in the framework of this report has found that even by combining significant financial mechanisms—such as HEU, CSP, RFCS, LIFE and IF—only about **€2 B would be available as grants for CO₂ emission reduction in the steel sector for the period 2021-30**. This is, of course, a large amount of money but unfortunately far from enough to turn breakthrough technologies into technically achievable and economically viable solutions, which would allow the sector to do its part toward achieving the objective of a climate-neutral EU by 2050. In addition, based on currently available information, the analysis of national and regional funding instruments has found that **approximately €400 M per year would be available for reducing CO₂ emissions in the steel sector in the period 2021-22**, for all 11 of the European countries considered.

These amounts are insufficient to meet the investment needs of the steel sector.

1. Introduction

1.1. Context

The European Union (EU) aims at becoming climate-neutral by 2050 and on 12 December 2019 the European Council, taking note of the communication of the European Commission (EC) on the European Green Deal (EGD), endorsed the goal of achieving a climate-neutral EU by 2050, in line with the objectives of the Paris agreement and in the light of the latest available science and of the need to step up global climate action (European Commission, 2017a). The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a better future for all.

All parts of society and economic sectors will play a role and the EU can lead the way by investing into realistic technological solutions, empowering citizens and aligning actions in key areas such as industrial policy, finance and research.

Along this difficult path, a new problem emerged during 2020, with the COVID-19 health crisis hitting the European economy hard. The economic outlook for 2020 predicts a recession in Europe that could have damaging effects for the EU industry. According to EC estimations the EU gross domestic product (GDP) fell by 15% in the second quarter of 2020 as compared with the same period of the previous year and the EU economy is expected to shrink by more than 7% in 2020. The lockdown imposed to contain the spread of the virus has slowed the EU industry, and supply chains and production lines in particular have been disrupted, with severe implications also for the EU steel industry.

The steel industry is among the main energy-intensive manufacturing systems worldwide. The European iron and steel industry annually generates over 200 M tonnes (t) of carbon dioxide (CO₂) (Borkent and de Beer, 2016; Rootzen and Johnsson, 2016), accounting for 5% of all CO₂ emissions produced across EU-28 countries in 2016 (Eurostat, 2016).

1.2. Challenges

The EU steel industry is the backbone of the EU manufacturing sector. The EU is the second largest producer of steel in the world after China. Its output is about 160 M t of steel a year, accounting for 8.5% of global output. Steel also forms part of several industrial value chains and is closely linked to many downstream industrial sectors such as automotive, chemical, construction, electronics, mechanical and electrical engineering. In addition, it has a significant cross-border dimension: 500 production sites (employing more than 300,000 people) are split between 23 member states (MS), making it a truly European industry.

However, steel production is under huge competition from non-EU Countries, China in particular. Also, steel production is energy-intensive, being responsible for 30% of EU industrial CO₂ emissions and the steel sector is the biggest industrial emitter. Research and innovation (R&I) are needed to develop breakthrough technologies that would allow, at the same time, being competitive worldwide and respecting the climate change targets in line with the EGD.

R&I activities in the steel sector have a high risk, require substantial capital investment and have no guarantee of success. If the risk of failure is too high, the private sector may be unwilling to

invest, even if the economic and societal returns can potentially be very high. Moreover, market failures provide a strong rationale for public support to R&I activities with positive externalities.

A European approach is needed to drastically reduce industrial greenhouse gas (GHG) emissions over the next decades. With current technologies, achieving the EU energy and environment targets for 2030 and 2050 will be impossible. European public and private investments worth several billion euros are needed to achieve these objectives. Neither a single company nor a single MS can do this alone. The European partnership on green steel would be a first important step allowing sharing risks among public and private actors, providing inputs to the European sustainable re-industrialisation and creating strategic synergies between public and private funding.

In this context, the present report aims at providing:

- a mapping of existing funding instruments at European, MS and regional level, including both public and private funding;
- an analysis of the blending/sequencing of the identified funding instruments accompanied by guidelines for creating synergies among EU and national/regional funding; and
- an analysis of funding and investment needs accompanied by relevant guidelines.

1.3. Current activities at EU level

EU legislation – The EU is providing the right regulatory framework on antitrust and state aid that is essential for a vibrant EU single market and for providing a level playing field for the steel industry.

Trade policy – Trade is particularly important for steel. At a bilateral level, the negotiation of free trade agreements (FTAs) is a key instrument to achieve a level playing field for EU companies.

Industrial policy – The EC has adopted relevant communications on future directions, such as:

- A New Industrial Strategy for Europe (COM/2020/102);²
- the Just Transition Mechanism (COM/2020/22);³ and
- the Sustainable European Investment Plan (COM/2020/21).⁴

In addition, the state of the art, the major issues and the challenges concerning the sectors related to the EU steel industries in 2018 and 2019 are addressed in the following publications:

- European steel – The Wind of Change;⁵ and
- Steel and coal – A New Perspective. Research and Innovation in Action.⁶

² For further details, please see https://ec.europa.eu/knowledge4policy/publication/communication-com2020102-new-industrial-strategy-europe_en.

³ For further details, please see <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0022>.

⁴ For further details, please see <https://www.eumonitor.eu/9353000/1/j9vvik7m1c3gyxp/vl5bgabajmzx>.

⁵ For further details, please see <https://publications.europa.eu/en/publication-detail/-/publication/fb63033e-2671-11e8-ac73-01aa75ed71a1/language-en/format-PDF>.

⁶ For further details, please see https://ec.europa.eu/info/publications/steel-and-coal-new-perspective_en.

Finally, the report on the seven-year (2011-17) monitoring and assessment of the Research Fund for Coal and Steel (RFCS) was published in 2020 (RFCS Monitoring and Assessment Report (2011-2017)).⁷

EU funds available for the EU steel industry - Various EU funds and policy instruments, such as the RFCS, Horizon 2020 (H2020), Horizon Europe (HEU) and the structural funds, can be mobilised to alleviate social costs and to ensure that the skills required for steelmaking are retained for the future competitiveness of the industry. To minimise the social impact, good practices in the field of training and reskilling at company level should be promoted.

Strategic Energy Technology Plan (SET-Plan) - The SET-Plan promotes R&I efforts across Europe by supporting the most impactful technologies in the EU's transformation to a low-carbon energy system. It promotes cooperation amongst EU countries, companies, research institutions and the EU itself. In this context, the 6th working group of the SET-Plan deals with energy efficiency (Moya and Pardo, 2013; Rosenow and Bayer, 2017) in industry, including the steel industry.

High-level expert group on energy-intensive industries - The High-level expert group on energy-intensive industries (EII) was set up to discuss the most pertinent issues that EIIs are facing with key stakeholders and national administrations, in particular with a view to upcoming EU initiatives.

EU emissions trading system (EU ETS) - The EU ETS is a cornerstone of the EU's policy to combat climate change and a key tool for reducing GHG emissions cost-effectively (Purvis and Vaghi, 2015). The new ETS (European Commission, 2011a) directive establishes and implements the Innovation Fund (IF) to support innovation in low-carbon technologies and processes, including in the steel sector.

1.4. The way forward for producing green steel in Europe

The aim should be to move from incremental funding to breakthrough technology thanks to synergies among EU and national funds, and the teaming up of private and public actors. The current level of funding is adequate only for incremental progress towards green steelmaking – what is needed to meet the climate energy targets, however, is a real breakthrough.

A complex balancing between technological priorities and funding programmes available at EU, MS and regional level, as either public or private investments, is the first step to face this new challenging landscape.

The main fund for the steel industry is running out of resources: the RFCS budget is drastically decreasing due to low ECB interest rates, from €60 M in 2003 to €22 M in 2019, and is expected to dwindle even further in the years to come. In addition, the share of the European Coal and Steel Community (ECSC) fund that should be returned to the UK in the framework of UK article 50 negotiations is around €250 M (cf. art. 138 of the draft agreement on the withdrawal of the United Kingdom from the EU, 19/3/2018). This amount will be reimbursed to the UK in five instalments from 2021 to 2025.

Moreover, under HEU and the upcoming IF no budget is earmarked for the steel sector. This holds true also for other EU funding where many industry sectors will compete for support.

⁷ For further details, please see https://ec.europa.eu/info/publications/research-fund-coal-and-steel-monitoring-and-assessment-%20report_en.

Therefore, there is a strategic need to create synergies among EU funds (ECSC assets, HEU and IF), and of co-programming and co-financing with the EU steel industry. Such join-up funds and efforts would provide the EU steel industry with a critical mass to ensure breakthrough technologies, and facilitate joint vision development and agenda setting. This could be initially achieved through the HEU partnership on clean steel.

The present report provides a mapping of existing and under development funding mechanisms at European, MS and regional level, including both public and private funding, and considers a wide number of programmes, i.e. 25 EU programmes (19 public and 6 private), 24 opportunities from banks (both conventional instruments and green bonds), and 81 national and regional instruments (from 11 countries).

The types of EU (European Commission, 2017b), MS and regional contributions under consideration in this report are:

- *Grants* - Grants are funding for projects contributing to EU policies. They are awarded to private and public organisations, and exceptionally to individuals. Grants are a form of complementary financing. The EU usually does not finance projects up to 100%. In other words, the project will be co-financed by the beneficiary organisation. Grants are mainly awarded through calls for proposals. The EC uses calls for proposals to advertise funding opportunities and explain how to apply for them.
- *Loans, guarantees and equity* - The EU provides loans, guarantees and equity as forms of assistance, in relation to EU policy and programmes. The financing goes through local financial institutions. These institutions — banks, guarantee societies or equity investors — determine the exact financing conditions: the amount, duration, interest rates and fees.
- *Subsidies* - Subsidies and other types of funding are managed directly by EU national governments, not by the EC. For instance, subsidies may be awarded to support industry decarbonisation.
- *Prizes* - Prizes are rewards to winners of contests from H2020. They are also called challenge prizes or inducement prizes. Generally, prizes are not relevant to the purpose of industry decarbonisation.

Public contracts are not a part of funding. In this case, the purchasing body looks for services, works or goods from the public for their internal use. Some examples of public contracts are conducting studies, providing technical assistance, training, conference organisation and consultancy. The service providers of public contracts are selected via calls for tenders issued by the competent departments, offices and agencies in Europe.

State aid is defined as an advantage in any form whatsoever conferred on a selective basis to undertakings by national public authorities. A company which receives government support gains an advantage over its competitors. Therefore, the Treaty generally prohibits state aid unless it is justified by reasons of general economic development. To ensure that this prohibition is respected and exemptions are applied equally across the EU, the EC is in charge of ensuring that state aid complies with EU rules.

As indicated above, synergies are needed between the above-mentioned financing opportunities. That is why the report also aims at exploring how to manage and create synergies among EU, MS and regional funds:

- EU grants under the multiannual financial framework (MFF), the RFCS, the regional funds, HEU, Digital Europe (DE), the IF, the Connecting Europe Facility (CEF), the small and medium-sized enterprise (SME) programme, Erasmus plus, etc. are analysed and a list of EU funds relevant to CO₂ emission reduction in the steel sector is provided;
- EU loans, i.e. the European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD) project bonds, are analysed;
- opportunities from European banks, in terms of both conventional instruments and green bonds, are studied; and
- Member States (MS) and regional funds.

Additional EU opportunities for funding, currently under discussion at political level, like the Recovery Plan (RP), expected to be in place beginning 2021, are also considered.

Finally, some examples of how EU opportunities are used by the private sector in the steel industries are also included. Among those, the most relevant to CO₂ emission reduction in the steel sector are listed in Table 2 below.

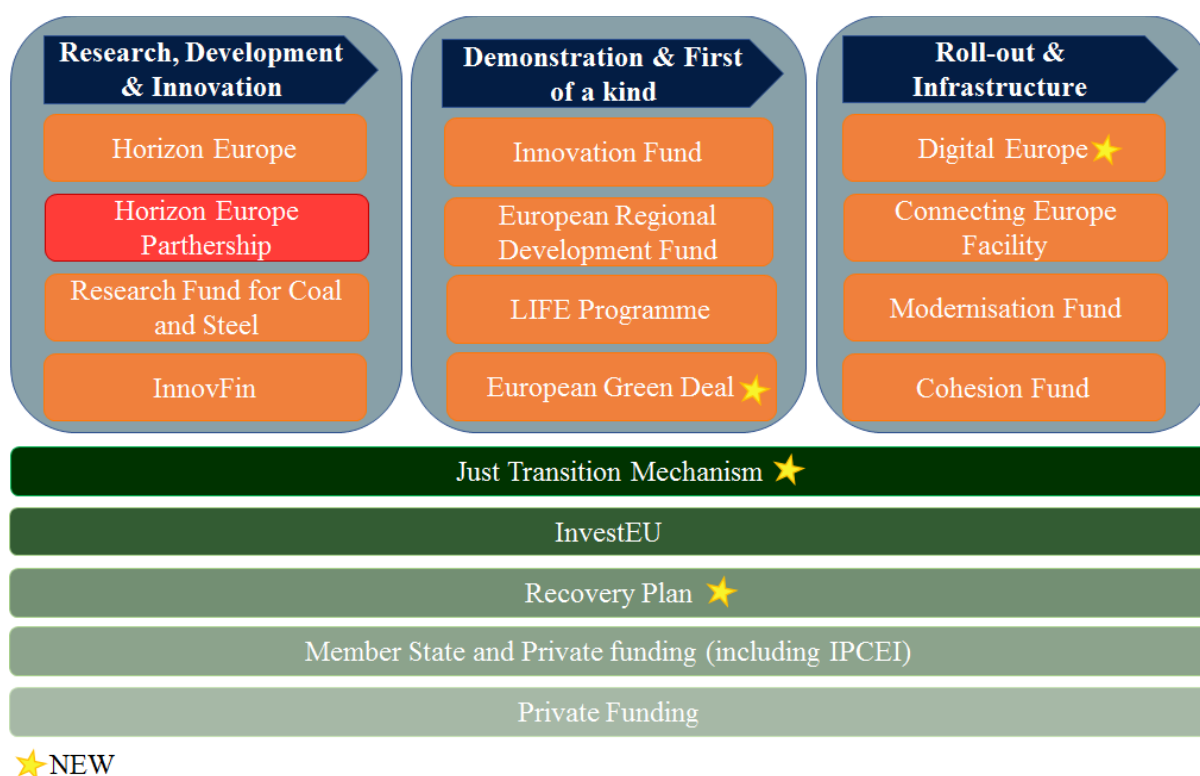
Table 2: List of funding instruments analysed in this report having an expected impact on CO₂ emission reduction in the steel sector

EU public funding opportunities (grant)	Public and private EU, national and regional funding opportunities (loan, guarantee)	National/regional opportunities (grant, financial support)
Horizon Europe (HEU), including PPPs Process4Planet (P4P) and Clean Hydrogen for Europe	European Investment Bank (EIB)	Austria and related regions
Clean Steel Partnership (CSP)	European Bank for Reconstruction and Development (EBRD)	Belgium and related regions
Research Fund for Coal and Steel (RFCS)	European Fund for Strategic Investment (EFSI)	Finland
Innovation Fund (IF)	European Regional Development Fund (ERDF)	France
LIFE Programme (LIFE)	EU Finance for Innovators (InnovFin)	Germany and related regions
European Green Deal Investment Plan (EGDIP)	InvestEU	Italy and related regions
Just Transition Mechanism (JTM)	Private banks (conventional instruments)	Luxembourg
Digital Europe (DE)	Private banks (green bonds)	The Netherlands

Connecting Europe Facility (CEF)		Poland and related regions
Modernisation Fund (MF)		Spain and related regions
Cohesion Fund (CF)		Sweden
Erasmus +		
Era-Net		
SME Programme		
Important project of common European interest (IPCEI)		
Recovery Plan (RP)		

Source: authors' own composition.

Figure 3: EU programmes supporting the decarbonisation of the steel industry



Source: authors' own composition.

The information provided in the present report has been collected through:

- desk research, based on official (institutional) documents;
- desk research, based on literature on the matter; and
- project partners, especially in what concerns EU funding opportunities.

2. EU funding opportunities

The EU ultimate aim is to make Europe the world's first climate-neutral continent by 2050. To be successful, energy and climate policies need to go hand in hand with industrial policies, bringing together large companies and SMEs in a sustainable cooperation with universities and research organisations.

R&I are the key to boosting the competitiveness of European industries and need to be at the heart of the EU's Industrial Strategy.

This will require a coordinated approach changing the way we produce, trade and consume, as well as unprecedented technological transformations; in turn, unprecedented technological transformations require money.

Finance is one of the key issues that must be addressed to ensure the emission reduction targets are met and the high number of funding mechanisms should be properly managed to avoid limited success stories, fostering instead the correct addressing and sizing of funding opportunities towards the transition to a low-carbon economy (European Commission, 2011b).

To achieve the EU climate goals, H2020, the current EU's main funding programme for R&I, and HEU, its successor programme, are not enough.

The present chapter provides an overview of the key funding streams for the low-carbon, climate-resilient development, and ensures a specific and comprehensive vision to promote a well-designed and tuned financial framework. In addition to funding instruments, state aid and antitrust rules are also considered.

2.1. EU public funding opportunities

Note to the reader: the present section illustrates the various EU instruments listed in Table 2 above extensively, instrument by instrument. If you are interested in the overall funding opportunities available through all EU instruments supporting CO₂ emission reduction in the steel sector, please go to Section 2.3 "Overview of opportunities available at the European level".

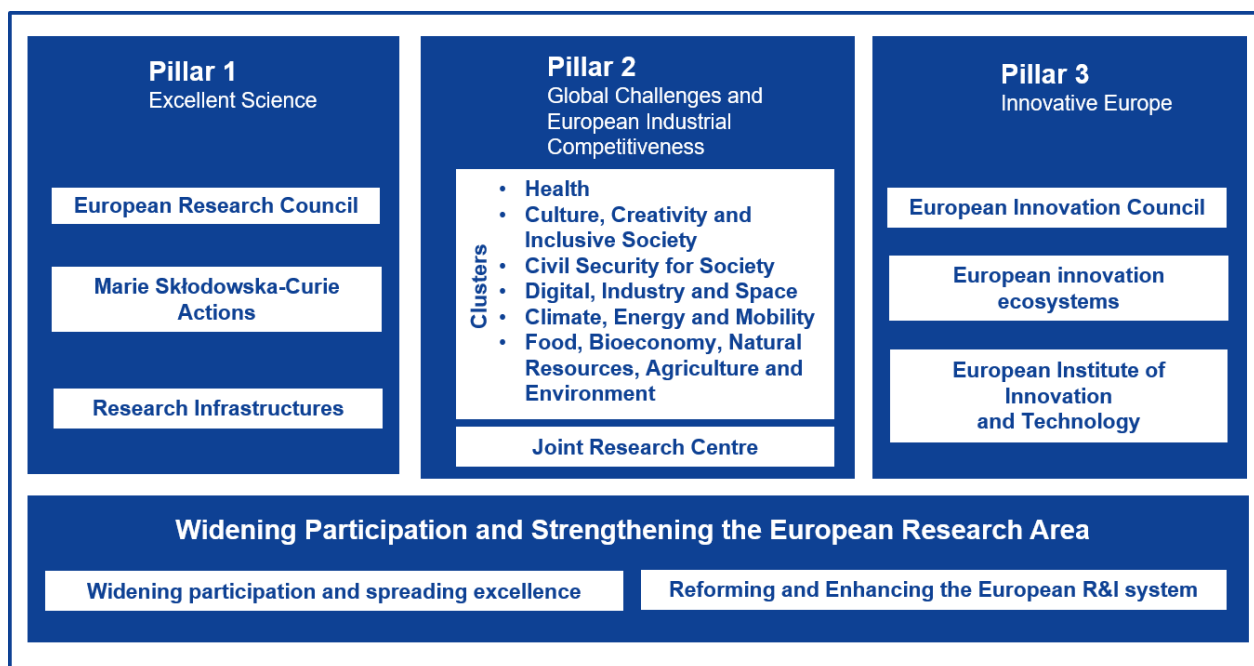
2.1.1. Horizon Europe – HEU

Horizon Europe (HEU)
<u>Link to financing programme website</u>
Scope and objective
Horizon Europe focuses on science and innovation, aiming at boosting EU competitiveness through the creation of trans-national and multidisciplinary networks, value chains and markets, and strengthening support for breakthrough/market creating innovations while respecting fair competition. The key novelties in HEU are the following:

- European Innovation Council (EIC);
- R&I missions;
- extended association possibilities;
- open science policy;
- new approach to partnerships; and
- spreading excellence.

The programme is designed around three pillars:

Figure 4: Horizon Europe Pillars and European Research Area



Source: European Commission, 2020a.

1) Excellent Science – Building on the success of the European Research Council, the Marie Skłodowska-Curie actions and the research infrastructures, the pillar adds more resources for projects with higher impacts. The projects are selected through a 'bottom-up' approach, are defined and driven by researchers and networks and are evaluated on the sole criterion of excellence.

2) Global challenges and industrial competitiveness – The pillar is built on clusters that aim at exploiting European strengths and assets by generating new knowledge and translating it into useful innovations, developing and applying digital and key enabling technologies along with a new mission approach. This will further ensure that R&I activities support EU policy priorities in areas such as the achievement of the sustainable development goals, health, food and natural resources, resilience and security, climate, energy and mobility to secure a low-carbon, circular and climate-resilient society, industrial competitiveness and other societal challenges. Industrial leadership will be prominent within the pillar and through the programme as whole.

3) Innovative Europe – This new pillar will offer a one-stop shop for high potential innovators, aiming at putting Europe at the forefront of market-creating innovation through a 'bottom-up' approach. It will develop future breakthrough technologies and attract innovative companies with potential for scaling

<p>up at international/European levels. It will offer fast, flexible grants and market-based instruments with private investors while ensuring that support close to the market activities does not unduly distort competition between innovators. These objectives are pursued through the creation of the EIC.</p> <p>The steel sector will have a role to play under HEU, especially under Pillar II 'Global challenges and industrial competitiveness' and more specifically in:</p> <ul style="list-style-type: none"> • cluster 4 - 'Digital, industry and space', aiming at: (i) ensuring the competitive edge and autonomy of EU industry; (ii) fostering climate-neutral, circular and clean industry; and (iii) bringing a major contribution to inclusiveness; and • cluster 5 - 'Climate, energy and mobility', aiming at fighting against climate change and improving the competitiveness of the energy and transport industry as well as the quality of the services that these sectors bring to society. The reduction of GHGs in the steelmaking process, including through energy efficiency and the use of renewable energy, is closely connected to the objectives of this cluster.
Specific rules of participation
The rules of participation are currently under discussion.
Funding available in total
<p>€100 B over 7 years (2021-27), of which €52.7 B for Pillar 2.</p> <p>35% of the total budget is targeted at tackling climate change.</p>
Type of action
Research and innovation action (RIA), innovation action (IA), coordinated and support action (CSA).
TRL
Starting at 2-3, targeting 6-7.
Complementarity with other EU and national/regional funds
<p>European Regional Development Fund (ERDF) - LIFE - CEF - Erasmus + - IF - External Instrument – European Social Fund (ESF+) - DE - Single Market Programme - InvestEU.</p> <p>The 'Seal of Excellence' scheme, aimed at allowing projects successfully evaluated under HEU criteria to be funded at regional level under the European Structural and Investment Funds (ESIF), will be expanded.</p> <p>InvestEU will allow transferring results from HEU to the market through specific windows dedicated to R&I, and supporting innovative SMEs.</p> <p>Through the reformed CEF, the Union will continue to invest in trans-European transport, digital and energy networks. The future programme will better exploit the synergies between transport, digital and energy infrastructure, for example through developing alternative fuels infrastructure or sustainable and smart grids underpinning the Digital Single Market and the Energy Union. Building on the successful approach of the current programming period, part of the Cohesion Fund (CF) allocation (€11.3 B) will be transferred to the CEF for transport projects offering high European added value.</p> <p>European Partnerships fall into three categories: (i) co-programmed European Partnerships, i.e. partnerships between the EC and private and/or public partners based on memoranda of understanding and/or contractual arrangements; (ii) co-funded European Partnerships, i.e. partnerships using a programme co-fund action and involving EU countries, with research funders and</p>

other public authorities at the core of the consortium; and (iii) institutionalised European Partnerships, i.e. partnerships where the EU participates in R&I funding programmes that are undertaken by EU countries; these partnerships require legislative proposals from the EC and are based on a Council regulation (article 187) or a decision by the European Parliament and the Council (article 185); they are implemented by dedicated structures. The EC carried out impact assessments (European Commission, 2014a) to help to identify candidates for partnerships. The portfolio of European Partnerships includes 49 candidates which have now been taken into the next step of preparations. Among those, candidates which are relevant for low-carbon processes in the steel industry (LowCarbonFuture, 2020), in addition to the CSP, are **Process4Planet** (P4P – the evolution of Sustainable process industry through resource and energy efficiency or SPIRE) and **Clean Hydrogen for Europe** (the evolution of FCH-JU) (Ranzani da Costa et al., 2013).

A mission is a portfolio of actions across disciplines intended to achieve a bold, inspirational and measurable goal within a set timeframe, with impact for society and policy making as well as relevance for a significant part of the European population and wide range of European citizens. HEU defines the characteristics and elements of governance of missions, and 5 mission areas. Specific missions will be programmed within the 'Global challenges and European industrial competitiveness' pillar (drawing on inputs from other pillars).

Possible contribution to direct CO₂ emission reduction in the steel sector

Part of HEU funds can be used to contribute to the new CSP:

Option 1 - Co-programming: a specific part of the work programme can be dedicated to clean steel with funds from HEU, the RFCS and, if possible, the IF. If pooling all resources under the same budget line is not possible, then the deadline of calls should be aligned and a single system of evaluation should be devised.

Option 2 - Mission: a mission on green steel can be launched publishing a call/work programme with different budget lines.

Option 3 - IPCEI: an important project of European common interest can be launched by the EU steel industry.

Considerations on HEU related to the CO₂ emission reduction in the steel industry in the period 2021-50

Period 2021-27 (and extrapolation to 2030)

Past/ongoing H2020 projects to be taken as reference examples	CARBON4PUR, FISSAC, FReSMe, GrInHy2.0, H2FUTURE, HISARNA (Meijer et al., 2011), POLYNSPIRE, RETROFEED, SIDERWIN, STEELANOL, STEEPWISE, TASIO
Overall funding available for the steel industry	<u>Timing:</u> generally, calls under H2020 have been spread all along the 7-year period; as interest for the steel sector, SPIRE and SC5 calls once a year.
	<u>Openness:</u> the above-mentioned calls are open to various EII and generally only a small part of funding has been granted to the steel sector.

	<p><u>Funding</u>: the funding level that has been generally available under H2020 and has been used by the steel sector ranges between 50 and 70% for a project dimension from €4 M to 20 M (funding).</p> <p>The CSP is a public and private partnership (PPP) which is fully dedicated to the steel sector and is expected to last up to 2027. It will benefit from funding from the RFCS and HEU, with the overall expected funding from HEU amounting to €350 M.</p>
	<p><u>Overall estimation</u>: considering that the steel industry has received an overall amount of € 60 M in seven years under H2020 and that the budget has been increased by 20% from H2020 to HEU, the expected funding from HEU to the steel sector could be estimated at € 75 M, depending on the institutional decisions that will be made .</p>
Period 2031-50	
Overall funding available for the steel industry	<p>Making a simple projection based on data available for the current framework programme relating directly to the steel sector (including the CSP) and an estimated €60-65 M/year, funding available can be estimated at €300 M for the period 2031-35 and at €1 B for the period 2036-50 (under the condition that the CSP and the new framework programmes are renewed).</p>

2.1.2. Clean Steel Partnership – CSP

Clean Steel Partnership (CSP) European Partnership for Clean Steel - Low Carbon Steelmaking
<u>Link to financing programme website</u>
Scope and objective
<p>The aim of the European Partnership for Clean Steel - Low Carbon Steelmaking is supporting Europe's industry in its progress towards high value added, low-carbon and pollutant emission and circular products and services, making increasing use of digitisation and smart products.</p> <p>This EU Partnership is the most effective to build a critical mass to support research up to industrial scale breakthrough steelmaking technologies in line with the EU 2050 decarbonisation strategy, to ensure breakthrough technology in the EU and to keep the industrial leadership in clean steelmaking.</p> <p>This Partnership will allow the EU industry to pool resources in an efficient way towards a climate-neutral economy.</p>
Specific rules of participation
Proposed starting year 2021, up to 2027
Funding available in total
<p>The two main sources of EU funding of the Clean Steel Partnership will be the synergies between:</p> <ul style="list-style-type: none"> part of the assets of the ECSC i.l. (cf. Protocol 37 of the EU Treaty, Council decisions 2003/76 and 77 as well as 2008/376); and

- contributions from HEU (cluster 'Digital, Industry and Space' and cluster 'Climate, Energy and Mobility').

The IF (ETS) may be useful for the sequencing of funding towards commercialisation.

Links with other Partnerships currently identified are 'Made in Europe' and 'Carbon neutral and circular industry'.

The expected type and composition of partners are the following:

- EU steel sector, committing €1 B to launch this initiative (see letter by EUROFER to President Juncker of 25 September 2018 – Ares (2018)4938147);
- major steel companies: ThyssenKrupp Steel Europe, Voestalpine, ArcelorMittal, Salzgitter, TataSteel Europe, Outokumpu, Riva, SSAB, CELSA, SIDENOR, Tenaris and representing the European steel industry, the European Steel Association (EUROFER) and the European Steel Technology Platform (ESTEP) for R&I;
- steel research centres: AM Maizières Research (FR), BFI (DE), CRM (BE), CSM (IT), IMZ (PL), K1-MET (AT) and SWERIM (SE);
- steel machines providers: Tenova, Danieli, Thyssen-Krupp;
- non-governmental organisations representing trade unions (IndustryAll) and environmental interests (Green Growth Platform and European Climate Foundation); and
- representatives from industry using steel, e.g. applications for the automotive, defence, construction, space, energy and home appliances sectors.

Type of action

The European Partnership for Clean Steel - Low Carbon Steelmaking supports EU leadership in the transformation of the steel industry into a carbon-neutral sector, serving as catalyser for other strategic sectors. By 2027 it will implement at least 2 demonstration projects leading to 50% CO₂ emission reduction and achieving technology readiness level (TRL) 8 by 2030 in at least 12 building blocks funded by the partnership. The final ambition is reducing CO₂ emissions by 80-95% by 2050, ultimately achieving carbon neutrality.

TRL

Starting at 5-6, targeting 7-8.

Complementarity with other EU and national/regional funds

HEU, P4P, Clean Hydrogen for Europe, RFCS, IF, IPCEI, JTM, national funds, regional funds

Possible contribution to direct CO₂ emission reduction in the steel sector

Funding totally dedicated to the above-mentioned scope.

Considerations on the CSP directly related to the CO₂ emission reduction in the steel industry in the period 2021-50

Period 2021-27 (and extrapolation to 2030)

Overall funding available for the steel industry

Timing: generally, calls under H2020 have been spread all along the 7-year period; as interest for the steel sector, SPIRE and SC calls once a year.

	<u>Openness</u> : the calls are entirely dedicated to the CO ₂ emission reduction in the steel industry.
	<u>Funding</u> : the co-funding rate from the programme could range between 50-100% for a project dimension from €1 M to €100 M (funding). The CSP is fully dedicated to the steel sector and is expected to last up to 2027. It will benefit from funding from the RFCS and HEU, with an overall expected funding from HEU amounting to € 350 M.
	<u>Overall estimation</u> : €700 M up to 2027 (HEU+RFCS). Depending on the institutional decisions that will be made, the expected available funding could be estimated at up to €975 M by 2030.
Period 2031-50	
Overall funding available for the steel industry	Making a projection based on data available for the current framework programme relating directly to the steel sector (CSP only) and an estimated €50 M/year, funding available can be estimated at €250 M for the period 2031-35 and at €750 M for the period 2036-50 (under the condition that the CSP and the new framework programmes are renewed).

2.1.3. Research Fund for Coal and Steel – RFCS

Research Fund for Coal and Steel (RFCS)	
<u>Link to financing programme website</u>	
Scope and objective	
<p>The Research Fund for Coal and Steel supports R&I projects in the coal and steel sectors. The RFCS programme is a Community programme with its own legal basis, which supports the competitiveness of the Community sectors related to the coal and steel industry. When the Treaty establishing the ECSC expired in 2002, its remaining assets were transferred to the European Community, and the RFCS was created. The activities carried out under the RFCS are exclusively financed by the yearly returns generated by these assets. The RFCS is fully managed within DG RTD.</p> <p>So far, almost 800 grant agreements have been signed. In 2018, for instance, running projects totalled 200. These are technical, innovative projects with well-defined objectives. Most RFCS projects are focussed on industrial subjects (almost problem-solving). Typically, the project is carried out by a dedicated and manageable consortium (5/8 partners) including industry, academia and research centres. The average funding is € 1-2 M per project and the average duration is about 3-4 years.</p> <p>The RFCS is outside and independent from the EU Research and Innovation Framework Programme. The legal basis of the RFCS is Protocol 37 of the Treaty and the fund is financed by the revenues of the ECSC assets.</p>	
Specific rules of participation	
Research projects: <ul style="list-style-type: none"> • investigative or experimental work; • ≤60% co-financing; indicative duration is 36 or 42 months; • no specific requirement (recommended total budget is between € 1.5 and 2.5 M); 	

<ul style="list-style-type: none"> • minimum three independent legal entities established in at least two different EU MSs. 	
Pilot & demonstration projects:	
<ul style="list-style-type: none"> • construction and/or operation of an installation at pilot or demonstration scale; • ≤50% co-financing (recommended total budget is between €3 and 4 M); • minimum two independent legal entities established in at least two different EU MSs. 	
Accompanying measures:	
<ul style="list-style-type: none"> • dissemination or promotion of knowledge gained; • ≤100% co-financing; indicative duration is 18 months; • no specific requirement (recommended total budget is between €0.2 and 0.6 M); • at least two independent legal entities established in at least two different EU MSs. 	
Funding available in total and average per project	
Every year around €40 M is made available to universities, research centres and private companies to fund projects.	
Type of action	
Projects cover the following areas: (i) production processes; (ii) application, utilisation and conversion of resources; (iii) safety at work; (iv) environmental protection; and (v) reducing CO ₂ emissions from coal use and steel production.	
TRL	
Starting at 2-3, targeting 5.	
Complementarity with other EU and national/regional funds	
H2020, HEU, IF, regional funds	
Possible contribution to direct CO₂ emission reduction in the steel sector	
Part of the ECSC assets can be used to contribute to the new CSP:	
Option 1 - transferring the money under the HEU relevant budget line (legal basis likely to be adapted).	
Option 2 - publishing a call/work programme with two different budget lines.	
Option 3 - if these two options are not possible, aligning the RFCS call with the HEU work programme and having a single system of evaluation that considers RFCS and HEU proposals as one single proposal (i.e. with a specific panel of evaluators for RFCS + HEU proposals).	
Considerations on the RFCS and projects directly related to the CO₂ emission reduction in the steel industry in the period 2021-50	
Period 2021-27 (and extension up to 2030)	
Past/ongoing RFCS projects to be taken as reference examples	ACASOS, CO2RED, GREENEAF, GREENEAF2, i3Upgrade, INNOCARB
Overall funding available for the steel industry	Considering €30 M of funding/year for the period 2021-30, available funding can be expected to amount to €300 M. Generally, RFCS projects have an incremental approach; the average dimension is about €1-1.5 M of funding, with a funding percentage either of 50% (pilot) or 60% (research).

2.1.4. Innovation Fund – IF

Innovation Fund (IF)
<u>Link to financing programme website</u>
<p>Scope and objective</p> <p>The Innovation Fund is one of the world's largest funding programmes for demonstration of innovative low-carbon technologies, focusing on:</p> <ul style="list-style-type: none"> • innovative low-carbon technologies and processes in EITs, including products substituting carbon-intensive ones; • carbon capture and use (CCU); • construction and operation of carbon capture and storage (CCS); • innovative renewable energy generation; and • energy storage. <p>The IF will:</p> <ul style="list-style-type: none"> • help create the right financial incentives for projects to invest now in the next generation of technologies needed for the EU's low-carbon transition; • boost growth and competitiveness by empowering EU companies with a first-mover advantage to become global technology leaders; and • support innovative low-carbon technologies in all MSs in taking off and reaching the market. <p>The IF is designed to take into account the lessons learned from its predecessor, the New Entrant Reserve 300 (NER300) programme (EIB, 2014), and is bigger and better in several ways:</p> <ul style="list-style-type: none"> • it is open to projects from EITs; • it improves the risk-sharing for projects: its grants cover up to 60% of the additional capital and operational costs of innovation; • it provides support in more flexible way, following the cash flow needs of the project through pre-defined milestones; • it ensures stronger synergies with other EU funding programmes; and • it features a streamlined governance and simplified decision-making. <p>The IF will focus on highly innovative technologies and big flagship projects with European value added that can bring on significant emission reductions. It is about sharing the risk with project promoters to help with the demonstration of first-of-a-kind highly innovative projects. It aims to finance in all MS a varied project pipeline achieving an optimal balance of a wide range of innovative technologies in all eligible sectors (EITs, renewable energy, energy storage, CCS and CCU).</p> <p>Among the above-mentioned topics, the most relevant for the EU steel industry are: CCS and CCU, Industry one (Iron & Steel) and Storage.</p>
<p>Specific rules of participation</p> <p>Single applicants (companies) or consortia, with long-term strategy.</p> <p>Selection criteria:</p> <ul style="list-style-type: none"> • potential to avoid GHG emissions;

<ul style="list-style-type: none"> • degree of innovation; • maturity in terms of planning, business model, and financial and legal structure; • potential for widespread application; and • cost efficiency in terms of emissions avoidance.
Funding available in total and average per project
<p>The EU ETS, the world's largest carbon pricing system, is providing the revenues for the IF from the auctioning of €450 M allowances from 2020 to 2030, together with any unspent funds from the NER300 programme.</p> <p>The fund may amount to about € 10 B, depending on the carbon price. In parallel to the IF, the EU ETS provides the main long-term incentive for these technologies to be deployed. The IF is a key funding instrument for delivering the EU's economy-wide commitments under the Paris agreement and its objective to be climate-neutral by 2050.</p> <p>The fund will also support cross-cutting projects on innovative low-carbon solutions that lead to emission reductions in multiple sectors, for example through industrial symbiosis or business model innovation. The IF regulation defines as 'large-scale' projects with capital expenditure above € 7.5 M, and as 'small-scale' projects below this threshold.</p> <p>The first deadline for calls for proposals is 29 October 2020 (for projects €>7,5 M), followed by regular calls until 2030.</p> <p>The IF can cover up to 60% of the eligible costs of a project.</p>
Type of action
Highly innovative technologies and big flagship projects with European added value.
TRL
<p>The IF is not a research programme, but aims at bringing highly innovative technologies to the market. Projects financed by the fund are at advanced TRLs and the IF helps them reach the market with a competitive advantage and viability.</p> <p>Pilot – Demonstration – Scale up.</p>
Complementarity with other EU and national/regional funds
<p>IF grants can be combined with other sources of funding, for example:</p> <ul style="list-style-type: none"> • InvestEU, as an investment support instrument to de-risk big projects; • HEU, to help bring such new technological solutions across the 'valley of death' and to the market; • partnerships and missions; • CEF, for the roll-out of key infrastructure; • Modernisation Fund (MF) and CF, to boost innovation in all MSs; • national programmes supporting R&I for low-carbon technologies; and • private capital. <p>The IF grant is not considered to be state aid. To cover the remaining costs, a project applicant can combine the IF grant with public support by a MS.</p>

Possible contribution to direct CO₂ emission reduction in the steel sector

The IF focuses on innovative low-carbon technologies and processes in EILs, as the steel sector, and CCS and CCU. The IF will provide adequate financial support to make the necessary steps to bring these technologies to TRL 8/9 in the steel sector.

2.1.5. LIFE Programme

LIFE Programme

[Link to financing programme website](#)

Scope and objective

The LIFE programme is the EU's funding instrument for the environment and climate action created in 1992.

The whole programme is divided into two sub-programmes: LIFE Environment and LIFE Climate Action, and each sub-programme has three priority areas:

- Environment sub-programme:
 - Environment & Resource Efficiency;
 - Nature & Biodiversity; and
 - Environmental Governance & Information;
- Climate Action sub-programme:
 - Climate Change Mitigation;
 - Climate Change Adaptation;
 - Climate Change Governance & Information.

The LIFE programme favours innovation and commercialisation introduced by dynamic start-ups and the LIFE project could represent, in this sense, a risk-free incubation context that allows the start-up to safely bring its solution to the market, supported by appropriate financial, technical, business means and expertise. In this context, the LIFE programme welcomes proposals whose partnership combines the knowledge and expertise of consolidated market players with the drive of start-ups which want to commercialise their solution.

Specific rules of participation

All legal entities registered in the EU can participate and propose innovations that meet the specifications of the six priority areas and fit the specific topics identified each year in the guidelines for the applicants of the two sub-programmes.

Funding available in total and average per project

The current funding period 2014-20 has a budget of € 3.4 B. 1 to 5 beneficiaries; EU contribution: €500,000 to € 1.5 M; 3/5 years (but no limits).

Co-funding rate: max. 55%, with two exceptions:

- Nature & Biodiversity projects: max. 60%; and
- Nature & Biodiversity projects, under specific conditions linked to conservation actions on priority habitats/species: max.75%.

Table 3: Calls and budget under the LIFE programme

AREA	CLOSING C.N.	CLOSING Full P.	BUDGET 20	~ % vs 2019
CLIMATE	n.a.	6 October 2020	€ 73 M	+ 31 %
ENV-RE	14 July 2020	February 2021	€ 84 M	+ 6.3 %
NAT	16 July 2020	February 2021	€ 143 M	+ 4.4 %
GIE	16 July 2020	February 2021	€ 11 M	+ 33 %
IPE	6 October 2020	March 2021	€ 103 M	+ 6 %
IPC	6 October 2020	March 2021	€ 35 M	+ 26 %

Source: <https://ec.europa.eu/easme/en/life>.

Type of action

The LIFE program concerns in particular actions for the climate and the environment. Each action must respond to the priorities indicated, i.e. minimization, reuse and recycling of waste, protection of the territory, protection of endangered species, alternative energies, energy consumption reduction and recovery of thermal waste.

The actions can fall into the traditional (pilot and demonstration projects) or Governance & Information type.

TRL

Falling into the environment and climate areas, actions must start from a context of innovation which is already experienced, at least on a small scale (TRL 6, i.e. technology demonstrated in a (industrially) relevant environment), to be marketed in the short term after the end of the project (TRL 8-9).

Complementarity with other EU and national/regional funds

Many of the topics covered by the LIFE programme are similar to those of H2020 2018-20 (climate action, environment, resource efficiency and raw materials) programmes, or to some topics covered by the RFCS, such as climate, circular economy and industrial symbiosis. However, the LIFE programme takes very well care of the regulatory, social and health aspects of the territory and gives particular importance to advertising, dissemination and involvement of the authorities present in the territory (municipal, national). Contrary to other programmes, the LIFE programme does not finance research, but the application of innovation to get to commercialization on an industrial level.

Possible contribution to direct CO₂ emission reduction in the steel sector

The LIFE programme takes particular account of EIs and finances innovations so that, at the end of the project, they reach industrial application. Many of the proposals concern the metallurgical sector and more particularly the steel sector. The LIFE Climate Action sub-programme, aiming at the minimisation of consumption, may take into consideration innovations, procedures and models for the recovery of waste and the reduction of consumption. The promotion and use of alternative energies, and the use of alternative fuels or raw materials from the residues of other industries are considered very important. In this field, the electric oven or blast furnace is well suited to use additives, fuels, oxides and metals from secondary materials or residues from other industries.

Considerations on LIFE contribution to the CO₂ emission reduction in the steel industry in the period 2021-50

Period 2021-27 (and extrapolation to 2030)

Past/ongoing LIFE projects to be taken as reference examples	HEATLEAP
Overall funding available for the steel industry	<u>Timing</u> : calls are launched once a year, with deadlines in the months of June-July and October, and partially overlapping with the RFCS call in the middle of September.
	<u>Openness</u> : calls are open to all sectors, including all EIs.
	<u>Funding</u> : € 3.4 B (2014-20) <u>CSP</u> : synergies with the CSP are expected. LIFE instruments allow co-financing with other programmes.
	<u>Overall estimation</u> : at least €5.4 B will be available for the period 2021-27. An amount of €7.6 B can be estimated on a linear basis for the period 2021-30. Today a single project with €10 M funding is quite rare. The instrument has not been used often by the steel sector. As a consequence, the funding available for CO ₂ emission reduction in the steel sector is expected to be less than a few percent of the overall available budget (2%).
Recommendation to the institutional framework	The overall funding of the LIFE Climate Action should be increased. Deadlines should be set avoiding overlapping with the RFCS, HEU, the CSP and the IF (e.g. today the RFCS deadline is September 15 th , the LIFE Climate Action October 6 th and the IF October 29 th). The funding ratio (today on average 55%) could be increased. The instruments should be evaluated and more could be added dedicated to the steel sector.
Period 2031-50	
Expected projects to come	Low-carbon projects for the steel sector, both small and big scale demonstrators, can be expected.
Overall funding available for the steel industry	A linear increase of available funding (Climate Action) can be assumed, provided that the institutional framework ensures stability of the instruments in the long term.
Recommendation to the institutional framework	High visibility and stability of long-term instruments for investments should be ensured.

2.1.6. European Green Deal Investment Plan – EGDIP

European Green Deal Investment Plan (EGDIP)
<u>Link to financing programme website</u>
Scope and objective

The EGD has been created to achieve the climate neutrality objective set by the EC for 2050. In this context, a series of initiatives will be carried out aiming at protecting the environment and boosting the green economy within Europe. The EGD is about making Europe climate-neutral and protecting our natural habitat, making it good for people, planet and economy.

The main aims of the EGD are the following:

- become climate-neutral by 2050;
- protect human life, animals and plants, by cutting pollution;
- help companies become world leaders in clean products and technologies; and
- help ensure a just and inclusive transition.

Regarding the industry, the EGD wants to support industry to innovate and to become global leaders in the green economy.

To achieve the ambition set by the EGD (2030 climate and energy targets), the EC has estimated € 260 B of additional annual investment, which will need to be sustained over time, mobilising both the public and private sector.

To help meet the additional funding needs, which will combine dedicated financing to support sustainable investments, and proposals for an improved enabling framework that is conducive to green investment, the EC has presented the **EGDIP**, also referred to as **Sustainable Europe Investment Plan (SEIP)**, as the investment pillar of the Green Deal.

The plan will mobilise at least **€1 trillion** in sustainable investments over the next decade.

The EGDIP has three main objectives:

- first, it will increase funding for the transition, and mobilise at least €1 trillion to support sustainable investments over the next decade through the EU budget and associated instruments, in particular InvestEU;
- second, it will create an enabling framework for private investors and the public sector to facilitate sustainable investments; and
- third, it will provide support to public administrations and project promoters in identifying, structuring and executing sustainable projects.

In other words, the EGDIP will mobilise EU funding and create an enabling framework to facilitate and stimulate the public and private investments needed for the transition to a climate-neutral, green, competitive and inclusive economy. Complementing other initiatives announced under the Green Deal, the plan is based on three dimensions:

- financing: mobilising at least €1 trillion of sustainable investments over the next decade. A greater share of spending on climate and environmental action from the EU budget than ever before will crowd in private funding, with a key role to be played by the EIB;
- enabling: providing incentives to unlock and redirect public and private investment. The EU will provide tools for investors by putting sustainable finance at the heart of the financial system, and will facilitate sustainable investment by public authorities by encouraging green budgeting and procurement, and by designing ways to facilitate procedures to approve state aid for just transition regions; and
- practical support: the EC will provide support to public authorities and project promoters in planning, designing and executing sustainable projects.

As part of the plan, the **JTM** has been created to address the social and economic effects of the transition, focusing on the regions, industries and workers who will face the greatest challenges, targeting a fair and just green transition. It will mobilise at least **€150 B** in investments over the period 2021-27 to support workers and citizens of the regions most impacted by the transition.

The JTM will consist of three main sources of financing:

- a new **Just Transition Fund (JTF)** of **€40 B**, expecting to generate at least €89-107 B of investments;
- a dedicated 'Just Transition' scheme under **InvestEU**, mobilising up to **€45 B** in investments; and
- a **public sector loan facility with the EIB** providing **€10 B** in loans, backed by €1.5 B from the EU budget, and mobilising up to €30 B of investments.

The next long-term EU budget will run for seven years from 2021 to 2027 and will invest substantially in climate- and environment-related objectives. The EC proposed 25% of its total to contribute to climate action and spending on the environment across multiple programmes (e.g. European Agricultural Fund for Rural Development (EAFRD), European Agricultural Guarantee Fund, European Regional Development Fund, CF, HEU and LIFE funds). Taken together and extrapolated from 7 to 10 years, as well as assuming that the climate target post-2027 will be at least maintained, the EU budget will provide €503 B to the EGDIP (European Commission, 2020b). This will trigger additional national co-financing of around €114 B over this timeframe on climate and environment projects.

InvestEU will leverage around €279 B of private and public climate and environment related investments over the period 2021-30. It will provide an EU budget guarantee to allow the EIB Group and other implementing partners to invest in more and higher-risk projects, crowding in private investors.

To ensure no one is left behind, the JTM will mobilise at least €100 B of investments over 2021-27 with financing coming from the EU budget, co-financing from MSs as well as contributions from InvestEU and the EIB. Extrapolated over ten years, the JTM will mobilise around €143 B.

Lastly, the Innovation and Modernisation funds, which are not part of the EU budget, but are financed by a part of the revenues from a key policy tool - the auctioning of carbon allowances under the EU ETS - will provide some €25 B for the EU transition to climate neutrality (European Commission, 2020c), with a special focus on lower-income MSs in the case of the MF.

TRL

High TRL expected

Complementarity with other EU and national/regional funds

InvestEU, EIB

2.1.7. Just Transition Mechanism – JTM

Just Transition Mechanism (JTM)

[Link to financing programme website](#)

Scope and objective

To help the most vulnerable regions deal with the socio-economic impacts of the green transition, the EC proposed in January 2020 a €100 B JTM consisting of three pillars: a JTF, a just transition scheme under InvestEU and a public sector loan facility. The mechanism is part of the €1 T EGDIP proposed in January 2020.

In light of the coronavirus crisis, the EC is reinforcing the JTM as part of its crisis response mechanism and in its new proposal for the next long-term EU budget. The overall budget of the JTF will be increased to €40 B and the just transition scheme under InvestEU will be reinforced. The EC has also presented its proposal for a public sector loan facility, which will mobilize between €25 and 30 B. In total, the JTM is now expected to mobilize at least €150 B of public and private investment.

The EC has identified three sectors it expects to decline and four sectors it expects to transform as a result of the transition to a low-carbon economy. The sectors expected to decline are: (i) mining of coal and lignite; (ii) extraction of crude petroleum; and (iii) natural gas and mining support service activities. On the other hand, the sectors expected to transform are: (i) the manufacture of chemicals and chemical products; (ii) the manufacture of other non-metallic mineral products; (iii) the manufacture of basic metals; and (iv) the manufacture of motor vehicles, trailers and semi-trailers (Bruegel, 2020).

The proposals will be negotiated with the European Parliament and the Council with a view to a rapid adoption. The first calls for projects are expected to be launched after the adoption and entry into force of the public loan facility, and the approval of the territorial just transition plans.

Name of the funding programme	JTF
Level:	<input checked="" type="checkbox"/> EU level <input checked="" type="checkbox"/> National level <input checked="" type="checkbox"/> Regional level <input type="checkbox"/> Global level
Funding source:	<input type="checkbox"/> Public source <input type="checkbox"/> Private financing body <input checked="" type="checkbox"/> Mixed funding source
Main focus:	<input checked="" type="checkbox"/> EIs <input checked="" type="checkbox"/> Steel industry <input checked="" type="checkbox"/> R&D&I in general <input checked="" type="checkbox"/> Decarbonisation <input checked="" type="checkbox"/> Energy efficiency
Geographical scope (open to all EU companies, EU and third countries companies, national companies, companies based in a certain region, other)	<input checked="" type="checkbox"/> Open to all EU companies <input type="checkbox"/> Open to EU and third countries companies <input checked="" type="checkbox"/> Open to national companies <input checked="" type="checkbox"/> Open to companies located in a certain region
Typical project duration (in years):	2-3 years
Single applicant accepted/consortium needed:	<u>Single applicant for the ERDF</u> – national operational programme and regional operational programme <u>Consortium of 2 or 3</u> –cross-border, transnational and interregional co-operation (i.e. Italy – Slovenia or Danube Region Strategy).

Overall co-financing rate (%):	To be indicated in the specific call – MS will co-finance the 1 st pillar. 2 nd and 3 rd pillars will be financed through financial products or loan facility
Specific co-financing rate (if any) for purchasing assets (%):	Common provisions regulation general rules – specific rules will be indicated in the specific call for proposals.
Specific co-financing rate (if any) for R&D expenditures (%):	Common provisions regulation general rules – specific rules will be indicated in the specific call for proposals.
Type of funding instrument (equity, debt, guarantee, grant, tax rebate/exemptions, other)	Pillar 1 - Grants Pillar 2 - Loans Pillar 3 - Public sector guarantee
Opportunities for blending with other funding programmes:	ERD, ESF, and with the Seal of Excellence also with HEU
Opportunities for sequencing with other funding programmes:	Sequencing according to TRL or according to the geographical scopes of the proposals
Barriers which do not allow your company to apply or make it more difficult to apply	<input type="checkbox"/> Confidentiality issues <input type="checkbox"/> Issues with intellectual property rights and open access <input checked="" type="checkbox"/> Rules on commercial/industrial exploitation of results <input checked="" type="checkbox"/> Administrative costs to prepare an application
Specific rules of participation	
<p>All investments under the JTM, including the public sector loan facility, will need to be implemented based on territorial just transition plans. MSs will prepare their territorial just transition plans taking into account the EC analysis in the 2020 European Semester exercise and providing an outline of the transition process until 2030. The plans need to be consistent with the national energy and climate plans and the transition to a climate-neutral economy. The territorial just transition plans will identify the most affected territories that should be supported in each MS and the priority policy areas for each region. The territorial just transition plans are currently being prepared by the MSs and will be approved by the EC. They will provide the framework for support from the three pillars of the JTM.</p> <p>The grant component of the facility will be managed under direct management by the EC and the loan component will be provided by the EIB, in line with the bank's rules, policies and procedures. To secure access to the facility, the grant component will be available to eligible projects in MSs, through national envelopes which will be earmarked until December 2024. Beyond this date, calls will be launched at EU level, to ensure the full implementation of the facility. The facility will become effective after an administrative agreement is signed between the EC and the EIB.</p>	

Eligible projects will be those public sector investments that directly benefit the identified territories and regions, provided they contribute to meeting their specific development needs stemming from the transition, in compliance with the territorial just transition plans.

Funding available in total and average per project

The JTM will consist of three main sources of financing:

1) JTF (pillar 1) – Grants (European Commission, 2020d)

- Amount of Funding - €7.5 B of fresh EU funds, coming on top of the EC proposal for the next long-term EU budget.
- Scope - Definition of the eligible regions - MSs will, in dialogue with the EC, have to identify the eligible territories through dedicated territorial just transition plans. They will also have to commit to match each euro from the JTF with money from the ERDF and the ESF+ and provide additional national resources. Taken together, this will provide between €30 and 50 B of funding, which will mobilise even more investments. The fund will primarily provide grants to regions. It will, for example, support workers to develop skills and competences for the job market of the future and help SMEs, start-ups and incubators to create new economic opportunities in these regions. It will also support investments in the clean energy transition.
- Reinforcement after the Coronavirus crisis - On top of the proposed €7.5 B, the EC is proposing a substantial additional funding, of €2.5 B under the next long-term EU budget and €30 B from Next Generation EU (NGEU). This brings the total for the JTF to €40 B. The funding will be used to alleviate the socio-economic impacts of the green transition in the regions most affected, by for example supporting the re-skilling of workers, helping SMEs to create new economic opportunities, and overall diversifying economic activity, investing in the future of the most affected regions.
- Common provisions regulation - The fund will be subject to the proposal for a common provisions regulation (CPR) that sets out common provisions for seven shared management funds, *inter alia*, the ERDF, the CF and the ESF+ (European Commission, 2018a).

Table 4: Just Transition Fund allocations by member state

MS	Allocation (M€, 2018 prices)	MS	Allocation (M€, 2018 prices)
BE	380	LT	568
BG	2,693	LU	19
CZ	3,413	HU	543
DK	185	MT	48
DE	5,152	NL	1,296
EE	736	AT	282

IE	176	PL	8,000
EL	1,726	PT	465
ES	1,806	RO	4,449
FR	2,142	SI	538
HR	387	SK	954
IT	2,141	FI	968
CY	210	SE	324
LV	398		
Total			40,000

Source: European Commission, 2020e.

2) Just transition scheme under InvestEU⁸ (pillar 2) - Financial products

- **Funding** - Up to €45 B of investments mobilized. It will seek to attract private investments, including in sustainable energy and transport, that benefit the identified regions and help their economies find new sources of growth.
- **Scope** - As stated in EGDIP, the just transition scheme under InvestEU (pillar 2 of the JTM) will provide for a scheme to generate additional investment to the benefit of just transition regions in complementarity with the JTF (pillar 1 of the JTM) and the public sector loan facility (pillar 3 of the JTM). The InvestEU just transition scheme will be reinforced as a consequence of the increase of the InvestEU guarantee.
- **Link with InvestEU** - Under the InvestEU just transition scheme, support to investments in just transition regions will be possible through any of the InvestEU policy windows, depending on the specific investment needs identified by MSs in their territorial just transition plans. Such support targeting economically viable investments by private and public sector entities in these regions will be implemented through InvestEU financial products proposed by the InvestEU implementing partners (e.g. the EIB Group or national promotional banks or institutions). To this end, the InvestEU investment guidelines laying down the requirements for investment operations supported through the InvestEU Fund will include a section on the InvestEU just transition scheme and its implementation modalities.

3) Public sector loan facility with the EIB backed by the EU budget (pillar 3)

- **Funding** - It will be used for loans to the public sector, for instance for investments in district heating networks and renovation of buildings. The facility will include €1.5 B in grants from the EU budget and up to €10 B in loans from the EIB's own sources. The facility will mobilise up to between €25 and 30 B of investments for helping territories and regions most affected by the

⁸ See section on InvestEU.

<p>transition to a climate-neutral economy, prioritising those that have less capacity to deal with the costs of the transition.</p> <ul style="list-style-type: none"> • Scope - On 28 May 2020 the EC presented its proposal for a public sector loan facility under the JTM (European Commission, 2020f). The facility will be implemented with the involvement of the EIB and will encourage investments that support the transition towards a climate-neutral economy by public sector authorities to the benefit of coal- and carbon-intensive regions. The facility will be accessible to all MSs, initially based on national envelopes, through calls for proposals that meet the following criteria: (i) projects benefit territories identified in an approved territorial just transition plan; (ii) projects receive an EIB loan under the facility; and (iii) projects do not generate sufficient market revenue streams. Projects must also comply with the lending policy of the EIB. Investment areas will include energy and transport infrastructure, district heating networks, public transport, energy efficiency measures and social infrastructure, and other projects that can directly benefit the communities in the affected regions and reduce the socio-economic costs of the transition towards a climate-neutral Europe by 2050. All investments under the public sector loan facility are to be carried out based on territorial just transition plans and have to also comply with the EIB lending policies, rules and procedures. An EIB financing must be secured in order to receive the grant. <p>The JTM will also rely on a Just Transition Platform: the EC will be providing technical assistance to MSs and investors, and make sure the affected communities, local authorities, social partners and non-governmental organizations are involved.</p>	
Type of action	
<p>The JTF will support a total of 11 types of activities which can be regrouped (apart from technical assistance) into three broad categories (Bruegel 2020):</p> <ol style="list-style-type: none"> 1) economic revitalisation: (i) productive investments in SMEs, including start-ups, leading to economic diversification and reconversion; (ii) investments in the creation of new firms, including through business incubators and consulting services; (iii) investments in R&I activities and fostering the transfer of advanced technologies; (iv) investments in the deployment of technology and infrastructures for affordable clean energy, GHG emission reduction, energy efficiency and renewable energy;(v) investments in digitisation and digital connectivity; (vi) investments in enhancing the circular economy, including through waste prevention, reduction, resource efficiency, reuse, repair and recycling; 2) social support: (vii) upskilling and re-skilling of workers; (viii) job-search assistance to jobseekers; (ix) active inclusion of jobseekers; and 3) land restoration: (x) investments in regeneration and decontamination of sites, land restoration and repurposing projects. 	
TRL	
1-9	
Complementarity with other EU and national/regional funds	
EIB, InvestEU, EGDIP, ERDF, ESF+	
Possible contribution to direct CO ₂ emission reduction in the steel sector	
The JTM can provide support in terms of funding and loans.	

2.1.8. Digital Europe - DE

Digital Europe (DE)
<u>Link to financing programme website</u>
<p>Scope and objective</p> <p>As part of the next long-term EU budget - the MFF - the EC has proposed DE, the EU's programme focused on building the strategic digital capacities of the EU and on facilitating the wide deployment of digital technologies, to be used by Europe's citizens and businesses. With a planned overall budget of €9.2 B, it will shape and support the digital transformation of Europe's society and economy.</p> <p>The programme will boost investments in supercomputing, artificial intelligence, cybersecurity, advanced digital skills, and ensuring a wide use of digital technologies across the economy and society. Its goal is to improve Europe's competitiveness in the global digital economy and increase its technological autonomy.</p>
<p>Funding available in total and average per project</p> <p>Within the de programme, funds are divided as follows:</p> <ul style="list-style-type: none"> • €2.7 B for supercomputing to: <ul style="list-style-type: none"> ○ build up and strengthen the EU's supercomputing and data processing capacities by buying world-class exascale supercomputers by 2022/23 and post exascale facilities by 2026/27; and ○ increase accessibility and broaden the use of supercomputing in areas of public interest such as health, environment and security, and in industry, including SMEs. • €2.5 B for artificial intelligence (AI) to: <ul style="list-style-type: none"> ○ invest in and open up the use of AI by businesses and public administrations; ○ facilitate safe access to and storage of large sets of data and algorithms; and ○ strengthen and support existing AI testing and experimentation facilities in areas such as health and mobility in MSs and encourage their cooperation. • €2 B for cybersecurity to: <ul style="list-style-type: none"> ○ support, together with MSs, the procurement of advanced cybersecurity equipment, tools and data infrastructures; ○ support the best use of European knowledge, capacity and advanced skills related to cybersecurity; ○ ensure the wide deployment of the latest cybersecurity solutions across the economy; and ○ reinforce capabilities within MSs and the private sector for a uniformly high level of security of network and information systems across the EU. • €700 M for advanced digital skills to: <ul style="list-style-type: none"> ○ support the design and delivery of short-term trainings and courses for entrepreneurs, small business leaders and the workforce; ○ support the design and delivery of long-term trainings and master courses for students, information technology professionals and the workforce; and

<ul style="list-style-type: none"> ○ support on-the-job training and traineeships for students, young entrepreneurs and graduates. • €1.3 B for ensuring the wide use of digital technologies across the economy and society to: <ul style="list-style-type: none"> ○ ensure that the public sector and areas of public interests, such as health and care, education, transport and the cultural and creative sectors, can deploy and access state-of-the-art digital technologies; ○ provide more interoperable public services across the EU and at EU level; ○ offer public administrations access to testing and piloting of digital technologies, including their cross-border use; ○ support the uptake of advanced digital and related technologies by the industry, notably SMEs; ○ build up and strengthen the network of European digital innovation hubs, aiming to have a hub in every region, to help companies benefit from digital opportunities; and ○ support and follow closely the latest technical developments with the potential to benefit the European economy and society.
Type of action
The programme will boost investments in supercomputing, artificial intelligence, cybersecurity, advanced digital skills, and ensuring a wide use of digital technologies across the economy and society. Its goal is to improve Europe's competitiveness in the global digital economy and increase its technological autonomy.
TRL
The programme will support digital investment (TRL 7-9) but also digital skills.
Complementarity with other EU and national/regional funds
HEU, PPPs, CSP, RFCS, LIFE, IF, IPCEI

2.1.9. Connecting Europe Facility – CEF

Connecting Europe Facility (CEF)
<u>Link to financing programme website</u>
Scope and objective
<p>The CEF is a key EU funding instrument to promote growth, jobs and competitiveness through targeted infrastructure investment at European level. It supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. CEF investments fill the missing links in Europe's energy, transport and digital backbone.</p> <p>The CEF benefits people across all MSs, as it makes travel easier and more sustainable, it enhances Europe's energy security while enabling wider use of renewables, and it facilitates cross-border interaction between public administrations, businesses and citizens.</p>
Specific rules
In addition to grants, the CEF offers financial support to projects through innovative financial instruments such as guarantees and project bonds. These instruments create significant leverage in their use of the

EU budget and act as a catalyst to attract further funding from the private sector and other public sector actors.
Funding available in total
Since January 2014, INEA has been the gateway to funding under the CEF. INEA implements most of the CEF programme budget, in total €28.7 B out of €30.4 B (€23.7 B for transport, €4.6 B for energy and €0.5 B for telecom).
Type of action
The CEF provides infrastructural support.

2.1.10. Modernization Fund – MF

Modernisation Fund (MF)
<u>Link to financing programme website</u>
Scope and objective
<p>The MF intends to:</p> <ul style="list-style-type: none"> • meet the 2030 climate and energy targets and play an active role in EU transition to climate neutrality; and • increase energy security in the beneficiary MSs by supporting increased interconnections and modernisation of energy networks. <p>The MF intends to support 10 lower-income EU MSs in their transition to climate neutrality by helping to modernise their energy systems and improve energy efficiency.</p> <p>The beneficiary MSs are Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia.</p>
Specific rules of participation
<p>The MF will operate under the responsibility of the beneficiary MS, who will work in close cooperation with the EIB, the investment committee set up for the fund and the EC.</p> <p>MSs submit the proposed investments to the EIB, the investment committee and the EC.</p> <p>The fund will enter into operation in the first quarter of 2021.</p>
Funding available in total and average per project
<p>The MF is funded from:</p> <ul style="list-style-type: none"> • revenues from the auctioning of 2% of the total allowances for 2021-30 under the EU ETS; and • additional allowances transferred to the MF by beneficiary MSs – five opted to do so (Croatia, Czechia, Lithuania, Romania and Slovakia). <p>The total revenues of the MF may amount to some €14 B in 2021-30, depending on the carbon price. The MF leaves the beneficiary MSs the freedom to decide on the form of support: they can use grants, premium, guarantee instruments, loans or capital injections.</p>
Type of action
<p>The MF will support investments in:</p> <ul style="list-style-type: none"> • generation and use of energy from renewable sources;

<ul style="list-style-type: none"> • energy efficiency; • energy storage; • modernisation of energy networks, including district heating, pipelines and grids; and • just transition in carbon-dependent regions: redeployment, re-skilling and upskilling of workers, education, job-seeking initiatives and start-ups.
TRL
TRL is defined by each MS.
Complementarity with other EU and national/regional funds
<p>The support granted by MSs using the MF resources needs to be compliant with the state aid rules. Co-financing from private and public entities is possible, as long as state aid rules are respected and the same costs are not already funded by another Union or national instrument (no double funding).</p> <p>MSs could draw on existing national funds and/or European instruments, such as:</p> <ul style="list-style-type: none"> • InvestEU programme; • CEF, including its energy projects (projects of common interest); • ESIF, including the CF and the ERDF; and • JTF.
Possible contribution to direct CO ₂ emission reduction in the steel sector
The support is limited to specific EU MSs.

2.1.11. Cohesion Fund – CF

Cohesion Fund (CF)
<u>Link to financing programme website</u>
Scope and objective
<p>The Cohesion Fund is established for the purpose of strengthening the economic, social and territorial cohesion of the Union in the interests of promoting sustainable development.</p> <p>The five policy objectives of the CF are:</p> <ul style="list-style-type: none"> • a smarter Europe – innovative and smart economic transformation; • a greener, low-carbon Europe; • a more connected Europe – mobility, and regional information and communication technology (ICT) connectivity; • a more social Europe – implementing the European pillar of social rights; and • Europe closer to citizens –sustainable and integrated development of urban, rural and coastal areas through local initiatives.
Specific rules of participation
The CF is reserved for MSs whose gross national income (GNI) per capita is less than 90% of the EU average.

During the 2014-20 programming period, the CF provided funding for 15 MSs: Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.
Funding available in total and average per project
For the 2014-20 programming period, the EU allocated some €63.4 B to the CF (excluding transfers to the CEF), and the level of financing from the CF for a project can amount to up to 85% of its cost. For the 2021-27 programming period, the proposed allocation to the CF is €41.3 B, of which the contribution to the CEF would be €10 B. The post-2020 CF will finance projects in the same 15 MSs as in the 2014-20 programming period.
Type of action
The CF finances activities under the following categories: <ul style="list-style-type: none"> • trans-European transport networks, notably priority projects of European interest as identified by the EU. The CF will support infrastructure projects under the CEF; and • environment, where the CF can also support projects related to energy or transport, as long as they clearly benefit the environment in terms of energy efficiency, use of renewable energy, developing rail transport, supporting intermodality, strengthening public transport, etc.
TRL
The funding supports large-scale investments in environmental sustainability, including through an increase in renewable energy use and energy efficiency, and in transport infrastructure, especially the trans-European transport networks.
Complementarity with other EU and national/regional funds
Complementarity and synergies should be ensured between interventions supported by the CF, the ERDF, the European territorial cooperation goal and the CEF.
Possible contribution to direct CO ₂ emission reduction in the steel sector
The CF investment priorities include supporting the shift towards a low-carbon economy in all sectors by: <ul style="list-style-type: none"> • promoting the production and distribution of energy derived from renewable sources; • promoting energy efficiency and renewable energy use in enterprises; • supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector; • developing and implementing smart distribution systems that operate at low and medium voltage levels; • promoting low-carbon strategies for all types of territories, in particular for urban areas, including the promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures; and • promoting the use of high-efficiency co-generation of heat and power based on useful heat demand (European Commission, 2016).

2.1.12. ERASMUS and ERASMUS+ for Research

Erasmus and Erasmus+
<u>Link to financing programme website</u>
<p>Scope and objective</p> <p>Erasmus+ also aims at promoting the sustainable development of its partners in the field of higher education and contributing to achieving the objectives of the EU Youth Strategy.</p> <p>Specific issues tackled by the programme include:</p> <ul style="list-style-type: none"> • reducing unemployment, especially among young people; • promoting adult learning, especially for new skills and skills required by the labour market; • encouraging young people to take part in European democracy; • supporting innovation, cooperation and reform; • reducing early school leaving; and • promoting cooperation and mobility with the EU's partner countries. <p>Erasmus+ offers opportunities for:</p> <ul style="list-style-type: none"> • individuals to spend a mobility or volunteering period abroad and to receive linguistic training; and • organisations to collaborate in project partnerships in the fields of academic and vocational training, schools, adult learning and European sport events. <p>Erasmus+ also supports teaching, research, networking and policy debate on EU topics.</p> <p>Erasmus+ includes a strong international dimension (i.e. cooperation with partner countries), notably in the field of higher education and youth, through institutional partnerships, youth cooperation and mobility worldwide.</p>
<p>Specific rules of participation</p> <p>Individuals students, trainees, apprentices, pupils, adult learners, young people, volunteers, professors, teachers, trainers, youth workers, professionals of organisations active in the fields of education, training and youth constitute the main target population of the programme. However, the programme reaches these individuals through organisations, institutions, bodies or groups that organise relevant activities. The conditions of access to the programme therefore relate to these two actors: the 'participants' (individuals participating in the programme) and the 'participating organisations' (including groups of at least four young people active in youth work but not necessarily in the context of youth organisations, also referred to as informal groups of young people). For both participants and participating organisations, the conditions for participation depend on the country in which they are based.</p>
<p>Funding available in total</p> <p>The dedicated budget amounts to €14.7 B.</p>
<p>Type of action</p> <p>To achieve its objectives, the Erasmus+ programme implements the following actions:</p> <p>1) Key action 1 – Mobility of individuals. This key action supports:</p>

- mobility of learners and staff: opportunities for students, trainees and young people, as well as for professors, teachers, trainers, youth workers, staff of education institutions and civil society organisations to undertake a learning and/or professional experience in another country;
- Erasmus Mundus joint master degrees: high-level integrated international study programmes delivered by consortia of higher education institutions that award full degree scholarships to the best master students worldwide; and
- Erasmus+ master loans: higher education students from programme countries can apply for a loan backed up by the programme to go abroad for a full master degree. Students should address themselves to national banks or student loan agencies participating in the scheme.

2) Key action 2 – Cooperation for innovation and the exchange of good practices. This key action supports:

- transnational strategic partnerships aimed at developing initiatives addressing one or more fields of education, training and youth, and promoting innovation, exchange of experience and know-how between different types of organisations involved in education, training and youth or in other relevant fields. Certain mobility activities are supported in so far as they contribute to the objectives of the project;
- knowledge alliances between higher education institutions and enterprises which aim at fostering innovation, entrepreneurship, creativity, employability, knowledge exchange and/or multidisciplinary teaching and learning;
- sector skills alliances supporting the design and delivery of joint vocational training curricula, programmes, and teaching and training methodologies, drawing on evidence of trends in a specific economic sector and skills needed in order to perform in one or more professional fields;
- capacity-building projects supporting cooperation with partner countries in the fields of higher education and youth with the aim of helping organisations/institutions and systems in their modernisation and internationalisation process. Certain types of capacity-building projects support mobility activities in so far as they contribute to the objectives of the project; and
- IT support platforms, such as eTwinning, the School Education Gateway, the European Platform for Adult Learning and the European Youth Portal, offering virtual collaboration spaces, databases of opportunities, communities of practice and other online services for teachers, trainers and practitioners in the field of school and adult education as well as for young people, volunteers and youth workers across Europe and beyond. In addition, since 2018, the Erasmus+ Virtual Exchange initiative offers intercultural learning experiences between young people in Europe and the Southern Mediterranean countries.

3) Key action 3 – Support for policy reform. This key action supports:

- knowledge in the fields of education, training and youth for evidence-based policy making and monitoring, in particular:
 - country-specific and thematic analysis, including through cooperation with academic networks;
 - peer learning and peer reviews through the open method of coordination in education, training and youth; and

<ul style="list-style-type: none"> initiatives for policy innovation to stimulate innovative policy development among stakeholders and to enable public authorities to test the effectiveness of innovative policies through field trials based on sound evaluation methodologies.
TRL
N.A.
Complementarity with other EU and national/regional funds
Wide complementarity in terms of subjects and funding combination or blending (RFCS, H2020/HEU, Digital Skills Awards, etc.)
Possible contribution to direct CO ₂ emission reduction in the steel sector
<p>The European steel sector contributed to the first phase of establishing a European Sectoral Skills Council (ESSC) and identified national actors, which provided important foundations for the identification of key stakeholders. The Sector Social Dialogue Committee Steel (SSDCS) provided the initial platform for the ESSC first phase, which has been followed up by the SSDCS working group on training.</p> <p>During the first phase of the ESSC, the following tasks were accomplished:</p> <ul style="list-style-type: none"> jobs and skills councils were identified at the national level (i.e. national structures, including social partners, education and training representatives, as well as public authorities on a national/regional level, which conduct labour market and skills development analysis in the steel sector); and information was exchanged on skills and employment regarding labour market developments and the evolution of skills requirement in the steel sector. <p>The SSDCS working group on training engaged social partners and experts in the identification of emerging workforce development, recruitment and retention needs. Further, several pilot projects (e.g. New Steel Industry Challenges, Equality and Diversity Learning in the European Steel Industry, Greening Technical Vocational Education and Training, DroMosplan, COCOP SPIRE, Fact4Workers, etc.) identified specific skills and recruitment challenges. Additionally, the ESTEP platform and some RFCS projects identified critical skills and recruitment issues in both general terms and in relation to the development of specific innovations and the introduction of new technologies into the steel sector workplace (e.g. DroMosplan).</p> <p>The foundations of the needs analysis are clear, but the solutions identified require consolidation and delivering under the umbrella of a single (Blueprint) strategy network.</p> <p>The stakeholder engagement methodology adopted by the steel sector is innovative to the industry as social innovation approach for addressing industry challenges emerging from the needs analysis conducted to date. Drawing together key stakeholders in a new and innovative way, it addresses seven drivers of change: (i) advanced manufacturing (Industry 4.0); (ii) advanced materials development; (iii) complex and global supply chains; (iv) market competition and over-capacity; (v) life cycle design, pollution prevention and product recyclability; (vi) decarbonisation and energy efficiency; and (vii) evolution of customer requirements.</p> <p>Erasmus+ thus constitutes a European industry-driven, sustainable skills agenda and strategy to be developed in cooperation with national vocational education and training (VET) systems. With a partnership of steel companies and research institutes from each participating MS this instrument identifies and anticipates the impacts of digital, organisational and ecological developments.</p>

The new actions required for responding to the needs identified by means of the above-mentioned analysis and supported by the Erasmus+ programme are described below, specifying approaches and results aimed at enhancing the current state of the art.

First, the project includes the following innovation units for establishing the skills alliance and facilitating wider sector engagement:

- research and economy: cooperation between research/training institutions and steel companies, accompanied by public VET institutions;
- policy: cooperation between the EC (representatives of the relevant directorates-general), MS representatives and social partners (EUROFER/IndustryAll); and
- transfer, implementation and monitoring: cooperation between European and national VET institutions, steel companies, steel forums and social partners (e.g. SSDC).

Second, the project aims at innovating to achieve the following results:

- development of an EU-wide database of sector specific job roles, occupations and skills needs for integration with VET, and thus:
 - profiling existing and emerging occupations (in accordance with ESCO and other relevant classification systems and frameworks);
 - identifying the skills and qualifications profiles required by the listed occupations (in accordance with relevant EU frameworks); and
 - producing forecasting reports on skills needs for the occupations identified;
 - analysing VET and training provision (including apprenticeships) with reference to the identified occupations to precisely identify the current skills and training gaps;
- definition of occupation-specific roadmaps and VET/training development programmes for filling identified gaps;
- development of strategies for recruitment from higher level/degree level apprenticeships;
- creation of a sector skills transferability and recognition (mobility) environment, including for displaced workers; and
- identification of industry barriers to the recruitment of talents and best practice recruitment processes.

Third, all relevant stakeholder groups will be involved right from the beginning in the development of the Blueprint provided for by the project in a social innovation process guaranteeing integration, co-creation, impact and sustainability, and combining technological developments with social and organisational impacts (e.g. new leadership).

This list summarizes the most important objectives of the project, featuring a significant innovative character and ensuring clear progress compared to the state of the art.

Considerations on ERASMUS and ERASMUS+ related to the skills needed by employees to implement CO₂ emission reductions in the steel industry in the period 2021-50

Period 2021-27 (and extension up to 2030)

Past/ongoing Erasmus+ projects to be taken as reference examples	ESSA; SPIRE-SAIS; DROMOSPLAN;
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Overall funding available for the steel industry	<u>Timing</u> : calls are generally published once a year in February
	<u>CSP</u> : Erasmus+ should be coordinated with the CSP.
	<u>Overall estimation</u> : under previous Erasmus projects, the steel sector benefitted from €6 M of funding. In addition, the EC DG GROW/EASME supported the tender on steel sector careers.
Any other remark	Currently the entire European steel sector directly employs 300,000 persons; this results in a yearly turnover of 10,000 skilled persons. Funding instruments need to be used to support the acquisition of new skills in order to support low-carbon projects for the steel sector. Both small-scale and large-scale demonstrators need specific new skills, especially on circular economy and digitisation.

2.1.13. ERA-NET

ERA-NET
<u>Link to financing programme website</u>
Scope and objective
<p>ERA-NET is a funding instrument under H2020 designed to support public-public partnerships in their preparation, establishment of networking structures, design and implementation, and coordination of joint activities.</p> <p>The instrument mainly 'tops-up' funding for single joint calls and transnational actions. In fact, the focus of ERA-NET has shifted from funding networks to 'topping-up' funding of single joint calls for transnational R&I. This is done in selected areas with high European added value and H2020 relevance. Under H2020 ERA-NET merges the former ERA-NET and ERA-NET Plus into a single financial instrument with the central compulsory element of implementing one substantial call with top-up funding from the EC. This aims at increasing substantially the share of funding that MSs dedicate jointly to challenge-driven R&I agendas.</p> <p>A primary motivation to take part in the ERA-NET Cofund instrument is the recognition that certain challenges can be dealt better through joint transnational efforts. These can create the necessary critical mass in both resources and research capacity. Other motivations reflect the participating countries' interest in strengthening the international profile of their research communities, improving their own experiences through transnational collaboration with other agencies and accessing additional funds to support nationally relevant research themes.</p> <p>Several projects have been developed under ERA-NET. Among those, the most relevant to the steel sector are MERA-NET, MANU-NET and ERA-MIN.</p> <p>Past/ongoing ERA-NET projects to be taken as reference examples include BIGDATA@MA, CHEAPSHAPE and HEYCOAT.</p>

2.1.14. SME Instrument

SME Instrument
<u>Link to financing programme website</u>
Scope and objective
<p>The SME Instrument supports high-risk, high-potential SMEs to develop and bring to market new products, services and business models that could drive economic growth. The SME Instrument is designed for innovators with ground-breaking concepts that could shape new markets or disrupt existing ones in Europe and worldwide.</p> <p>Proposals can be funded after a thorough evaluation by multinational panels of technology, business and finance experts. Selected companies receive funding and are offered business coaching to scale up their innovation idea and can also receive mentoring. They are helped in networking with other SME Instrument clients, with other companies of all sizes, and with potential co-investors and follow-up investors across Europe. As an SME Instrument client, an SME will gain visibility and boost its chances of success in European and international markets.</p> <p>This instrument is considered to contribute indirectly to the purpose of CO₂ emission reduction in the steel sector. Consequently, additional detailed information can be found in Annex 1.</p>

2.1.15. Important Project Of Common European Interest – IPCEI

Important Project of Common European Interest (IPCEI)
<u>Link to financing programme website</u>
Scope and objective
<p>Article 107(3) (b) of the Treaty on the Functioning of the European Union allows MSs to grant aid to promote the execution of an important project of common European interest.</p> <p>IPCEI projects must provide a contribution to the Union's objectives and a significant impact on economic growth, sustainability or value creation across the EU.</p> <p>More in detail, IPCEI projects must:</p> <ul style="list-style-type: none">• contribute to strategic EU objectives;• involve several MSs;• involve private financing by the beneficiaries;• generate positive spill-over effects across the EU; and• be highly ambitious in terms of R&I, i.e. go beyond what is widely regarded as the 'state of the art' in the sector concerned. <p>The EC has identified 6 key strategic value chains (SVC) of systemic importance and with a clear contribution to EU's growth, jobs and competitiveness: (i) connected, clean and autonomous vehicles; (ii) smart health; (iii) low-carbon industry; (iv) hydrogen technologies and systems; (v) industrial Internet of Things; and (vi) cyber-security.</p>

<p>The above-mentioned SVCs form the basis for the development of IPCEI projects and two of them could very well include projects for the EU steel industry, i.e. hydrogen technologies and low-CO₂ emission industries.</p>
<p>Specific rules of participation</p>
<p>IPCEI rules support investments for research, development and innovation (R&D&I), and first industrial deployment on condition that the projects receiving this funding are highly innovative and do not cover mass production or commercial activities.</p> <p>The eligibility criteria are the following:</p> <ul style="list-style-type: none"> • single project or integrated project (a group of single projects inserted in a common structure, roadmap or programme aiming at the same objective and based on a coherent systemic approach); • common European interest; and • importance of the project. <p>IPCEI projects must be of common European interest, where:</p> <ul style="list-style-type: none"> • R&D&I projects must be of major innovative nature or constitute an important value added in terms of R&D&I; and • projects comprising of industrial deployment must allow for the development of a new product or service with high R&I content, and/or the deployment of a fundamentally innovative production process. <p>IPCEI projects are subject to specific EU state aid rules: IPCEI projects are large scale transnational projects where MSs receive permission from the EC to support industrial actors at levels that would otherwise not be allowed by state aid regulations.</p>
<p>Funding available in total and average per project</p>
<p>The project can be aided up to 100% of the funding gap on the basis of a large set of eligible costs. The costs for the first industrial deployment (i.e. from pilot line to the start of mass production) are considered eligible.</p> <p>Two IPCEIs are already in progress:</p> <ul style="list-style-type: none"> • Microelectronics: integrated project jointly notified by France, Germany, Italy and the UK for R&I in microelectronics, a key enabling technology of common European interest. The four MSs will provide up to €1.75 B in funding for this project that aims to unlock an additional 6 B€ in private investment. The project should be completed by 2024; and • Batteries: with a funding capacity of up to €3.2 B, it was jointly notified by Belgium, Finland, France, Germany, Italy, Poland and Sweden.
<p>Type of action</p>
<p>R&D&I projects must be of a major innovative nature or constitute an important added value in terms of R&D&I in the light of the state of the art in the sector concerned.</p> <p>Projects comprising of industrial deployment must allow for the development of a new product or service with high R&I content, and/or the deployment of a fundamentally innovative production process. Regular upgrades without an innovative dimension of existing facilities and the development of newer versions of existing products do not qualify as IPCEI.</p>

Environmental, energy or transport projects must either be of great importance for the environmental, energy, including security of energy supply, or transport strategy of the Union or contribute significantly to the internal market, including, but not limited to those specific sectors.
TRL
R&D&I projects must be of a major innovative nature or of important added value in the light of the state of the art in the sector. Industrial deployment is covered when it allows for the development of a new product with high R&D&I content or of a fundamentally innovative production process.
Complementarity with other EU and national/regional funds
IPCEIs provide the possibility for integrated projects to be supported not only through national resources and the structural funds, but also through central EU funding programmes.
Possible contribution to direct CO ₂ emission reduction in the steel sector
The EC has identified a series SVCs of systemic importance and with a clear contribution to EU's growth, jobs and competitiveness. These SVCs form the basis for the development of IPCEIs and some IPCEIs are already in progress (e.g. in the fields of microelectronics and batteries). Among the different SVCs, two could very well include CCU projects, i.e. hydrogen technologies and low-CO ₂ emissions industries.

2.1.16. Next Generation EU – Recovery Fund

Next generation EU – Recovery Fund
<u>Link to financing programme website</u>
Scope and objective
<p>The EC is proposing to harness the full potential of the EU budget to mobilise investment and frontload financial support in the crucial first years of recovery. These proposals are based on:</p> <ul style="list-style-type: none"> • an emergency European recovery instrument (NGEU) amounting to €750 B. This will temporarily boost the EU budget with new financing raised on the financial markets. The funds raised will be channelled through EU programmes to underpin the immediate measures needed to protect livelihoods, get the economy back on its feet, and foster sustainable and resilient growth; and • a reinforced MFF for 2021-27. The EC is proposing to create new tools and strengthen key programmes using NGEU to direct investment quickly to where it is most needed, reinforce the single market, step up cooperation in areas such as health and crisis management, and equip the Union with a long-term budget to drive the green and digital transitions and build a fairer and more resilient economy. <p>Together with the three important safety nets for workers, businesses and sovereigns endorsed by the European Council on 23 April and amounting to a package worth €540 B, these exceptional measures taken at the EU level would reach €1,290 B of targeted and front-loaded support to Europe's recovery. Applying conservative estimates of the leverage effect of the MFF and NGEU, the total investment that could be generated by this package of measures amounts to €3.1 T (European Commission, 2020g).</p>

These measures respond decisively to the calls by the European Parliament for “a massive recovery and reconstruction package for investment to support the European economy after the crisis [...] that is part of the new multiannual financial framework” and by leaders for a recovery fund “of sufficient magnitude, targeted towards the sectors and geographical parts of Europe most affected, and dedicated to dealing with this unprecedented crisis”.

Following a starting proposal by the EC and after a long discussion among the leaders from the 27 MSs, a general agreement was adopted unanimously on 21 July 2020. The agreement covered the following:

- the post-Covid-19 European Recovery Plan (2021-23), i.e. the new recovery instrument worth €750 B called NGEU; and
- the general EU budget for 7 years (2021-27), i.e. the MFF of an overall amount of €1,074.3 B.

The agreement reached by the EU leaders was adopted in the European Council conclusions (European Council, 2020) published on the same day.

According to the agreement and the European Council conclusions, the amounts under NGEU for individual programmes and the newly-shaped budget shall be as follows:

- Recovery and Resilience Facility: €672.5 B, of which loans €360 B and grants €312.5 B;
- ReactEU: €47.5 B;
- HEU: €5 B;
- InvestEU: €5.6 B;
- Rural development: €7.5 B;
- JTF: €10 B;
- RescEU: €1.9 B;
- Total: €750 B.

The new budget deal endorsed by EU leaders will reduce the size of a wide array of programmes, including a newly proposed health programme, and in the end €75.9 B will be allocated to the core programme, i.e. HEU, with a €5 B boost from NGEU.

Further steps are needed to urgently finalise work carried out so far at legal level. The European Council, following the adoption of the conclusions, will start negotiations with the European Parliament regarding the adoption of the MFF. The European Council needs first to obtain the consent of the European Parliament, and the latter needs to issue an opinion, but the decision-making authority will remain of the MSs, which will have to unanimously adopt the decision and approve it, in accordance with their respective constitutional requirements.

2.2. EU private funding opportunities: loans, guarantees and project bonds

2.2.1. European Investment Bank – EIB

European Investment Bank (EIB)

[Link to financing programme website](#)

Scope and objective
<p>The EIB is the long-term lending institution of the EU, owned by its MSs. It makes long-term finance available for sound investment in order to contribute towards EU policy goals.</p> <p>The EIB seeks to boost Europe's potential in term of jobs and growth, to support action to mitigate climate change and to promote EU policies outside the EU.</p> <p>The Bank borrows money on capital markets and lends it on favourable terms to projects that support EU objectives. About 90% of loans are made within the EU. None of the money comes from the EU budget.</p> <p>The main types of products and services that the EIB provides are:</p> <ul style="list-style-type: none"> • lending - about 90% of its total financial commitment. The Bank lends to clients of all sizes to support growth and jobs, and this support often helps to attract other investors; • blending - allowing clients to combine EIB financing with additional investment; and • advising and technical assistance - maximising value for money. <p>The EIB makes loans above €25 M directly. Where smaller loans are involved, it opens credit lines for financial institutions that then lend funds to creditors.</p> <p>All EU countries are shareholders in the EIB. Decisions are taken by the following bodies:</p> <ul style="list-style-type: none"> • the board of governors, comprising ministers (mostly finance ministers) from all EU countries. It defines the general lending policy; • the board of directors, chaired by the EIB president, which comprises 27 members appointed by the EU countries and one appointed by the EC. It approves lending and borrowing operations; and • the management committee, the Bank's executive body, which handles day-to-day business. <p>The audit committee checks that EIB operations are conducted in a proper manner.</p> <p>The Bank's departments implement management decisions.</p> <p>The EIB makes borrowing and lending decisions based on the merits of each project and the opportunities offered by financial markets. Within the EU, it has specific lending priorities. Outside the EU, it supports the EU development and cooperation policies worldwide.</p> <p>As an independent body, the Bank makes its own borrowing and lending decisions and cooperates with other EU institutions, especially the EC, the European Parliament and the Council of the EU.</p>

2.2.2. European Fund for Strategic Investment – Investment Plan for Europe

European Fund for Strategic Investment (EFSI) – Investment Plan for Europe
<u>Link to financing programme website</u>
Scope and objective
<p>The Investment Plan for Europe – also known in the past as the Juncker Plan – is one of the EC's top priorities. It aims to boost investment, thereby creating jobs and fostering growth. To this end, smarter use is being made of new and existing financial resources, and obstacles to investment are being removed. At the same time, investment projects are being brought more to the attention of the public and supported by technical assistance.</p>

The EFSI forms the central pillar of the Juncker Plan. It provides first-loss guarantees, enabling the EIB to finance more projects, which often carry greater risks. The EFSI has already achieved tangible results. The projects and agreements approved for funding under the EFSI are expected to mobilise €450.6 B of investments and will benefit more than one million SMEs in the 27 EU countries.

2.2.3. European Regional Development Fund – ERDF

European Regional Development Fund (ERDF)

[Link to financing programme website](#)

Scope and objective

The **ERDF** and the **CF** support development by co-financing investment in R&I; climate change and environment; business support to small businesses; services of general economic interest; telecommunications, energy and transport infrastructure; health, education, culture and social infrastructure; and sustainable urban development and smart villages. Without the two funds, this investment would not benefit from the framework that is put in place for the funds, including multiannual programming, the partnership principle and the establishment of smart specialisation strategies.

The funds are implemented in partnership with the MSs and their regions through shared management. These partnerships involve a strong mobilisation of national, regional and local stakeholders, as well as civil society.

The interventions financed by the ERDF and the CF focus on five objectives, including:

- a smarter Europe: to promote competitiveness, digital transformation, entrepreneurship and innovation (including inclusive growth and social enterprises), and enhance the business environment as a part of industrial adaptation to the challenges of globalisation, circular economy and climate change;
- a greener carbon-free Europe: clean and fair energy transition, to enhance energy efficiency; to support transition to low-carbon economy; to stimulate renewable energy; to support innovative use of low-carbon technologies; and to support green and blue investment, including in sustainable natural resource management, circular economy, climate adaptation and mitigation; and
- a more connected Europe: mobility, energy and regional ICT connectivity to develop regional networks and systems to promote sustainable transport, smart energy grids and high-speed digital access in order to enhance regional, local and cross-border connectivity, including security.

Cohesion policy keeps on investing in all regions, still on the basis of three categories (less-developed; transition; and more-developed), while the ERDF supports economic and social cohesion in the EU by correcting imbalances between its regions. R&I and the low-carbon economy are among the four priority areas of investment of the fund.

For the next long-term EU budget 2021-27, the EC proposes to modernise cohesion policy, the EU's main investment policy and one of its most concrete expressions of solidarity. The main features of the EC's proposal for a modernised cohesion policy are:

- 1) a focus on key investment priorities, where the EU is best placed to deliver: the bulk of ERDF and CF investments will go towards innovation, support to small businesses, digital technologies and

<p>industrial modernisation. It will also go to the shift towards a low-carbon, circular economy and the fight against climate change, delivering on the Paris agreement;</p> <p>2) a cohesion policy for all regions and a more tailored approach to regional development:</p> <ul style="list-style-type: none"> • investing in all regions: regions still lagging behind in terms of growth or income – mostly located in the South and East of Europe – will keep benefiting from important EU support; • a tailored approach: cohesion policy keeps three categories of regions (less-developed, transition and more-developed); • locally-led: the 2021-27 cohesion policy stands for a Europe that empowers, by supporting locally-led development strategies. <p>3) fewer, clearer, shorter rules and a more flexible framework:</p> <ul style="list-style-type: none"> • simplifying access to funds: the EC proposes to make the rules less complex in the next long-term EU budget, with less red tape and lighter control procedures for businesses and entrepreneurs benefiting from EU support; • a single rulebook: one set of rules now covers seven EU funds implemented in partnership with MSs ('shared management'), which will make life easier for EU funds programme managers. The framework also allows for more efficient links with other funds from the EU budget toolbox; for example MSs can choose to transfer some of their cohesion policy resources to the InvestEU programme. <p>4) a strengthened link with the European Semester to improve the investment environment in Europe: country-specific recommendations formulated in the context of the European Semester will be taken into account twice over the budgetary period, i.e. in the beginning, for the design of cohesion policy programmes, and during the mid-term review. To further set the right conditions for growth and job creation, new 'enabling' conditions will help remove barriers to investments.</p>
Specific rules of participation
For businesses and entrepreneurs benefiting from EU support, the new framework offers less red tape, with simpler ways to claim payments using simplified cost options. To facilitate synergies, a single rulebook now covers 7 EU funds implemented in partnership with MSs ('shared management').
Funding available in total and average per project
Depending on the programme
Type of action
Co-financed projects
TRL
From 1 to 5, depending on the programme
Complementarity with other EU and national/regional funds
Common rules (i.e. the CPR) will be introduced for all shared management funds, covering the following: the ERDF, the CF, the ESF+, the EAFRD, the European Maritime and Fisheries Fund (EMFF), the Asylum and Migration Fund (AMF), the Internal Security Fund (ISF) and the Integrated Border Management Fund (IBMF). This will create a convergence of rules that will enhance coherence and synergies among these funds.

Cohesion policy will increase its concentration on innovation. Complementarities with Erasmus+ and HEU will also be reinforced through an alignment of relevant rules, a reinforcement of the 'Seal of excellence' mechanisms and a dedicated ex-ante conditionality. Further development of the smart specialisation strategy concept will continue.

Trans-European transport networks projects will continue to be financed from the CF via both shared management and the direct implementation mode under the CEF. €11 B of the CF will be transferred to the CEF for this purpose.

Synergies will be ensured with the LIFE programme for Environmental and Climate Action, in particular through LIFE strategic integrated projects, to optimise the uptake of funds supporting environmental investments.

The new legal framework will also allow for more efficient links with other EU programmes. For example, MSs will be able to transfer some of their allocated funds to the InvestEU fund, in order to have access to the guarantee provided by the EU budget. This streamlines existing financial instruments into a single structure, to boost investments in strategic areas such as R&I, digital networks and the low-carbon economy across Europe. They will also be able to fund 'Seal of Excellence' projects identified by the HEU programme as internationally excellent projects in their regions. The 'Seal of Excellence' allows projects successfully evaluated under HEU to be funded by cohesion policy without having to pass another selection process, if they are consistent with the region's or the programme's smart specialisation strategy. This will help ensure that investment in infrastructure is well-coordinated with other EU investment in crucial areas such as R&I, digital networks, decarbonisation, social infrastructures and skills.

More in general, on a voluntary basis, and within certain limits, MSs can transfer cohesion policy resources to another EU instrument to fund a project; in this case, the rules of the other instrument apply. The other way around, MSs can also choose to use their cohesion policy money to finance a project selected under another EU budget tool; in this case cohesion policy rules apply.

Possible contribution to a steel partnership

Part of the regional funds can be used to contribute to the new green steel partnership:

Option 1 - Project division by geographical and qualitative scope: the part of the project with a European dimension could be financed under HEU and the RFCS, while the other parts, more related to a specific region or company located in a specific region, could be submitted under the regional and cohesion funds (**i.e. ILVA POR Puglia and PON Italy Competitiveness**).

Option 2 - Public-private cooperation also at national and regional level to better exploit regional funds.

2.2.4. EU Finance for Innovators – InnovFin

EU Finance for Innovators (InnovFin)

[Link to financing programme website](#)

Scope and objective

Among EIB instruments, InnovFin is one of the most interesting opportunities. InnovFin is a joint initiative launched in 2014 by the EIB Group, i.e. the EIB and the European Investment Fund (EIF), in cooperation with the EC under H2020.

<p>InnovFin aims at facilitating and accelerating access to finance for innovative businesses and other innovative entities in Europe.</p> <p>One of the key factors constraining the implementation of R&I activities is the lack of available financing at acceptable terms to innovative businesses since these types of companies or projects deal with complex products and technologies, unproven markets and intangible assets.</p> <p>In order to overcome these difficulties, the EU and the EIB Group have joined forces to provide finance for R&I to entities that may otherwise struggle to access financing.</p> <p>InnovFin supports activities which by their nature are riskier and harder to assess than traditional investments, and therefore often face difficulties in accessing finance. All are demand-driven instruments, with no prior allocations between sectors, countries or regions.</p>
<p>Specific rules of participation</p> <p>Firms and other entities located in EU MSs and H2020 associated countries are eligible to become final beneficiaries. The EIB assesses the eligibility of the company and/or the project, technological and economic viability and environmental soundness, as well as the promoter's financial situation and outlook.</p>
<p>Funding available in total and average per project</p> <p>From 2014 to 2017 the EIB provided about €7.4 B (of which 34% to the industry and manufacturing sector) and the EIF provided about €6.8 B.</p> <p>So far, InnovFin has financed more than 110 projects and over 11,000 small and early-stage enterprises have benefited, from small tech start-ups to large research facilities and circular economy companies.</p> <p>Typically, the EIB provides between 35% and 50% of the project or investment cost and is often key in attracting other investors from the public or private sector.</p>

2.2.5. InvestEU

InvestEU
<u>Link to financing programme website</u>
<p>Scope and objective</p> <p>The InvestEU fund is part of the EIB instruments and the Union's new investment instrument. It provides an EU guarantee with a view to mobilising public and private financing in the form of loans, guarantees, equity or other market-based instruments, for strategic investments in the support of EU internal policies. It builds on the successful implementation under the previous period 2014-20 of the EFSI and other financial instruments.</p> <p>European added value. The EU long term goals regarding sustainability, competitiveness and inclusive growth require significant investments in new mobility models, renewable energies, energy efficiency, R&I, digitisation, education and skills, social infrastructure, circular economy, natural capital, climate action or small businesses creation and growth. Renewed efforts are needed to tackle persisting market failures caused by private investors' risk aversion, the public sector's limited capacity and structural inefficiencies of the investment environment. MSs cannot always bridge those investment gaps alone.</p> <p>Grants alone cannot address the significant investment gaps. The use of financial instruments, with a leverage effect and closer to the market, efficiently complements grants in the EU budget toolbox. Intervention at Union level provides economies of scale in the use of innovative financial instruments by</p>

catalysing private investment in the whole EU and making best use of the European institutions and their expertise for that purpose.

EU intervention also gives access to a diversified portfolio of European projects and allows for the development of innovative financing solutions which can be scaled up or replicated in all MSs. The multiplying effect and the impact on the ground are thus much higher than what could be achieved by an initiative in a single MS, in particular for large-scale investment programmes. EU level intervention also provides flexibility to support intermediaries and final beneficiaries in locations where they are most needed, often in urban areas which do not necessarily benefit from the ESIF. In addition, it allows to effectively address investment needs linked to EU-wide policy objectives, complementing efforts to promote structural reforms and improved regulatory environment to thus address the remaining investment gaps in the post-2020 period.

Objectives. The InvestEU fund aims at mobilising investment within the EU to support political priorities and to contribute to the integration of European capital markets and the strengthening of the single market. It will target investments promoting sustainable infrastructure, R&I, digital transformation, the access to finance for SMEs, education, skills, social infrastructure and the development and consolidation of market structures underlying micro-credits and the social economy. Digital investment will be a key cross-cutting priority for all InvestEU windows. In addition, the InvestEU fund provides advisory support and accompanying measures to foster the creation and development of projects.

Specific rules of participation

The InvestEU programme will comprise the InvestEU Fund, InvestEU Assistance and the InvestEU Portal. The InvestEU Fund will pool all centrally-managed financial instruments in a single, flexible, multi-policy guarantee instrument at the EU level, allowing for significant economies of scale and attracting private investors. Building on the EFSI, the InvestEU Fund will address market gaps and sub-optimal investment situations by providing an EU guarantee to the EC's strategic implementing partner, the EIB Group, as well as to other partners such as national promotional banks and institutions or international financial institutions (e.g. the EBRD). To ensure the best possible financing mix for strategic projects across the EU, the InvestEU Fund will allow for simple combination with grants from the EU budget as well as with ESIF (on voluntary basis).

Building on the European Investment Advisory Hub, InvestEU Assistance will provide a single-entry point for 360-degree project development assistance for project promoters. Building on a powerful partner network, InvestEU Assistance will help projects get off the ground and make them investment-ready. The InvestEU Portal will bring together investors and project promoters, building on the European Investment Project Portal.

Funding available in total and average per project

A key feature of InvestEU will be a new facility to increase Europe's resilience by building strategic autonomy in vital supply chains at the European level.

A **Strategic Investment Facility** will be created as an additional window under InvestEU. This facility will support projects contributing to building strong and resilient value chains across the EU and enhancing the autonomy of the Union's single market, while maintaining its openness to competition and trade in line with its rules. This will enhance the resilience of the Union economy whilst providing the resources for strategically important companies to prosper and grow within the EU. MS support for these projects is unlikely to be sufficient and the strong cross-border dimension means that a coordinated European approach is vital to success.

With provisioning of €15 B from NGEU, the new facility would provide an EU budget guarantee of €31.5 B and could generate investments of up to €150 B to incentivise European industrial leadership in strategic sectors and key value chains, including those crucial to the twin green and digital transitions. The window will ensure that such investments exploit the potential of the single market to the full, with the EU budget guarantee supporting companies from across the European economy and becoming a powerful instrument of recovery.
TRL
7-9
Complementarity with other EU and national/regional funds
As a delivery tool for EU policies, the InvestEU fund will foster investment in full synergy with the corresponding EU policies and programmes, such as the CEF, HEU, the DE Programme or the Single Market Programme. It will ensure complementarity with investments under the ESIF and with EU support provided by relevant spending programmes in the form of grants. Moreover, the programme will allow for the blending of financial instruments with grants from other programmes, in particular for projects that do not generate sufficient revenue.
Possible contribution to direct CO ₂ emission reduction in the steel sector
The InvestEU fund can support investments related to the steel sector.

2.2.6 European Bank for Reconstruction and Development – EBRD

European Bank for Reconstruction and Development (EBRD)
<u>Link to financing programme website</u>
Scope and objective
<p>The EBRD operates in 38 economies across three continents, working only on projects that meet a strict and clear set of criteria.</p> <p>The EBRD supports local commercial banks, which in turn provide loans to SMEs and municipalities. Tools that may be available include credit lines, bank-to-bank loans, standby credit facilities and equity investments in the local banks.</p> <p>EBRD loans to the private sector projects usually start from a minimum of €3 M up to €250 M. The average amount is €25 M.</p> <p>The EBRD's loans are structured with a high degree of flexibility to provide loan profiles that match client and project needs. This approach determines each loan currency and interest rate formula.</p> <p>The basis for a loan is the expected cash flow of the project and the ability of the client to repay the loan over the agreed period. The credit risk can be taken entirely by the Bank or may be partly syndicated to the market. A loan may be secured by a borrower's assets and/or it may be converted into shares or be equity-linked. Full details are negotiated with the client on a case-by-case basis.</p>

2.3. Overview of opportunities available at the European level

Chapter 2 has presented an in-depth research and mapping of all main relevant European financial instruments (19 public and 6 private). More in detail, the analysis has included the scope and objectives, the funding availability, the participation criteria, the type of actions, the TRL requirements, and the blending and sequencing opportunities. A particular focus has been put on the direct contribution to CO₂ emission reduction in the steel sector. The main characteristics of the instruments are summarised in Table 5 below.

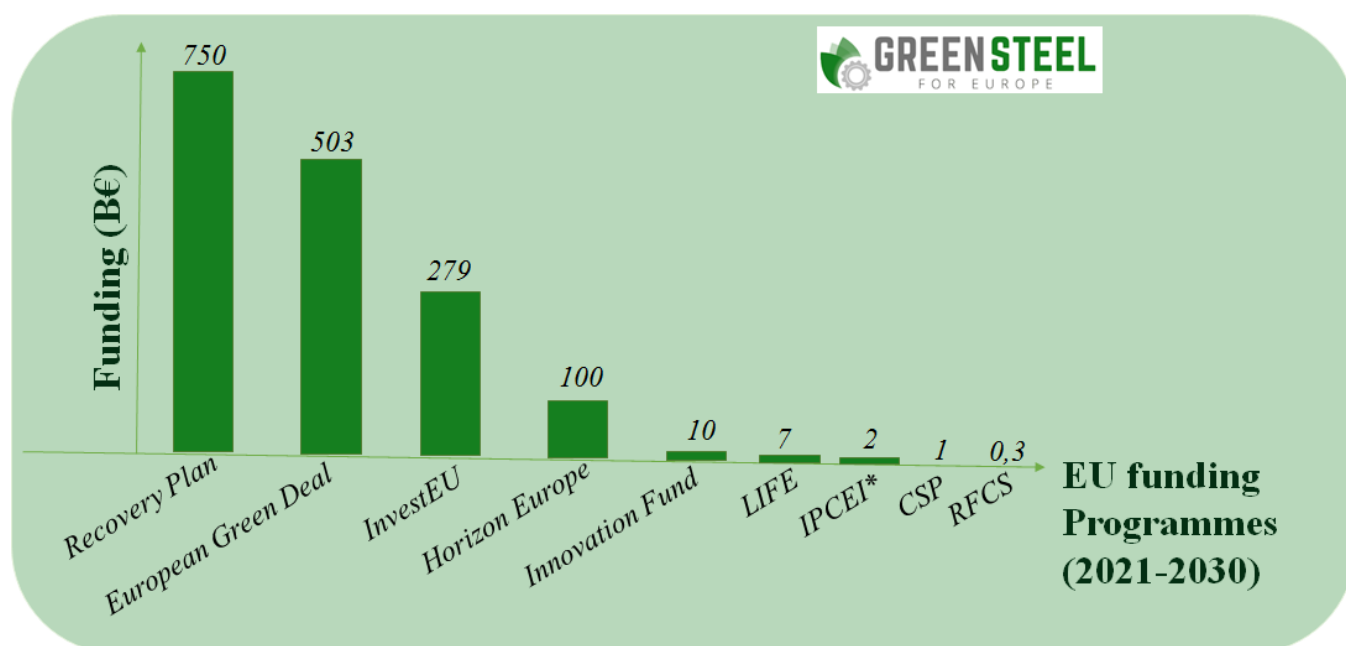
Of the available instruments, the following are significant:

- **HEU** (€100 B), the EU's main funding programme for R&I;
- the **CSP**, the key instrument for CO₂ emission reduction in the steel sector, integrated by the EU into HEU;
- the **RFCS**, providing funding for generally smaller clean steelmaking R&I breakthrough projects;
- the **LIFE programme**, an environment and climate action programme that may provide additional support to the transformation of the EU, including the steel sector, into a clean, circular, energy-efficient, low-carbon and climate-resilient economy;
- the **IF**, the funding programme for the demonstration of innovative low-carbon technologies; and
- the **EGDIP**, the **JTM** and various other EU instruments, not only for R&D&I, but also for first-of-a-kind and infrastructure and skills programmes.

Based on information currently available, the review shows that several instruments do not target CO₂ reduction in the steel sector directly: some will work as enablers, while others have a wider objective.

Figure 5 below shows the funding volume (€ B) available from European programmes for the period 2021-30, as either existing or new opportunities. Clearly, funding programmes specifically targeted at the steel sector (the RFCS together with the CSP) offer the lowest amount of funding to support investments in new CO₂ emission reduction breakthrough technologies. An additional support could be expected from new programmes, such as the EGD, and new political initiatives, such as the RP, but available figures clearly show that these instruments do not cover the high range of grants (€>100 M).

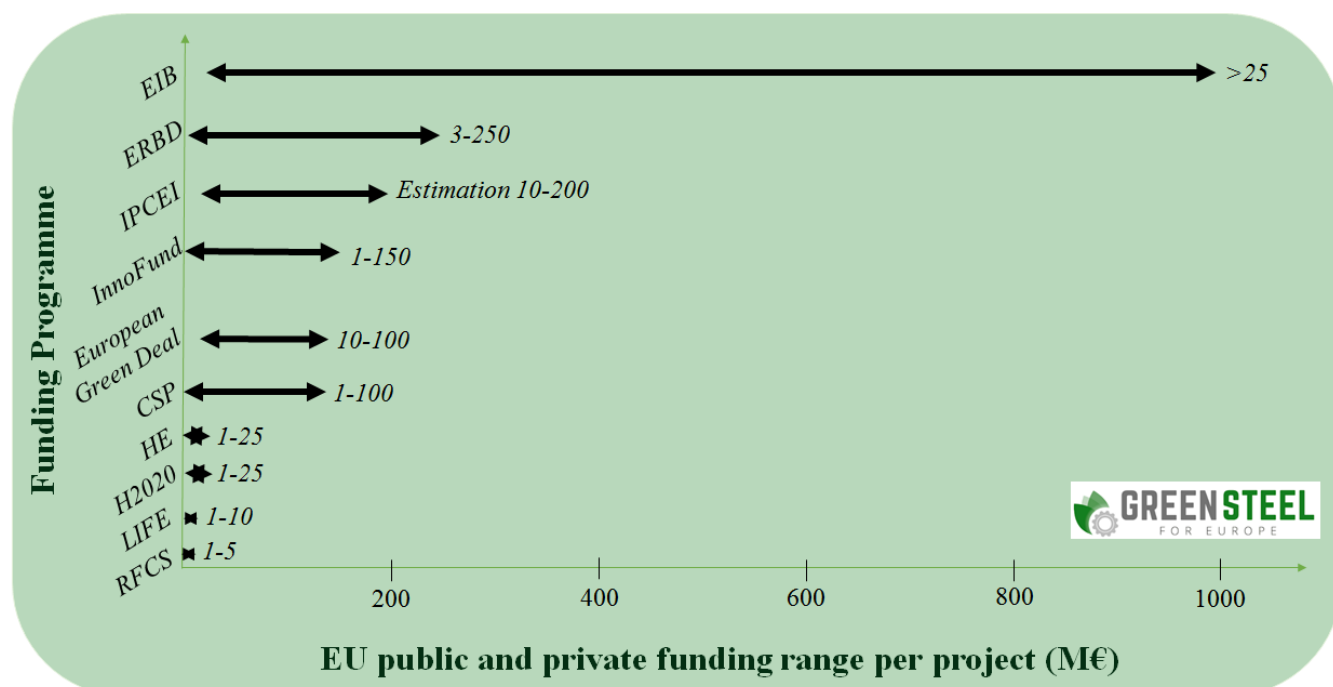
Figure 5: Funding available per programme (2021-30)



Source: authors' own composition.

Figure 6 shows the range of EU public and private funding (€ M) available per project to better identify the most appropriate instrument for the specific technical needs of the project.

Figure 6: Estimated range of funding available per project



Source: authors' own composition.

Importantly, EIB and ERBD instruments are providing support mainly through loans, while the other instruments by grants. Currently, projects requiring investments over €100 M, i.e. those which can significantly contribute to CO₂ reduction, are usually financed through loans rather than through grants.

Table 5: Overview of European public funding opportunities

EU Programme	Scope and objective	Funding available in total	Estimation of funding available for CO ₂ emission reduction in the steel sector	Beneficiaries	Type of action	Blending with other instruments	TRL
Horizon Europe (HEU)	Driving economic growth and creating jobs	€100 B (2021-27)	€80 M (2021-30)	Undertakings and individuals	R&D&I RIA, IA, CSA	CSP, RFCS, IF, LIFE	1-9
Clean Steel Partnership (CSP)	Supporting the decarbonization of the steel industry	€700 M (2021-27)	€975 M (2021-30)	Undertakings and individuals	R&D&I small-scale demonstration projects	RFCS, HEU, IF, LIFE	5-8
Research Fund for Coal and Steel (RFCS)	Supporting R&I in coal and steel sectors. Projects cover: (i) production processes; (ii) application, utilisation and conversion of resources; (iii) safety at work; (iv) environmental protection; (v) <u>reduction of CO₂ emissions from steel production</u>	€ 40 M per year (€30 M for steel)	€300 M (2021-30)	Undertakings and individuals	R&D&I Research projects (up to 60%), pilot and demonstration projects (up to 50%) and accompanying measures (up to 100%)	HEU, CSP, IF, LIFE	3/5-7
Innovation Fund (IF)	Supporting the demonstration of	€10 B (2021-30)		EII, renewable energy, IT	Demonstration & first-of-a-kind big	HEU, CSP, RFCS, LIFE	7-9

	innovative low-carbon technologies and promoting GHG emission avoidance		€500 M (for 20 different sectors) (2021-30)		(€>7.5 M) or small (€<7.5 M) projects. Big projects: up to 60% of additional costs related to innovative technologies; small projects: up to 60% of CAPEX		
LIFE	Promoting environment and climate actions	€5.4 B (2021-27)	€50 M (2021-30)	Climate, environment, nature	Demonstration & first-of-a-kind projects	HEU, CSP, RFCS, IF	6-9
European Green Deal Investment Plan (EGDIP)	Helping the most vulnerable regions deal with the socio-economic impacts of the green transition	€503 B (2021-27)	Currently under evaluation at EU level	Climate, environment	Demonstration & first-of-a-kind projects	HEU, CSP, RFCS, IF	7-9
Digital Europe (DE)	Building the strategic digital capacities in the EU and facilitating the wide deployment of digital technologies	€9.2 B (2021-27)	Not directly contributing to CO ₂ emission reduction	Undertakings and individuals	Roll-out infrastructure digitisation projects	Draft orientation	Draft orientation
Connecting Europe Facility (CEF)	Promoting growth, jobs and competitiveness through targeted infrastructure investment at European level (to support the development of high-performing,	€28.7 B (2021-27)	Not directly contributing to CO ₂ emission reduction	Undertakings and individuals	Roll-out infrastructure projects in energy, telecom and transport sectors	CF	Infrastructure networks

	sustainable and efficiently-interconnected trans-European networks in the fields of transport, energy and digital services)						
Erasmus+	Supporting education, training, youth and sport in Europe	€14.7 B (2021-27)	Not directly contributing to CO ₂ emission reduction	Undertakings and individuals	Projects aimed at skills, mobility, cooperation, and policy reform	Not applicable (co-financing up to 100%)	Education, skills and training
ERA-NET	Supporting the preparation and establishment of networking structures, and the design, implementation and coordination of joint activities	Depending on the amount allocated by each region and the EC	Indirect contribution to CO ₂ emission reduction	Depending on the specific call	SMEs, depending on EC and regional criteria	EC	Depends on the specific call
SME Instrument	Supporting high-risk, high-potential SMEs to develop and bring to the market new products, services and business models that could drive economic growth	1.2 B€	Estimated not directly contributing to CO ₂ emission reduction	SMEs	Dedicated to SMEs COSME, INNOSUP, EUROSTAS, SME instruments	Regions	4-9
Important project of common European	Providing a contribution to Union objectives and significant impact on economic growth,	Agreement among at least three MSs	Around €2 B (based on the two existing IPCEI for R&D)	By sector	R&D&I	National funding, structural funds and central EU	5-9

interest (IPCEI)	sustainability or value creation across the EU					funding programmes	
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Source: authors' own composition.

Based on currently available programmes, an overall amount of about €2 B funding can be estimated for CO₂ emission reduction in the steel sector for the period 2021-30. For IPCEIs, as instrument based on the support of MSs, lobby actions from the sector need to be considered. Additional funds could also come from initiatives which are either new or under development, such as the EGDIP (worth €503 B). Finally, additional support could come from the RP (€750 B) and InvestEU (€279 B), that have to be properly considered for the purpose. The EC latest estimation of all funds available at European level is €1 T.

Table 6: Overview of European private funding opportunities

EU programme	Scope and objective	Funding available per project	Type of instrument	Beneficiaries	Cooperation	Co-financing	TRL
European Investment Bank (EIB)	Contributing to EU policy goals through long-term finance	€≥25 M	Loan, InnovFin, InvestEU	Companies of all sizes	EC, EP and EU Council	HEU, RFCS, IF	7-9
European Bank for Regional Development (EBRD)	Supporting local commercial banks	€3-250 M; average €5 M	Loan	SMEs; banks	EIB	HEU, RFCS, IF	8-9
European Fund for Strategic Investment (EFSI)	Boosting investments	No specific limitation	First-loss guarantee	SMEs	EIB	HEU, RFCS, IF	9
European Regional Development Fund (ERDF)	Supporting economic and social cohesion	No specific limitation	Co-financing investments	Companies of all sizes	MSs and regions	HEU, RFCS, IF	8-9
InnovFin	Promoting innovative businesses	No specific limitation; 35-50% of investment	Loan	Industry and manufacturing sectors	EIB, EC, InnovFin	HEU, RFCS, IF	6-9
InvestEU	Promoting financial investments	Up to €150 M per project	EU guarantee	Industries of all sizes	EIB, EC	HEU, RFCS, IF	9

Kreditanstalt für Wiederaufbau (KfW) (Germany)	Promoting innovative projects	€<25 M	Loan	SMEs	-	No limitation with public instruments	6-9
NRW.BANK (Germany)	Introducing new, technologically-advanced products or production processes, or substantially improving existing products and processes	No specific limitation	Loan	SMEs	EIB	No limitation with public instruments	6-9
Mediocredito italiano - Gruppo Intesa Sanpaolo (Italy)	Investing in renewable energy or energy efficiency projects	No specific limitation	Loan	Industries of all sizes	Italian Ministry for Economic Development	No limitation with public instruments	8-9
Group of 7 Banks (Sweden)	Promoting sustainable energy and energy saving	No specific limitation	Loan	Industries of all sizes	Local authorities	No limitation with public instruments	7-9
Credit Agricole Group (France - EU wide)	Investing in green and sustainable activities	No specific limitation	Green bond, transition bond, loan	Industries of all sizes	EU, national and local authorities	No limitation with public instruments	8-9
BNP Paribas (France)	Investing in climate-related activities	No specific limitation	Green bond, transition bond, loan	Industries of all sizes	EU, national and local authorities	No limitation with public instruments	8-9
HSBC Holdings plc	Promoting sustainable finance	No specific limitation	Green bond, transition	Industries of all sizes	EU, national and local authorities	No limitation with public instruments	8-9

			bond, equity- linked green bond, green structured bond				
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Source: authors' own composition.

Loan instruments described above have to be considered a milestone for big innovative projects (€>100 M). As the mapping exercise relating to industrial investments in the steel sector has shown, up until now EIB loans have provided significant support (see also Annex 2).

3. National and regional funding opportunities

The present chapter presents public and private funding opportunities at national and regional level. First, a mapping exercise has been carried out. Then, the amount of funding strongly related to CO₂ emission reduction in the steel sector has been calculated per MS and region.

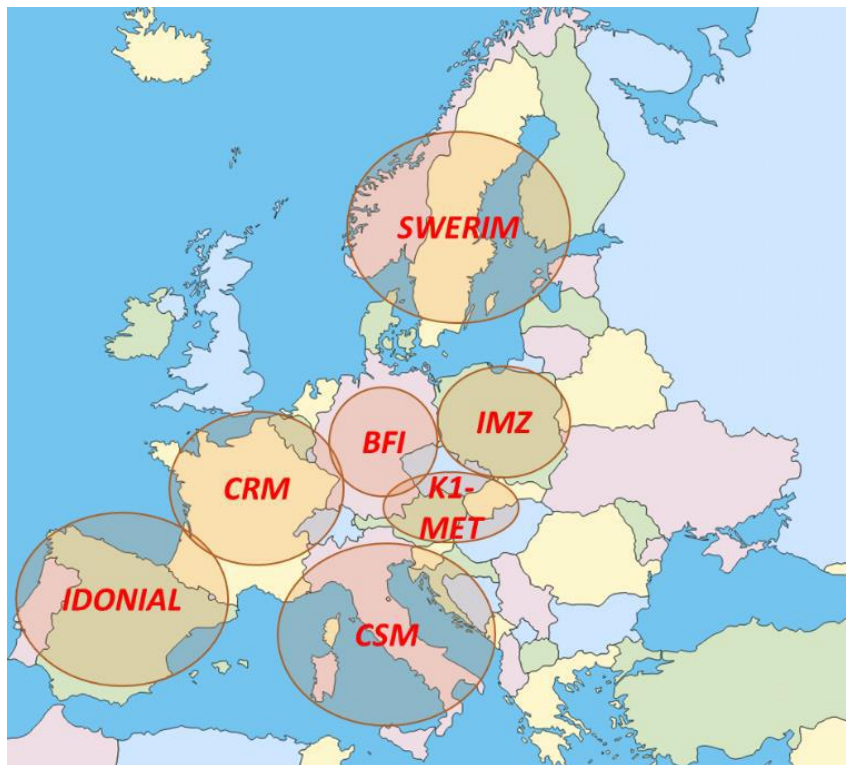
3.1. National and regional public funding opportunities

The information presented below has been collected through partners at national and regional level by means of a questionnaire including the following requests of information:

- main funding supporting systems and their technical focus at national level;
- main funding supporting systems and their technical focus at regional level;
- typical funding support range and typical maximum amount funded/percentage limit on the total foreseen costs;
- calls set and exercise duration from call opening to evaluation and approval;
- typical project duration, and starting and targeted TRL for the projects presented;
- typical kind and size of companies participating in the calls;
- extent to which consortia are favoured;
- incidence of research and development (R&D) in the projects; and
- possibilities of blending or sequencing with different funding sources.

The geographical distribution of the partners has ensured (see Figure 7) that, either directly or via networks, the information collected covered all EU MSs, up to 90% of steel production value in the EU and at least 80% of emissions (World Steel Association, 2017).

Figure 7: RTOs – Geographical coverage



Source: CSP composition based on World Steel Association, 2018.

Note for the reader: the present section illustrates the various national and regional instruments extensively, country by country. If you are interested in the overall funding opportunities available through all national and regional instruments supporting CO₂ emission reduction in the steel sector, please go to section 3.3 “Overview of opportunities available at the national and regional level”.

3.1.1. Austria and related regions

Austria aims at climate neutrality by 2040 and availability of 100% renewable electricity by 2030. To that end, the Austrian Climate and Energy Fund supports three Flagship Region Energy programmes (WIVA P&G, NEFI and Green Energy Lab) to develop innovative energy technologies. Over 200 project partners from business, science and research are working on the country's energy future and successfully positioning Austria at the pinnacle of the international stage.

National funding:

- Funding by the **Austrian Research Promotion Agency (FFG)** through the following programmes:
 - General Programme;

- COMET (FFG on behalf of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, and the Federal Ministry for Digital and Economic Affairs);
- BRIDGE (FFG in cooperation with the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology); and
- Beyond Europe (FFG in cooperation with the Federal Ministry for Digital and Economic Affairs);
- Funding by the **Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology** through the following programmes:
 - BRIDGE (Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology in cooperation with the FFG); and
 - Beyond Europe (Federal Ministry for Digital and Economic Affairs in cooperation with the FFG);
- Funding by the **Austrian Science Fund (FWF)** through the following projects:
 - stand-alone projects; and
 - joint projects;
- Funding by the **Climate and Energy Fund** through the following programmes:
 - Flagship Region Energy programmes (Green Energy Lab, NEFI and WIVA P&G) (Climate and Energy Fund in cooperation with the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology); and
 - Energy Transition 2050; and
- Funding by the Christian Doppler Gesellschaft.

Regional Funding:

- Funding by the **Zukunftsfond Steiermark** through Green Tech 100 - 1 Earth, 0 Carbon, 0 Waste (Energy Systems).

In the following tables, other Austrian programmes are detailed.

Programme	General Programme Funding agency: FFG
Country/Region	Austria/All regions.
Link to financing programme website	www.ffg.at/en/programme/general-programme
Main objective	Improving the competitiveness of companies based in Austria by supporting the development of new products, processes and services.
Topics	No restrictions.
Call set	Applications can be submitted at any time.
Beneficiaries	Companies of all sizes (start-ups, SMEs, large enterprises, etc.) from all branches of industry.
Funding	Overall budget: max. €100 M per year.

	<p>Maximum funding per project: €3 M.</p> <p>Co-financing rate: up to 50% (70% for start-ups) of total eligible project costs. The amount of funding depends on the size of the company (large enterprises: 19%; SMEs: 25%-28%; start-up: 31%).</p> <p>Several financing instruments (such as grants and low-interest loans) are combined.</p>
Project conditions	Projects are analysed and assessed based on technical and economic criteria. Technical criteria: degree of innovation; technical challenge of the project. Economic criteria: commercialisation potential; applicant's economic performance.
Eligible costs	All costs attributable to the project incurred directly, actually and additionally (to the normal operational costs) during the funding period in accordance with the funding agreement are eligible for funding. In particular: personnel costs, costs of infrastructure use, costs of materials, third party costs, travel costs and overhead costs.
Project duration	Up to 60 months.
Starting and targeted TRL	No restrictions.
Blending with other funding programmes	Higher subsidies are possible when cooperating with research institutions or international projects (e.g. EUREKA and ERA-NETs), as well as when national subsidies or, for example, subsidies from the ERDF are involved. Furthermore, temporary bonuses can be awarded in the case of current priorities.
Sequencing	Project duration can be extended (usually in 12-month periods).

Programme	<p>COMET – Competence Centres for Excellent Technologies</p> <p>Funding agency: FFG on behalf of the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology and the Federal Ministry for Digital and Economic Affairs. Austrian provinces support COMET with additional funds.</p>
Country/Region	Austria/All regions.
Link to financing programme website	www.ffg.at/en/comet-competence-centers-excellent-technologies
Main objective	<ul style="list-style-type: none"> • Building up key research competences by cooperation between science and industry; and • providing a network of hubs offering high quality research.
Topics	3 programme lines: COMET Centre (K1 and K2), COMET Project (formerly K-project) and COMET Module.

	No restrictions.
Call set	<p>COMET Centres (K1): 5th call, 04.12.2017 - 04.05.2018.</p> <p>COMET Centres (K2): 4th call, 24.04.2018 - 24.10.2018.</p> <p>COMET Projects: 8th call: 11.11.2019 - 23.06.2020.</p> <p>COMET Modules: 1st call: 24.04.2018- 24.10.2018.</p>
Beneficiaries	SMEs, large companies, universities, universities of applied sciences, competence centres, research facilities.
Funding	<p>Figure 8: 3-line model of the COMET Programme</p> <p>The 3-line model enables potential partners to:</p> <ul style="list-style-type: none"> open up new research areas for COMET Centres through COMET Modules (min. 1 scientific and 3 company partners) build up competences and human resources in a physical COMET Centre (min. 1 scientific and 5 company partners) enter the COMET Programme within the consortium of a COMET Project (min. 1 scientific and 3 company partners) <p>Source: COMET Fact Sheet, FFG Status, April 2020.</p>
Project conditions	<p>COMET Centres (K2): min. 1 scientific and 5 company partners.</p> <p>COMET Centres (K1): min. 1 scientific and 5 company partners.</p> <p>COMET Projects: min. 1 scientific and 3 company partners.</p> <p>COMET Modules: min. 1 scientific and 3 company partners.</p>
Eligible costs	Personnel costs; costs for instruments and equipment; costs for contract research, technical expertise and patents purchased at market price from third parties; additional overheads and other costs of operation (e.g. materials, supplies).
Project duration	<p>COMET Centres (K2): 8 years.</p> <p>COMET Centres (K1): 8 years (4 + 4).</p> <p>COMET Projects: 3 to 4 years.</p> <p>COMET Modules: 4 years.</p>
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Blending is possible (Austrian provinces support the programme with additional funds).

Programme	<p>Bridge</p> <p>Funding agency: FFG and the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.</p>
Country/Region	Austria/All regions.
Link to financing programme website	www.ffg.at/en/programme/bridge
Main objective	<ul style="list-style-type: none"> • Promoting basic research projects conducted by consortia of partners involved in scientific research and industrial commercialisation; • transferring and developing basic research findings to industrial application; • enhancing research collaboration between science and industry; • facilitating access to scientific research for SMEs; • supporting the transfer of researchers from universities to industrial research (PhD theses, post docs); • strengthening research performance in high-level industrial research and experimental development as well as innovations in social and economic sciences and services; and • supporting the commercialisation of high-tech innovations to enhance the innovative performance of the Austrian economy.
Topics	No restrictions.
Call set	32 nd call: 10.06.2020 - 02.09.2020.
Beneficiaries	Researchers and companies from all scientific disciplines and sectors in Austria.
Funding	<p>Co-financing rate: up to 80% (if the project is carried out in cooperation with SMEs).</p> <p>Maximum total funding: €360 K.</p> <p>For example, projects undertaken with small enterprises may submit project costs of up to €450 K in order to achieve a co-financing rate of 80%. The maximum total costs are €514 K for projects undertaken with medium-sized enterprises (70% co-financing rate) and €600 K for projects with large enterprises (60% co-financing rate).</p>
Project conditions	The consortium must consist of at least two partners (one each from science and industry).
Eligible costs	All costs attributable to the project incurred directly, actually and additionally (to the normal operational costs) during the funding period in accordance with the funding agreement are eligible for funding. In particular: personnel costs, costs of infrastructure use, costs of materials, third party costs, travel costs and overhead costs.

Project duration	Up to 36 months.
Starting and targeted TRL	No restrictions.
Blending with other funding programmes and sequencing	Blending is not allowed.

Programme	Beyond Europe Funding agency: FFG and the Austrian Federal Ministry for Digital and Economic Affairs.
Country/Region	Austria/All regions.
Link to financing programme website	www.ffg.at/en/program/beyond-europe-programme
Main objective	<ul style="list-style-type: none"> Supporting Austrian companies, research and university institutes, and other organisations creating and extending collaborations; granting funding for exploratory projects and cooperative R&D development projects of the category 'experimental development'.
Topics	No restrictions.
Call set	3 rd call: 12.2018 until 03.2019.
Beneficiaries	Austrian companies, research and university institutes, and other organisations.
Funding	Up to €200 K: exploratory projects aimed at preparing R&D&I projects (for one year). From €100 K up to €500 K: collaborative projects (several consortium partners work jointly on defined goals; with a maximum duration of three years).
Eligible costs	All costs attributable to the project incurred directly, actually and additionally (to the normal operational costs) during the funding period in accordance with the funding agreement are eligible for funding. In particular: personnel costs, costs of infrastructure use, costs of materials, third party costs, travel costs and overhead costs.
Project duration	Exploratory projects: 1 year. Collaborative projects: up to 3 years.
Starting and targeted TRL	Not specified.

Blending with other funding programmes and sequencing	Not specified.
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Programme	Stand-alone projects Funding agency: FWF
Country/Region	Austria/All regions.
Link to financing programme website	fwf.ac.at/en/research-funding/fwf-programmes/stand-alone-projects/
Main objective	Promoting high academic quality at an international level in the field of basic research.
Topics	Research.
Call set	Applications can be submitted at any time.
Beneficiaries	Researchers (any discipline) who are working in Austria. Applications can only be submitted by an individual natural person (institutions or companies cannot apply).
Funding	-
Project conditions	Funding can be requested for projects in the field of basic research that are clearly defined, convincingly described in terms of objectives and methods, and limited in time (up to 48 months). Applicants must prove to have the research qualifications needed to carry out the project (publication record over the last five years commensurate with their career stage and demonstrating their international visibility).
Eligible costs	Project-specific costs are eligible for funding. These include personnel and non-personnel costs that are necessary for carrying out the project and that go beyond the resources provided by the infrastructure of the research institution. The infrastructure or basic equipment of research institutions is not financed.
Project duration	Up to 48 months.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Blending is not allowed.

Programme	Joint projects Funding agency: FWF.
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Country/Region	Austria/All regions.
Link to financing programme website	fwf.ac.at/en/research-funding/fwf-programmes/international-programmes/joint-projects/
Main objective	Funding of closely integrated, bilateral research projects.
Topics	-
Call set	Submission deadlines and calls vary by country.
Beneficiaries	Researchers of any discipline.
Funding	The project parts carried out in the two participating countries are funded separately by the FWF and its partner organisation.
Project conditions	Cooperation arrangements have to involve two researchers from two different countries and the two parts of the project have to be closely integrated (one part cannot be carried out without the other).
Eligible costs	-
Project duration	Max. 3 or 4 years, depending on the country.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Blending is not allowed.

Programme	Flagship Region Energy Programme (Green Energy Lab, NEFI and WIVA P&G) Funding agency: Climate and Energy Fund and Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology.
Country/Region	Austria/all regions.
Link to financing programme website	www.vorzeigeregion-energie.at/
Main objective	Promoting an efficient interaction of energy production, consumption, system management and storage.
Topics	<ul style="list-style-type: none"> • Green Energy Lab: increasing the number of days with 100% renewable electricity and heat fivefold by 2025; • NEFI – New Energy for Industry: demonstrating the path towards complete decarbonisation of the producing and energy-intensive industry; • WIVA P&G – Hydrogen Initiative Flagship Region Austria Power & Gas: demonstrating the transition of the Austrian economy and energy production to an energy system based strongly on hydrogen. Renewable

	hydrogen will play a central role towards achieving the goal of a CO ₂ -neutral future.
Call set	3 rd call: 03.07.2019 – 02.04.2020.
Beneficiaries	Companies, research institutions, communities, areas.
Funding	Up to €120 M in three flagship regions. A funding budget of €20 to 40 M per selected flagship region is to be allocated until 2021.
Eligible costs	-
Project duration	Up to 4 years.
Starting and targeted TRL	Flagship regions aiming at reaching TRLs 8 to 9 at the end of the project will be given priority (3 rd call). Sub-projects of a flagship region can also aim at lower TRLs (primarily 5-9).
Blending with other funding programmes and sequencing	Not specified.

Programme	Energy Transition 2050 Funding agency: Climate and Energy Fund and FFG
Country/Region	Austria/All regions.
Link to financing programme website	www.ffg.at/energy-transition-2050
Main objective	Promoting the social and economic transition towards a low-carbon and sustainable future focussing on transition processes and social innovations that accelerate energy system transformation and limit climate change to a manageable level.
Topics	Six priorities for the 3 rd call. Priorities 1-5: non steel-related topics. Priority 6: industrial waste heat potentials in Austria - survey, visualisation, scenarios, measures and chances for innovation. Objective: assessment, evaluation, modelling and visualisation of industrial waste heat potentials until 2040 in Austria; identification of technologies for their integration; and formulation of techno-economic recommendations for future implementation.
Call set	3 rd call: 06.2020 until 08.2020
Beneficiaries	Research institutes, companies.
Funding	Co-financing rate: up to 100%. Overall budget: max. €700 K. Priority 6: max. €150 K (excl. VAT).
Project conditions	-

Eligible costs	-
Project duration	Max. 18 months.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Not specified.

Programme	Christian Doppler Gesellschaft
Country/Region	Austria/All regions
Link to financing programme website	www.cdg.ac.at/en/funding-programmes
Main objective	Promoting application-oriented basic research.
Topics	-
Call set	Application can be submitted at any time.
Beneficiaries	Highly-qualified scientists at universities or non-university research institutions.
Funding	<p>Annual budget: min €140 K - max. €750 K.</p> <p>Financing from the public purse: 50% of eligible costs. If SMEs are involved, 60% (in proportion of the SME's involvement).</p> <p>Financing from the private sector (commercial partners): 50% of eligible costs. If SMEs are involved, 40% (in proportion of the SME's involvement)</p> <p>Contributions in kind are not considered eligible.</p>
Project conditions	<p>Christian Doppler Laboratories can be set up at Austrian and non-Austrian universities and non-university research institutions. Non-university research institutions have to offer a scientific environment that is comparable to that found at universities.</p> <p>Business cooperation partners can be Austrian and, under certain conditions, foreign companies.</p>
Eligible costs	-
Project duration	7 years: 2-year introductory phase; 3-year first phase of extension; and 2-year second phase of extension.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Not specified.

Programme	GreenTech 100
Country/Region	Austria/Styria
Link to financing programme website	www.zukunftsfonds.steiermark.at/cms/beitrag/12768018/145290866/#tb2
Main objective	Promoting energy systems and resource recycling.
Topics	<ul style="list-style-type: none"> • Energy systems: <ul style="list-style-type: none"> ○ overall system efficiency by sector coupling, including smart grids, urban energy systems, integrated city districts and buildings, heat recovery and grid integration of electromobility; ○ storage and conversion technologies, including electricity and heat storage and system integration; ○ renewable energies, with further development of decentralised conversion technologies (from primary to secondary energy), such as bioenergy (Mintenig et al., 2017), solar, hydrogen, hydropower and wind power, to integrated solutions; ○ industrial processes and energy systems; and • resources/recycling: in line with the European circular economy package, raw materials and resources along the value chain must be considered in order to use them as efficiently as possible.
Call set	13 th call (2020)
Beneficiaries	Industrial processes and energy systems.
Funding	<ul style="list-style-type: none"> • Overall budget: €2 M (Zukunftsfonds Steiermark (Land Steiermark)) + €1.5 M (Klimaschutzfond der Stadt Graz). • Co-financing rate: up to 80% (max. €400 K).
Project conditions	<p>Support for non-economic activities relating to fundamental research, industrial research or experimental development.</p> <p>Cooperation of (non-)university research institutions is required. Cooperation of regional research institutions with regional partners in science, tourism, economy, administration, culture, agriculture, etc. is possible or appreciated.</p>
Eligible costs	Personnel costs, overhead costs, material costs and investment costs.
Project duration	Max. 24 months.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Not specified.

3.1.2. Belgium and related regions

In **Belgium** several programmes supporting carbon neutrality in the steel sector have been set up in the Flanders region, including:

- the **Strategic Ecology Support**⁹ (VLAIO), focussing on ecology investments that lead to environmental protection. The programme supports technologies aiming at preventing or remedying damage to the environment or the natural resources, including energy-saving measures and the use of renewable energy sources; and
- the **Flanders Industry Innovation Moonshot**¹⁰ programme, supporting the transformation of Flemish industries towards a circular and low-carbon economy by 2050. More specifically, from 2020 to 2040, the Flemish government will invest in innovative research in the circularity of carbon materials, electrification, radical process transformation and energy innovation.

In Belgium support to research is usually managed by regions. An exception is the **Energy Transition Fund**, which has a technical focus on innovative ideas in the field of energy and concentrates on three thematic axes (renewable energy in the North Sea and biomass; nuclear energy; and energy storage and transport). The target budget is €25 M/call, with a co-funding rate of 100% for fundamental research; 50% for industrial research; 25% for development projects; and 50% for feasibility studies.

In the following tables other main Belgian programmes are reported.

Programme	VLAIO - <i>Innovatiesteun aan bedrijven</i> (Support for innovation in companies)
Country/Region	Flanders.
Link to financing programme website	https://www.vlaio.be/nl/nieuws/record-aan-innovatiesteun-voor-vlaamse-kmos
Main objective	Supporting innovation in Flanders
Topics	Any technical topic.
Call set	Continuously open.
Beneficiaries	Companies.
Funding	Total annual support in 2019: €2 M Co-financing rate: 25% for the development part; 50% for the research part.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	2 years.

⁹ For further details, please see <https://www.vlaio.be/nl/subsidies-financiering/strategische-ecologiesteun>

¹⁰ For further details, please see <https://moonshotflanders.be/>

Starting and targeted TRL	Various starting TRL; targeted TRL up to 9.
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

Programme	VLAIO – <i>Strategische tranformatie steun</i> (Support to strategic transformation)
Country/Region	Flanders
Link to financing programme website	https://www.vlaio.be/nl/subsidies-financiering/strategische-transformatiesteun
Main objective	Supporting training and investment for companies development in terms of innovation, sustainability and internationalisation.
Topics	Innovation, sustainability and internationalisation.
Call set	Continuously open.
Beneficiaries	Companies of all sizes only (50% large companies, 25% medium-sized companies and 25% small companies).
Funding	Total funding: €32 M for 51 projects (33% to SMEs, 67% to large companies).
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	Not specified.
Starting and targeted TRL	Medium-high.
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

Programme	VLAIO - <i>Ecologiepremie+</i> (Ecology premium)
Country/Region	Flanders.
Link to financing programme website	https://www.vlaio.be/nl/subsidies-financiering/ecologiepremie
Main objective	Supporting investments in performant ecological technologies.
Topics	Ecological technologies (limitative list): <ul style="list-style-type: none"> • cooling; • transport; • lighting; • heating;

	<ul style="list-style-type: none"> • water.
Call set	Continuously open.
Beneficiaries	Companies of all sizes only.
Funding	Total funding: €17 M (69% to SMEs, 32% to large companies). Max. €1 M/company. Co-financing rate: 15-55%.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection. R&D is not eligible.
Project duration	Maximum 3 years.
Starting and targeted TRL	Medium-high.
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

Programme	VLAIO - <i>Strategische ecologiesteun</i> (Strategic Ecology Support)
Country/Region	Flanders.
Link to financing programme website	https://www.vlaio.be/nl/subsidies-financiering/strategische-ecologiesteun
Main objective	Supporting investments in performant ecological technologies not part of the standard list.
Topics	Ecological technologies.
Call set	Continuously open.
Beneficiaries	Companies of all sizes only.
Funding	Total funding: €7.5 M (100% to large companies, but also open to SMEs). Co-financing rate: 20-40%.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection. R&D is not eligible.
Project duration	Not specified.
Starting and targeted TRL	Medium-high.
Blending with other funding programmes and Sequencing	Blending is not allowed. Sequencing is allowed.

Programme	VLAIO – <i>Onderzoeksproject</i> (Research project)
Country/Region	Flanders.
Link to financing programme website	https://www.vlaio.be/nl/subsidies-financiering/subsidies-voor-ooi-een-internationaal-consortium
Main objective	Promoting applied research.
Topics	No specific technical focus.
Call set	Continuously open.
Beneficiaries	Companies, RTOs and possible subcontractors (57% SMEs and 43% large companies).
Funding	Total funding: €187 M. Co-financing rate: up to 60%.
Project conditions	Applied research.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	Not specified.
Starting and targeted TRL	Medium-high.
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

Programme	VLAIO – <i>Ontwikkelingsproject</i> (Development project)
Country/Region	Flanders.
Link to financing programme website	https://www.vlaio.be/nl/subsidies-financiering/subsidiedatabank/icon-subsidies-voor-cooperatief-vraaggedreven-onderzoek
Main objective	Implementing an innovative idea into a business case.
Topics	No specific technical focus.
Call set	Continuously open.
Beneficiaries	Companies, RTOs and possible subcontractors.
Funding	Total funding: €8 M. Co-financing rate: 25%-50%.
Project conditions	Applied research.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	Not specified.

Starting and targeted TRL	Starting TRL: 6-7. Targeted TRL: up to 8-9.
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

Programme	Energy Transition Fund
Country/Region	Belgium
Link to financing programme website	https://www.cnc-nkc.be/en
Main objective	Technical focus on promoting innovative ideas in the field of energy.
Topics	<ul style="list-style-type: none"> Renewable energy in the North Sea and biomass; nuclear energy; energy storage and transport. <p>The steel industry could benefit from activities related to biomass, and energy storage and transport (for instance related to hydrogen).</p>
Call set	1-2 per year.
Beneficiaries	Not specified, open to any kind of partner.
Funding	<p>Target budget: €25 M/call.</p> <p>Project budget: from €100 K to €5 M.</p> <p>Co-financing rate: 100% for fundamental research; 50% for industrial research; 25% for development projects; and 50% for feasibility studies.</p>
Project conditions	No specific conditions on consortia.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	Various.
Starting and targeted TRL	Various.
Blending with other funding programmes and sequencing	Cumulating of aid with other aid, irrespective of its source, form or purpose, is only possible to the extent that the thresholds laid down in the general block exemption regulation are not exceeded. If the granting of aid threatens to result in those thresholds being exceeded, the amount of aid to be granted will be limited to the difference between the lowest applicable threshold and other aid. Sequencing is allowed.

Programme	BeISME
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Country/Region	Belgium
Link to financing programme website	https://recherche-technologie.wallonie.be/fr/annonces/a-la-une/bel-sme-2020.html
Main objective	Promoting SMEs competitiveness.
Topics	Open topics.
Call set	Not specified.
Beneficiaries	SMEs (RTOs and academia as subcontractors only)
Funding	€250 K.
Project conditions	Minimum two SMEs from the three Belgian regions
Eligible costs	Fixed assets, technical staff and materials.
Project duration	From 1 to 2 years.
Starting and targeted TRL	Various.
Blending with other funding programmes and Sequencing	Blending and sequencing are not allowed.

Programme	Interreg
Country/Region	Wallonia – Flanders - France
Link to financing programme website	https://www.interreg-fwvl.eu/
Main objective	Promoting the transition to the circular economy.
Topics	Circular economy and recycling, among others.
Call set	Once a year.
Beneficiaries	Local economy actors, including SMEs and large companies. Based on value chain consortium
Funding	€3-4 M per project.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	3 years.
Starting and targeted TRL	Mostly projects oriented at high TRLs, including economic aspects and deployment.
Blending with other funding programmes and sequencing	Inter-regional blending is allowed.

Programme	Plan Marshall
Country/Region	Wallonia
Link to financing programme website	http://economie.wallonie.be/content/plan-marshall-40
Main objective	Supporting Wallonia industry
Topics	<p>Circular economy and environment (pillar 4), sometimes as cross-cutting axes.</p> <p>Competitiveness clusters include:</p> <ul style="list-style-type: none"> • Mecatech (mechanics); • GreenWin (chemistry and materials); and • Skywin (aeronautics and aerospace).
Call set	Twice a year. The calls and the evaluation process are managed by a specific body named Pole (Mecatech, Greenwin).
Beneficiaries	<p>RTOs, large companies, SMEs and academia; coordinated by an industrial partner.</p> <p>Based on value chain consortium.</p>
Funding	€3-4 M per project (65% for industrial partners).
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	3 years.
Starting and targeted TRL	Activities are divided into two main categories: DE (TRL 6-7/8) and RI (TRL 3-5); most of the time they are subject to negotiation and conditions for the funding rate.
Blending with other funding programmes and sequencing	Blending and sequencing are allowed only at regional level.

3.1.3. Finland

The Finnish government will work to ensure that **Finland** will be carbon neutral by 2035 and carbon negative soon after that. In accordance with the government programme, sectoral low-carbon roadmaps will be drawn up in cooperation with companies and organisations in the relevant sectors.

In this context, the **Integrated National Energy and Climate Plan**¹¹ introduces financing measures in the area of R&I at national level, including Union support and the use of Union funds.

¹¹ For further details, please see:

https://ec.europa.eu/energy/sites/ener/files/documents/finland_draftnecp.pdf

The funding puts special focus on ELLs. In addition, **Finland's Innovation Fund (SITRA)**¹² provides financial support for new operating models and stimulates business that aims at sustainable well-being. It particularly promotes activities supporting the National Road Map to a Circular Economy (2016-25)¹³.

Finally, the **coordination mechanisms with MSs and regional authorities** established in the governance of the partnership (see Section 3.3) are expected to maximise synergies with national policies, programmes and activities.

Business Finland is the Finnish government organisation for innovation funding, and trade, travel and investment promotion. It offers Finnish companies a unified customer journey for innovation activities, internationalisation, investments and tourism promotion. Business Finland's funding activities and programmes are presented in the tables below.

In the following tables, some Finnish programmes are detailed.

Programme	Business Finland - Even Smarter Energy
Country/Region	Finland.
Link to financing programme website	https://www.businessfinland.fi/en/for-finnish-customers/services/programs/smart-energy-finland/
Main objective	<ul style="list-style-type: none"> • Supporting the international growth of companies and attracting international investments to Finland; • contributing to the creation of a solid foundation for expertise with the development of smart energy ecosystems and test platforms; • challenging the energy sector into utilizing digitisation, the Internet of Things, AI and the Internet of Energy; • introducing new business concepts in the fields of energy efficiency, renewable energy, energy storage systems, smart networks and integration of steering as well as consumer-oriented business.
Topics	<ul style="list-style-type: none"> • Funding for both ecosystem projects and the development of smart solutions for individual companies; • opportunities for participation in the development of ecosystems and test platforms for business activities in Finland and the target markets; • internationalization services for export purposes, including customized B2B, buyer and influencer meetings; help with leads and recognition of market prospects globally; training and support for the development of qualities needed for export activities; and market analyses.
Call set	Yearly.
Beneficiaries	Universities, research institutes, companies, SMEs.

¹² For further details, please see: <https://www.sitra.fi/en/>

¹³ For further details, please see: <https://toolbox.finland.fi/business-innovation/circular-economy/>

Programme	Business Finland - Bio and Circular Finland
Country/Region	Finland.
Link to financing programme website	https://www.businessfinland.fi/en/for-finnish-customers/services/programs/bio-and-circular-finland/
Main objective	<ul style="list-style-type: none"> Supporting the development of competitive bio and circular economy solutions and ecosystems that offer solutions to global environmental challenges and hold potential for significant global markets; increasing the exports of bio and circular economy solutions in order for Finnish solutions to be adopted in international markets. The program directs export activities particularly for the plastic and packaging industries; supporting new innovations in various sectors of the circular economy, particularly for new applications in textiles and construction.
Topics	<p>Figure 9: Themes of the Bio and Circular Finland Programme</p> <p>THEMES OF PROGRAM</p> <p>Cross-cutting drivers:</p> <ul style="list-style-type: none"> New business models & value chains creating added value Sustainability Traceability Climate-smart & carbon-balanced business <p>Specific Themes:</p> <ul style="list-style-type: none"> BIO-BASED SOLUTIONS PACKAGES WASTE TO VALUE TEXTILES CIRCULAR SOLUTIONS BUILDING SECTOR <p>THEMES OF PROGRAM (Central Hub)</p> <p>Source: Bio and Circular Finland, Business Finland.</p>
Call set	Yearly.
Beneficiaries	Universities, research institutes, companies, SMEs.
Funding	<p>The programme will be carried out over a four-year period and its budget is €300 M. Business Finland's innovation funding makes up €150 M of this sum. To date, the programme has granted over €50 M of funding to projects.</p> <p>In addition to the programme's focused internationalization activities, bio and circular economy companies have access to Business Finland's standard funding instruments for supporting the prerequisites for internationalization, as well as the Business Finland network of experts, who provide contacts and assistance in identifying global market opportunities.</p>

Programme	Business Finland - Co-creation
Country/Region	Finland.
Link to financing programme website	https://www.businessfinland.fi/en/for-finnish-customers/services/funding/cooperation-between-companies-and-research-organizations/co-creation/
Main objective	<p>Supporting cooperation among research organizations and companies on developing a research idea carrying significant international business potential in relation to the required funding.</p> <p>In a Co-Creation project, the research problem and the path to resolving it are determined, the project plan is processed to attract companies and a new network of companies is constructed. During the project, the companies also make preparations for their own R&D projects. The goal is the Co-Innovation joint action carried out by the research organisation in close cooperation with its new partnering companies.</p>
Topics	<ul style="list-style-type: none"> • Demonstrating the relevance of a research idea and the genuine demand related to the subject, and further developing the idea; • building a network of companies and the international network required for the research and the development of innovations; • other work related to the feasibility of the idea. <p>The problem to be addressed and its solution must be provisionally defined in the application. The research idea must be new and broadly utilizable.</p>
Call set	-
Beneficiaries	Universities, research institutes, companies, SMEs.
Funding	Business Finland's funding to a research organisation covers 60% of the project's approved total eligible costs. The size of projects is at maximum €100 K per idea.
Project conditions	The projects shall comply with the general terms and conditions of public research funding applied by Business Finland.
Eligible costs	All costs that arise must be related to the implementation of the project. Eligible costs include: salaries, indirect personnel costs (50%), overheads (20%), travel expenses, costs of materials and supplies, and purchased services necessary for the implementation of the project.
Project duration	Typically from 4 to 6 months.

Programme	Business Finland - Co-Innovation
Country/Region	Finland.
Link to financing programme website	https://www.businessfinland.fi/en/for-finnish-customers/services/funding/cooperation-between-companies-and-research-organizations/co-innovation/

Main objective	<p>Promoting cooperation among companies and research organisations to develop new knowledge and innovations to serve as a basis for international business activities.</p> <p>The participants in a joint action have a common goal, the need to do projects in collaboration with others and a plan for reaching the joint objective. Funding is used for enhancing the research organisation's competence, and for accelerating the utilization of research data and development of new export products. Co-Innovation joint actions reinforce both the Finnish and international networks. Co-Innovation funding is used for funding projects that have undergone the Co-Creation phase or projects prepared directly without such a phase.</p>
Topics	<p>In a Co-Innovation joint action, there may be several research organisations and several companies as partners. Companies may have different roles: they may have their own R&D project, or they may be co-funding the research project or act as a subcontractor to a project implemented by another company.</p> <p>A Co-Innovation project can be formed by at least two companies together. If one or more research organisations are involved in the Co-Innovation project, there must also be at least three companies which have applied for Business Finland funding for their R&D project.</p> <p>The consortium must be of an appropriate size with a view to implementing the project. Every participant must have a justified role regarding the implementation or utilisation of project results. Often an appropriate size for a consortium is 5 to 7 participants, with additional companies funding the project or otherwise involved in it without having an R&D project of their own.</p> <p>Priority is given to credible projects supporting the growth and internationalization of SMEs or mid cap companies, where involvement of large corporations is also possible. For start-ups, a separate project of their own is often more practical than participation in a Co-Innovation joint action. However, for a justified reason start-ups may also participate in a joint project, to bring some special expertise to the project, for example. Practice has shown that good corporate partners have been the kind of organisations which already have some exports or international business activities.</p>
Beneficiaries	Universities, research institutes, companies, SMEs.
Funding	<p>Business Finland's funding to a research organisation typically covers 70% of the research project's approved total eligible costs.</p> <p>As for companies, the level of funding is based on the size of the company, and the content and objectives of the project. The company must have sufficient resources and funding of its own for completing the project.</p>
Project conditions	The projects implemented by research organisations comply with the general terms and conditions of public research funding applied by Business Finland.

	<p>The company funding complies with the forms of funding granted to and assessment criteria applied to private companies by Business Finland. The private-sector projects funded by Business Finland must comply with the general criteria applicable to the funding of private-sector R&D.</p> <p>The growth objectives and strategies of an individual company should be reached also in projects implemented as part of a joint action. In the company's own application, it is important to describe how the sub-project is linked to joint activities.</p>
Project duration	From 2 to 3 years.

Programme	Business Finland - Research to Business
Country/Region	Finland.
Link to financing programme website	https://www.businessfinland.fi/en/for-finnish-customers/services/funding/cooperation-between-companies-and-research-organizations/research-to-business/
Main objective	Preparing the commercialisation of a research-based idea and supporting the applied research that supports it.
Topics	<p>The main focus is on commercialisation preparation, not on the research of the idea.</p> <p>In addition to funding, Research to Business supports commercialisation preparation by organizing events where teams benefitting from Research to Business funding can meet early-stage investors and peers.</p> <p>The funded teams have an opportunity to showcase their project also in the Deal Flow Finland tool to wake the interest of domestic and international investors.</p> <p>At the same time the team members will have a chance to develop their own commercialisation skills.</p>
Call set	Two calls for applications per year, one in spring and another in autumn.
Beneficiaries	Research to Business funding is intended for public research groups and researchers in public research organisations who want to build new businesses based on their research and commercialize their idea.
Funding	Business Finland can fund 70% of the eligible costs. At least 40% of project costs must be targeted at the preparation of commercialisation. If the project is funded in two phases, this rule applies in both phases.
Eligible costs	Commercialisation preparation costs can include: (i) novelty searches, and other intellectual property rights and freedom to operate analyses; (ii) an evaluation of the research idea from the commercialisation perspective (proof of relevance); (iii) the determination of customer value, market surveys and customer surveys; (iv) an analysis of competing solutions; (v) an experimental confirmation that the idea will work (proof of concept); (vi) funding model

	investigations and potential investor surveys; (vii) business model investigations; (viii) the protection of the intangible rights of the idea (not the maintenance costs); and (ix) commercialisation and entrepreneurship training.
Project duration	From 12 to 24 months, depending on the project's industry and the readiness of the idea.
Starting and targeted TRL	High TRL.

Programme	Business Finland - Energy Aid
Country/Region	Finland.
Link to financing programme website	https://www.businessfinland.fi/en/for-finnish-customers/services/funding/energy-aid/
Main objective	Promoting the development of innovative solutions for replacing the energy system with a low-carbon alternative in the long term.
Topics	<p>Energy Aid funding can be granted for investment and investigation projects that promote:</p> <ul style="list-style-type: none"> • the production or use of renewable energy; • energy savings or improved efficiency of energy production or use; and • other solutions to replace the energy system with a low-carbon one.
Beneficiaries	<ul style="list-style-type: none"> • Companies of all sizes, including self-employed persons, traders and sole traders; and • communities and organisations, such as municipalities, parishes and foundations.
Funding	<p>Investments in renewable energy in 2020:</p> <ul style="list-style-type: none"> • Investigation projects: <ul style="list-style-type: none"> ○ renewable energy audits in the municipal sector, 50%. • Investment projects: <ul style="list-style-type: none"> ○ heating plant projects (wood fuels), 10-15%; ○ heat pump projects, 15%; ○ solar heat projects, 20%; ○ small hydroelectric power projects, 15-20%; ○ landfill gas projects, 15-20%; ○ small wind power projects, 15-20%; ○ small combined heat and power projects, 15-20%; ○ solar electricity projects, until 30.4.2019 25%; ○ solar electricity projects, from 1.5.2019 20%; ○ biogas projects, 20-30%. <p>Investments promoting energy savings and energy efficiency in 2020:</p> <ul style="list-style-type: none"> • Investigation projects:

	<ul style="list-style-type: none"> ○ energy audits in the municipal sector, in micro-enterprises and in SMEs related to energy efficiency agreements, 50%; ○ other energy audits, analyses and investigation projects, 40%. • Investment projects: <ul style="list-style-type: none"> ○ 20% for companies and communities that have entered into energy efficiency agreements; ○ 25% when the ESCO service is used in the above; ○ 15% for companies and communities other than those that have entered into energy efficiency agreements when the ESCO service is used. <p>Projects involving new technology: investments in renewable energy sources and energy efficiency, new technology, maximum 40%.</p>
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3.1.4. France

France has developed several strategies and plans aiming at tackling carbon emissions in the industrial sector, including:

- the draft **National Energy and Climate Plan**,¹⁴ putting in place instruments to support industry with innovation-based solutions which could be translated into energy-related competitiveness objectives; and
- the **National Low-Carbon Strategy**,¹⁵ aiming at reducing industrial emissions through carbon-free resources, energy efficiency, and technologies that capture, store and reuse carbon generated by industrial processes in order to offset residual emissions.

In the following tables, other main French programmes are reported.

Programme	Ecological Transition Agency – R&D programme
Country/Region	France
Link to financing programme website	https://entreprises.ademe.fr/recherche-innovation
Main objective	Promoting development, experimental implementation, action research and pre-normative research.
Topics	<ul style="list-style-type: none"> • Climate change; • circular economy; • energy; • mobility/transport; • air quality;

¹⁴ For further details, please see: https://ec.europa.eu/energy/sites/ener/files/documents/fr_swd_en.pdf p.10; https://ec.europa.eu/energy/sites/ener/files/documents/necp_factsheet_fr_final.pdf

¹⁵ For further details, please see: <https://www.ecologie.gouv.fr/sites/default/files/Projet%20SNBC%20EN.pdf>, p.86.

	<ul style="list-style-type: none"> • soils/agriculture/forest; • building.
Call set	Yearly.
Beneficiaries	Research organisations, enterprises, associations and collectivities.
Funding	Annual budget: €25 M. Funding per project: €50 to 300 K.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	Various.
Starting and targeted TRL	From 4 up to 7.
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

Programme	Ecological Transition Agency - Investments for the future
Country/Region	France.
Link to financing programme website	https://entreprises.ademe.fr/recherche-innovation
Main objective	Promoting demonstration, first-of-a-kind experiments and first industrialisation.
Topics	<ul style="list-style-type: none"> • Climate change; • circular economy; • energy; • mobility/transport; • air quality; • soils/agriculture/forest; • building.
Call set	Yearly.
Beneficiaries	Mainly enterprises.
Funding	Annual budget: €350 M. Funding per project: >€1 M.
Eligible costs	Fixed assets, technical staff, materials, external collaborations, acquisition of patents and industrial property protection.
Project duration	Various.

Starting and targeted TRL	6-9
Blending with other funding programmes and sequencing	Blending is not allowed. Sequencing is allowed.

3.1.5. Germany and related regions

In **Germany**, several research programmes support the decarbonisation of the steel industry:

- the **Climate Action Programme**¹⁶ promotes measures to enhance energy and resource efficiency, to increase the use of renewables and to support the decarbonisation in the production process in EIs, where the steel sector plays an important role. The programme supports R&D into the storage and use of CO₂ in particular;
- the **Hydrogen Strategy**,¹⁷ (European Commission, 2020h) currently being developed by several ministries, envisages the promotion of research and use of carbon-free gas in the industry and transport sectors. Given Germany's leading role in the EU steel production and the importance of using hydrogen in decarbonising the steel sector, this collaboration will lead to remarkable benefits for the EU steel sector;
- the 7th **Energy Research Programme** of the federal government¹⁸ promotes research in the fields of energy efficiency, reduction with hydrogen, flexibilization, waste heat recovery and efficient steel products; and
- the **Regulatory Sandboxes – Testing Environments for Innovation and Regulation**¹⁹ enable to test infrastructural requirements within real conditions. A conceptual study regarding hydrogen infrastructure and a laboratory-scale direct reduction plant will be supported in the framework of the programme. An existing hydrogen pipeline in the area will be extended to satisfy demand-driven hydrogen supply.

In the following other main German programmes are reported.

Programme	Innovations for the energy transition, part of the general part of the 7 th <i>Energieforschungsprogramm</i> (Energy Research Programme) Funding agency: Federal Ministry for Economic Affairs and Energy
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¹⁶ For further details, please see https://bundesfinanzministerium.de/Content/EN/Standardartikel/Topics/Priority-Issues/Climate-Action/2019-09-19-climate-action-programm-download.pdf?jsessionid=88DF264E070912A0BCA6211C4EEA4DC7.delivery1-master?_blob=publicationFile&v=2.

¹⁷ For further details, please see <https://www.euractiv.com/section/energy-environment/news/germanys-steel-industry-in-transition/>

¹⁸ For further details, please see https://www.bmwi.de/Redaktion/DE/Downloads/B/bekanntmachung-forschungsfoerderung-im-7-energieforschungsprogramm.pdf?_blob=publicationFile&v=3

¹⁹ For further details, please see <https://www.bmwi.de/Redaktion/EN/Dossier/regulatory-test-beds-testing-environments-for-innovation-and-regulation.html>

Country/Region	Germany.								
Link to financing programme website	https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/7-energieforschungsprogramm-der-bundesregierung.pdf?__blob=publicationFile&v=14								
Main objective	Promoting applied research, development and demonstration of energy technologies.								
Topics	<ul style="list-style-type: none"> • Increase of energy and resource efficiency; • expansion of renewable energies; • reduction of GHGs; • sector coupling and digitisation; • CO₂ cycle economy; • technology-related research on societal issues of the energy transition; • acceleration of the deployment of energy technologies, and rapid transfer of research results to applications and the market; • open technology promotion. 								
Call set	No deadlines, except for specific calls.								
Beneficiaries	Industry and R&D institutions, located in Germany (at least the branch office taking part in project).								
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality.</p> <table border="1"> <thead> <tr> <th>Company size</th><th>Collaboration projects</th></tr> </thead> <tbody> <tr> <td>SME</td><td>50%</td></tr> <tr> <td>Other industry</td><td>40%</td></tr> <tr> <td>Non-profit R&D</td><td>50% industrial research 100% basic research</td></tr> </tbody> </table> <p>Budget: €6.4 B between 2018 and 2022, then another budget will be adopted for the following period (2023-27). No budget is reserved for specific sectors.</p>	Company size	Collaboration projects	SME	50%	Other industry	40%	Non-profit R&D	50% industrial research 100% basic research
Company size	Collaboration projects								
SME	50%								
Other industry	40%								
Non-profit R&D	50% industrial research 100% basic research								
Project conditions	Start after approval.								
Eligible costs	Fixed assets, materials, technical staff, travel, external collaborations and overhead costs.								
Project duration	Typically 3 years; no explicit limit.								
Starting TRL	3								
Targeted TRL	7-9								

Blending with other funding programmes and sequencing	Not specified.
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Programme	<i>Reallabore der Energiewende</i> (Real laboratories of the energy transition), part of the 7 th <i>Energieforschungsprogramm</i> (Energy Research Programme) Funding agency: German Federal Ministry for Economic Affairs and Energy (Agora Energiewende and Wuppertal Institut, 2019).								
Country/Region	Germany								
Link to financing programme website	https://www.energieforschung.de/spotlights/reallabore								
Main objective	Contributing to bridging the difficult phase between technology development and market penetration.								
Topics	<ul style="list-style-type: none"> • Acceleration of the deployment of energy technologies, and rapid transfer of research results to applications and the market; • open technology promotion; • increase of energy and resource efficiency; • expansion of renewable energies; • reduction of GHGs; • sector coupling and digitisation; • CO₂ cycle economy; • technology-related research on societal issues of the energy transition. 								
Call set	Last call in 2019; a new call will follow in 2020.								
Beneficiaries	Industry and R&D institutions, located in Germany (at least the branch office taking part in project).								
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality.</p> <table border="1"> <thead> <tr> <th>Company size</th><th>Collaboration projects</th></tr> </thead> <tbody> <tr> <td>SME</td><td>60%</td></tr> <tr> <td>Other industry</td><td>50%</td></tr> <tr> <td>Non-profit R&D</td><td>100%</td></tr> </tbody> </table> <p>Budget: approx. €100 M per year for the period 2019-22. No budget is reserved for specific sectors.</p> <p>Maximum funding per partner: €20 M.</p>	Company size	Collaboration projects	SME	60%	Other industry	50%	Non-profit R&D	100%
Company size	Collaboration projects								
SME	60%								
Other industry	50%								
Non-profit R&D	100%								
Project conditions	Start after approval.								

Eligible costs	Fixed assets; materials; technical staff; travel; external collaborations; and foundations, enclosures, access roads and fencing. <ul style="list-style-type: none"> Investments enclosed in 85%-flat-rate of personal costs
Project duration	Up to 5 years, followed by one to three years of test operation and monitoring.
Starting TRL	7, in justified exceptional cases 6 or 5.
Targeted TRL	9
Blending with other funding programmes and sequencing	Not specified.

Programme	<i>Kopernikus</i> , part of the 7 th <i>Energieforschungsprogramm</i> (Energy Research Programme) Funding agency: Federal Ministry of Education and Research
Country/Region	Germany
Link to financing programme website	https://www.bmbf.de/foerderungen/bekanntmachung-1084.html
Main objective	Promoting energy transition with the aim of making it possible for Germany to be climate-neutral by 2050.
Topics	<p>Four main projects:</p> <ul style="list-style-type: none"> the ENSURE project is developing the power grid of the future; the P2X project investigates the conversion of CO₂, water and electricity from renewable sources into gases, fuels, chemicals and plastics; the SynErgie project studies how energy-intensive industrial processes can be made more flexible in order to adapt them to the availability of renewable energy sources; and the Ariadne project analyses in a joint learning process between science and society how policy measures work – from individual sectors to the big picture. <p>Projects are carried out in three phases:</p> <ul style="list-style-type: none"> phase 1: concepts and theory (2016 to 2019); phase 2: validation and preparation of the practical phase (2019 to 2022); and phase 3: transfer of the developed technologies to demonstration facilities (2022 to 2025).
Call set	Four projects approved in 2015; duration: 10 years, up to 2020.
Beneficiaries	Industry and R&D institutions, located in Germany (at least the branch office taking part in project).

Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality.</p> <table border="1"> <thead> <tr> <th>Company size</th><th>Collaboration projects</th></tr> </thead> <tbody> <tr> <td>SME</td><td>50%</td></tr> <tr> <td>Other industry</td><td>50%</td></tr> <tr> <td>Non-profit R&D</td><td>100%</td></tr> </tbody> </table> <p>Budget: approx. €400 M between 2015 and 2025; no budget is explicitly allocated to the steel sector (2021-30).</p>	Company size	Collaboration projects	SME	50%	Other industry	50%	Non-profit R&D	100%
Company size	Collaboration projects								
SME	50%								
Other industry	50%								
Non-profit R&D	100%								
Project conditions	Start after approval.								
Eligible costs	Fixed assets, materials, technical staff, travel and external collaborations.								
Project duration	10 years.								
Starting TRL	1								
Targeted TRL	9								
Blending with other funding programmes and sequencing	Not specified.								

Programme	<p><i>Vermeidung von klimarelevanten Prozessemissionen in der Industrie (KlimPro-Industrie)</i> (Avoidance of climate-relevant process emissions in industry)</p> <p>Funding agency: Federal Ministry of Education and Research</p>
Country/Region	Germany.
Link to financing programme website	https://www.bmbf.de/foerderungen/bekanntmachung-2565.html
Main objective	<ul style="list-style-type: none"> Enabling the German basic materials industry to develop processes and process combinations that avoid GHGs and to put them into practice in the medium to long term; and promoting cross-project networking and transfer projects to be linked to relevant European cross-cutting activities (2030 climate and energy framework, 2050 long-term strategy, etc.).
Topics	<ul style="list-style-type: none"> Carbon direct avoidance (CDA), neither CCS nor CCU; new technologies and process combinations (systemic approach); consideration of larger parts of the value chains, including life cycle assessment (LCA);

	<ul style="list-style-type: none">operational capability of the industry, taking into account the necessary infrastructural investment measures and the economic aspects;steel, e.g. hydrogen as reducing agent and iron ore electrolysis.															
Call set	16.12.2019, 15.12.2020.															
Beneficiaries	Industry and research institutes, with a focus on SMEs. The project can be carried out individually or in collaboration.															
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality.</p> <table><tr><th>Company size</th><th>Basic research</th><th>Industrial research</th></tr><tr><td>Small</td><td>100%</td><td>70%</td></tr><tr><td>Medium</td><td>100%</td><td>60%</td></tr><tr><td>Big</td><td>100%</td><td>50%</td></tr><tr><td>Non-profit R&D</td><td>100%</td><td>80%</td></tr></table> <p>Budget: €6.5 M per year.</p>	Company size	Basic research	Industrial research	Small	100%	70%	Medium	100%	60%	Big	100%	50%	Non-profit R&D	100%	80%
Company size	Basic research	Industrial research														
Small	100%	70%														
Medium	100%	60%														
Big	100%	50%														
Non-profit R&D	100%	80%														
Project conditions	Two-step application procedure. The project should be carried out in the territory of Germany.															
Eligible costs	Fixed assets, materials, technical staff, travel and external collaborations.															
Project duration	Up to 48 months.															
Starting TRL	Low TRL.															
Targeted TRL	5															
Blending with other funding programmes and sequencing	Applicants should check whether EU funding (H2020) is available and to what extent an exclusive or additional application for funding can be submitted to the EU.															

Programme	<p>Environmental Innovation Programme</p> <p>Funding agency: Federal Ministry of the Environment, Nature Conservation and Nuclear Safety and the KfW (i.e. the promotional bank of Germany)</p>
Country/Region	Germany.
Link to financing programme website	https://www.umweltinnovationsprogramm.de/
Main objective	Promoting the conversion of EIs to a largely GHG-neutral production through pilot projects.

Topics	<ul style="list-style-type: none"> • First large-scale application of technologies and processes with the aim of reducing process-related GHG emissions (>80-95%) in EIs as far as possible and in the long term; • conversion from fossil fuels to electricity-based processes; • bridge technologies, which represent a substantial step on the way to largely GHG-neutral production processes; • new alternative products and corresponding manufacturing processes introduced to the market in EIs, replacing energy-intensive products with process-related emissions.
Call set	Start: 2019; end: 2023.
Beneficiaries	EIs (such as steel, cement, lime and chemicals).
Funding	<p>Instrument: grant by the Ministry (30%); loan from the KfW (70%).</p> <p>Budget for grants: €45 M for the period 2019-23. The current programme ends in 2023 but may then be extended (2020-30). No budget is reserved for specific sectors; all EIs can apply.</p> <p>No limit is provided for projects.</p>
Project conditions	The R&D part has to be completed before the project starts. The project has to be completed by the end of 2023. The actions supported must be of a demonstrative nature and transferable. CCS is not covered.
Eligible costs	Fixed assets and investments.
Project duration	Plants/processes are to be operated for 5 years in accordance with their intended purpose.
Starting TRL	8
Targeted TRL	9
Blending with other funding programmes	Combination of grants by the Ministry (30%) and loans from the KfW (70%).
Sequencing	Sequencing is allowed.

Programme	<i>Arbeitsgemeinschaft industrieller Forschungsvereinigungen</i> (German Federation of Industrial Research Associations), national and international Funding agency: Federal Ministry for Economic Affairs and Energy
Country/Region	Germany.
Link to financing programme website	https://www.aif.de/
Main objective	Promoting applied research and development benefiting non-profit R&D institutions and SMEs.

Topics	<ul style="list-style-type: none"> • Building up alliances together with partners from industry, science and government in order to turn ideas into successful products, processes or services in the market; • following an industry-driven approach; • qualifying the new generation of academics in innovative fields; • strengthening cooperation between SMEs and research institutions; • enhancing knowledge and technology transfer; • developing synergies and other positive effects in innovation networks.
Call set	No deadlines.
Beneficiaries	<p>R&D-institutions and SMEs.</p> <p>The project can be carried out individually or in collaboration with partners. Option PLUS: cooperation with a number of industrial partners; options CORNET and IraSME: cooperation with international partners.</p>
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on several parameters. In general for non-profit R&D institutions it amounts to 100%, with limitations based on the public service tariff.</p> <p>Budget: approx. €180 M per year, redefined each year (€180 M for all sectors in 2019 and presumably the same in the following years (2020-30)). No budget is reserved for specific sectors.</p>
Project conditions	Start after approval. The German part should be carried out in the territory of Germany.
Eligible costs	Fixed assets, technical staff, other costs like materials (with a 20% flat-rate) and external collaborations.
Project duration	Typically 2 years; no explicit limit.
Starting TRL	1
Targeted TRL	5
Blending with other funding programmes and sequencing	Options CORNET and IraSME are based on cooperation with international partners; each partner is funded by national institutions.

Programme	<p><i>Zentrales Innovationsprogramm Mittelstand</i> (Central Innovation Programme SMEs), national and international</p> <p>Funding agency: Federal Ministry for Economic Affairs and Energy</p>
Country/Region	Germany.
Link to financing programme website	https://www.zim.de/

Main objective	Strengthening the innovative strength and thus the competitiveness of SMEs.																															
Topics	No specific topic or industry is mentioned, but the programme focuses on: <ul style="list-style-type: none">mitigating technical and economic risks associated with R&D from technology-based projects;encouraging SMEs to make more efforts for market-oriented research, development and technological innovations;strengthening cooperation between companies and research institutions;enhancing knowledge and technology transfer;developing synergies and other positive effects in innovation networks; andimplementing R&D results quickly, promoting innovation in a market-oriented manner and improving innovation in SMEs.																															
Call set	No deadlines.																															
Beneficiaries	SMEs. The project can be carried out individually or in collaboration with national or international partners.																															
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality.</p> <table><tr><th>Company size</th><th>Single projects</th><th>Collaboration projects</th><th>International projects</th></tr><tr><td>Small enterprises in structurally weak regions</td><td>45%</td><td>55%</td><td>60%</td></tr><tr><td>Small, young enterprises</td><td>45%</td><td>50%</td><td>60%</td></tr><tr><td>Small enterprises</td><td>40%</td><td>45%</td><td>55%</td></tr><tr><td>Medium-sized enterprises</td><td>35%</td><td>40%</td><td>50%</td></tr><tr><td>up to 500 employees</td><td>25%</td><td>30%</td><td>40%</td></tr><tr><td>Large enterprises up to 1000 employees</td><td>-</td><td>30%</td><td>40%</td></tr></table>				Company size	Single projects	Collaboration projects	International projects	Small enterprises in structurally weak regions	45%	55%	60%	Small, young enterprises	45%	50%	60%	Small enterprises	40%	45%	55%	Medium-sized enterprises	35%	40%	50%	up to 500 employees	25%	30%	40%	Large enterprises up to 1000 employees	-	30%	40%
Company size	Single projects	Collaboration projects	International projects																													
Small enterprises in structurally weak regions	45%	55%	60%																													
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Medium-sized enterprises	35%	40%	50%																													
up to 500 employees	25%	30%	40%																													
Large enterprises up to 1000 employees	-	30%	40%																													

	Budget: €555 M in 2020, redefined each year. The same amount is expected for the following years (2021-30). No budget is reserved for specific sectors. Budget per project: up to €550 K and €450 K in collaboration projects for companies; up to €220 K for R&D institutions; up to €2.3 M for a project. Number of projects: approx. 3,000 new projects per year.
Project conditions	Start after approval. The German part should be carried out in the territory of Germany.
Eligible costs	Technical staff, plus 85% flat-rate for other costs; and investments enclosed in 85%-flat-rate of personal costs.
Project duration	Typically 2 years; no explicit limit.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	When projects are carried out in cooperation with international partners, each partner is funded by its own national institutions.

Programme	<i>Programm für rationelle Energieverwendung, regenerative Energien und Energiesparen (progres.nrw)</i> (Programme for the rational use of energy, renewable energies and energy saving), national and international Funding agency: Ministry of Economic Affairs, Innovation, Digitisation and Energy of North Rhine-Westphalia; ERDF (EU)
Country/Region	Germany / North Rhine-Westphalia.
Link to financing programme website	https://www.ptj.de/projektfoerderung/wettbewerbe-nrw/progres-nrw
Main objective	Strengthening the innovative strength and thus the competitiveness of SMEs in North Rhine-Westphalia.
Topics	No specific topic or industry is mentioned, but the programme focuses on: <ul style="list-style-type: none"> • reducing harmful emissions; • increasing the share of renewable energies and integrating them into the supply network; • making the energy system more flexible and developing or strengthening cross-sectoral ecological flexibility options; • strengthening the scientific or technological bases in these areas; and • supporting the innovation capacity of companies and institutions.
Call set	No deadlines.
Beneficiaries	R&D institutions and SMEs. The project can be carried out individually or in collaboration with national or international partners.

Funding	Instrument: grant.																				
	Co-financing rate: the aid intensity depends on the project category and the size of the company.																				
	<table><tr><th>Company size</th><th>Feasibility studies</th><th>Industrial research</th><th>Experimental research</th></tr><tr><td>Small enterprises</td><td>70%</td><td>70%</td><td>45%</td></tr><tr><td>Medium-sized enterprises</td><td>60%</td><td>60%</td><td>35%</td></tr><tr><td>Large enterprises</td><td>50%</td><td>50%</td><td>25%</td></tr><tr><td>Non-profit R&D institutions</td><td>100%</td><td>100%</td><td>100%</td></tr></table>	Company size	Feasibility studies	Industrial research	Experimental research	Small enterprises	70%	70%	45%	Medium-sized enterprises	60%	60%	35%	Large enterprises	50%	50%	25%	Non-profit R&D institutions	100%	100%	100%
	Company size	Feasibility studies	Industrial research	Experimental research																	
	Small enterprises	70%	70%	45%																	
	Medium-sized enterprises	60%	60%	35%																	
	Large enterprises	50%	50%	25%																	
Non-profit R&D institutions	100%	100%	100%																		
Under special conditions, +15% for enterprises. Limit: 70% (medium-sized enterprises), 80% (small enterprises).																					
Budget: flexible (2020-30). No budget reserved for specific sectors.																					
Project conditions	Start after approval. The North Rhine-Westphalia part should be carried out in the territory of North Rhine-Westphalia.																				
Eligible costs	Fixed assets, materials, technical staff, travel, external collaborations, overhead costs and investments.																				
Project duration	No explicit limit.																				
Starting and targeted TRL	Targeted TRL: 5.																				
Blending with other funding programmes and sequencing	Not specified.																				
Any additional remark	<ul style="list-style-type: none">• Pilot and demonstration projects are possible.• Project reference: H2BF (<i>CO₂-Minderung durch H2-Injektion in den Hochofen – Projektphase 1</i>) (CO₂ reduction by H2 injection into the blast furnace – phase 1).• Potential of up to 20% CO₂ reduction.																				

3.1.6. Italy and related regions

The main financial opportunities available in **Italy** at national, regional and national-regional level, depending on the source of financing, are listed below based on the search and mapping work carried out.

Programme	<i>Contratto di Sviluppo</i> (Development Contract)
Country/Region	Italy
Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/contratti-di-sviluppo
Main objective	Supporting big strategic, productive and innovative investments in the industrial and environmental fields.
Topics	<p>The instrument can provide financial support to R&D&I projects, namely:</p> <ul style="list-style-type: none"> • industrial development programmes, including programmes relating to the processing and marketing of agricultural products; • development programmes for environmental protection; and • touristic activity development programmes which may include, for an amount not exceeding 20% of the total investments to be made, programmes intended for the development of commercial activities. <p>As part of the above-mentioned projects, the instrument can also finance research, development and innovation programmes as well as infrastructure works, within the limits set by implementing legislation.</p> <p>Industrial development contracts finance investment projects in:</p> <ul style="list-style-type: none"> • the manufacturing, mining, transport (European Commission, 2017c) and energy supply sectors (while complying with prohibitions and limitations provided for by EU legislation); • waste management and remediation activities; and • service, information and communication activities. <p>In the coal, shipbuilding, transport, and energy production and distribution sectors only projects submitted by SMEs will be eligible. Any project submitted by large companies will be subject to notification to the EC.</p> <p>Environmental protection development contracts finance projects aimed at:</p> <ul style="list-style-type: none"> • raising the level of environmental protection by the proposing company beyond the thresholds set by current EU legislation (or in the absence of this); • anticipating compliance with new Union rules (not yet in force) that raise the level of environmental protection; • allowing greater energy efficiency; • creating high-efficiency cogeneration plants; and • carrying out recycling and reuse activities of special industrial waste.
Call set	Periodic calls.
Beneficiaries	A <i>Contratto di Sviluppo</i> can be carried out by one or more companies of any size, Italian or foreigner (following EC regulations). The development programme can also be carried out jointly, including through the use of the

	<p>network contract tool referred to in article 3, paragraph 4-ter, of decree-law n. 5 of 10 February 2009.</p> <p>The beneficiaries are divided as follows:</p> <ul style="list-style-type: none"> proposing party, i.e. the company that promotes the development programme and is responsible for the technical and economic consistency with the programme; and participating companies, i.e. any other companies that carry out investment projects within the development programme. <p>The proposing party must submit eligible expenses of not less than €10 M for industrial development and environmental protection programmes; not less than €3 M for programmes exclusively concerning the processing and marketing of agricultural products; and not less than €5 M for tourism development programmes.</p> <p>Investments submitted by participating companies (including research, development and innovation) must include expenses of not less than €1.5 M.</p>
Funding	<p>Funding is granted in the following forms (also in combination):</p> <ul style="list-style-type: none"> subsidized loan, up to 75% of the eligible expenses; interest-rate subsidy; grants related to assets; and direct contribution to spending. <p>The form of the support is defined during the negotiation phase.</p> <p>Specific criteria for determining the support are set for development programmes relating to environmental protection, and the processing and marketing of agricultural products, in implementation of current EU regulations.</p>
Project conditions	<p>Funding applications must be submitted to Invitalia, i.e. the agency managing the subsidy measure, through the forms available in the dedicated section of the agency's website and following the procedure specified therein. The agency then carries out a preliminary evaluation based on the order of submission of applications, taking into account the available financial resources. With the decree of the Minister of Economic Development of 8 November 2016, a specific procedure was introduced for the financing and evaluation of large-scale development programmes (\geq €50 M or \geq €20 M for projects related to the processing and marketing of agricultural products).</p>
Eligible costs	<p>The total eligible amount must not exceed €20 M for each company.</p>
Project duration	<p>From 36 to 48 months.</p>
Funding sources	<p>For the 2014-20 programming period, €3,595.3 M were allocated to the Development Contract instrument, as detailed below:</p>

	<ul style="list-style-type: none"> • €250 M from the Development and Cohesion Fund 2014-20 (Inter-ministerial Committee for Economic Programming resolution n. 33/2015); • €336.3 M from the ERDF 2014-20 national operational programme on enterprises and competitiveness (decrees of the Minister of Economic Development of 29 July 2015 and 21 May 2018); • €352.2 M from the complementary national programme on enterprises and competitiveness 2014-20 (Inter-ministerial Committee for Economic Programming resolution n. 10/2016); • €90 M from the Fund for Sustainable Growth (decree of the Minister of Economic Development of 9 August 2016, subsequently amended by the decree of the Minister of Economic Development of 2 August 2017 and the decree of the Minister of Economic Development of 18 December 2017); • €20 M from the Fund for Sustainable Growth, reserved for risk capital interventions (decree of the Minister of Economic Development of 23 March 2018); • €1,745.6 M from the Development and Cohesion Fund 2014-20 enterprises and competitiveness plan (Inter-ministerial Committee for Economic Programming resolutions n. 25/2016, n. 52/2016 and n. 14/2018); • €88.7 M from the Development and Cohesion Fund, reserved for development programmes promoted by SMEs in the territory of the Sicily region; • €112.5 M allocated by the budget law for 2019 (article 1, paragraph 202, of law n. 145 of 30 December 2018); • €200 M allocated by the budget law for 2020 (article 1, paragraph 231, of law n. 160 of 27 December 2019); and • € 400 M allocated by the Cura Italia decree-law (article 80 of decree-law n. 18 of 17 March 2020).
Starting TRL	6
Targeted TRL	9
Blending with other funding programmes	Blending allowed is not allowed.
Sequencing	Sequencing is allowed.

Programme	<i>Accordo per l'Innovazione</i> (Agreement for Innovation)
Country/Region	Italy.

Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/accordi-per-l-innovazione
Main objective	Supporting projects relating to industrial research and experimental development.
Topics	Creation of new products, processes or services, or significant improvement of existing products, processes or services, through the development of one or more of the technologies identified by H2020.
Call set	Periodic calls.
Beneficiaries	<p>Companies of any size, with at least two approved financial statements, which carry out industrial, agro-industrial, artisan or industrial services activities (i.e. activities referred to in article 2195 of the civil code, numbers 1, 3 and 5) as well as research activities.</p> <p>The proposing companies can also present projects jointly with each other and/or with research organisations, up to a maximum of five co-proposers.</p>
Funding	<p>Funding can take the following forms:</p> <ul style="list-style-type: none"> • a direct contribution to the expenditure amounting to at least 20% of the eligible costs and expenses (to which a variable contribution can be added depending on the financial resources available at regional level); and • subsidized loans, if provided for in the agreement, covering up to 20% of the eligible costs and expenses (to which additional funding can be added at regional level). <p>If the ministry uses the resources of programmes which are co-financed by the structural funds or the related national programming, or the agreement is co-financed with resources managed centrally by the institutions, agencies, joint ventures or other bodies of the EU, the amount of the direct contribution to the expenditure is increased in order to maximize the support that can be granted within the limits of the current state aid rules.</p>
Project conditions	<p>Once project proposals are submitted, the Ministry of Economic Development enters a dialogue with the regions and the autonomous provinces, and starts the evaluation of the strategic validity of the proposed initiatives by analysing the following elements:</p> <ul style="list-style-type: none"> • relevance of the initiative in terms of technological developments and degree of innovation of the expected results; • industrial interest in carrying out the initiative in terms of its ability to encourage innovation in specific sectors; • direct and indirect effects on the employment level of the production sector and/or the reference territory;

	<ul style="list-style-type: none"> • national value of the interventions in terms of the multiregional effects of the initiative; • any ability to attract foreign investments, including through the strengthening and expansion of foreign companies already present in the national territory; and • ability to strengthen the presence of Italian products in market segments characterized by strong international competition.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • employees of the proposing company, people working for the proposing company with a project-based contract or a job administration contract, or beneficiaries of a specific research grant (limited to technicians, researchers and other auxiliary staff), to the extent that they contribute to the research and development activities carried out in the context of the project. Expenses for personnel carrying out administrative, accounting and commercial tasks are excluded; • newly-manufactured tools and equipment, to the extent that and for the period in which they are used for the research and development project. If the tools and the equipment are used for a period which is shorter than the entire useful life of the asset, only the ordinary tax amortisation rates relating to the period of implementation of the research and development project are eligible; • consultancy and other services used in the context of the research and development project, including the acquisition or licensing of research results, patents and know-how, through a transaction carried out at normal market conditions; • general expenses directly deriving from the research and development project, charged pro-rata on the basis of the ratio between the overall value of the general expenses and the overall value of the company's personnel expenses. The above-mentioned expenses must be calculated with reference to the financial statements of the project period and, in any case, cannot exceed 50% of the personnel expenses referred to in letter a); and • the materials used to carry out the project.
Project duration	36 months.
Starting and targeted TRL	Not specified.
Blending with other funding programmes	Combination with other (community, national and regional) state aid is possible within the limits set by articles 38 and 46 of the general block-exemption regulation.

Sequencing	Not specified.
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Programme	<i>Fondo Nazionale Efficienza Energetica</i> (National Fund for Energy Efficiency)
Country/Region	Italy.
Link to financing programme website	https://www.mise.gov.it/index.php/it/energia/efficienza-energetica/fondo-nazionale-efficienza-energetica
Main objective	Supporting the implementation of interventions aimed at ensuring the achievement of national energy efficiency targets.
Topics	The fund supports energy efficiency measures carried out by enterprises on buildings, plants and production processes. Specifically, the interventions supported must concern the reduction of energy consumption in industrial processes, and the construction and expansion of district heating networks.
Call set	The financial resources allocated for the fund amount to approximately €185 M. Furthermore, an additional allocation of €125 M is envisaged for the two-year period 2019-20. Projects are assessed on the basis of the chronological order of arrival without merit ranking.
Beneficiaries	<p>All sectors are eligible for subsidies without prejudice to the exclusions and limitations provided for by the general block exemption regulation (articles 1 and 3) and the <i>de minimis</i> regulation (article 1).</p> <p>In particular, aid granted to companies is not eligible when:</p> <ul style="list-style-type: none"> • the amount of the aid is fixed on the basis of the price or quantity of the products purchased from primary producers or placed on the market by the companies concerned; • the aid is conditional on being partially or entirely transferred to primary producers; • the activities are related to export to third countries or MSs, i.e. aid directly linked to the quantities exported, to the establishment and operation of a distribution network or to other current costs linked to the export activity; • aid is contingent upon the use of domestic over imported goods; • in the transport and storage sector, if vehicles or parts of vehicles are purchased for road freight transport.
Funding	Loans at a subsidized rate of 0.25% to cover up to 70% of the eligible costs for amounts between €250 K and 4 M. Maximum duration: 10 years.
Project conditions	<p>The following initiatives can be financed:</p> <ul style="list-style-type: none"> • reduction of energy consumption in industrial processes; • creation and/or implementation of district heating and cooling networks and systems;

	<ul style="list-style-type: none"> • efficiency of public services and infrastructures, including public lighting; and • energy requalification of buildings.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • Consultancy (up to 10% of the eligible expenses), with particular reference to costs incurred for the design of building and plant structures, works management, test certificates, the design and implementation of energy management systems, feasibility studies, energy performance certificates for buildings and energy diagnoses for public buildings; • plant, machinery and equipment, including remote management, remote control and monitoring systems for the collection of data regarding the savings achieved as well as the supply of the materials and components required for the implementation of the intervention; • interventions on the building envelope, including masonry and related works, and costs for earthquake risk mitigation interventions if concerning building elements affected by energy efficiency measures; and • specific infrastructures, including civil works, supports and supply lines for the water, electricity (including connection to the network), gas and/or biomass necessary for the operation of the plant, as well as measurement systems for the various operating parameters.
Project duration	36 months.
Starting and targeted TRL	Not specified.
Blending with other funding programmes	Combination with other (community, national and regional) state aid is possible within the limits set by articles 38 and 46 of the general block exemption regulation and the <i>de minimis</i> regulation.
Sequencing	Not specified.

Programme	Revolving Fund for Business Support and Research Investment – R&D projects
Country/Region	Italy.
Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/bando-grandi-progetti-r-s-fri
Main objective	Promoting growth, and important research and development projects.
Topics	<ul style="list-style-type: none"> • Large research and development projects in the sector of electronic ICTs and for the implementation of the Italian Digital Agenda;

	<ul style="list-style-type: none"> large research and development projects in specific fields relevant to a sustainable industry.
Call set	Periodic calls.
Beneficiaries	Companies of any size, carrying out industrial activities for the production of goods and services as well as agro-industrial, artisan and transport activities, and providing services to companies that carry out the above-mentioned activities, as well as research centres with legal personality. Innovative start-up companies that carry out the above-mentioned activities and spin-offs of research organisations are also eligible. Eligible entities can also submit projects jointly, up to a maximum of five participants per project.
Funding	<p>Funding can take the following forms:</p> <ul style="list-style-type: none"> contribution to the expenditure, amounting to 20% of the eligible project costs; subsidized loans, amounting between 50 and 70% of the eligible costs for micro enterprises and SMEs, and between 50 and 60% of the eligible costs for large companies.
Project conditions	Productive investment programmes and/or environmental protection investment programmes are eligible for subsidies. To complete the above-mentioned investment programmes, the organisation's innovation projects are also eligible for an amount not exceeding 20% of total investments (eligible production and/or environmental protection) and 10% of eligible investments (eligible production and/or environmental protection), staff training projects.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> employees of the proposing company, people working for the proposing company with a project-based contract or a job administration contract, or beneficiaries of a specific research grant (limited to technicians, researchers and other auxiliary staff), to the extent that they contribute to the research and development activities carried out in the context of the project. Expenses of personnel carrying out administrative, accounting and commercial tasks are excluded; newly-manufactured tools and equipment, to the extent that and for the period in which they are used for the research and development project. If the tools and equipment are used for a period which is shorter than the useful life of the asset, only the ordinary tax amortisation rates relating to the period of implementation of the research and development project are eligible; consultancy and other services used in the context of the research and development project, including the acquisition or licensing of

	<p>research results, patents and know-how, through a transaction carried out at normal market conditions;</p> <ul style="list-style-type: none"> • general expenses directly deriving from the research and development project, charged pro-rata on the basis of the ratio between the overall value of the general expenses and the overall value of the company's personnel expenses. The above-mentioned expenses must be calculated with reference to the financial statements of the project period and, in any case, they cannot exceed 50% of the personnel expenses referred to in letter a); and • the materials used to carry out the project.
Project duration	Usually from 36 to 48 months, depending on the call.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Blending and sequencing are generally not allowed.
Any additional remark	Grants for large research and development projects are based on the resources of the fund. Projects must include eligible expenses ranging between €5 M and €40 M.

Programme	Relaunch of areas affected by an industrial crisis (law 181/89)
Country/Region	Italy/Taranto/Piombino/Terni/Trieste.
Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/interventi-settoriali-ambientali-e-in-aree-di-crisi
Main objective	Relaunching industrial activities, safeguarding employment levels, and supporting investment programmes and entrepreneurial development in areas affected by industrial and sectoral crises.
Topics	<ul style="list-style-type: none"> • Implementation of productive investment programmes and/or investment programmes for environmental protection; • Increase in the number of employees of the production unit covered by the investment programme.
Call set	Periodic calls.
Beneficiaries	SMEs, also in networks.
Funding	<p>Funding can take the following forms:</p> <ul style="list-style-type: none"> • subsidized loans amounting between 30% and 50% of the eligible investments. The return must take place within 10 years, to which a maximum pre-amortisation period of 3 years must be added;

	<ul style="list-style-type: none"> grants for plants and possibly a direct contribution to the expenditure determined within the maximum aid intensity provided for by the general block exemption regulation and the limits established by the national legislation. The amount of the contribution depends on the location and size of the company as well as on the type of aid scheme applicable; overall, the grant cannot exceed 75% of the total eligible costs.
Project conditions	Productive investment programmes and/or investment programmes for environmental protection are eligible for subsidies. To complete the above-mentioned investment programmes, the organisation's innovation projects are eligible for an amount not exceeding 20% of total investments (eligible production and/or environmental protection), and 10% of eligible investments (eligible production and/or environmental protection), staff training projects.
Eligible costs	The total eligible expenses of an investment programme must amount to at least €1 M. If an investment programme is submitted as a network contract, the individual investment programmes of the companies participating in the network must include total eligible expenses amounting to at least €400 K. Therefore, the overall expenses of a network contract must amount to at least €1.2 M.
Project duration	Usually from 36 to 48 months, depending on the call.
Starting and targeted TRL	Not specified.
Blending with other funding programmes	Combination with other support granted to the beneficiary on the same assets is allowed, unless the rules governing these other measures explicitly prohibit combination with general measures.
Sequencing	Not specified.

Programme	Aid to tackle the complex industrial crisis affecting the area of Taranto
Country/Region	Italy/Taranto
Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/interventi-settoriali-ambientali-e-in-aree-di-crisi/taranto-area-crisi-industriale
Main objective	Promoting reconversion and requalification projects.
Topics	The industrial area of Taranto has been recognized as “area affected by a complex industrial crisis” by decree-law n. 129 of 7 August 2012, including “Urgent provisions for the environmental remediation and the redevelopment of the territory of the city of Taranto” in accordance with the applicable regulations as consolidated by decree-law n. 83/2012 (article 27). In this context, on 26 April 2018 the Ministry of Economic Development, the National Agency for Active Labour Market Policies, the Ministry of the Environment and

	the Protection of the Territory and the Sea, the Ministry of Infrastructure and Transport, the Apulia Region, the Province of Taranto, the Municipality of Taranto, the Ionian Sea Port System Authority and the National Agency for the Attraction of Investments and Business Development signed a programme agreement for the implementation of the project for the industrial reconversion and requalification of the area of Taranto. The project aims at relaunching entrepreneurial activities, safeguarding employment levels, and supporting investment programmes and business development.
Call set	Periodic calls.
Beneficiaries	-
Funding	Definition of specific agreements.
Project conditions	<p>Projects include:</p> <ul style="list-style-type: none"> entrepreneurial initiatives capable of supporting the local economy, identifying sustainable development trajectories, promoting innovative projects for the integration of production chains, and supporting investment projects for process and/or product innovations; active policy services and measures, with particular reference to requalification and skill upgrading, aiming at re-employing workers belonging to a specific group through cooperation among all competent entities and integration of available resources.
Eligible costs	Innovation and investment projects.
Project duration	Based on the specific project.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Blending is generally not allowed.

Programme	Tax credit for investments in capital goods
Country/Region	Italy.
Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/credito-d-imposta-beni-strumentali
Main objective	Supporting investments in technologically-advanced capital goods.
Topics	Investments in new, tangible and intangible, capital goods, functional to the technological and digital transformation of production processes.
Call set	Yearly.

Beneficiaries	All enterprises based in the Italian territory, including permanent establishments of non-resident entities, regardless of the legal nature, the economic sector, the size, the accounting system and the system for determining income for tax purposes.
Funding	<p>A tax credit is recognized up to:</p> <ul style="list-style-type: none"> • 40% of the cost for the share of investments up to €2.5 M; • 20% of the cost for the share of investments over €2.5 M with overall eligible costs amounting to maximum €10 M. <p>For investments in intangible capital goods functional to 4.0 transformation processes, a tax credit is recognized up to 15% of the cost with eligible costs amounting to maximum €700 K. Expenses incurred for cloud computing solutions are also eligible for the portion attributable on an accrual basis.</p> <p>For investments in other tangible capital goods, a tax credit is recognized up to 6% of the cost with eligible costs amounting to maximum €2 M.</p> <p>The tax credit can be combined with other support to the same costs up to the costs incurred.</p>
Project conditions	<p>For technologically-advanced and intangible assets, companies are required to submit a simple technical report issued by an engineer or industrial expert registered in the relevant professional registers, or a certificate of conformity issued by an accredited certification body, proving that the goods have the necessary technical characteristics to be included in the relevant lists and are interconnected with the company production management system or the supply network. For goods with a unit cost of acquisition not exceeding €300 K, a declaration by the legal representative is sufficient.</p> <p>Companies wishing to take advantage of the instrument are required to make a communication to the Ministry of Economic Development. The form, including its content, and the methods and terms for the communication will be included in a specific director decree. The communication is requested only to gather the information necessary to evaluate the progress, uptake and effectiveness of the measures.</p>
Eligible costs	Technologically-advanced tangible capital goods; intangible capital goods.
Project duration	The tax credit applies to investments made from 1 January 2020 until 31 December 2020, or 30 June 2021 provided that the order is accepted by the seller by 2020 and at least 20% of the acquisition cost has already been paid in advance.
Starting TRL	Not applicable.
Targeted TRL	Not applicable.

Blending with other funding programmes and sequencing.	Combination with other incentives is possible up to the cost of the asset.
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Programme	Tax exemption for environmental investments (law 388/2000)
Country/Region	Italy.
Link to financing programme website	https://www.mise.gov.it/index.php/it/incentivi/impresa/agevolazioni-ambientali-l-388-2000
Main objective	Promoting environmental investments by SMEs.
Topics	The law contains provisions on the taxation of business income, establishing a tax exemption system for SMEs that make environmental investments.
Call set	Always open.
Beneficiaries	SMEs.
Funding	Tax credit.
Project conditions	<p>The law provides that:</p> <ul style="list-style-type: none"> the part of income of SMEs allocated to environmental investments is excluded from the taxable income for income taxes; 'environmental investment' means the purchase cost of the tangible fixed assets referred to in article 2424, first paragraph, letter b), point II of the civil code, which are necessary to prevent, reduce and repair damage caused to the environment, excluding investments made to comply with legal obligations; and to benefit from the tax exemption referred to in paragraph 13, companies are required to include the environmental investments made in the financial statements.
Eligible costs	Environmental investments.
Project duration	Applicable to the entire duration.
Starting TRL	1
Targeted TRL	9
Blending with other funding programmes and sequencing	Blending is generally not allowed.

Programme	Axis IV - CO ₂ emission reduction
Country/Region	Italy/Lombardy.

Link to financing programme website	https://www.fesr.regione.lombardia.it/wps/portal/PROUE/FESR/assi/asse-4-riduzione-co2#:~:text=Per%20contribuire%20a%20contenere%20le,di%20illuminazione%20pubblica)%20ed%20interventi
Main objective	Helping contain carbon emissions and reduce, in the 2014-20 period, the gap with respect to the target set by the Europe 2020 Strategy.
Topics	Axis IV supports measures aimed at reducing energy consumption in the public sector (public buildings and public lighting systems) and promoting low-carbon strategies in urban and metropolitan areas, in line with other regional sectoral instruments (Regional Energy and Environment Plan and Regional Plan for Measures for Air Quality).
Call set	Periodic calls.
Beneficiaries	Municipalities, also in association; PPPs; local bodies; public companies and public-owned companies; public bodies and owners or managers of areas for public use; the Lombardy Region; territorial bodies; managers of the local public transport/railway network/regional railway service.
Funding	Budget: €194 M.
Project conditions	<ul style="list-style-type: none"> • Reduction of energy consumption in residential and non-residential buildings and structures which are public or for public use, and integration of renewable sources; • increase of sustainable mobility in urban areas; • development of the infrastructure necessary for the use of vehicles with low environmental impact (charging hubs); • renewal of the rolling stock.
Eligible costs	Research and experimental development.
Project duration	Generally from 2 to 3 years.
Starting TRL	Not specified.
Targeted TRL	Not specified.
Blending with other funding programmes	ERDF.
Sequencing	Not specified.

Programme	Energy efficiency of SMEs
Country/Region	Italy/Veneto.
Link to financing programme website	https://www.regione.veneto.it/web/programmi-comunitari/fesr-2014-2020

Main objective	Containing energy expenditure, reducing climate-altering gas emissions and using renewable sources based on energy saving opportunities.
Topics	Reducing energy consumption and climate-changing gas emissions in companies through continuous monitoring of energy flows as well as the development of good practices, the installation of high-efficiency systems, and the integration of systems and components capable of containing energy consumption in production processes.
Call set	Periodic calls.
Beneficiaries	SMEs. The project can be carried out individually or in collaboration.
Funding	Budget: €13 M. Instrument: grant. Co-financing rate: 30% of the accepted costs. Minimum contribution: €24 K; maximum contribution: €150 K.
Project conditions	The project must be carried out in the territory of the Veneto Region.
Eligible costs	Eligible costs are the following: <ul style="list-style-type: none"> • purchase of machinery, plants, equipment, systems and components; • technical staff; • construction and plant works, also for the production of energy from renewable sources; • issuance of environment/energy management certificates by bodies accredited by the Italian certification body or the corresponding foreign certification bodies responsible for the specific standard to be certified; and • premiums paid for guarantees.
Project duration	Expenses must be incurred and paid between the date of submission of the application and 10 May 2022.
Starting and targeted TRL	Not specified.
Blending with other funding programmes	ERDF regional operating programme 2014-20, axis IV, action 4.2.1.
Sequencing	Not specified.

The **Accordo di Programma** ('Programme Agreement')²⁰ is related to a Fund for industrial sustainable growth and provides support to R&D&I in the framework of agreements between the Ministry of Economic Development, and regions and/or other public administrations. The programme is aimed at promoting the competitiveness of big industries and/or specific regions by supporting innovation projects, including technological clusters, with positive effects on employment. The overall financial support amounts to €80 M. Regional co-financing is envisaged up to almost 10% of government support. No strict criteria are identified for R&D projects and only the main guidelines of the projects are considered to guarantee uniform use of the fund actions in terms of duration, eligible expenses and relevant technologies. Projects should be in line with H2020.

The ministerial decree of 7 December 2016 regulates the methods and terms for granting subsidies to **development programmes for environmental protection**. Without prejudice to compliance with the general requirements set out in the development contract regulations, the notice provides eligibility only for development programmes for environmental protection (excluding R&D&I projects) which allow for the reduction of energy consumption and climate-changing gas emissions from companies and production areas. Companies of any size which can implement programmes in relation to local units belonging to the sectors of economic activity qualifying as energy-intensive can access the instrument (the attachment to the decree identifies the eligible economic activities by making reference to the codes for the classification of economic activities). Most probably, also companies of any size qualified as EIs and included in a specific list prepared by the *Cassa per i servizi energetici e ambientali* (Body for energy and environment services) will be able to benefit from the instrument. The subsidized programmes must involve local units located in the least developed regions (Basilicata, Campania, Calabria, Apulia and Sicily).

3.1.7. Luxembourg

The two main public funding opportunities offered in **Luxembourg** are described below.

Programme	MECO Funding agency: Luxembourgish Ministry of Economy
Country/Region	Luxemburg
Link to financing programme website	https://mecco.gouvernement.lu/
Main objective	Promoting industrial research and industrial development.
Topics	Any industrial topic.
Call set	Continuous call; in general, a decision is made six months after submission of the application.

²⁰ For further details, please see

<https://www.sviluppoeconomico.gov.it/index.php/it/incentivi/impresa/fondo-per-la-crescita-sostenibile/progetti-di-ricerca-e-sviluppo-accordi-di-programma>.

Beneficiaries	Small to large companies. Consortia of Luxembourgish companies and financial partners (public institutes, universities, etc.) or (foreign) third parties as sub-contractors.																							
Funding	<p>Instrument: grant.</p> <p>Maximum funding: not specified.</p> <p>Figure 10: Maximum aid intensity by enterprise size</p> <table><tr><th>Maximum Aid Intensity</th><th>Large Enterprise</th><th>Medium-Sized Enterprise</th><th>Small Enterprise</th></tr><tr><td>Experimental development</td><td>25%</td><td>35%</td><td>45%</td></tr><tr><td>Experimental development + collaboration</td><td>40%</td><td>50%</td><td>60%</td></tr><tr><td>Industrial research</td><td>50%</td><td>60%</td><td>70%</td></tr><tr><td>Industrial research + collaboration</td><td>65%</td><td>75%</td><td>80%</td></tr></table> <p>Source: Luxembourgish Ministry of Economy.</p>				Maximum Aid Intensity	Large Enterprise	Medium-Sized Enterprise	Small Enterprise	Experimental development	25%	35%	45%	Experimental development + collaboration	40%	50%	60%	Industrial research	50%	60%	70%	Industrial research + collaboration	65%	75%	80%
Maximum Aid Intensity	Large Enterprise	Medium-Sized Enterprise	Small Enterprise																					
Experimental development	25%	35%	45%																					
Experimental development + collaboration	40%	50%	60%																					
Industrial research	50%	60%	70%																					
Industrial research + collaboration	65%	75%	80%																					
Project conditions	As calls are continuously open and can be activated at any moment, the funding system is very flexible. If rejected, proposals can be re-submitted after modification. Sequential projects are allowed. The success rate is high.																							
Eligible costs	Fixed assets and investments; staff cost; materials; external collaborations and sub-contractors; industrial property protection; and investments.																							
Project duration	Maximum 3 years.																							
Starting and targeted TRL	Not specified.																							
Blending with other funding programmes and sequencing	Official blending is not allowed. Sequencing is allowed, depending on how research activities are organised.																							

Programme	BRIDGE Funding agency: Luxembourgish National Research Fund
Country/Region	Luxembourg.
Link to financing programme website	https://www.fnr.lu/funding-instruments/bridges/
Main objective	Supporting advanced technological research.
Topics	Any industrial topic needing considerable R&D activities.
Call set	Two calls per year; a decision is made within three months after the submission deadline.

Beneficiaries	Collaboration between at least one national public research institute and national/international small to large companies.
Funding	Max. funding: €400 K. Luxembourg-based collaborating companies are required to cover 15% of eligible costs. International collaborating companies are required to cover 30% of eligible costs.
Eligible costs	Fixed assets and investments; staff cost; materials; external collaborations and sub-contractors; industrial property protection; and investments.
Project duration	From 12 to 36 months.
Starting and targeted TRL	Not specified.
Blending with other funding programmes and sequencing	Official blending is not possible. Sequencing is possible, depending on how research activities are organised.

3.1.8. The Netherlands

The government of **the Netherlands** has the ambition to be a frontrunner and EU leader in climate change. Therefore, new policies and strategies are under development to support that ambition:

- ***Klimaatakkoord (Climate Agreement)***. In 2015 the Netherlands signed the Paris climate convention, which was then transposed into the Climate Act. This law provides that CO₂ emissions must be reduced by 49% by 2030 and by 95% by 2050, compared to 1990. In addition, the share of renewable energy must increase to 100% by 2050. In 2019 the Dutch government organised thematic round tables with more than 100 parties/stakeholders to discuss measures for reducing GHGs and generating clean energy. At the end of the process, the Climate Agreement was signed, covering five sectors (the so-called climate tables): built environment; mobility; industry; electricity; and agriculture. The Climate Agreement will be implemented step by step. First, all measures need to be precisely defined and policies need to be transposed into legislation by the Dutch parliament. Five regional geographical clusters, representing government parties, the industry, the communities and other stakeholders, will be in charge of the implementation of the measures developed in the context of the Climate Agreement;
- ***Demonstratie Energie- en Klimaatinnovatie (Demonstration Energy and Climate Innovation)***. In line with the objectives of the Climate Agreement, the Dutch government wants to support industry for investments aimed at innovative demonstration projects in the field of CO₂ emission reduction in industry and flexibilization of the electricity system. Focus areas include: energy innovation and efficiency; renewable energy (including flexibilization of the electricity system, through e.g. hydrogen and spatial integration); carbon capture and usage or storage (CCUS) (ZEP, 2018); and other CO₂ emission reduction measures in the industry or electricity sector;

- **Public-Private Partnership with Knowledge and Innovation Covenant.** In 2019 the Dutch industry, universities and science foundations as well as the Dutch government signed an agreement to jointly invest €4.9 B annually, of which €2.85 B from public funds. The focus of the cooperation is on four societal themes of the mission-driven knowledge and innovation policy: energy transition and sustainability; agriculture; water and food; and health, care and safety. The thematic missions, and the knowledge and innovation agendas should pay particular attention to putting the expected results into practice; and
- **Stimuleringsregeling Duurzame Energietransitie (Stimulating Sustainable Energy Production Scheme) and Sustainable Energy Transition Incentive Scheme.** The Stimulating Sustainable Energy Production Scheme has been the main instrument for the development of a sustainable energy supply in the Netherlands since 2011. The scheme focuses on all forms of energy production by means of renewable sources and provides a subsidy on the operational costs. In 2020, the existing scheme was renamed Sustainable Energy Transition Incentive Scheme and broadened to other categories of production of renewable energy and CO₂-reducing options. The focus was changed from energy production towards energy transition. The scheme will support the transition by means of a subsidy compensating the inevitable loss related to these techniques. The current technologies will continue to be covered by the new scheme, but will be supplemented with other techniques that save CO₂ such as CCS, waste heat utilisation, hydrogen production by electrolysis, electric boilers and heat pumps in industry. The list of techniques will be reviewed on a regular basis and, if needed, additional or new techniques can be added in the future.

In the following tables, other main programmes are shown.

Programme	<i>Demonstratie Energie- en Klimaatinnovatie</i> (Demonstration Energy and Climate Innovation)
Country/Region	Netherlands.
Link to financing programme website	https://www.rvo.nl/subsidie-en-financieringswijzer/demonstratie-energie-en-klimaatinnovatie-dei-2020
Main objective	Subsidizing pilots and demonstrators of innovative CO ₂ emission reduction technologies.
Topics	<ul style="list-style-type: none"> • Energy innovation; • energy efficiency; • renewable energy (including flexibility of the electricity system, through e.g. hydrogen and spatial integration); • local infrastructure; • CCUS; • other CO₂-reducing measures in the industry or electricity sector; • natural gas-free houses, neighbourhoods and buildings.

Call set	Yearly.		
Beneficiaries	Industry and sub-contractors.		
Funding	Budget: €86.1 M. Funding per project: €10 to 15 M, depending on the sort of project.		
Project conditions	Type of project	Grant	Note
	Pilot project/experimental development	25% 80%	For businesses For research organisations (non-economic activities)
	Environmental project/other CO ₂ -reducing measures (demo)	40%	Eligible costs: additional costs compared to the less environmentally-friendly investment that would have been made without the aid.
	Recycling project (demo)	35%	Eligible costs: additional costs compared to a conventional re-use and recycling process with the same capacity that would have been built without the aid.
	Infrastructure project (local infrastructure) (demo)	50%	Subsidy ≤ investment costs - operating profit
	Energy efficiency	30%	Eligible costs: additional costs compared to the less environmentally-friendly investment that would have been made without the aid.
	Renewable energy (demo)	45%	If: a) the investment can be identified as a separate investment; b) the investment is offset against reference costs.
		30%	c) for small installations for which no comparable traditional system exists.

	All projects	+10 percentage points +20 percentage points	For medium-sized companies For small businesses
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • Labour costs, with a fixed hourly rate of € 60; • cost of purchased machines and equipment; • cost of consumed materials and resources; • outsourcing costs (costs of third parties); and • investments. 		
Project duration	Maximum 4 years.		
Starting TRL	6-7		
Targeted TRL	8-9		
Blending with other funding programmes	Blending is not allowed.		
Sequencing	Sequencing is allowed.		

Programme	<i>Stimuleringsregeling Duurzame Energietransitie</i> (Sustainable Energy Transition Incentive Scheme)
Country/Region	Netherlands.
Link to financing programme website	https://english.rvo.nl/subsidies-programmes/sde
Main objective	Extending subsidies for technologies for the production of renewable energy to energy transition, with a focus on technologies for GHG emission reduction.
Topics	<ul style="list-style-type: none"> • Renewable energy (solar, wind, geothermic, etc.); • CCS; • hydrogen per pyrolysis; • industrial heat.
Call set	Yearly.
Beneficiaries	Industry and sub-contractors.
Funding	Budget: €5 B. Subsidies are granted per ton of avoided carbon.
Eligible costs	-
Project duration	-

Starting TRL	High TRL
Targeted TRL	8-9
Blending with other funding programmes	Blending is not allowed.
Sequencing	Sequencing is allowed.

3.1.9. Poland and related regions

In **Poland**, R&D projects are financed from two sources: (i) the state budget; and (ii) EU funds, through the so-called operational programmes. Government operational programmes were established for successive budget periods (2000-06, 2007-13, 2014-20 and 2021-27). In the past, the following programmes were implemented: the sectoral operational programme for the improvement of enterprise competitiveness (2004-06) and the innovative economy operational programme (2007-13). Currently, the smart growth operational programme is being implemented and an operational programme for increased innovation and digitisation in the Polish economy is expected to be approved for the period 2021-27.

Currently, most of the applied research is co-financed precisely from the smart growth operational programme, established for the period 2014-20. The objectives set for operational programmes, however, are short-term and do not relate to the reduction of CO₂ emissions. As a result, no funds are specifically allocated for the implementation of projects reducing these emissions. In any case, the programmes which are currently implemented under the smart growth operational programme include two programmes of general nature with funds for the steel sector (**Fast Track** and **Demonstrator**) and one programme established for the steel sector only (**Innostal**).

The National Centre for Research and Development (which combines national resources with EU funds) also provides funding for R&D works at the national level. A variety of projects exist based on the size of the enterprises (employment, budget, etc.): projects for large enterprises, SMEs and micro enterprises; projects for consortia of several enterprises and consortia of enterprises and scientific units; and competitions for universities and research institutes. More in detail, national funds finance R&D works carried out as part of subsequent competitions under the strategic R&D programme Modern Material Technologies (or TECHMATSTRATEG,²¹ currently at the 3rd competition), which is open to consortia of enterprises and scientific units in the number of three to seven. The National Centre for Research and Development also finances a series of TANGO competitions (currently at the 4th competition) directed to scientific units, and scientific and industrial consortia conducting conceptual work, industrial research and development work based on the results of basic research previously financed by the National Science Centre.

In addition, funds for R&D are available for entrepreneurs under the Eastern Poland operational programme and 16 regional operational programmes for individual voivodships. Regional programmes managed by the voivodship self-government mainly finance low-cost projects for SMEs. They aim at promoting research, development and innovation in enterprises; strengthening

²¹ For further detail, please see: <https://www.ncbr.gov.pl/programy/programy-strategiczne/nowoczesne-technologie-materialowe-techmatstrateg/>.

the innovation potential of enterprises; and supporting enterprises wishing to start or develop their activities. For large enterprises, these programmes offer low-interest loans for environmental protection, reduction of gas and waste emissions, and reclamation of post-industrial areas (e.g. Śląskie Voivodeship).

In the Innostal III programme, the minimum value of eligible costs of the co-financed project was PLN2 M and the maximum value was PLN30 M. In the TECHMATSTRATEG programme, the minimum value of eligible costs is PLN5 M. The maximum co-financing value is PLN30 M. The co-financing rate varies depending on the size of the enterprises and the type of work: conceptual work is co-financed at 90% without differentiation; industrial research is co-financed at 70% for micro and small enterprises, 60% for medium enterprises and 50% for large enterprises; and development work is financed at 45% for micro and small enterprises, 35% for medium enterprises and 25% for large enterprises. In the Fast Track programme, the minimum value of eligible costs is PLN1 M for SMEs and PLN2 M for the other entities. The total value of eligible costs may not exceed €50 M. The intensity of public aid for industrial research is 70% for micro and small companies, 60% for medium companies and 50% for large companies. These values may increase by 10% (bonus) for the dissemination of results at conferences and in publications. The public aid intensity for development work is 45% for micro and small companies, 35% for medium companies and 25% for large companies, and the bonus is 15%. For scientific units, the co-financing rate is 100% regardless of the type of research.

There is a wide variety of periods for establishing programmes and announcing competitions. The TECHMATSTRATEG programme has been established annually for three years. In the TECHMATSTRATEG III programme, the call for proposals lasted from 30 December 2019 to 29 April 2020. In the 4th TANGO competition, the call for proposals runs from 29 November 2019 to 30 June 2020, broken down into three 2-month rounds. As part of the smart growth operational programme, various thematic competitions are announced approximately every quarter. In a typical competition, the application preparation period does not exceed six months: e.g. a competition was announced on 7 January 2020, and the call for proposals started on 7 February 2020 and ended on 18 June 2020. In the case of the Fast Track programme, the application preparation period is shortened to three months: e.g. in the Fast Track call for Mazovia, the competition was announced on 9 March 2020, and the call submission period started on 9 April 2020 and ended on 14 May 2020. The period from the establishment of the programme to the conclusion of the contract and the start of the project is at least 12 months.

The proposed **Integrated National Energy and Climate Plan**²² also promotes the development of R&I that contributes to the decarbonisation of the industrial sector. The plan puts special focus on EILs, in particular on the steel sector as the largest industrial emitter of CO₂ in the country. The plan emphasises the importance of developing technologies that enhance low-energy manufacturing processes in industry.

Programme	Fast Track
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²² For further details, please see

https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_sk_necp.pdf

	Company size	For industrial research	For industrial research incl. bonuses	For experimental development	For experimental development incl. bonuses	For pre-implementation works – <i>de minimis</i>	For pre-implementation works - advisory services for SMEs
	Micro	70%	80%	45%	60%	90%	50%
	Small	70%	80%	45%	60%	90%	50%
	Medium	60%	75%	35%	50%	90%	50%
	Large	50%	65%	25%	40%	90%	not applicable
Bonuses are meant for the commitment to widely disseminate project results.							
Project conditions	<ul style="list-style-type: none"> Co-financing applies to projects that include: <ul style="list-style-type: none"> industrial research and experimental development; or experimental development. The project may additionally include pre-implementation works. The amount of eligible costs for pre-implementation works may not exceed 20% of the total eligible costs of the project. The co-financed project must relate to at least one national smart specialisation. The project must end by 31 December 2023. When a project is carried out by a consortium, each consortium member participates in the industrial research or experimental development work. The project may be co-financed if the applicant undertakes to implement the results of industrial research and experimental development/experimental development work within three years of the completion of the project. The eligible costs of the project must amount to at least PLN1 M (€250 K) for a single SME and PLN2 M (€500 K) for a higher number of entities. The eligible costs of the project can amount to maximum €50 M. 						
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> materials (raw materials, reagents, etc.); maintenance of technological lines, experimental installations, etc. during the period and in the proportion of use in the project; elements used for construction and permanently installed in the prototype, pilot or demonstration installation; advisory and equivalent services; external services (maintenance services, repair costs, transport services, etc.); participation in conferences; training of employees who carry out research tasks; separate bank account; project promotion; 						

	<ul style="list-style-type: none"> • external audit; • delegations; • salaries; • costs of scientific research apparatus and other devices serving research purposes (purchase, depreciation); • costs of technical knowledge and patents purchased or used under licenses, obtained from third parties under market conditions; • buildings and land costs; • subcontracting costs; • costs of renting or maintaining buildings, including renting, cleaning and protecting premises; • costs of adapting the rooms for the purposes of the project; • infrastructure maintenance costs (utility costs as electricity, gas, heating and water, waste disposal, periodic maintenance and inspection of equipment, etc.); • remuneration costs of the management, administrative, technical and support staff involved in the permanent operation of the unit and only indirectly involved in the implementation of the project (unit managers, accounting, occupational health and safety, etc.); • postal, telephone, internet and courier services; • costs of office and stationery, printing services and photocopiers; • costs of office appliances and equipment; • property insurance costs; • investment outlays are not eligible costs: only the cost of building a demonstration installation that cannot serve commercial purposes is acceptable. This installation can be converted into an industrial installation after the end of the project.
Project duration	Up to three or five years. The project must end by 31 December 2023.
Different funding sources	The programme does not allow other public sources of financing. The beneficiary is required to make an own contribution to cover part of the eligible costs of the implemented project. Own contribution can only be made in cash.
Starting TRL	Minimum 2
Targeted TRL	As high as possible, 9
Blending with other funding programmes	The programme does not allow other public sources of financing. The projects are financed from two sources, i.e. the applicant's own resources and co-financing in accordance with the principles set out in the Funding section.
Sequencing	Sequencing is not allowed.
Any additional remark	The Fast Track programme does not provide funding for CO ₂ emission reduction in the steel sector.

Programme	Demonstrator																
Country/Region	Poland																
Link to financing programme website	https://www.ncbr.gov.pl/programy/programy-krajowe/demonstrator-wsparcie-badan-naukowych-i-prac-rozwojowych-w-skali-demonstracyjnej/																
Main objective	Strengthening the transfer of research results to the economy by supporting research and development projects in the field of developing a new technology or product, including testing the developed solution on a demonstration scale.																
Topics	<p>The projects submitted in the competition, covering industrial research and development works, focus on searching for new solutions and implementing innovative technologies, including:</p> <ul style="list-style-type: none">• large integrated research and development projects aimed at commercialising research results covering all stages from scientific research to preparation of an innovative product (technology) tested on a pilot/demonstration installation;• construction of pilot/demonstration installations for testing new technological solutions developed in research organisations or enterprises.																
Call set	Competitions are announced irregularly: 1 st competition - May 2015, 2 nd competition - December 2015. These competitions were preceded by a pilot project (Demonstrator+) - March 2013.																
Beneficiaries	Entrepreneurs or scientific consortia comprising at least one scientific unit and one entrepreneur (consortium leader) in the 1 st competition; only entrepreneurs in the 2 nd competition.																
Funding	<p>Maximum funding for project:</p> <table><tr><th>Company size</th><th>Industrial research</th><th>Development works</th><th>Technical feasibility studies for development works</th></tr><tr><td>Small</td><td>80%</td><td>60%</td><td>50%</td></tr><tr><td>Medium</td><td>75%</td><td>50%</td><td>50%</td></tr><tr><td>Large</td><td>65%</td><td>40%</td><td>40%</td></tr></table> <p>Total amount for co-financing the programme (last competition): PLN500 M (€125 M).</p>	Company size	Industrial research	Development works	Technical feasibility studies for development works	Small	80%	60%	50%	Medium	75%	50%	50%	Large	65%	40%	40%
Company size	Industrial research	Development works	Technical feasibility studies for development works														
Small	80%	60%	50%														
Medium	75%	50%	50%														
Large	65%	40%	40%														
Project conditions	<ul style="list-style-type: none">• Applicants are entrepreneurs or scientific consortia.• The eligible costs of the project must amount to at least PLN5 M (€1.25 M).• The eligible costs can amount to maximum PLN100 M (€25 M).• The project implementation period is maximum three years.																

	<ul style="list-style-type: none"> • The project must relate to one of the national smart specialisations (2nd competition). • The eligible costs of industrial research can account for up to 15% of the total eligible costs of the project. • For large enterprises, the basic gross public aid intensity may not exceed: • 50% of eligible costs for industrial research; and • 25% of eligible costs for development works. • The intensity of public aid can be increased if the applicable conditions specified in the regulation on public aid are met. • Where pilot or demonstration projects are to be subsequently used for commercial purposes, any revenue generated in this respect should be deducted from the amount of eligible costs for public aid.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • salaries; • costs of scientific and research apparatus and other devices used for carrying out research; • land and building costs, to the extent and for the period they are used to implement the project; • subcontracting of research services based on a contract, technical knowledge and patents; • other operating costs, including costs of purchasing and consuming materials, supplies and similar products incurred directly in connection with the implementation of the project; • additional overheads incurred directly in connection with the project implementation, with flat-rate billing: up to 8% of the total eligible costs for entrepreneurs and up to 15% of the total eligible costs for scientific units; • costs of components for construction and permanently installed in a prototype, pilot or demonstration installation; • activities related to experimental production and testing of products, processes and services, provided that they are not used or transformed for industrial or commercial applications.
Project duration	Three years
Different funding sources	The programme does not allow other public sources of financing. The beneficiary is required to make an own contribution to cover part of the eligible costs of the implemented project.
Starting TRL	Minimum 6.
Targeted TRL	Higher than the starting, up to 9.

Blending with other funding programmes	The programme does not allow other public sources of financing. The projects are financed from two sources, i.e. the applicant's own resources and co-financing in accordance with the principles set out in the Funding section.
Sequencing	Sequencing is not allowed.
Any additional remark	The Demonstrator programme does not provide funding for CO ₂ emission reduction specifically for the steel sector.

Programme	Innostal																
Country/Region	Poland																
Link to financing programme website	https://www.ncbr.gov.pl/programy/fundusze-europejskie/poir/konkursy/konkurs-2-1-2-2019/																
Main objective	Promoting industrial research and/or experimental development work, which can be supplemented with pre-implementation work, in the steel sector.																
Topics	<ul style="list-style-type: none">• New and improved steel products and their production technologies;• new and improved input materials and alloys for metallurgical production;• recovery and recycling of raw materials from metallurgical waste and scrap;• optimisation of energy consumption, input materials, utilities as well as metallurgical tools and equipment;• innovative systems and technologies that reduce harmful emissions to the environment;• innovative solutions modernising and supporting metallurgical technological processes.																
Call set	Three competitions were announced in 2016, 2017 and 2019.																
Beneficiaries	The Innostal sectoral programme, aimed at financing R&D works in the steel sector, was created as a response to the needs of associated entrepreneurs operating in and representing the steel sector. The programme was established on the basis of a feasibility study submitted by the Polish Steel Association. Innostal is a one-off initiative.																
Funding	<div>Maximum funding for projects:</div> <table><tr><th>Company size</th><th>Industrial research</th><th>Experimental development works</th><th>Pre-implementation</th></tr><tr><td>Small</td><td>70-80%</td><td>45-60%</td><td>90%</td></tr><tr><td>Medium</td><td>60-75%</td><td>35-50%</td><td>90%</td></tr><tr><td>Large</td><td>50-65%</td><td>25-40%</td><td>90%</td></tr></table> <div>For industrial research and experimental development works, the public aid intensity is increased to the maximum (bonus) if the project is implemented</div>	Company size	Industrial research	Experimental development works	Pre-implementation	Small	70-80%	45-60%	90%	Medium	60-75%	35-50%	90%	Large	50-65%	25-40%	90%
Company size	Industrial research	Experimental development works	Pre-implementation														
Small	70-80%	45-60%	90%														
Medium	60-75%	35-50%	90%														
Large	50-65%	25-40%	90%														

	<p>under the so-called effective cooperation of consortium members or if beneficiaries commit to widely disseminating project results. For the above-mentioned research, scientific units are entitled to 100% funding.</p> <p>Total amount for co-financing the programme: PLN120 M (€30 M) for the 1st competition, PLN95 M (€24 M) for the 2nd competition and PLN190 M (€48 M) for the 3rd competition.</p>
Project conditions	<ul style="list-style-type: none"> • Applicants are entrepreneurs only (1st and 2nd competition) or consortia of enterprises and scientific units (3rd competition). • The eligible costs of the project must amount to at least PLN2 M (€500 K). • The eligible costs can amount to maximum PLN30 M (€7.5 M). • The project implementation period is three years for the 1st and 2nd competition and four years for the 3rd competition. • Projects are implemented in less developed regions (except for the Mazowieckie Voivodship). • Research results must be implemented within three years of project completion. • The project must include experimental development. • Pre-implementation works can account for up to 20% of the eligible costs of the project. • For industrial research and development works sub-contracting is limited to: <ul style="list-style-type: none"> ○ 50%-60% of eligible costs for entrepreneurs; and ○ 10% of eligible costs for scientific units.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • salaries; • subcontracting; • costs of apparatus and intangible assets; • buildings and land costs; • other operational costs; • indirect costs; • investment outlays are not eligible; only the costs of components for construction and permanently installed in a prototype, pilot or demonstration installation are eligible.
Project duration	<p>36 months for the 1st and 2nd competition and 48 months for the 3rd competition. Projects must end by 31 December 2023.</p>
Different funding sources	<p>The programme does not allow other public sources of financing. The beneficiary is required to make an own contribution to cover part of the eligible costs of the project. Own contribution can only be made in cash.</p>
Starting TRL	<p>2</p>

Targeted TRL	9
Blending with other funding programmes	The programme does not allow other public sources of financing. The projects are financed from two sources, i.e. the applicant's own resources and co-financing in accordance with the principles set out in the Funding section.
Sequencing	Sequencing is not allowed.
Any additional remark	The Innostal sector programme was one of several programmes established for various sectors of the Polish economy. It is financed under priority I "Support for conducting R&D works by enterprises" of the smart growth operational programme 2014-20. The Innostal programme does not provide funding for CO ₂ emission reduction in the steel sector.

3.1.10. Spain and related regions

The Spanish State Plan for Scientific and Technical Research and Innovation 2017-20 is the programming instrument for the development, financing and implementation of the public policies of the general administration of the state on the promotion and coordination of R&D&I. The plan is articulated through four national programmes that are developed through subprogrammes with specific objectives and which include state, annual and multiannual public aid dedicated to activities of R&D&I that is granted through competitive concurrence calls:

- **National Programme for the Promotion of Talent and its Employability.** It aims at financing and incentivising, by means of competitive tendering, the training and specialisation of human resources involved in R&D&I, and promoting their employment within public and private sectors, as well as facilitating mobility as fundamental part of the research career;
- **National Programme to encourage the Generation of Knowledge and Strengthening of the R&D&I System.** It aims at the consolidation and strengthening of scientific and technological knowledge at public research organisations as well as the main national research infrastructures;
- **National Programme on Business Leadership in R&D&I.** It is focused on the activation of private investment in R&D&I, and the strengthening of the technological and innovative capacities of the industrial sector in order to boost the competitiveness and growth of the Spanish economy; and
- **National Programme for R&D&I oriented to the Challenges of Society.** This programme aims at finding innovative ideas and technologies in order to contribute to overcoming the challenges that, due to their nature and complexity, have a global dimension and impact on prosperity and quality of life.

Public R&D funding is mostly organised through research projects on a competitive basis and is granted by two **national funding bodies**, both attached to the Ministry of Science, Innovation and Universities:

- the National Research Agency, that has the mission of promoting research in science and technology in all areas of knowledge and uses scientific or technical merit as main criterion for the allocation of resources; and
- the Centre for Industrial Technological Development (CDTI),²³ which is responsible for fostering industrial innovation, and uses technical or market merit and the socioeconomic impact of projects as a criterion for the allocation of resources.

The National Programme on Business Leadership in R&D&I includes the national subprogramme called R&D&I Business. The CDTI, as a funding agent, is the main responsible for the subprogramme. This subprogramme includes, among other actions, the launch of strategic sectoral business innovation initiatives. Those are defined as major R&D&I-intensive strategic initiatives that incorporate the latest scientific-technical trends, developments and challenges to identify and solve the challenges facing, in the future, productive sectors critical to the Spanish economy and job creation. These initiatives are developed in public-private collaboration. Strategic sectoral business innovation initiatives can be financed by the **Science and Innovation Missions Programme**.²⁴ This programme aims at financing large strategic R&D initiatives, carried out by a group of companies with the relevant participation of research bodies, technology centres and universities, whose objective is to contribute to the development of the five missions identified because of their great relevance to the future challenges of Spain. The five missions identified in the 2019 call, that was closed in June 2020, are (i) safe, efficient and clean energy for the 21st century; (ii) sustainable and intelligent mobility; (iii) large, sustainable and healthy agri-food sector; (iv) promotion of the Spanish industry in the industrial revolution of the 21st century; and (v) sustainable response to diseases and needs arising from aging. Within the first mission, the idea is to promote the decarbonisation of the Spanish economy to drastically reduce the emission of polluting gases (CO₂, NO₂, etc.), as well as energy dependence on fossil fuels in Spain by investing in R&D in renewable and sustainable energies.

Programme	Science and Innovation Missions Programme
Country/Region	Spain
Link to financing programme website	http://www.cdti.es/index.asp?MP=100&MS=902&MN=2&TR=C&IDR=2902&r=2560*1440
Main objective	Supporting large strategic R&D-intensive initiatives, developed in private-public collaboration, incorporating the latest scientific-technical trends and challenges to identify and solve the challenges faced by productive sectors critical to the Spanish economy.
Topics	Cross-sectoral, according to the selected missions.
Call set	First call opened.
Beneficiaries	Groups of companies in two categories:

²³ For further information, please see <https://www.cdti.es/>

²⁴ For further details, please see <http://www.cdti.es/index.asp?MP=100&MS=902&MN=2>

	<ul style="list-style-type: none"> missions for large companies, with consortia between three and eight partners, of which at least one must be an SME, led by a large company; missions for SMEs, with consortia between three and six partners, all of them SMEs, led by a medium-sized enterprise.
Funding	<p>Maximum co-financing rate:</p> <ul style="list-style-type: none"> industrial research: 65% for large enterprises, 75% for medium-sized enterprises and 80% for small companies; experimental development: 25% for large enterprises, 35% for medium-sized enterprises and 45% for small companies. <p>For each project and beneficiary, the aid intensity limit is given by the weight of each type of activity (industrial research or experimental development) and by the maximum intensity corresponding to each case.</p>
Project conditions	<p>Any participant can be responsible for more than 50% of the project's eligible costs.</p> <ul style="list-style-type: none"> Missions for large companies: <ul style="list-style-type: none"> minimum eligible costs: €5 M; maximum eligible costs: €10 M; minimum eligible costs per company: €175 K; eligible costs for industrial research: at least 85% of the total; outsourcing with knowledge centres (RTOs): at least 20% of the eligible costs. Missions for SMEs: <ul style="list-style-type: none"> minimum eligible costs: €1.5 M; maximum eligible costs: €3 M; minimum eligible costs per company: €175 K; eligible costs for industrial research: at least 60% of the total; outsourcing with knowledge centres (RTOs): at least 15% of the eligible costs.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> personnel costs; instrument and material costs; contractual research costs; technical knowledge and patents acquired at market prices; additional overhead and operating expenses arising directly from the project; expenditure for the auditor report; instrumental and material inventory costs are accepted to the extent they are used for the project and only amortisation costs corresponding to the project duration can be considered.

Project duration	Missions for large companies: 3-4 years. Missions for SMEs: 2-3 years.
Starting and targeted TRL	The programme is not tied to any TRL.
Blending with other funding programmes and sequencing	Aid granted within the framework of this call is incompatible, during its execution period, with any other public aid at European, state or regional level with the same objectives and purpose.

Programme	CIEN Strategic Programme
Country/Region	Spain
Link to financing programme website	https://www.cdti.es/index.asp?MP=100&MS=803&MN=2
Main objective	<p>Financing large industrial research projects developed in collaboration with business groups and aimed at conducting a planned research in strategic areas of the future with potential international projection.</p> <p>The projects will aim at carrying out industrial research activities in which knowledge and techniques are acquired that may be useful for the creation of new products, processes or services, or contribute to a significant improvement in existing products, processes or services, always incorporating relevant specific developments. These projects may include the creation of complex system components that are necessary for industrial research, especially the validation of generic technology, except prototypes. In addition, projects may also include some experimental development activity.</p>
Topics	Cross-sectoral.
Call set	Open all year.
Beneficiaries	Consortia consisting of groups of companies, formalised by means of a private agreement of collaboration. Each consortium must consist of a minimum of three and a maximum of eight companies; at least two of them must be autonomous and at least one should be considered as SME.
Funding	<p>Partially-repayable grant covering up to 85% of the approved budget:</p> <ul style="list-style-type: none"> • repayable tranche of the aid: one-year Euribor fixed at the date of approval of the grant, to be paid in 7-10 years, with 2-3 years of grace; • non-repayable tranche of the aid: amounting to 33%, calculated on the 75% financial aid coverage. <p>Advance of 35% of the aid with a limit of €250 K, without requiring additional guarantees.</p>

Project conditions	<p>The minimum and maximum budgets to be financed amount to €5 M and €20 M, respectively. The minimum budget to be financed by the project and the company is €4.5 M and €175 K, respectively.</p> <p>The participation of the companies in the consortium must be balanced, so that none of the participating autonomous companies, or groups of related or associated companies can exceed 70% of the project's eligible budget.</p> <p>At least 50% of the budget must correspond to industrial research activities. At least 15% of the total budget of the approved project must be subcontracted to research organisations, of which one, at least, is publicly owned.</p>
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs; • instrument and material costs; • contractual research costs; • technical knowledge and patents bought or licensed at market prices; • additional general expenses arising directly from the project; • expenditure for the auditor report; • instrumental and material inventory costs are accepted to the extent they are used for the project and only amortisation costs corresponding to the project duration can be considered.
Project duration	From 36 to 48 months.
Starting and targeted TRL	The programme is not tied to any TRL.
Blending with other funding programmes and sequencing	<p>In projects financed with CDTI funds, aid is incompatible with any other public aid destined to the same project, except:</p> <ul style="list-style-type: none"> • with aid from the autonomous communities with which the CDTI has signed the corresponding co-financing agreement; and • with other public aid granted by local entities and other agents managing public funds, which can be direct or indirect, whether or not co-financed with European funds. <p>In projects co-financed with EU funds managed by the CDTI, the aid granted by the CDTI is compatible with any other public aid, direct or indirect, that is intended to finance the project, provided that its source of financing does not come from the budget of the EU.</p> <p>Similarly, the aid is incompatible with any private aid whose source of financing, or granting of guarantee or re-guarantee is any fund from the budget of the EU (ESIF or others).</p> <p>All these grants, destined to the same project, must be communicated to the Centre during the evaluation process and must respect the maximum limits of aid intensity.</p>

Programme	Research and Development Projects
Country/Region	Spain
Link to financing programme website	www.cdti.es/index.asp?MP=100&MS=802&MN=2
Main objective	Promoting projects of an applied nature by a single company or a business group for the creation and significant improvement of a production process, product or service.
Topics	Industrial research and experimental development activities in all sectors and technological fields.
Call set	Open all year.
Beneficiaries	<ul style="list-style-type: none"> • R&D individual projects: all companies. • R&D projects in national cooperation: an economic interest grouping or consortium consisting of minimum two and maximum six independent companies. • International technological cooperation projects: individual companies, or an economic interest grouping or consortium made up of at least two independent companies.
Funding	<p>Partially-repayable grant covering up to 85% of the approved budget:</p> <ul style="list-style-type: none"> • repayable tranche of the aid: one-year Euribor fixed at the date of approval of the grant, to be paid in 7-10 years, with 2-3 years of grace; • non-repayable tranche of the aid: amounting to up to 33%, calculated on the 75% financial aid coverage, depending on the project category and the type of beneficiary. <p>Advance of 35% of the aid with a limit of €250 K, without requiring additional guarantees.</p>
Project conditions	<p>The minimum budget is €175 K per company. For projects run by a consortium or an economic interest grouping, the minimum budget for a project is around €500 K.</p> <p>The participation of each company shall be balanced and no single company can hold a stake exceeding 65% of the total budget under any circumstances.</p>
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs; • instrument and material costs; • contractual research costs; • technical knowledge and patents bought or licensed at market prices; • costs for materials and suppliers;

	<ul style="list-style-type: none"> • additional general expenses arising directly from the project; • expenditure for the auditor report; • instrumental and material inventory costs are accepted to the extent they are used for the project and only amortisation costs corresponding to the project duration can be considered.
Project duration	From 12 to 36 months for individual projects and from 12 to 48 months for the other categories of projects. Only projects which have not yet begun prior to the validity date of the application can be funded.
Starting and targeted TRL	The programme is not tied to any TRL.
Blending with other funding programmes and sequencing	<p>In projects financed with CDTI funds, aid is incompatible with any other public aid destined to the same project, except:</p> <ul style="list-style-type: none"> • with aid from the autonomous communities with which the CDTI has signed the corresponding co-financing agreement; and • with other public aid granted by local entities and other agents managing public funds, which can be direct or indirect, whether or not co-financed with European funds. <p>In projects co-financed with EU funds managed by the CDTI, the aid granted by the CDTI is compatible with any other public aid, direct or indirect, that is intended to finance the project, provided that its source of financing does not come from the budget of the EU.</p> <p>Similarly, the aid is incompatible with any private aid whose source of financing, or granting of guarantee or re-guarantee is any fund from the budget of the EU (ESIF or others).</p> <p>All these grants, destined to the same project, must be communicated to the Centre during the evaluation process and must respect the maximum limits of aid intensity.</p>

Programme	Cervera Technological Transfer Projects
Country/Region	Spain
Link to financing programme website	https://www.cdti.es/index.asp?MP=100&MS=881&MN=2&r=2560*1440
Main objective	Promoting individual applied R&D projects for the creation or significant improvement of a production process, product or service, developed by companies collaborating with national technology centres on Cervera priority technologies.
Topics	<p>The priority technologies are the following:</p> <ul style="list-style-type: none"> • advanced materials;

	<ul style="list-style-type: none"> • eco-innovation; • energy transition; • smart manufacturing; • health technologies; • safe and healthy food chain; • deep learning and AI; • advanced mobile networks; • smart transport; • protecting information.
Call set	Open all year.
Beneficiaries	SMEs and mid-cap companies.
Funding	<p>Partially-repayable grant covering up to 85% of the approved budget:</p> <ul style="list-style-type: none"> • repayable tranche of the aid: one-year Euribor fixed at the date of approval of the grant, to be paid in 7-10 years, with 2-3 years of grace; • non-repayable tranche of the aid: amounting to 33%, always calculated on the 75% financial aid coverage. <p>Advance of 35% of the aid with a limit of €250 K, without requiring additional guarantees.</p>
Project conditions	<p>Projects must demonstrate a differential technological aspect over existing technologies on the market.</p> <p>The minimum budget is €175 K per company.</p> <p>The participation of technology centres must amount to at least 10% of the total project budget.</p>
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs; • instruments and materials costs; • contractual research costs; • technical knowledge and patents acquired at market prices; • additional general costs arising directly from the project; • expenditure for the auditor report; • instrumental and material inventory costs are accepted to the extent they are used for the project and only amortisation costs corresponding to the project duration can be considered.
Project duration	From 12 to 36 months.
Starting and targeted TRL	The programme is not tied to any TRL.

Blending with other funding programmes and sequencing	<p>In projects financed with CDTI funds, aid is incompatible with any other public aid destined to the same project, except:</p> <ul style="list-style-type: none"> • with aid from the autonomous communities with which the CDTI has signed the corresponding co-financing agreement; and • with other public aid granted by local entities and other agents managing public funds, which can be direct or indirect, whether or not co-financed with European funds. <p>In projects co-financed with EU funds managed by the CDTI, the aid granted by the CDTI is compatible with any other public aid, direct or indirect, that is intended to finance the project, provided that its source of financing does not come from the budget of the EU.</p> <p>Similarly, the aid is incompatible with any private aid whose source of financing, or granting of guarantee or re-guarantee is any fund from the budget of the EU (ESIF or others).</p> <p>All these grants, destined to the same project, must be communicated to the Centre during the evaluation process and must respect the maximum limits of aid intensity.</p>
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Programme	CDTI Innovation Programme
Country/Region	Spain
Link to financing programme website	www.cdti.es/index.asp?MP=100&MS=812&MN=2
Main objective	Supporting technological innovation projects carried out by companies to improve their competitiveness by incorporating emerging technologies in the sector.
Topics	<ul style="list-style-type: none"> • Integration of emerging technologies in the company, and adaptation and improvement of new technologies for new markets; • application of industrial design, and product and process engineering for their technological improvement; • application of a new or significantly improved production or supply method, including significant changes in techniques, equipment and/or computer programmes.
Call set	Open all year.
Beneficiaries	All companies.
Funding	<p>Partially-repayable grant covering up to 75% of the approved budget (85% with ERDF co-financing):</p> <ul style="list-style-type: none"> • repayable tranche of the aid: one-year Euribor +0.2%, to be paid in 3 years or Euribor +1.2%, to be paid in 5 years;

	<ul style="list-style-type: none"> • non-repayable tranche of the aid: 2% (5% with ERDF co-financing) always calculated on the 75% financial aid coverage. <p>Advance of 35% of the aid with a limit of €400 K without requiring additional guarantees or advance of 75% with guarantees.</p> <p>Aid subject to the <i>de minimis</i> scheme.</p>
Project conditions	<p>The funded projects should have an applied nature and be very close to the market, with medium/low technological risk and a short return on investment.</p> <p>The minimum eligible budget is €175 K.</p>
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • acquisition of new fixed assets; • personnel costs; • materials and consumables; • hiring of external services and subcontracting; • general expenses; • project audit costs (maximum limit of €2 K); • investments, but only for the acquisition of new fixed assets that represent a significant technological leap for the company. Land, buildings, constructions, wheelbarrows, auxiliary facilities, furniture and storage racks are not included.
Project duration	From 6 to 18 months.
Starting and targeted TRL	The programme is not tied to any TRL.
Blending with other funding programmes and sequencing	The aid is incompatible with any other public aid destined to the same project, except for aid under the <i>de minimis</i> scheme.

Programme	Collaboration Challenges (managed by the National Research Agency)
Country/Region	Spain
Link to financing programme website	https://www.ciencia.gob.es/
Main objective	<ul style="list-style-type: none"> • Advancing the integration of scientific-technical knowledge and results that allow the validation and precompetitive development of new technologies, products and services; and • supporting projects carried out in cooperation between companies and research bodies in order to promote the development of new technologies and the business application of new ideas and techniques, and to develop new products and services.

Topics	<p>Social challenges defined in the National Plan for Scientific and Technical Research and Innovation:</p> <ul style="list-style-type: none"> • health, demographic change and well-being; • bioeconomy (sustainability of primary and forest production systems, security and food chain, marine and maritime research, and bioproducts); • safe, efficient and clean energy; • sustainable, intelligent, connected and integrated transport; • climate change and use of natural resources and raw materials; • social sciences and humanities, and science with and for society; • economy, society and digital culture; • security, protection and defence. <p>R&D activities associated to social challenge 5 “Climate change and use of natural resources and raw materials” have the final objective of favouring the transition to a low-carbon and climate-resilient economy, allowing progress towards sustainable development. These activities must enable to meet the commitments of the Paris agreement and the EU 2030 Framework on energy and climate, as well as to respond to the issues raised in the National Plan for Adaptation to Climate Change, the European Strategy for Adaptation to Climate Change and the Roadmap 2020 in the fuzzy sectors.</p>
Call set	Annual performance programme.
Beneficiaries	Cooperation projects in which at least two entities must take part in the project and one of them must necessarily be a public or private research body. The representative of the consortium must be a company (all sizes).
Funding	<p>Subsidies for entities in the public sector and private research agencies, and loans for private companies.</p> <p>Gross equivalent subsidy: up to 40% for large companies, up to 50% for medium-sized companies, up to 60% for small-sized companies and up to 100% for R&D bodies.</p> <p>Loan conditions:</p> <ul style="list-style-type: none"> • interest rate: 12-month Euribor rate; • maximum repayment period: 10 years; • maximum grace period: 3 years.
Project conditions	<p>Minimum budget: €500 K.</p> <p>Minimum participation by entity: 10%.</p> <p>Maximum participation by entity: 70%.</p> <p>Business participation: greater than 60%.</p>
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs;

	<ul style="list-style-type: none"> • instrument and material costs; • costs for materials and suppliers; • subcontracting (up to 50%); • expenditure for the auditor report; • other direct costs (patents, technical assistance, travels, etc.); and • overheads.
Project duration	From 12 to 48 months.
Starting and targeted TRL	The programme is not tied to any TRL.
Blending with other funding programmes	<p>These subsidies are compatible with other subsidies, grants, income or resources for the same purpose from any public authority, or public or private entity in Spain or in the EU, or from international bodies.</p> <p>The verification is carried out on the same eligible costs, so that the permitted intensities are not exceeded.</p>
Sequencing	Not specified.

At **regional level**, the Research and Innovation Strategies for Smart Specialisation (RIS3) 2014-20 were defined by the autonomous communities with the support of the national government, following a bottom-up approach, involving regional stakeholders and considering the regional context. These strategies influence the distribution of ERDF funds within the regional R&D programmes.

The only autonomous community specifically considering steel as a priority in the RIS3 strategy is Asturias.²⁵ Consequently, this region has been selected to exemplify the kind of funding opportunities available in Spain at regional level. In any case, other Spanish autonomous communities include in their priority areas scientific domains which could include R&D for the decarbonisation of steel production. Table 7 below provides an overview of these priorities.

Table 7: Overview of the Research and Innovation Strategies for Smart Specialisation in Spain by region

Region	RIS3 Priority name	Description
Galicia	Industrial modernisation and eco-innovation	Optimisation of low production processes through the implementation of the 'Factory of the Future' concept and through eco-innovation; improvement of efficiency and environmentally-friendly behaviour in industry.

²⁵ See Eye@RIS3 tool: <https://s3platform.jrc.ec.europa.eu/map>

Asturias	Energy supply, consumption and production; sustainable materials; industrial steel pole.	Minimisation, reuse, recovery and recycling of waste; reduction of the CO ₂ renewal cycle (bioproducts as raw materials of industrial processes); energy efficiency in industry; open innovation processes in steel production; automation of processes.
Basque Country	Building a new circular economy; energy; advanced Manufacturing.	New production model based on a circular economy view of the production of goods and services: more green and new types of products and businesses, cleaner technologies and processes, and adaptation to and mitigation of climate change.
Madrid	Nanoscience; advanced materials; industrial technology; space.	Industrial technologies (including processes with a lower environmental impact).
Castile and Leon	Energy and sustainability.	Technologies for energy management; energy efficiency; renewable energies; environmental sustainability of industry.
Canary Islands	Renewable energy	Low-carbon economy; energy efficiency; industrial development.

Source: authors' elaboration.

The programmes of the autonomous community of Asturias are detailed in the tables below as examples of regional programmes prioritising steel and steel production plants. The R&D&I funding programmes are managed by the Economic Development Agency of the Principality of Asturias, a public entity dependent on the regional government.

In addition to existing programmes, a new regional programme called 'Action plans for Business R&D&I Centres' was expected to be published in June 2020. €4 M will be allocated to the programme. This newly-created line aims at facilitating the implementation of action plans to improve the competitiveness of the company and act as catalyst for the regional economy. Eligible costs are those relating to fixed assets, technical personnel, materials, external collaborations and patent acquisition for projects with an eligible expenditure between €200 K and €2 M.

Programme	R&D Projects Funding agency: Asturias
Country/Region	Spain
Link to financing programme website	https://www.idepa.es/detalle-ayuda/-/asset_publisher/EorU9gEBOv3g/content/ayuda-idepa-subvenciones-dirigidas-a-la-ejecucion-de-proyectos-de-i-d-en-el-principado-de-asturias-
Main objective	Supporting R&D projects falling into three categories (industrial research, experimental development or feasibility studies) and aiming at obtaining new

	or improved products, processes or services; projects are either carried out directly by the company or subcontracted to an external R&D provider.																
Topics	Fields of specialisation defined as priorities in the Asturias RIS3, which include open innovation in the production and transformation of steel, energy-efficient processes and use of sustainable materials.																
Call set	Yearly.																
Beneficiaries	SMEs and large companies. The project can be carried out individually or in collaboration.																
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality:</p> <table><tr><th>Company size</th><th>Industrial research</th><th>Experimental development</th><th>Feasibility study</th></tr><tr><td>Small</td><td>70%</td><td>45%</td><td>60%</td></tr><tr><td>Medium</td><td>60%</td><td>35%</td><td>60%</td></tr><tr><td>Large</td><td>50%</td><td>25%</td><td>50%</td></tr></table> <p>The maximum aid intensity for industrial research or experimental development projects carried out in collaboration, with at least an SME participating, may be increased by 5 percentage points.</p> <p>Maximum aid per company: €800 K.</p>	Company size	Industrial research	Experimental development	Feasibility study	Small	70%	45%	60%	Medium	60%	35%	60%	Large	50%	25%	50%
Company size	Industrial research	Experimental development	Feasibility study														
Small	70%	45%	60%														
Medium	60%	35%	60%														
Large	50%	25%	50%														
Project conditions	<p>The project should start after the date of submission.</p> <p>Eligible projects must be carried out by the beneficiary company in its establishment located in the Principality of Asturias and its results must remain or have a tangible impact in the region.</p>																
Eligible costs	Fixed assets; technical staff; materials; external collaborations; and acquisition of patents.																
Project duration	From 12 to 24 months.																
Blending with other funding programmes	ERDF.																

Programme	Innova-IDEPA
Country/Region	Spain
Link to financing programme website	https://www.idepa.es/detalle-ayuda/-/asset_publisher/EorU9gEBOv3g/content/ayuda-idepa-subvenciones-innovaidepa-programa-ris3empresa-
Main objective	Supporting experimental development and innovation projects on processes under a selection of RIS3 topics (including steel production).

Topics	<ul style="list-style-type: none">• Sustainability, bioeconomy and food market;• digitisation of industry (Industry 4.0);• steel (open innovation in the steel production and transformation, development of pilot plants and strengthening of value chains in markets such as energy and transport, through product improvements and development of new parts, elements or operating conditions); and• health.												
Call set	Yearly.												
Beneficiaries	SMEs. The project can be carried out individually or in collaboration.												
Funding	<p>Instrument: grant.</p> <p>Co-financing rate: the aid intensity depends on the project category, the size of the company and the implementation modality.</p> <table><tr><th>Company size</th><th>Experimental development</th><th>Collaboration projects</th><th>Innovation</th></tr><tr><td>Small</td><td>45%</td><td>50%</td><td>50%</td></tr><tr><td>Medium</td><td>35%</td><td>40%</td><td>50%</td></tr></table> <p>Maximum aid per company: €300 K.</p>	Company size	Experimental development	Collaboration projects	Innovation	Small	45%	50%	50%	Medium	35%	40%	50%
Company size	Experimental development	Collaboration projects	Innovation										
Small	45%	50%	50%										
Medium	35%	40%	50%										
Project conditions	<p>The project should start after the date of submission and must include an eligible amount between €10 K and €250 K. The eligible amount for a company may not exceed 50% of the turnover of the previous year. The eligible costs of personnel for a company cannot exceed 50% of the personnel expenses corresponding to the previous year.</p> <p>The project should be carried out in the territory of the Principality of Asturias.</p>												
Eligible costs	Fixed assets; technical staff; materials; external collaborations; acquisition of patents; and industrial property protection.												
Project duration	12 months.												
Starting and targeted TRL	Not specified.												
Blending with other funding programmes and sequencing	ERDF.												

Programme	Differential R&D&I projects
Country/Region	Spain.
Link to financing programme website	https://www.idepa.es/detalle-ayuda/-/asset_publisher/EorU9gEBOv3g/content/subvenciones-dirigidas-a-la-

	ejecucion-de-proyectos-i-d-i-diferenciales-o-tractores-en-el-principado-de-asturias-																			
Main objective	Supporting collaborative projects to develop the necessary knowledge to respond to the needs and challenges that the Asturian society will face in the medium and long term in the areas and sectors related to the Regional Smart Specialisation Strategy; the projects must fall into the categories of industrial research, experimental development and innovation in terms of organisation or processes.																			
Topics	Fields of specialisation defined as priorities in the Asturias RIS3, which include open innovation in the production and transformation of steel, energy-efficient processes and use of sustainable materials.																			
Call set	Yearly.																			
Beneficiaries	Consortium consisting of at least three independent companies, including one leading large company and an SME.																			
Funding	<div>Instrument: grant.</div> <div>Co-financing rate: the aid intensity depends on the project category and the size of the company.</div> <table><tr><th>Company size</th><th>Industrial Research</th><th>Experimental development</th><th>Innovation</th></tr><tr><td>Small</td><td>80%</td><td>55%</td><td>50%</td></tr><tr><td>Medium</td><td>70%</td><td>45%</td><td>50%</td></tr><tr><td>Large</td><td>60%</td><td>35%</td><td>15%</td></tr></table>				Company size	Industrial Research	Experimental development	Innovation	Small	80%	55%	50%	Medium	70%	45%	50%	Large	60%	35%	15%
Company size	Industrial Research	Experimental development	Innovation																	
Small	80%	55%	50%																	
Medium	70%	45%	50%																	
Large	60%	35%	15%																	
Project conditions	<div>The project should start after the date of submission.</div> <div>The project budget must amount between €400 K and €1 M. Between 10% and 14% of the project budget must be subcontracted to research centres. A single company can get between 10% and 70% of the project total budget.</div> <div>The project should be carried out in the territory of the Principality of Asturias.</div>																			
Eligible costs	Fixed assets; technical staff; materials; external collaborations; acquisition of patents; audit; and indirect costs.																			
Project duration	Up to 24 months.																			
Blending with other funding programme	ERDF.																			

3.1.11. Sweden

Sweden adopted a new climate policy framework in 2017. The framework consists of a Climate Act which came into force in January 2018 and a long-term target to have zero net GHG emissions by 2045 at the latest. In this context:

- the **Industriklivet (Industrial Life)** initiative was launched in August 2017 and is planned to run until 2040. The programme is directed by the Swedish Energy Agency and involves frequent calls for feasibility studies, pilot and demonstration projects, and investment projects. HYBRIT is one of the projects receiving support;
- the **Klimatklivet** initiative provides support to local and regional investments that reduce emissions of CO₂ and other gases that affect the climate. The invested funds are supported by the Swedish Environmental Protection Agency. To date, a total of SEK13.45 B has been invested by local actors and the Swedish Environmental Protection Agency together;²⁶ and
- the **Integrated National Energy and Climate Plan**²⁷ highlights R&I in the area of low-carbon technologies as a crucial factor to achieve energy and climate targets. The plan particularly supports breakthrough technologies in EIs contributing to the objectives of higher energy and resource efficiency, and elimination of CO₂ emissions in industry.

In the following tables, other main Swedish programmes are detailed.

Programme	<i>Industriklivet</i> - Process-related emissions Funded agency: Swedish Energy Agency
Country/Region	Sweden.
Link to financing programme website	http://www.energimyndigheten.se/utlysningar/industriklivet--forsknings--och-innovationsprojekt-for-minskning-av-processindustrins-utslapp-av-vaxthusgaser/
Main objective	Reducing process-related emissions
Topics	Process-related emissions include: <ul style="list-style-type: none"> • emissions arising directly from industry processes according to climate reporting; • emissions arising from the combustion of residual products from fossil raw materials in manufacturing processes; and • flaring of industrial residual gases.
Call set	Yearly. Applications can be submitted on two occasions during the year.
Beneficiaries	All actors who can help reduce the industry's process-related GHG emissions can apply for grants, including: <ul style="list-style-type: none"> • companies; • public sector; • universities and colleges; • institutes related to the relevant industry; • other players related to the relevant industry.

²⁶ For further details, please see <https://www.naturvardsverket.se/Stod-i-miljoarbetet/Bidrag/Klimatklivet/Resultat-for-Klimatklivet/>

²⁷ For further details, please see: https://ec.europa.eu/energy/sites/ener/files/documents/sweden_draftnecp.pdf

	Projects where different types of actors (industry, academia and research institutes) work together are seen as positive. Gender equality and diversity must be taken into account in the composition of the project team, in the selection of project managers and in the project's implementation, content, objectives and effects.
Funding	<ul style="list-style-type: none"> • SEK500 M per year for the period 2020-22. • SEK250 M per year for the period 2023-27.
Project conditions	The call is aimed at projects that contribute to technological leaps that greatly reduce the industry's process-related GHG emissions. Emissions from purchased fuels that are burned solely to extract energy are not included. Conventional fuel replacements are also not included.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs; • costs for instruments and equipment to the extent and during the time they are used for the project; • cost of buildings and land to the extent and during the time they are used for the project; • costs for contract research, knowledge and patents purchased or leased from external sources on market terms, as well as costs for consulting services and similar services used exclusively for the research activities; and • other overheads and other operating costs, including costs of stock, supplies and similar products, arising as a direct result of a project.
Project duration	From 12 to 36 months.
Starting and targeted TRL	Not required.
Blending with other funding programmes and sequencing	Blending is not allowed.
Any additional remark	€150 M and €175 M are available in the period 2020-22 and 2023-27, respectively, for all industries including the steel sector.

Programme	<i>Industriklivet</i> - Negative emissions Funding agency: Swedish Energy Agency
Country/Region	Sweden
Link to financing programme website	http://www.energimyndigheten.se/utlysningar/industriklivet-negativa-utslapp-forskning-och-innovation/
Main objective	Reducing process-related emissions and contributing to negative emissions.

Topics	Projects that receive funding under Industrial Life will contribute to achieving the goal of net zero emissions in 2045. The call finances R&I projects that contribute to negative emissions through the capture, transport and geological or equivalent permanent storage of GHGs of biogenic origin or removed from the atmosphere. Negative emissions are achieved, for example, by capturing and storing CO ₂ from the combustion of biofuels. The call does not include CCU or biocarbon projects such as production and use.
Call set	Yearly. Applications can be submitted on two occasions during the year.
Beneficiaries	<p><i>Industriklivet</i> - Negative emissions is mainly aimed at companies with biogenic GHG emissions in, for example, the pulp and paper industry and cogeneration plants, but also universities or research institutes.</p> <p>All actors who can help reduce the industry's process-related GHG emissions can apply for grants, including:</p> <ul style="list-style-type: none"> • companies; • public sector; • universities and colleges; • institutes related to the relevant industry; and • other players related to the relevant industry. <p>Projects where different types of actors (industry, academia and research institutes) work together are seen as positive. Gender equality and diversity must be taken into account in the composition of the project team, in the selection of project managers and in the project's implementation, content, objectives and effects.</p>
Funding	<ul style="list-style-type: none"> • SEK100 M per year for the period 2020-22. • SEK50 M per year for the period 2023-27.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs; • costs for instruments and equipment to the extent and during the time they are used for the project; • cost of buildings and land to the extent and during the time they are used for the project; • costs for contract research, knowledge and patents purchased or leased from external sources on market terms, as well as costs for consulting services and similar services used exclusively for the research activities; and • other overheads and operating costs, including costs of stock, supplies and similar products, arising as a direct result of the project.
Project duration	From 12 to 36 months.

Starting and targeted TRL	Not required.
Blending with other funding programmes and sequencing	Blending is not allowed.
Any additional remark	About €30 M and €25 M are available in the period 2020-22 and 2023-27, respectively, for all industries including the steel sector. Project reference: HYBRIT, see Annex 3.

Programme	<i>Industriklivet</i> - Negative emissions (investment, pilot and demonstration projects and feasibility studies) Funding agency: Swedish Energy Agency
Country/Region	Sweden
Link to financing programme website	http://www.energimyndigheten.se/utlysningar/industriklivet-negativa-utslapp-investerings--pilot--och-demonstrationsprojekt-och-genomforbarhetsstudier/
Main objective	Contributing to negative emissions.
Topics	<p>The call finances applications aimed at achieving negative GHG emissions through:</p> <ul style="list-style-type: none"> • investment projects; • pilot and demonstration projects; and • feasibility studies. <p>Projects that receive funding under Industrial Life will contribute to achieving the goal of net zero emissions in 2045. The call finances applications that contribute to negative emissions through capture, transport and geological or equivalent permanent storage of GHGs of biogenic origin or removed from the atmosphere. Negative emissions are achieved, for example, by capturing and storing CO₂ from the combustion of biofuels. The call does not include CCU or biocarbon projects such as production and use.</p>
Call set	Applications can be submitted at any time during the year.
Beneficiaries	<p>Industrial Life - Negative emissions is mainly aimed at companies with biogenic GHG emissions in, for example, the pulp and paper industry and cogeneration plants, but also universities or research institutes.</p> <p>All actors who can help reduce the industry's process-related GHG emissions can apply for grants, including:</p> <ul style="list-style-type: none"> • companies; • public sector; • universities and colleges; • institutes related to the relevant industry; and

	<ul style="list-style-type: none"> • other players related to the relevant industry. <p>Projects where different types of actors (industry, academia and research institutes) work together are seen as positive. Gender equality and diversity must be taken into account in the composition of the project team, in the selection of project managers and in the project's implementation, content, objectives and effects.</p>
Funding	<ul style="list-style-type: none"> • SEK100 M per year for the period 2020-22. • SEK50 M per year for the period 2023-27.
Eligible costs	<p>Eligible costs are the following:</p> <ul style="list-style-type: none"> • personnel costs; • costs for instruments and equipment to the extent and during the time they are used for the project; • cost of buildings and land to the extent and during the time they are used for the project; • costs for contract research, knowledge and patents purchased or leased from external sources on market terms, as well as costs for consulting services and similar services used exclusively for the research activities; and • other overheads and operating costs, including costs of stock, supplies and similar products, arising as a direct result of the project.
Project duration	From 12 to 36 months
Starting and targeted TRL	Not required.
Blending with other funding programmes and sequencing	Blending is not allowed
Any additional remark	About €30 M and €25 M are available in the period 2020-22 and 2023-27, respectively, for CO ₂ emission reduction in all industries, including the steel sector.
Programme	<p><i>Klimatklivet</i></p> <p>Funding agency: Swedish Environmental Protection Agency</p>
Country/Region	Sweden.
Link to financing programme website	https://www.naturvardsverket.se/Stod-i-miljoarbetet/Bidrag/Klimatklivet/
Main objective	Supporting local and regional measures that reduce emissions of CO ₂ and other gases that affect the climate; several of the measures are long-term and run over several years with large investments.

Topics	Reduction of the impact of the society on the climate.
Call set	Yearly.
Beneficiaries	Companies, region and county councils, municipalities and municipal companies, associations, tenant-owner associations, foundations, among others.
Funding	-
Project conditions	The call is aimed at projects that contribute to technological leaps that greatly reduce the industry's process-related GHG emissions. Emissions from purchased fuels that are burned solely to extract energy are not included. Conventional fuel replacements are also not included.
Eligible costs	<i>Klimatklivet</i> can only provide support for physical investments. This means that measures aimed at a behavioural change cannot receive support from <i>Klimatklivet</i> . Measures aimed at a behavioural change are called information measures within <i>Klimatklivet</i> , although activities other than information are often included in the concept.
Project duration	Not specified.
Starting and targeted TRL	Not required.
Blending with other funding programmes and sequencing	Finances and repayment periods are also important parts of the Swedish Environmental Protection Agency's review. In particular, self-financing is an important prerequisite for implementation. Applicants therefore need to be able to prove their ability to finance the remaining part of the costs.

Programme	Energy transitions Funding agency: MISTRA (Swedish Foundation for Strategic Environmental Research)
Country/Region	Sweden.
Link to financing programme website	https://www.mistra.org/en/research/energy-transitions-a-systemic-approach/
Main objective	Addressing significant environmental challenges facing society and promoting long-term solutions, in particular by transforming the energy sector eliminating emissions of CO ₂ and other GHGs through a comprehensive change in the energy mix, behaviour and infrastructure.
Topics	Pursuant to the Paris agreement to combat climate change and the United Nations (UN) sustainable development goals, the Swedish government has adopted a target of achieving a society with net zero GHG emissions by the year 2045. To reach this target, the various sectors of society will need to eliminate or offset their GHG emissions. The overarching objective of a fossil-

	<p>free society requires a transition from the current energy-intensive industrial system. This in turn will require a system perspective, new societal structures, transformative approaches and the introduction of new technologies, some of which have not been developed, or perhaps even thought of, to date.</p> <p>In the Swedish and European context, a number of public and private initiatives are under way to prepare the society for the transformation of the energy system. These initiatives have produced, or are expected to produce soon, reports describing the problems that lie ahead and proposing some potential solutions. These reports provide important insights into how different sectors of society view the current situation and how it may be addressed.</p> <p>As a step towards meeting the above-mentioned challenges, MISTRA asked an international expert group to prepare a background paper on the topic. This paper highlights some central challenges and areas of research, and serves to bring about discussion.</p>
Call set	2020 call – 2-step proposal.
Beneficiaries	<p>This call addresses research groups in all academic disciplines working at Swedish higher education institutions, research institutes, government agencies and companies, and also in the public sector and civil society. Researchers and organisations active outside Sweden may participate, but the principal applicant and planned programme host must be a Swedish organisation.</p>
Funding	<ul style="list-style-type: none"> • Expected programme budget: a total of SEK57.5 M over four years. • Financial contribution by MISTRA: up to SEK50 M. • Co-funding: at least 15% of the financial contribution by MISTRA.
Project conditions	<p>Most current research funding in Sweden tends to focus either on purely technological issues or, to a lesser extent, on questions that fall squarely within the boundaries of the social sciences. This programme aims at recognising and addressing more clearly the connections among various pathways of future energy-system development, drawing on an array of research fields working together on inter- and transdisciplinary research.</p> <p>The research programme should address and recognise the multifaceted nature of the energy challenge. This requires a systemic view spanning the entire technological spectrum of the energy system, from demand to distribution of energy carriers, but also energy conversion and supply, and new technologies such as AI. Exploring drivers of demand for energy services, institutional aspects of innovation and similar non-technical aspects can add value compared with other research efforts in the area.</p> <p>The stage 1 proposal must clearly define the strategic environmental problems to be addressed and include an account of how the research results are expected to help solve problems. Goal conflicts among sustainable</p>

	<p>development goals may also be important to consider in this context. Benefits and relevance for Swedish competitiveness should be described.</p> <p>The background paper identifies several potential research areas, some of which should be addressed in the envisaged research programme.</p>
Eligible costs	Salary; consultancy; equipment; material; laboratory; travelling; etc.
Project duration	Four years
Starting and targeted TRL	Not required.
Blending with other funding programmes and sequencing	Blending is not allowed
Any additional remark	About €5 M are available in the period 2021-24 for CO ₂ emission reduction in all industries, including the steel sector.

Programme	<p>SIP STRIM-2020</p> <p>Funding Agency: Vinnova (Swedish Innovation Agency)</p>
Country/Region	Sweden
Link to financing programme website	https://www.vinnova.se/en/calls-for-proposals/the-strategic-innovation-programme-for-mining-and-metal-recovery--strim/sip-strim-2020-tackling-2020-01958/
Main objective	Tackling the branch-wide challenges of the mining and metals industry, focussing for this year's call on innovations addressing sustainability, climate change and environmental impact.
Topics	<p>The call is open to any applications which address the challenges described in the Strategic Research and Innovation Roadmap. In order to strengthen SIP STRIM's portfolio, priority will be given to innovation projects to meet climate and environmental challenges, and also improve workplace safety and diversity.</p> <p>The call focuses particularly on the following topics (but is not limited to):</p> <ul style="list-style-type: none"> • improving energy efficiency and/or shifting to fossil-free energy, including supply of innovation-critical metals; • improving resource efficiency and recycling; • improving production efficiency; • improving environmental performance (emissions to air, water, land, etc); • improving remediation of industrial/mining sites; and • improving workplace safety and physical environment and promoting progressive and gender diverse workplaces.

	<p>Projects are expected to contribute to the development of an equal society by providing both women and men equal parts of the funding, influence and activities in the projects and by the projects' results benefiting both women and men.</p>
Call set	Annual call
Beneficiaries	<p>The call for proposals is aimed at consortia where companies, universities, research institutes and other relevant stakeholders contributing to SIP STRIM's objectives can be included.</p> <p>Pre-studies can be applied for by a single partner as long as the proposal can demonstrate industrial and/or societal relevance in the form of a letter of intent from at least one relevant company or other organisation that is not a university or research institute. Consortia applying for full-scale innovation projects or pilot projects must include at least one research organisation (institute or academia) and two other relevant organisations that are not universities or research institutes.</p> <p>Project consortia covering the entire innovation chain from idea to end-user/market are considered positively as well as consortia with actors traditionally working in industries other than mining and metal extraction, so that more ground-breaking innovations can be created through new approaches. Involvement of SMEs is strongly encouraged.</p> <p>The involvement of foreign organisations (companies, universities, etc.) is encouraged provided the value to Swedish industry is clearly justified. Foreign organisations are not eligible for funding, except in exceptional circumstances, but can contribute with own funding.</p>
Funding	<p>The planned budget of this call for proposals is SEK20 M.</p> <p>Pre-studies can apply for funding up to a maximum of SEK500 K. Full-scale projects can apply for funding up to a maximum of SEK10 M. For full-scale innovation projects and pilot projects the maximum funding level is 50% of the project's eligible costs, and for pre-studies it is 75% of eligible costs.</p> <p>Note that funding to individual project partners is limited by the rules for state aid.</p>
Project conditions	<p>Pre-studies (maximum duration of six months) will aim at developing, verifying and validating the development and commercial potential of possible future full-scale projects. The project consortium can consist of only one partner, but the pre-study proposal must be able to demonstrate industrial relevance in the form of a letter of intent from at least one relevant organisation that is not a university or a research institute.</p> <p>Full-scale innovation projects (maximum duration of 36 months) aim at developing and implementing ideas that contribute to the realisation of STRIM's overall objectives. Full-scale innovation projects must have a TRL</p>

	<p>between 4 and 7 and focus on innovation, industrial engagement and benefits. The project consortium must consist of at least one research organisation (institute or academia) and two other relevant organisations that are not universities or research institutes.</p> <p>Pilot projects (maximum duration of 18 months) aim at demonstrating, testing or implementing new technologies, methods, processes or working procedures. Pilot projects must have a TRL between 5 and 7 and focus on innovation, industrial engagement and benefits. The project consortium must consist of at least one research organisation (institute or academia) and two other relevant organisations that are not universities or research institutes.</p>
Eligible costs	-
Project duration	4 years.
Starting and targeted TRL	5-7
Blending with other funding programmes and sequencing	Blending is not allowed.

Nordea's global climate fund was launched in 2008. The fund's main purpose is to generate an attractive, risk-adjusted return in the long term, and to contribute to a positive development in the world by investing in companies that follow the new megatrend in climate and environment. Therefore, companies get support for solutions for sustainable energy, efficient resource utilisation and environmental protection, and contribute to a greener and more sustainable planet. The investment area has grown steadily and now comprises over 1,200 companies with a total market value of just over €6 B (from around 500 companies with a market value of just under €3 B in 2009).²⁸

Kommuninvest green bonds raise funds from fixed income investors to support lending for investment projects that seek to mitigate climate change or help adapt to it. To date, nine green bonds have been issued, most recently a \$1 B (\$=USD) transaction in November 2019, by the largest issuer of green bonds in Sweden.²⁹

²⁸ For further details, please see <https://nordeafondmagasinet.se/innehaall/investeringar-i-klimat-och-miljo-har-ar-utsikterna-2020>

²⁹ For further details, please see <https://kommuninvest.se/en/funding-and-funding-need-3/greenbonds/>

3.2. National and regional private funding opportunities

Among national and regional private funding opportunities, three main instruments are expected to support the transition towards a low-CO₂ emission steel sector. Two of those instruments are offered by banks: (i) conventional instruments to support risk investments; and (ii) green bonds. The third instrument is private investment by the industrial sector, as industry should clearly contribute with its own resources too. Instruments offered by banks are presented below.

3.2.1. Conventional instruments

Many of the instruments used by banks to support risk investment in the industrial sector are now consolidated. The following paragraphs include some examples related to France, Germany, Italy and Sweden (a group of seven banks).

3.2.1.1. *Public Bank of Investment - BPI*

Public Bank of Investment (BPI) - France
Scope, objective and overall financing plafond available
Supporting the French industry with recoverable advances or R&D innovation loans. Maximum amount per investment: €3 M. Total amount in 2019: €22 M.
Topics
Any R&D&I project, collaborative or not, aiming at the development of innovative products, processes or services and presenting concrete industrialisation and commercialisation prospects.
TRL level – Technological risk
Starting TRL: 6 to 9. Targeted TRL: 8 to 9.

3.2.1.2. *Kreditanstalt für Wiederaufbau - KfW*

Kreditanstalt für Wiederaufbau (KfW) - Germany
Instrument name
<i>ERP-Digitalisierungs- und Innovationskredit</i> (ERP Digitisation and Innovation Credit)
Scope, objective and overall financing plafond available
Supporting procedures and services that are new to the company and connected to an innovation project for new product development (e.g. digitisation projects by innovative companies). Measures eligible for funding: investments, equipment.
Maximum financing amount per project
€25 M

Specific rules for financing
<p>Funding as instalment loans for up to 100% of the investment with a fixed rate of interest for the whole funding duration.</p> <p>Additional grants possible (but information not publicly available).</p> <p>Medium-sized enterprises (<€500 M annual revenue).</p> <p>Investment location in Germany.</p>
Financing available for CO ₂ emission reduction in the steel industry
<p>Timing: no limitations with regard to the starting date; maximum duration of 10 years.</p> <p>Openness: open to any medium-sized company (<€500 M annual revenue) located in Germany; investment location also in Germany.</p> <p>Funding: €25 K-25 M as credit, with 70% exemption from liability for loans possible; additional grants possible (but information not publicly available).</p> <p>Overall estimation: financing tool for medium-sized companies in Germany.</p>
TRL level – Technological risk
TRL 6-9
Past or ongoing projects to be taken as reference examples
As this is private funding, typically projects are not published.
Expected impact on CO ₂ emission reduction
Tool for financing e.g. (first) industrial deployment of CO ₂ mitigation measures. The exact amounts of CO ₂ mitigated cannot be directly indicated.
Complementarity with other private and public EU and national/regional funds
Combination with other funding instruments (credits or grants) possible.

3.2.1.3. North Rhine-Westphalian Bank

North Rhine-Westphalian Bank - Germany
Instrument name
NRW.BANK. <i>Innovationskredit</i> (Innovation Credit)
Scope, objective and overall financing plafond available
<p>Introducing new, technologically-advanced products or production processes or substantially improving existing products and processes.</p> <p>Measures eligible for funding: fixed assets, demonstration plants, adaptation of plants, machines or devices, license acquisitions and external consultancy services</p>
Maximum financing amount per project
No maximum financing.
Specific rules for financing

<p>Funding as instalment and bullet loans for up to 100% of the investment with a fixed rate of interest for the whole funding duration.</p> <p>Medium-sized enterprises (<€500 M annual revenue, with at least two years of business activity).</p> <p>Investment location in North Rhine-Westphalia, Germany.</p> <p>Fixed assets to be installed on the company's premises and directly related to the investment project.</p> <p>Consultancy services purchased externally to ensure unique information when opening up new markets or introducing new production methods.</p>
Financing available for CO ₂ emission reduction in the steel industry
<p>Timing: no limitations.</p> <p>Openness: open to any medium-sized company (<€500 M annual revenue, with at least two years of business activity); investment location in North Rhine-Westphalia, Germany.</p> <p>Funding: no maximum funding, but loan secured in accordance with standard banking practice within the applicant's possibilities.</p> <p>Overall estimation: unlimited financing tool for medium-sized companies in North Rhine-Westphalia.</p>
TRL level – Technological risk
TRL 6-9
Past or ongoing projects to be taken as reference examples
As this is private funding, typically projects are not published.
Expected impact on CO ₂ emission reduction
Tool for financing e.g. first industrial deployment. The exact amounts of CO ₂ mitigated cannot be directly indicated.
Complementarity with other private and public EU and national/regional funds
Refinancing by KfW or LR (German national level) or EIB (EU level) possible.

3.2.1.4. Gruppo Intesa Sanpaolo

Gruppo Intesa Sanpaolo Mediocredito Italiano - Italy,
Instrument name
Energy Desk
Scope, objective and overall financing plafond available
Energy Desk is aimed at all entrepreneurs who have planned investments in renewable energy or energy efficiency projects and has the task of evaluating projects from a technical-industrial point of view, paying particular attention to the financial sustainability of the initiatives. It therefore provides a complete service, which ranges from credit aspects to advice on new technological directions.
Financing rules
<ul style="list-style-type: none"> Financing products provide for durations and repayment methods in line with the typical cash flows of companies operating in these contexts.

- Evaluation models, in addition to taking into account the economic-patrimonial elements of the investing companies, analyse the more specific technological and environmental characteristics of the projects, allowing a more accurate examination, not only from a merely financial point of view, but also from a technical-industrial.
- Consultancy support from the desk specialists, both when evaluating projects and building the financial structure, also identifies, if necessary, technical and/or industrial partners. In this regard, agreements have been entered into both with primary installers and insurance brokers.
- Advice is aimed at informing entrepreneurs and facilitating their access to subsidies regarding investments, such as subsidized loans, capital grants and tax bonuses, according to the criteria determined by the individual regions.
- Access to financing services and products takes place through direct contact with the Network of the Banca dei Territori di Intesa Sanpaolo, made up of over 5,500 branches distributed throughout the country. Managers in the branch are a first point of reference for the customer who will subsequently be followed, in his/her specific needs, by the specialists of Mediocredito Italiano.

3.2.1.5. *Swedish banks*

The seven largest banks (i.e. Skandia, Länsförsäkringar, Handelsbanken, Danske Bank, SEB, Swedbank and Nordea) in Sweden invest almost twice as much of savers' money in fossil energy compared with sustainable energy. Following the Paris agreement, Nordea and SEB have lent billions to large coal and oil companies. This is shown by a recent review by, among others, the Swedish Society for Nature Conservation and Diakonia. Swedish banks have invested SEK44.2 B in fossil energy and only SEK9.8 B in sustainable energy.³⁰

3.2.2. *Green bonds*

Green bond issuance is so far dominated by top-rated government-related entities, multilateral banks, and real estate and financial corporates. Every year, all main development banks (World Bank, International Finance Corporation, EBRD, EIB, Asian Development Bank, African Development Bank, etc.) renew their commitment to sustainability by launching new green bond emission plans.³¹

Banks are heightening their focus on sustainability, as evidenced in part by the launch of the Principles for Responsible Banking in September 2019. The principles are designed to foster responsible banking practices and to formally implement sustainability impact analysis, target-setting and accountability among signatories. They also aim to align banks' business practices with the UN sustainable development goals and the Paris climate agreement. The scale of the principles' ambition, their sponsorship by the UN and the wide degree of industry support – they attracted 130 banks at launch with a combined \$47 T (\$=USD) in assets, representing a third

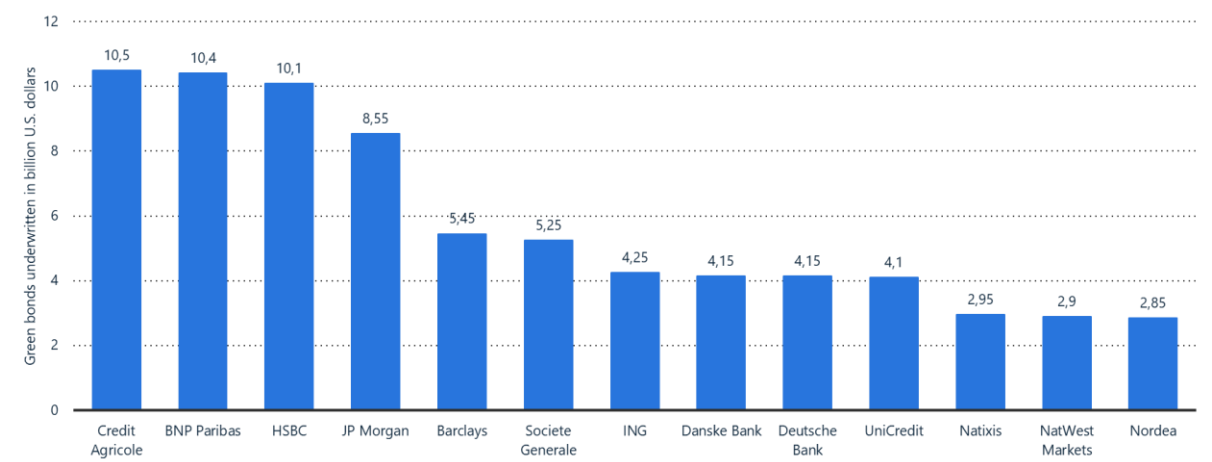
³⁰ For further details, please see <https://fairfinanceguide.se/nyheter/2018/svenska-storbanker-motverkar-klimatmaalen/>

³¹ For further details, please see <https://www.borsaitaliana.it/notizie/sotto-la-lente/green-bond-definizione.htm>

of the global banking sector – indicate the potential scale of their impact on the banking sector (Moody’s Investors Service, 2020).

In 2019, Crédit Agricole (\$10.6 B) was the largest green bond underwriter in the global market, winning a close race with BNP Paribas (\$10.5 B) and HSBC (\$10.1 B). The top three underwriters accounted for 17% of the total underwritten amount. The top three green bonds underwritten by Crédit Agricole include deals with Enel (\$1.3 B), Crédit Agricole (\$1.1 B) and Republic of Chile (\$972 M). In 2019, Morgan Stanley was the largest US green Muni deal underwriter (\$1.96 B), followed closely by BofA Securities (\$1.82 B).

Figure 11: Leading European banks for green bonds underwriting in 2019 by value of bonds(\$ B)



Source: Climate Bonds Initiative – Statista.

For the top three issuers in the figure above, a further analysis has been carried out focusing on the kind of projects financed by the green bonds (in particular to see whether some of them were related to the steel sector or in general to industry and, if so, what the amount of those bonds was). In addition, a special focus has been put on the attention paid to transition bonds, which, together with similar instruments within the transition finance (e.g. sustainability-linked bonds), can be the most suitable instrument for companies of the steel industry aiming at becoming net zero carbon in 2050.³²

3.2.2.1. Crédit Agricole Group

Crédit Agricole Group		
Key figures on Corporate Social Responsibility: ³³ €12.3 B outstanding amount of environmental initiatives €49.2 B of green bonds structured by CACIB		#1 Green Bond bookrunner worldwide for Crédit Agricole CIB (Bloomberg)

³² For further details, please see <https://energycentral.com/c/ec/pale-green-bond-energy-transition>
³³ For further details, please see <https://www.credit-agricole.com/var/storage/original/application/17e07093a10333b4440a10144df1417c.pdf>

<p>€310.9 B assets incorporating an environmental social and green filter</p> <p>Almost €50 M budget allocated to local initiatives and in the territories</p>		
Type of instrument	Actual positioning in the market	Future projections/target
Green bonds	<p>Crédit Agricole holds a leading position in green and sustainable finance activities worldwide.</p> <p>Crédit Agricole is leader in the financing of renewable energies (64% share of renewables in electricity generation portfolio in 2018).</p> <p>Crédit Agricole has a recognized expertise and a major role in setting market standards.</p>	Crédit Agricole aims at remaining in the world top 5 in green and sustainable financing (green and sustainability bonds, and green lending incl. green project finance) ³⁴
Transition bonds	<p>In the context of the AXA Climate Impact Day hold in November 2019 in Paris, Crédit Agricole CIB announced the issuance of a €100 M transition bond, as a private placement subscribed by AXA IM, on behalf of AXA Group. Listed on the Luxembourg Stock Exchange, the bond has a 10 year maturity and will pay a coupon of 0.55%.</p> <p>An amount equivalent to the proceeds of the transition bond will be earmarked by Crédit Agricole CIB to a selection of loans made to projects in carbon-intensive sectors which contribute to the transition to a low-carbon economy, such as LNG-powered ships, investments in energy-efficient industries as well as gas power assets in countries where power generation currently relies on coal. The underlying projects are estimated to abate carbon emissions by a total amount of 26,500 t CO₂ annually.</p> <p>This first transition bond issued by a commercial bank will allow AXA Group to contribute to the financing of climate transition assets, while benefiting from Crédit Agricole credit strengths and global origination network.³⁵</p>	Crédit Agricole plans to lend an equivalent amount to carbon-intensive sectors to help them shift to cleaner fuels. The bank has clear targets for cutting emissions along the way, though these bonds do not contain any penalties if the targets are not met. ³⁶

³⁴ For further details, please see <https://www.ca-cib.com/sites/default/files/2019-12/Slides-Workshop-CACIB-EN.pdf>

³⁵ For further details, please see <https://www.ca-cib.com/pressroom/news/credit-agricole-cib-issues-eur-100-M-transition-bond-subscribed-axa>.

³⁶ For further details, please see <https://www.ft.com/content/ff2b3e88-21b0-11ea-92da-f0c92e957a96>.

Other financing schemes	<p>Crédit Agricole was the first to issue a bond linked to sustainable development goals in the market, on behalf of Enel as a joint bookrunner.</p> <p>The first sustainability-linked loan was issued by Suez, with Crédit Agricole CIB as the sole structuring advisor.</p> <p>Crédit Agricole CIB developed a structured green product linked to the performance of green equity indices, which offers investors the opportunity to take a decisive part in the energy transition.</p>	Crédit Agricole aims at expanding their offering of innovative sustainable solutions within all Crédit Agricole CIB's business lines (e.g. green transaction banking, green equities and equity solutions) with the target of doubling the size of the green loan portfolio to €13 B by 2022. ³⁷
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3.2.2.2. BNP PARIBAS

BNP Paribas		
<p>Key figures on Corporate Social Responsibility:³⁸</p> <p>Asset management branch currently holding €35 B in socially responsible investment and almost €900 M invested in green bonds - a world record³⁹</p> <p>Recognised as n. 1 European bank for the management of climate-related risks and opportunities in Share Action's 2020 ranking.</p>		1 st bank in France and 3 rd bank worldwide in the Global 100 Most Sustainable Corporations ranking.
Type of instrument	Actual positioning in the market	Future projections
Green bonds	BNP Paribas has identified sectors with a positive impact on the environment for its Green Bond Framework (the 'eligible sectors'), namely renewable energies; energy efficiency; mass and public transportation; water management and water treatment; and recycling (for instance for metals, plastic and paper).	The group has increased its financing target for renewable energy projects from €15 B to €18 B by 2021.
Transition bonds	The issuance of transition bonds is considered as the option of the future to	Because energy transition is one of the priorities set in its Corporate Social Responsibility strategy, BNP Paribas Cardif had already

³⁷ For further details, please see <https://www.ca-cib.com/sites/default/files/2019-12/Slides-Workshop-CACIB-EN.pdf>.

³⁸ For further details, please see <https://www.credit-agricole.com/var/storage/original/application/17e07093a10333b4440a10144df1417c.pdf>.

³⁹ For further details, please see <https://group.bnpparibas/en/news/green-bonds-reasons-success>.

	<p>help allocate capital towards a low-carbon economy.</p> <p>The use of transition capital has been broadened to make it an attractive prospect, with transparency key to success.</p>	<p>committed itself to a target of €3.5 B in green investments by the end of 2020. In addition, as part of its directly-financed assets, BNP Paribas Cardif will no longer finance energy-producing companies in which coal accounts for over 30% of installed electricity production capacity.</p>
Other financing schemes	<p>Over the last six years the Group has been joint lead manager for €10.2 B, €1.1 B of which in equity-linked bonds.</p> <p>At the end of 2017, BNP Paribas also launched its own green bond fund - Parvest Green Bonds - that in 2018 recorded investments worth €5.3 B.</p> <p>At the start of 2019 the Group also issued its first green bond on the Stockholm stock market for Swedish clients and investors.</p>	

3.2.2.3. HSBC HOLDINGS PLC⁴⁰

HSBC Holdings plc	
<p>Key figures on Corporate Social Responsibility⁴¹:</p> <p>Environmental Finance Awards 2019:</p> <ul style="list-style-type: none"> • Lead manager of the year, Green Bonds: Local authority/municipality; • Lead manager of the year, Social Bonds: Corporate; • Lead manager of the year, Sustainability Bonds: Corporate. <p>Euromoney Awards 2019:</p> <ul style="list-style-type: none"> • World's Best Bank for Sustainable Finance; • Asia's Best Bank for Sustainable Finance; • Middle East's Best Bank for Sustainable Finance. <p>Extel Awards 2019:</p>	<p>Member of the International Capital Market Association's Executive Committee for the Green Bond Principles; part of the 2019/20 Working Group Climate Transition Finance.</p>

⁴⁰ For further details, please see <https://www.hsbc.com/who-we-are/esg-and-responsible-business>

⁴¹ For further details, please see <https://www.credit-agricole.com/var/storage/original/application/17e07093a10333b4440a10144df1417c.pdf>.

<ul style="list-style-type: none"> No.1 in a range of categories including Environmental, Social and Governance; Socially Responsible Investment; and Sustainability; <p>World Resources Institute 2019:</p> <ul style="list-style-type: none"> 9 out of 10 (dark green status) in bank's sustainable finance commitments. 		
Type of instrument	Actual positioning in the market	Future projections
Green bonds	<p>Cumulative progress has reached \$52.4 B since 2017, of which \$43.6 B (\$=USD) relate to green or sustainable products.</p> <p>In 2019 approximately 2.7% of total wholesale loans and advances to customers and banks related to metal and mining.</p> <p>Proceeds were mainly used for renewable energy (72%), followed by green buildings and energy efficiency</p>	<p>HSBC has pledged to provide \$100 B in sustainable financing and investment by 2025, as part of its set of commitments to support the transition to a low-carbon economy and promote sustainable growth.⁴²</p>
Transition bonds	<p>The HSBC White paper on transition finance was published, identifying a number of ways to accelerate sustainable investment in transition sectors.</p>	
Other financing schemes	<p>Other financing schemes include:</p> <ul style="list-style-type: none"> equity-linked green bonds (related to green building projects); and green structured bonds (mainly related to green building, renewable energy and sustainable waste management projects). 	<p>HSBC is developing a new green finance framework, which will act as an overlay on some of the bank's conventional trade finance products (e.g. trade loans) and align fully with the Green Loan Principles published as per guidance from the Loan Market Association.</p>

⁴² For further details, please see <https://www.hsbc.com/our-approach/building-a-sustainable-future/sustainable-finance>.

3.3. Overview of opportunities available at the national and regional level

Chapter 3 summarizes the in-depth research and mapping exercise carried out with regard to (public and private) national and regional financial instruments. This last section aims at estimating the related funding available for CO₂ emission reduction in the steel sector per each MS and, whenever applicable, per each region. This amount is in addition to the amount available through European funding instruments.

In order to have an overview of the public and private instruments available, the information presented above is summarized in Table 8 below, dividing funding opportunities by MS and/or region.

Table 8: Overview of the analysed opportunities by member state and/or region

	National funding	Regional funding	Blended instrument (national+regional)	All instruments
Austria	9	1		10
Belgium	2	8		10
Finland	2			2
France	4			4
Germany	11	1		12
Italy	7	4	2	13
Luxemburg	2			2
Netherland	4			4
Poland	3			3
Spain	10	3	1	14
Sweden	7			7
TOTAL	61	17	3	81

Source: authors' own calculation.

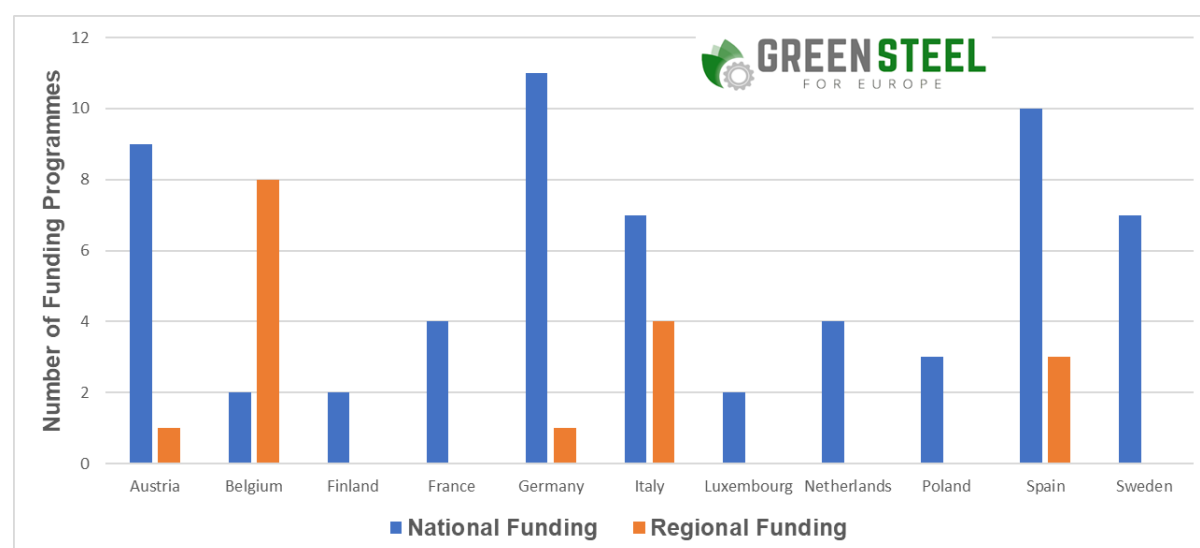
As shown in the table, a total number of 81 instruments (61 national, 17 regional and 3 combining national and regional financing) have been analysed, presenting information with regard to scope and objective, funding available in total, eligibility criteria, eligible costs, TRL requirements, and blending and sequencing opportunities.

Among the MSs included in the mapping exercise, Austria, Italy, Spain, Germany and Belgium feature the highest number of funding instruments, while Sweden ranks in the middle range and the other countries offer a lower number of funding instruments.

In any case, in the majority of the instruments funds dedicated to the steel sector are limited or nil.

In general, only few of the instruments allow blending with European ones. In addition, funding institutions usually do not include proper procedures for sequencing, which mainly depends on the specific technological characteristics of the single project. Even if a very wide variety of rules have been observed, the analysis result underlies the interest of MS to support industrial transformation. Figure 12 shows the relation between national and regional financial instruments in each country. The 11 countries included in the mapping exercise account for at least 90% of the EU steel production and 80% of CO₂ emissions. MSs where iron and steel production (IEAGHG, 2013) is highly intensive, and therefore attention to CO₂ emission reduction is key, are more pro-active, with specific financial instruments providing support. In general, national instruments are consistently higher in number compared to regional ones, but also regions are demonstrating coherent support.

Figure 12: Breakdown of national/regional funding instruments



Source: authors' own elaboration.

Table 9: Overview of national and regional public funding opportunities

National/regional programmes	Scope and objective	Funding available in total	Estimation of funding available for CO ₂ emission reduction in the steel sector	Beneficiaries	Eligible costs	Blending and sequencing	TRL
AUSTRIA							
COMET – Competence Centres for Excellent Technologies (Austria)	Building up key research competences through cooperation between science and industry, by providing a network of hubs offering high-quality research	Not specified	No funding earmarked for the steel sector	SMEs, large companies, universities, universities of applied sciences, competence centres, research facilities	Research programmes defined jointly by science and industry	Blending allowed	Programme not tied to a specific TRL
General Programme (Austria)	Supporting the development of new products, processes and services to improve the competitiveness of companies based in Austria	€100 M per year (max. funding per project: €3 M)	No funding earmarked for the steel sector	Companies of any size	R&D	Blending allowed	Programme not tied to a specific TRL
Bridge (Austria)	Supporting the utilisation and further development of basic research through cooperation between science and industry	Not specified	No funding earmarked for the steel sector	Research institutions, companies	Basic research (and potential for exploitation)	Blending not allowed	Programme not tied to a specific TRL

Beyond Europe (Austria)	Supporting Austrian companies, research and university institutes, and other organisations to create and expand collaborations	€4.6 M (3 rd call)	No funding earmarked for the steel sector	Austrian companies, research and university institutes, other organisations	Exploratory projects and cooperative R&D development projects	-	Program me not tied to a specific TRL
Stand-alone projects (Austria)	Funding individual research in the area of non-profit oriented scholarly/scientific research	Not specified	No funding earmarked for the steel sector	Researchers working in Austria	Basic research	Blending not allowed	Program me not tied to a specific TRL
Joint projects (Austria)	Supporting bilateral research projects with closely integrated content	Not specified	No funding earmarked for the steel sector	Researchers working in Austria	Basic research	Blending not allowed	Program me not tied to a specific TRL
Flagship Region Energy Programme (Austria)	Promoting the efficient interaction of energy production, consumption, system management and storage	Up to €120 M in three flagship regions (€20-40 M per model region until 2021)	No funding earmarked for the steel sector	Companies, research institutions, communities, areas	R&D projects, demonstration projects	Supplementary grants and funding possible (EU, national, regional)	Preferably TRL 8 to 9, but lower-level TRLs can also be submitted
Energy Transition 2050 (Austria)	Promoting the social and economic transition towards a low-carbon, sustainable future	€700 K	No funding earmarked for the steel sector	Research institutes, companies	R&D		Program me not tied to a

							specific TRL
Christian Doppler Gesellschaft (Austria)	Promoting the link between economy and science	Max. €750 K (per year)	No funding earmarked for the steel sector	Scientists at universities or non-university research institutions	Application-oriented basic research	-	Programme not tied to a specific TRL
GreenTech 100 (Austria)	Supporting the transformation towards a green economy with a focus on renewable energy, energy efficiency and resource efficiency	€3.5 M	No funding earmarked for the steel sector	Styrian universities, Styrian, non-university non-profit research institutions, Styrian associations (scientifically oriented)	Fundamental research, industrial research or experimental development (non-profit)	-	Programme not tied to a specific TRL
TOTAL AUSTRIA			Generally no budget earmarked for the steel sector			Blending allowed in few cases	
BELGIUM							
Strategic Ecology Support (Belgium)	Supporting ecology investment oriented towards environmental protection	-	-	-	Remediation of damage to the environment,	-	-

					energy saving and use of renewable resources		
Energy Transition Fund (Belgium)	Promoting innovative ideas in the field of energy, with a focus on three thematic axes: renewable energy in the North Sea and biomass, nuclear energy, and energy storage and transport	€25 M for each call (1-2 years)	Activities related to energy storage and hydrogen	Steel industry; industries of any size	Technical staff, materials, external collaborations, patents	Blending not allowed; sequencing allowed	Programme not tied to a specific TRL
Flanders Industry Innovation Moonshot (Belgium)	Supporting the transformation of Flemish industries towards a low-carbon and circular economy by 2050	Target budget: €25 M/call; 100% for fundamental research; 50% for industrial research; 25% for development projects; 50% for feasibility studies	CO ₂ -low and circular economy	Industries	Fundamental and industrial research, development projects, feasibility studies	-	5-9
BeISME (Belgium)	Promoting competitiveness SME	€250 K	No specific budget for the steel sector	SMEs	Fixed assets, technical staff, materials	Blending and sequencing not allowed	Programme not tied to a specific TRL

Interreg (Belgium: Wallonia- Flanders; France)	Promoting the circular economy and recycling	€3-4 M per project	Circular economy, recycling	Companies of any size	Fixed assets, technical staff, materials, patents	Inter- regional blending and sequencing allowed	7-9
Plan Marshall (Belgium: Wallonia)	Promoting the circular economy and the environment	€3-4 M per project (65% for industrial partners)	Subject to negotiation	RTOs, large companies, SMEs, academia	Fixed assets, technical staff, materials, patents	Blending and sequencing allowed only at regional level	3-8
VLAIO <i>Innovatiesteun aan bedrijven</i> (Belgium: Flanders)	Supporting investment in any technical topic	€2 M in 2019; 25% for the development part and 50% for the research part	Research and development activities	RTOs and industries	Fixed assets, technical staff, materials, patents	-	1-9
VLAIO <i>Strategische transformatie steun</i> (Belgium: Flanders)	Supporting training and investment for the transition of companies in terms of innovation, sustainability and internationalisation	€32 M for 51 projects (33% SMEs, 67% large companies)	Training and investment	Companies of any size	Fixed assets, technical staff, materials, patents	-	Skills, 7-9
VLAIO <i>Ecologiepremie</i> + (Belgium: Flanders)	Supporting investments in performant ecological technologies in Flanders	€17 M (69% SMES and 32% large companies); 15-55% support;	No specific budget for the steel sector	Companies of any size	Fixed assets, technical staff,	-	7-9

		maximum €1 M /company			materials, patents		
<i>Strategische ecologiesteun</i> (Belgium: Flanders)	Supporting investments in performant ecological technologies not part of the standard list in Flanders	€7.5 M (100% large companies, but also open to SMEs); 20-40% support	No specific budget for the steel sector	Companies of any size	Fixed assets, technical staff, materials, patents	-	7-9
<i>Onderzoeksproject</i> (Belgium: Flanders)	Supporting applied research	€187 M; maximum 60% funding	No specific technical focus, steel sector can participate	Companies, RTOs, possible subcontractors (57% SMSs; 43% large companies)	Fixed assets, technical staff, materials, patents	-	Medium TRL
<i>Ontwikkelingsproject</i> (Belgium: Flanders)	Implementing an innovative idea into a business case	€8 M; minimum 25% and maximum 50% funding	Implementing innovative ideas into business cases	Companies, RTOs, possible subcontractors	Fixed assets, technical staff, materials, patents	-	6-9
TOTAL BELGIUM			Generally no specific technical focus; steel sector can participate.			Generally not allowed	
FINLAND							
TOTAL FINLAND		Four programmes are considered for Finland (Integrated National Energy and Climate Plan, Finland's Innovation Fund (SITRA), the coordination mechanisms with MSs and					

		regional authorities and Business Finland). Specific information is available in the previous section dedicated to Finland.					
FRANCE							
National Energy and Climate Plan (France)	Supporting industry with innovation-based solutions	Information currently not yet available	The measures explicitly detailed in the final version of the PPE and therefore in the PNIEC will have to be supplemented by additional measures to achieve all of the objectives by 2030			Expected blending allowed	-
National Low-Carbon Strategy (France)	Reducing industry emission by using carbon-free resources	Information currently not yet available	The measures explicitly detailed in the final version of the PPE and therefore in the PNIEC will have to be supplemented by additional measures to achieve all of the objectives by 2030			Expected blending allowed	-
Ecological Transition Agency – R&D programme (France)	Promoting development and experimental implementation actions, and research	€25 M per year; maximum project value €0.3 M	Too low funding available	Research organisms, enterprises and associations	Technical staff, materials, patents, external collaborations	Not allowed	4-7
Ecological Transition Agency – Investments for the Future programme (France)	Supporting demonstration-scale experiments and first industrialization in the field of climate change, circular economy and energy saving	€350 M per year; minimum project value €1 M	Estimated €20 M per year	Mainly enterprises	Technical staff, materials, patents, external collaborations	Not allowed	6-9

TOTAL FRANCE			€20 M per year			Generally not allowed	
GERMANY							
KlimPro-Industrie (Germany)	Promoting climate protection, high-tech implementation and sustainable development	€6.5 M per year	Unknown	Industry research and institutes, focus on SMEs	Basic and industrial research	Blending allowed	1-5
Kopernikus (Germany)	Promoting the energy transition	€400 M (2015-25)	No estimation possible	Industry and R&D institutions	Four main projects for 10 years	-	1-9
Environmental Innovation Programme (Germany)	Promoting the conversion of EII to a largely GHG-neutral production	€45 M (2019-23)	No estimation possible	EII	Demonstration plants, industrial deployment	Combination of grants and loans allowed in specific cases	8-9
<i>Arbeitsgemeinschaft industrieller Forschungsvereinigungen</i> (Germany)	Promoting applied R&D	Approx. €180 M per year	No estimation possible	Non-profit institutions R&D and SMEs	Applied R&D	CORNET and EASME	1-5
Innovations for the Energy Transition (Germany)	Promoting applied research, development and demonstration of energy technologies	€6.4 B (2018-22)	No estimation possible	Industry and R&D institutions	R&D, demonstration plants	-	3-9

<i>Reallabore der Energiewende</i> (Germany)	Bridging the phase between technology development and market penetration	Approx. €100 M per year (2019-22)	No estimation possible	Industry and R&D institutions	Demonstration plants, industrial deployment	-	7-9
<i>Zentrales Innovationsprogramm Mittelstand</i> (Germany)	Promoting applied R&D	Approx. €500 M per year; €555 M in 2020	No estimation possible	Non-profit R&D institutions and SMEs	Applied R&D	If cooperation with international partners, each partner funded by the relating national institution	1-6
<i>Programm für Rationelle Energieverwendung, Regenerative Energien und Energiesparen</i> (progres.nrw) (Germany)	Strengthening the competitiveness of SMEs in North-Rhine Westphalia	Unknown	No estimation possible	Industry and R&D institutions	Applied R&D	-	1-5
For other German programmes (Climate Action Programme, Hydrogen Strategy, Energy Research Programme and Regulatory Sandboxes) additional information is available in the section relating to Germany.							

TOTAL GERMANY			No estimation currently possible			Blending possible in some cases	
ITALY							
<i>Contratto di Sviluppo</i> (Italy)	Promoting strategic, productive and innovative industrial and environmental investment	€3.6 B (2014-20); up to 75%; interest rate subsidy	Estimation: €25 M per year; call not regularly published	Italian or foreign large companies	Personnel, investments, operational costs	CF, ERDF, MISE, Cura Italia	8-9
<i>Accordo per l'innovazione</i> (Italy)	Supporting industrial research and experimental development	Specific analysis of the project	>20% of eligible costs, which increases by regional resources	Companies of any size	Personnel, investments	Other state aid (EU, national and regional) within the limits set by articles 38 and 46 of the general block exemption regulation	6-9
National Fund for Energy Efficiency (Italy)	Ensuring national energy efficiency targets	€125 M (2019-20); maximum €4 M per project	Estimation: €3 M per year on average	Companies operating in all sectors	Equipment, infrastructure s, consultancy	Other state aid (EU, national and regional) within the limits set by	8-9

						articles 38 and 46 of the general block exemption regulation	
Revolving Fund for Business Support and Investment in Research (Italy)	Supporting growth, and important research and development projects	Based on specific calls, published on an irregular basis	€5-40 M per project; >20% of eligible costs, which increases by regional resources	Companies of any size	Personnel, investments, materials	Blending not allowed; sequencing to be evaluated based on the specific projects' sequence (no duplication of funding)	6-8
Relaunch of areas affected by an industrial crisis (law 181/89) (Italy)	Promoting industry relaunch in areas affected by industrial and sector crises	Depending on the specific funding dedicated to the instrument	€>1 M	SMEs and large companies, also in the form of networks	Investments (e.g. CSM old offices in Taranto)	Blending not allowed; sequencing to be evaluated based on the specific projects' sequence (no	9

						duplication of funding)	
Aid to tackle the complex industrial crisis affecting the area of Taranto (Italy)	Supporting reconversion and requalification projects	Depending on specific funding dedicated to the instrument	€>1 M	Entrepreneurial activities in the area of Taranto	30-50% of investment funded	Blending not allowed; sequencing to be evaluated based on the specific projects' sequence (no duplication of funding)	9
Tax credit for investments in capital goods (Italy)	Supporting investments in technologically-advanced material capital goods	Not applicable	Tax credit	Companies of any size	Technologically-advanced material capital goods (40%), intangible capital goods (15%)	Other instruments up to the value of the asset	1-9
Tax exemption for environmental investments (law 388/2000) (Italy)	Supporting environmental investments by SMEs	Old instrument, quite complex rules	Tax credit	Only SMEs	Environmental investments	Blending not allowed; sequencing to be evaluated	4-7

						based on the specific projects' sequence	
Axis IV CO ₂ emission reduction (Italy: Lombardy)	Reducing the CO ₂ emission reduction gap compared to the Europe 2020 Strategy	€194 M (2014-20)	Each single measure to be defined by the specific calls	PPP	Environmental investments	Blending not allowed; sequencing to be evaluated based on the specific projects' sequence (no duplication of funding)	8-9
Energy efficiency of SMEs (Italy: Veneto)	Containing energy expenditure, reducing climate-altering gas emissions and using renewable sources based on energy saving opportunities	Up to €150 K per project	-	Only SMEs	Machinery, plants, equipment, systems, technical staff	Blending not allowed; sequencing to be evaluated based on the specific projects' sequence	4-7

<i>Accordo di programma</i> (Italy: Italian regions)	Promoting the competitiveness of big industries and/or specific regions by supporting innovation projects	€80 M per single call, published on an irregular basis	No upper limit	Mainly large, but also small companies	Investments and technologies relevant to the project	Specific agreements between the Ministry of Economic Development and the Italian regions; blending with European instruments not allowed	6-7
Development contracts for environmental protection (Italy: Southern Italy)	Promoting the development of programmes for environmental protection which allow the reduction of energy consumption and climate-changing gas emissions from companies and production areas	€100 M (call published in 2019)	€5-40 M per project; >20% of eligible costs, which increases by regional resources	Companies of any size	Personnel, investments, materials	Blending not allowed; sequencing to be evaluated based on the specific projects' sequence	6-8
TOTAL ITALY			Estimation: about €110 M per year			Blending generally not allowed	
LUXEMBOURG							

MECO (Luxembourg)	Supporting industrial research and development	Small amounts available	Low funding	Small and large companies	Technical staff, materials, patents, external collaborations	Blending not allowed; sequential projects allowed	No specific requirements
BRIDGE (Luxembourg)	Supporting advanced and technological research in Luxembourg	€0.4 M per year	Low funding	Small and large companies (Luxembourgish and international)	Technical staff, materials, patents, external collaborations	Blending not allowed; sequential projects allowed	No specific requirements
TOTAL LUXEMBOURG:			Low funding			Blending not allowed; sequential projects allowed	
THE NETHERLANDS							
<i>Demonstratie Energie- en Klimaatinnovatie</i> (Netherlands)	Subsidising pilot and demonstrators of CO ₂ emission reduction innovative technologies	€86.1 M per year; €10-15 M per project	CCUS, energy innovation and energy efficiency	Industry and sub-contractors	Personnel, machines and equipment, consumables	No specific limitations	6-9

<i>Stimuleringsregeling Duurzame Energietransitie</i> (Netherlands)	Subsidising technologies for production of renewable energy, then extended to energy transition with a focus on technologies for GHG emission reduction	€5 B	Subvention per tonne of avoided carbon	Industry and sub-contractors	Subvention per tonne of avoided carbon	No specific limitations	8-9
<i>Klimaatakkoord</i> (Netherlands)	Reducing CO ₂ emissions by 49% by 2030 and by 95% by 2050, compared to the year 1990, as well as increasing the share of renewable energy to 100% by 2050	-	No specific budget for the steel sector	Additional information available in Section 3.1.8			
<i>Demonstratie Energie- en Klimaatinnovatie</i> (Netherlands)	Supporting investments aimed at innovative demonstration projects in the field of CO ₂ emission reduction in industry and flexibilization of the electricity system	-	No specific budget for the steel sector	Additional information available in Section 3.1.8			
Public Private Partnership with Knowledge and Innovation Covenant (Netherlands)	Promoting investments in energy transition and sustainability, agriculture, water and food, and health, care and safety	€4.9 B per year	No specific budget for the steel sector	Additional information available in Section 3.1.8			
<i>Stimuleringsregeling Duurzame</i>	Promoting the development of a sustainable energy supply in the Netherlands	-	No specific budget for the steel sector	Additional information available in Section 3.1.8			

Energietransitie (Netherlands)							
TOTAL NETHERLAND S			No specific budget for the steel sector			Few information currently available	
POLAND							
Fast Track (Poland)	Supporting industrial research (R&D projects)	€250 M per year; maximum €20 M per project (scheduled up to 2023)	€20 M per year	Enterprises and scientific units	Commercial investments not eligible; demonstrations eligible	Blending and sequencing not allowed	2-9
Demonstrator (Poland)	Supporting pilot and demonstration installations	€125 M; maximum €25 M per project	Estimation: €10 M every two years	Enterprises and scientific units	Components for prototypes, pilots or demonstrations	Blending and sequencing not allowed	6-9
Innostal (Poland)	Supporting industrial research and experimental development	€25 M on average in the period 2016-19; maximum €7.5 M per project	Estimation: €5-7 M per year on average	Enterprises and scientific units	Components for prototypes, pilots or demonstrations	Blending and sequencing not allowed	2-9
TECHMATSTR ATEG (Poland)	Supporting industrial research	€7.5 M per year (2019-2020)	Low funding available	Enterprises and SMEs	Conceptual work,	Not relevant considering	2-9

					industrial research	the low funding available	
TOTAL POLAND			Estimated: €35 M per year			Blending and sequencing generally not allowed	
SPAIN							
Innova-IDEPA (Spain: Asturias)	Supporting experimental development and innovation projects on processes under a selection of RIS3 topics	€1.5 M (for 2019)	No specific data for the steel sector	SMEs; the project can be carried out individually or in collaboration	Experimental development, process innovation	-	5-8
Differential R&D&I projects (Spain: Asturias)	Supporting collaborative projects to develop the necessary knowledge to respond to the needs and challenges that the Asturian society will face in the medium and long term in the areas and sectors related to the Regional Smart Specialisation Strategy	€1.5 M (for 2019)	No specific data for the steel sector	Consortium consisting of at least three independent companies, including a leading large company and an SME	Industrial research, experimental development, innovation projects, process or organisation	-	3-8
R&D Projects (Spain: Asturias)	Supporting R&D projects falling in the categories of industrial research, experimental development or feasibility studies and aiming	€3.6 M (for 2020)	No specific data for the steel sector	SMEs and large companies; the project can be carried out	Industrial research, experimental development	-	3-6

	at obtaining new or improved products, processes or services			individually or in collaboration	and feasibility studies		
TOTAL SPAIN			No specific data for the steel sector			No data currently available	
SWEDEN							
<i>Industriklivet</i> (Sweden)	Supporting demonstration and investment projects	2017-40	HYBRIT has been funded under this scheme. See also Annex 3	Industries	Investments	Blending allowed in specific cases	7-9
<i>Klimatklivet</i> (Sweden)	Reducing GHG emissions	SEK13.4 M	CO ₂ emission reduction	-	Local and regional investments	-	7-9
Integrated National Energy and Climate Plan (Sweden)	Promoting low-carbon technologies	-	Steel could participate as EII	EIIs	Technologies and investments	-	Investment
<i>Industriklivet</i> - Process-related emissions (Sweden)	Reducing process-related emissions	Approx. €150 M for the period 2020-22; approx. €175 M for the period 2023-27	No funding earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-9

<i>Industriklivet</i> - Negative emissions (Sweden)	Promoting negative emissions	Approx. €30 M for the period 2020-22; approx. €25 M for the period 2023-27	No funding earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-9
<i>Industriklivet</i> - Negative emissions (Sweden)	Supporting companies with biogenic GHG emissions in, for example, the pulp and paper industry and cogeneration plants	Approx. 30 €M for the period 2020-22; approx. €25 M for the period 2023-27	No funding earmarked for the steel sector	All actors (industry, academia and research institutes)	R&D, pilot, demonstration, investment, feasibility studies	-	1-9
Energy Transitions (Sweden)	Transforming the energy sector by eliminating emissions of CO ₂ and other GHGs through a comprehensive change in the energy mix, behaviour and infrastructure	Approx. €5 M 2021-24	No funding earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-9
SIP STRIM-2020 (Sweden)	Tackling the challenges of the mining and metals industry	€Approx. 2 M	No funding earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-7
TOTAL SWEDEN			HYBRIT has been funded with one of the above-			No sufficient data	

			mentioned instruments			currently available	
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Source: author's elaboration

In conclusion, even though in general no funding is specifically earmarked for the steel sector, some MSs (such as Germany, Sweden, Belgium, France, Italy, the Netherlands and Poland) are quite supportive of CO₂-low production technologies (including in the steel sector). Differently, in the MSs that have been analysed but not mentioned above the funding available for this kind of technologies is generally lower, or information is currently not fully available.

At the moment, however, national and regional instruments are often not sufficiently coordinated with regard to one or more of the following aspects: scope, timeline and funding availability. In addition, better long-term visibility and stability must be ensured to provide a clearer picture, integrating the set of EU instruments in order to properly support CO₂ emission reduction in the steel sector. In particular, based on the research and analysis carried out in this regard, the duration and coverage of programmes and projects appear to be different (annual vs. multiannual) and the information provided is often incomplete (with some programmes mentioning the maximum amount per project, but not clearly the overall budget of the programme).

In light of the above, a methodological approach has been developed to harmonise information and, in the end, calculate the overall financial resources available every year for CO₂ emission reduction in the steel sector in the European countries considered in the study. More in detail, the following estimations have been carried out:

- a) estimation of the total amount of funding available for the countries under evaluation;
- b) estimation of the total amount of funding available for the same countries for a single year; and
- c) estimation of the share of the latter amount that can be allocated to issues related to CO₂ emission reduction in the steel sector in a single year (in the period 2021-22).

Based on currently available information on national and regional funds, and the calculation described above, **approximately €400 M per year** (in the period 2021-22) are estimated to be available for the European countries considered. To have a comprehensive picture, this figure should be added to the ones provided in the tables relating to EU instruments.

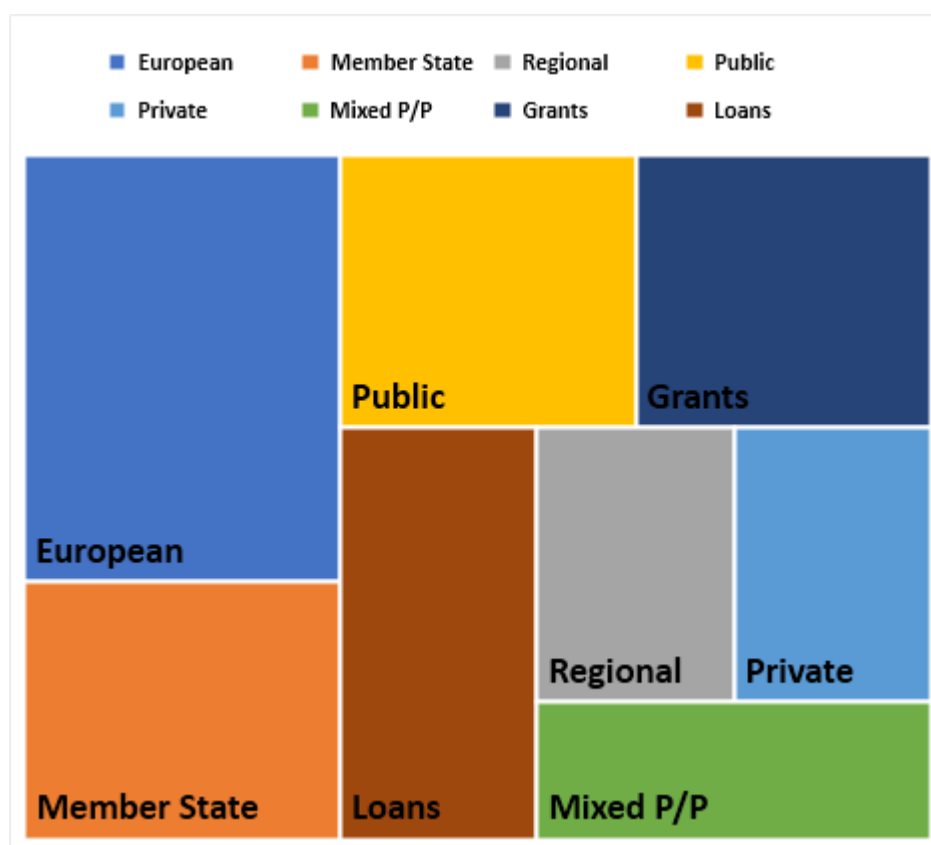
4. Blending and sequencing

From a methodological point of view, according to the World Economic Forum's definition, blended finance is "an approach to development finance that employs the strategic use of development finance and philanthropic funds to mobilise private capital flows to emerging and frontier markets" (World Economic Forum and OECD, 2015). In this specific case, blending can be defined as the strategic use of a limited amount of EU financial resources to mobilise additional financing from other sources, including private funding, to enhance the development of investment projects.

Blended finance can be used to develop and bring to market new products, services and business models that could drive economic growth, filling the market gap by supporting innovation activities that are too risky for private investors. Concrete examples of this type of approach are given by the EIB, *Cassa Depositi e Prestiti* (Deposits and Loans Fund) and national promotional banks.

The elements considered to build the reference blending framework for the purpose of this analysis are: EU, MS and regional resources; public and private funding; and grants and loans.

Figure 13: Main elements of the blending framework



Source: authors' own compilation.

Based on the analysis performed so far, 25 EU programmes, 24 bank opportunities and 81 national and regional instruments available in Europe can be blended, at least to some extent, thus creating multiple advantages such as:

- involving public and private investors, thereby increasing the total amount of funds available for projects, when compared to support through grants only;
- providing a greater, more extensive and more stable support to beneficiaries that may not be supported by a single grant at EU or national level, also considering state aid rules;
- reducing the innovation risk and bridging the typical funding gap characterising the 'innovation valley of death'; and
- providing higher alignment of interested companies and improving the dissemination of the successful outcomes of the projects.

4.1. Blending/synergies at programme and project level

The present section considers synergies between European and national programmes respectively as well as synergies at the project level, focusing on those fostering CO₂ reduction in the steel sector. The analysis is aligned with a similar assessment of funding opportunities performed in the context of the SET-Plan Action 6, led by DG ENER of the EC,⁴³ to better coordinate the output of both activities.

4.1.1. Synergies at EU level

To achieve synergies all levels and stages of programming and implementation need to be addressed, i.e. starting at the strategic level with awareness and understanding of the opportunities offered by the different EU programmes. In this context, Annex 5 to this report provides specific detailed rules and provisions from HEU programmes related to cumulative blending and sequencing that apply to all combinations below involving HEU.

4.1.1.1. Combining the RFCS and HEU

While a more comprehensive assessment of the options to ensure coordination between the RFCS and HEU will be performed in work package 3 of Green Steel for Europe (GREENSTEEL), in what follows a preliminary analysis of such options is performed.

To achieve the challenging objectives related to CO₂ reduction a strong collaboration between and joint commitment of the private and public sector is needed. This is essential to mobilise private and public funding opportunities, and improve synergies among the EU funding instruments which are particularly useful and suitable to achieve the above-mentioned objectives, such as the RFCS and HEU.

The systematic exchange of information among the relevant institutions and stakeholders managing the RFCS and HEU is the first step to maximise synergies in order to avoid duplication and foster collaboration.

The ideal setting could be a single funding mechanism (the so-called 'one-stop shop approach') for the RFCS and HEU, where research activities, objectives and funding opportunities are aligned. However, this approach is not easy to realise mainly due to timing constraints, and political, organisational and financial reasons.

⁴³ For further details, please see <https://setis.ec.europa.eu/implementing-integrated-set-plan/energy-efficiency-industry-ongoing-work>

As alternatives to the 'one-stop shop', the following harmonisation steps can be considered to improve the synergies between the two programmes.

An adequate budget should be made available to reach the EU's goal to achieve climate neutrality by 2050; in this respect, a reinforced long-term HEU and RFCS budget (at least for the period 2021-27), with full flexibility with regard to fiscal and state aid rules, is a necessary step:

- reinforced budget for HEU: the budget for pillar II 'Global challenges and industrial competitiveness' should be increased, more specifically within:
 - cluster 4 - 'Digital, industry and space', aiming at achieving three main objectives, namely (i) ensuring the competitive edge and autonomy of EU industry; (ii) fostering climate-neutral, circular and clean industry; and (iii) bringing a major contribution to inclusiveness; and
 - cluster 5 - 'Climate, energy and mobility', aiming at fighting against climate change and improving the competitiveness of the energy and transport industry as well as the quality of the services that these sectors bring to society. The reduction of GHGs in the steelmaking process, including through energy efficiency and the use of renewable energy, is remarkably connected to the objectives of this cluster.

The CSP, under pillar II of HEU, currently offers a specific HEU public funding of €350 M for the period 2021-27 (based on a comparable effort by the private industry);

- reinforced budget for the RFCS: the RFCS research programme should continue to support collaborative research with a budget of at least €40 M per year and should be able to fund new large clean steelmaking R&I breakthrough projects (as proposed in COM(2020) 319 final, COM(2020) 320 final and COM(2020) 321 final).

For the CSP, the RFCS offers a specific budget of €350 M from the assets of the ECSC in liquidation, i.e. €50 M per year in the period 2021-27.

Presenting CSP calls as a single package (the so-called 'single package' approach) should also be considered. The proposal is to coordinate calls for the RFCS and HEU in terms of technical topics, timing and evaluation.

RFCS and HEU proposals should ensure alignment in terms of eligibility criteria and thus a common denominator between the two programmes. For example, for H2020 a minimum of three independent legal entities established in different MSs or associated countries are requested (and the same criterion is expected for HEU), while the RFCS requires at least three legal entities for research projects and at least two legal entities for pilot and demonstration projects or accompanying measures, independent from each other and established in at least two different EU MSs. In light of the above, in general alignment should ensure a less binding context, also considering that for H2020 (and the same is expected for HEU) the success rate is lower than that for the RFCS. In addition, RFCS and HEU proposals should be evaluated on the basis of the same selection and award criteria, i.e. 'excellence', 'impact' and 'quality and efficiency of the implementation'.

As it is in line with the spirit of the EGD and HEU, the RFCS Annual Priority can continue to be adopted in order to consider unforeseen and unpredictable (technical) situations but also to mitigate possible negative market contexts.

RFCS and HEU calls for the CSP should avoid the submission of project proposals in the same month of 'conventional' RFCS (September) and HEU (e.g. generally January-February for SPIRE

and April for FCH JU) calls. In addition, the first call of the IF this year was published on 29 October 2020. One common deadline for CSP calls should be identified instead. The proposal is to make sure that deadlines for conventional (both RFCS and HEU) and CSP calls do not overlap.

Furthermore, a proper timing should be identified for CSP calls for proposals. The recommendation is to avoid the same deadline of already existing calls which are relevant for the sector, properly aligning both RFCS and HEU calls for proposals for the CSP (for instance on a yearly basis in May/June or early/mid-December).

RFCS and HEU proposals for the CSP could be evaluated on the basis of a common, central evaluators database, under the supervision of the EC staff and with the contribution of independent external experts acting as evaluators promoting impartiality criteria. In addition, at least one expert participating in the evaluation out of four should be new (i.e. an expert who did not take part in either RFCS or HEU evaluations in the previous three years) and each expert should be allowed to participate to a maximum of three consecutive RFCS or HEU evaluations.

RFCS and HEU proposals should be evaluated based on a common, central proposals and experts database, with a proper connection with RFCS or HEU conventional calls in order to maximise synergies, avoid duplications of efforts and properly catalyse investments.

Finally, the RFCS and HEU should be evaluated on a programme level, with a mid-term evaluation informing the respective programme committees (Programme Committee for HEU and COSCO for the RFCS). The evaluation should be aimed at determining the overall progress of the implementation of the actions of the specific programme in order to assess the degree of accomplishment of the specific and operational objectives and measure progress in terms of the concrete changes to the production processes.

To summarize, the following options could be considered:

- Option 1 - Combining HEU and RFCS funds and assets under the same CSP call for proposals (the so-called 'one-stop shop' approach) to ensure synergies at European level;
- Option 2 - Presenting CSP calls as a single package (the so-called 'single package' approach); and
- Option 3 - Publishing at least (RFCS and HEU) CSP calls with the same deadline.

HEU and the RFCS CSP should steer the process.

The numerous European (as well as national and regional) instruments should be strategically organised, both on the public and private side, and a coordinated action is needed in order to maximize the efficiency of the instruments. The system already in place could be used to that end. Then, if the institutional process is positively completed, establishing the CSP, that partnership could be used strategically to co-programme HEU, the RFCS and possibly other useful instruments also on the private side.

4.1.1.2. Comments on the RFCS modernisation package

On 16 July 2020 the EC adopted the three communications composing the RFCS modernisation package:

- COM(2020) 319 on Decision 2003/76/EC establishing the measures necessary for the implementation of the Protocol (European Commission, 2020i);

- COM(2020) 320 on Decision 2008/376 on the adoption of the Research Programme of the Research Fund for Coal and Steel and on the multiannual technical guidelines (European Commission, 2020j); and
- COM(2020) 321 (DG BUDG) on Decision 2003/77 laying down multiannual financial guidelines for managing the assets of the ECSC in liquidation (European Commission, 2020k).

This revision paves the way to increase synergies between EU funds and to co-programme the CSP with HEU and RFCS funds.

In this regard, on the private side a Task Force under the EUROFER chairmanship has been formed to look at possible future issues for the RFCS programme and to propose measures to remedy, if any, current inadequacies. The members have been proposed via the ESTEP Steering group. The Task Force is reporting to the EUROFER Refocus Working Group.

According to the Task Force, the RFCS programme must remain an important pillar of collaborative research at EU level, bringing the broad steel community together. Changes to the RFCS because of modifications of the legal package – past as well as forthcoming in regard to the CSP – have altered the RFCS programme. In any case, the RFCS modernisation package has received a good appreciation. Nonetheless, the Task Force has sought to propose improvements to the RFCS programme in line with the existing and anticipated framework.

Potential improvements to the RFCS programme can be related to the following issues:

- Call and Info Pack - is the information clear, could anything be improved?
- Priorities - should annual priorities be kept, and if so, how many and with what bonus?
- Evaluation process - does this work well or is there room for improvement? If so, what and how?
- Reporting - are the reporting requirements clear, justified and adequate or is there room for improvement? If so, what and how?
- Technical Group Acier - do the groups work well, is the workload reasonable and is the feedback to the projects useful?
- Strategy - where should the RFCS programme be in 10 years' time? What steps should be made now?

The aim was that responses can be structured and fully prepared for input to the Commission prior to the SAG meeting in December 2020.

4.1.1.3. Combining HEU and the RFCS with the IF

The IF is one of the world's largest funding programmes for demonstration of innovative low-carbon technologies and focuses on:

- innovative low-carbon technologies and processes in EILs, including products substituting carbon-intensive ones;
- CCU;
- construction and operation of CCS (ZEP, 2011, 2013);
- innovative renewable energy generation; and
- energy storage.

The IF will focus on highly innovative technologies and big flagship projects with European value added that can bring on significant emission reductions.

The IF grant is not considered to be state aid. To cover the remaining costs, a project applicant can combine the IF grant with public support by a MS.

The IF provides funding above and below €7.5 M CAPEX with two separated calls (large and small-scale projects). The first large-scale project call was opened in the second half of 2020, while the small-scale project call is expected to be opened in the first half of 2021.

According to the explaining examples provided by the EC (referring to the process industry), the IF can generally provide, with a rough estimation, between 20% and 30% of funding.

IF grants can be combined with funding from other support programmes, as HEU and the RFCS.

HEU and IF. The combination of HEU and the IF could ensure a better synergy for the steel sector: HEU can support innovation up to the pilot phase and the IF can support innovation also in the demonstration and scale-up phases.

RFCS and IF. Blending the two instruments is formally possible, provided that there is no double funding. If the two instruments are blended, the RFCS can support innovation for research up to the pilot and demonstration phases, while the IF can support innovation also in the scale-up phase. The RFCS programme provides three different levels of funding: 50% for pilot and demonstration projects, 60% for research projects and up to 100% for accompanying measures. With regard to blending with the IF, the focus should be on the 50% funding for pilot and demonstration projects. In particular, a practical synergy between the two instruments is possible mainly for pilot and demonstration projects below €7.5 M. To properly evaluate the blending and sequencing opportunities for the two instruments, however, three other elements are extremely relevant: project maturity (which can be measured for both instruments based on the TRL), degree of innovation and GHG emission avoidance. *The IF call for projects below €7.5 M is not currently open and is expected in the first semester of 2021.*

4.1.1.4. Combining HEU and the RFCS with LIFE

HEU and LIFE Climate Action. HEU and LIFE could be combined to ensure better synergies for CO₂ reduction in the steel sector. The LIFE Climate Action sub-programme strongly supports projects related to renewable energy and energy efficiency (Pardo and Moya, 2013) with a high TRL to contribute to the CO₂ emission reduction targets. To that end, the EU is now working to provide more support through the LIFE Climate Action financial instrument in order to have a basis for a higher number of projects. For instance, the funds of the next call (cut-off date 6 October) have been increased by roughly 30% compared with information provided initially.

RFCS and LIFE Climate Action. The RFCS and LIFE could also be combined to obtain better synergies. The LIFE Climate Action sub-programme supports projects to develop innovative ways to respond to the challenges of climate change in Europe. In particular, one of the main objectives of the sub-programme is to contribute to the shift towards a low-carbon and climate-resilient economy. Importantly, this objective can be better achieved by ensuring synergies with the RFCS.

4.1.1.5. Combining HEU and the RFCS with IPCEIs

The IPCEI is not an EU funding scheme but a legal framework that allows pooling different types of funding (EU, national, regional and private) for a project with a strong EU added value. The notion of the IPCEI is enshrined in article 107 of the Treaty, which provides that “aid to promote

the execution of an important project of common European interest” may be considered to be compatible with the internal market. In order to qualify for public funds under the IPCEI framework, the projects must fulfil five conditions: contribute to strategic EU objectives; involve several MSs; include private financing by the beneficiaries; generate positive spill-over effects across the EU; and be highly ambitious in terms of R&I, i.e. go beyond what is widely regarded as the ‘state of the art’ in the sector concerned. In addition, the project should not provide an unfair advantage to companies financed by public funding, as prohibited by state aid rules.

The advantages of an IPCEI are the following:

- the existence of the market failure affecting the project can be presumed (under normal R&D&I aid rules, this needs to be proven for larger projects);
- the project can be aided up to 100% of the funding gap on the basis of a large set of eligible costs (normal regional and R&D&I aid rules provide for upper limits and the closer to the market, the lower the cap); and
- the costs of first industrial deployment (i.e. between the pilot line and the start of mass production) are considered eligible.⁴⁴

In the wake of the coronavirus crisis, the IPCEI framework is currently under revision, as part of the ‘fitness check’ to improve EU regulation and cut red tape.

MSs, the EU steel industry and other actors (under the supervision of the CSP) could explore the possibility to table a proposal for setting up an **IPCEI on Green Steel** (Olofsson, 2019). This IPCEI would create a legal framework allowing the combination of EU, national, regional and private funding in compliance with state aid rules.

In this respect, the Commission may consider eligible an ‘integrated project’, i.e. a group of single projects inserted in a common structure, roadmap or programme aiming at the same objective and based on a coherent systemic approach. The individual components of the integrated project may

⁴⁴ Eligible costs under the IPCEI framework: (i) feasibility studies, including preparatory technical studies and the costs of obtaining the permissions necessary for the realization of the project; (ii) costs of instruments and equipment (including installations and transport vehicles) to the extent and for the period they are used for the project. If such instruments and equipment are not used for their full life for the project, only the depreciation costs corresponding to the life of the project, as calculated on the basis of good accounting practice, are considered as eligible; (iii) costs of the acquisition (or construction) of buildings, infrastructure and land, to the extent and for the period they are used for the project. Where these costs are determined with regard to the commercial transfer value or the actually incurred capital costs, as opposed to the depreciation costs, the residual value of the land, building or infrastructure should be deducted from the funding gap, either ex ante or ex post; (iv) costs of other materials, supplies and similar products necessary for the project; (v) costs for obtaining, validating and defending patents and other intangible assets; (vi) costs of contractual research, knowledge and patents bought or licensed from outside sources at arm’s length conditions, as well as costs of consultancy and equivalent services used exclusively for the project; (vii) personnel and administrative costs (including overheads) directly incurred for the R&D&I activities, including those R&D&I activities related to first industrial deployment, or in the case of an infrastructure project, incurred during the construction of the infrastructure; (viii) in case of aid to a project of first industrial deployment, the capital and operating expenditures (CAPEX and OPEX), as long as the industrial deployment follows on from an R&D&I activity and itself contains a very important R&D&I component which constitutes an integral and necessary element for the successful implementation of the project. The operating expenditures must be related to such component of the project; (ix) other costs may be accepted if justified, and where they are inextricably linked to the realisation of the project, to the exclusion of operating costs not covered by point (viii).

relate to separate levels of the supply chain but must be complementary and necessary for the achievement of the important European objective.

To achieve this, a constant coordination is needed between the CSP and the EC in order to align RFCS and HEU calls, and national and regional contributions with the objectives of the IPCEI.

The IPCEI on Green Steel could be organised into three layers:

- **European level** (grants) - EU direct funding from schemes like the RFCS, HEU and others to support research on the three main root and pilot demonstrations. This would represent the European common denominator of the IPCEI project;
- **national level** (grants) - Specific projects at national level (for example Hydrogen in Sweden and Austria, CCS/CCU in Italy and Poland) to be financed by regional or national funds. Structural funds and national funds could be used for the deployment of the specific technologies and converting of the existing steel plants (i.e. ex-ILVA in Taranto, Italy); and
- **lending facility** - Loans, public sector guarantees, private equities and other financial instruments from the EIB and private banks (InvestEU, JTM, etc.) to complement funding from EU and national programmes or other sources to reach the scale needed for innovation and deployment projects.

If it finds that the aid is necessary, proportional and transparent, and that its negative effects in terms of potential distortion of competition and on trade between MSs are limited and outweighed by the positive effects, the EC may declare the aid compatible with the internal market. In such cases – and where justified by the funding gap analysis – the aid can cover up to 100% of the funding gap based on a large set of eligible costs. Where it allows for the development of a new product with high R&D&I content or of a fundamentally-innovative production process, the aid may cover the costs for the first industrial deployment, i.e. the critical phase of upscaling or ramping up the first demonstration or pilot line and the testing phase, which include the upscaling or first-in-kind equipment and facilities for which significant research and development work is still necessary. Regular upgrades without an innovative dimension of existing facilities and the development of newer versions of existing products do not qualify as IPCEI.

Table 10 below presents a possible structure of an IPCEI on Green Steel.

Table 10: Possible structure of an IPCEI on Green Steel

Lending facility (public and private)	EIB, <i>Cassa Depositi and Prestiti</i> , KfW, Private banks	EIB, private banks	EIB, EBRD, private banks
National level (contribution allowed under the IPCEI framework)	Italy, Spain, Germany Building on research at EU level; specific applications for existing steel plants in Italy, Spain and Germany.	Sweden, Austria Focus on CDA	Poland, Romania, Slovakia Focus on CCU/CCS
European level (grants)	Research and demonstration on the three paths (CDA, CCU/CCS and PI); upgrade of technology from the existing TRL to the TRL expected in 2030		

	and 2050, respectively; EU-wide research serving as baseline to apply technologies in the different countries (see the national level).
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Source: authors' own compilation.

4.1.1.6. Combining HEU with ESIF

HEU and ESIF. In the next budget cycle, the CF and the structural funds will aim at supporting the green transition. In this context, Annex 3 presents an extensive analysis of the combination of HEU and ESIF for ambitious industrial projects, while Annex 4 provides an overview of the differences between H2020 and the structural funds. Finally, on the practical side, a real industrial case of combination of ESIF with EIB loans is reported in Annex 2 (example 3).

4.1.2. Blending/synergies at member state and regional level

4.1.2.1. Member state level

Considering the needs involved and the objectives to be achieved, actions for decarbonisation must be immediate and coordinated across MSs, production routes and technologies, and must have sufficient public support.

To that end, the CSP is intended to help remove R&D&I and systemic bottlenecks such as the transition from the pilot phase to industrial-scale deployment, high technology risks, large capital requirements and higher production costs. By relying on strong collaboration and joint commitment from both the private and public sectors, it is aimed at accelerating the transformation of the steel industry by tackling important R&D&I challenges, bringing a range of breakthrough technologies for clean steel production up to large-scale demonstration by 2030 and developing technologies at TRL8 to reduce CO₂ emissions stemming from EU steel production by 80-95% compared to 1990 levels by 2050, ultimately leading to carbon neutrality.

The general aim is therefore to establish formal and informal mechanisms of cooperation with MSs to create additional synergies with national and regional policies and programmes. As a matter of fact, EIs are not only of EU high interest, but also of interest at national level, as reported for example in the national operational programme on enterprises and competitiveness.⁴⁵

4.1.2.2. Regional level

The Smart Specialisation Strategy is an approach that aims at boosting growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages. Through its partnership and bottom-up approach, smart specialisation brings together local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds. The strategy consists of the following building blocks:

- Smart - Identifying the region's own strengths and comparative assets;
- Specialisation – Promoting priority R&I investment in competitive areas; and

⁴⁵ For further details, please see https://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/italy/2014it16fop003

- Strategic - Defining a shared vision for regional innovation.

An example of Smart Specialisation Strategy is the ERDF 2014-20 regional operational programme⁴⁶ of the Italian region of Apulia, mainly aiming at promoting full convergence of the region in terms of growth and employment while ensuring sustainability.

4.1.3. Blending/synergies at project level

Synergies, which allow to increase R&I investments and their impact, to implement innovative ideas along the innovation cycle or value chain up to the market and to obtain more significant impacts on competitiveness, jobs and growth in the EU, can also be achieved acting at project level.

Project synergies can be achieved by combining:

- funding related to the same project idea, as HEU and other EU funds (RFCS, structural funds, IF, InvestEU and CEF), through a single action or a group of coordinated actions/operations, always provided that there is no double funding of the same expenditure item, with a view to achieving cohesion, and greater impact and efficiency;
- bricolage or successive projects, benefitting from the activities and results of the previous projects and building a main technological roadmap;
- parallel projects, complementing each other when projects following different technological paths can run in parallel with a combination of different funding; and
- projects in different stages, vertically and horizontally.

Table 11 shows vertical synergies among projects with different TRLs and different funding instruments according to the relevant TRL.

Table 11: Vertical synergies among projects

TRL	Funding instrument
TRL 1 – Basic principles observed	HEU, RFCS, regional funds
TRL 2 – Technology concept formulated	HEU, RFCS, regional funds
TRL 3 – Experimental proof of concept	HEU, RFCS, regional funds
TRL 4 – Technology validated in lab	HEU, RFCS, regional funds
TRL 5 – Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)	HEU, RFCS, IF
TRL 6 – Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)	HEU, RFCS, IF
TRL 7 – System prototype demonstration in operational environment	HEU, RFCS, IF
TRL 8 – System complete and qualified	HEU, InvestEU
TRL 9 – Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies)	HEU, InvestEU

Source: authors' own compilation.

⁴⁶ For further details, please see https://ec.europa.eu/regional_policy/en/atlas/programmes/2007-2013/italy/operational-programme-puglia

Table 12 shows horizontal synergies between single projects with different activities that can be carried out at EU, MS and regional level.

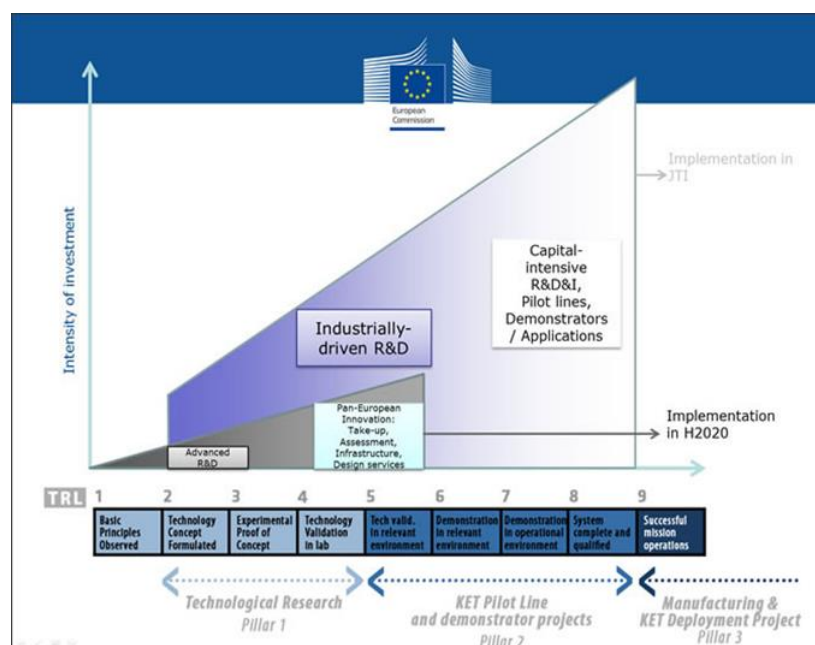
Table 12: Horizontal synergies between projects

EU/member state/region	Type of funding
ESTEP – EU-wide research activities	HEU and RFCS + national programme on industry (financed by the ERDF)
Rena – EU-wide research activities	
Italy – Italian steel industry	
Italy – Apulia	
Italy – Friuli-Venezia Giulia	
Belgium	

Source: authors' own compilation.

Synergies among projects are particularly necessary when a complex framework arises, adequate coordination is essential, high financial efforts are required, the TRL plays a key role (see Figure 14 below), and stakeholders have to properly manage and address activities to achieve the expected results.

Figure 14: TRL versus intensity of investment



Source: European Commission.

4.1.4. Blending/synergies at organisation level

The various organisations that are relevant to the steel sector and are working to achieve synergies for the purpose of CO₂ reduction in the steel sector are, among others, EUROFER (EUROFER, 2013, 2014; Ghenda, 2017), ESTEP and the Research Initiative for European Steelmaking (RIES).

EUROFER. EUROFER is an international not-for-profit organisation under the Belgian law, based in Brussels. EUROFER was founded in 1976 and represents the entirety of steel production in the

EU. EUROFER members are steel companies and national steel federations throughout the EU. The major steel companies and national steel federations in Switzerland and Turkey are associate members.⁴⁷

ESTEP. ESTEP was created in 2004 and recognised by the EC. It serves as a spokesman for the whole steel sector in terms of technological foresight, innovation and R&D, and as a privileged interlocutor to the EC. It can be defined as a think tank, gathering representatives of the stakeholders of the steel industry (including its value chain, and the research and academic institutions that are related thereto) and focusing both on foresight and on actions to be carried out in the context of the roadmaps that it produces collectively with its members. ESTEP's mission is to engage in collaborative EU actions and projects on technology which are tackling EU challenges (notably on renewable energy, climate change (low-carbon emission) and circular economy) in order to create a sustainable EU steel industry. In addition, a Mirror Group was established gathering the members of the Steering Committee and MS representatives to ensure information and communication between the Steering Committee and MSs as regards the implementation of the strategic research agenda of ESTEP within the different programmes funded by the EU. The work is carried out by experts representing its members in the Focus Groups. European projects, such as Industry 4.0, circular economy, digitisation, light-weight solution, ultra-low carbon steel making and CO₂ emission avoidance, foster the collaborative approach among the Focus Groups.⁴⁸

RIES. RIES is a virtual network supported by BFI, CRM, CSM and SWERIM, established to reach critical mass to carry out ambitious and large-scale projects. Overall, RIES gathers more than 600 graduate and postgraduate researchers. RIES has matched skills and resources to increase the competitiveness of the European steel industry and to coordinate a strategy for European research. The mission of RIES is to strengthen the R&D offer of the steel industry in Europe by making leverage on and integrating research capabilities and experience in order to:

- provide innovative and breakthrough ideas;
- reach critical mass to establish ambitious and large-scale projects;
- develop and validate technical concepts in prototypes and pilot installations; and
- implement solutions on a suitable industrial scale.

RIES is open for any European research institute which deals with the steel manufacturing process, is independent, has relevance on national level and has international recognition.

⁴⁷ For further details, please see www.eurofer.eu.

⁴⁸ For further details, please see www.estep.eu.

4.2. Overview of blending and sequencing opportunities

Table 13 below shows the existing synergies between the main European funding programmes among them, and between the main European funding programmes, on the one side, and the selected national and regional funding instruments, on the other, with regard to CO₂ emission reduction in the steel sector.

The different colours mean the following:

- green: a synergy is possible between the instruments;
- red: synergies are generally not allowed;
- yellow: the instrument is still under discussion at political level; and
- grey: information is currently not sufficient to have a clear picture.

For ease of reading, MS columns consider all national and regional financial instruments for that MS in a single cell, showing the general relationship between those instruments and EU ones. While at European level the various instruments can generally be combined (left side of the table), synergies between EU and MS instruments are generally not allowed, except for very few cases (right side of the table).

In any case, exhaustive information for each instrument, from European to national and regional ones, is reported in Annex 6 (similar to the table of the SET-Plan Action) in order to properly compare all information. The table in Annex 6 also serves as GREENSTEEL database of financing programmes for CO₂ emission reduction in the steel industry.

Table 13: R&D&I funding instruments – Blending

HEU	CSP	P4P	Clean Hydrogen for Europe	RFCS	Innovation Fund	LIFE	EGDIP calls	JTF	Erasmus+	ERA-NET	IPCEI	Recovery Plan	EIB	EBRD	InnovFin	InvestEU	Austria	Belgium	Finland	France	Germany	Italy	Luxembourg	Netherlands	Poland	Spain	Sweden	
																												HEU
																												CSP
																												P4P
																												Clean Hydrogen for Europe
																												RFCS
																												Innovation Fund
																												LIFE
																												EGDIP calls
																												JTF
																												Erasmus+
																												ERA-NET
																												IPCEI
																												Recovery Plan
																												EIB
																												EBRD
																												InnovFin
																												InvestEU
																												Private Banks


Source: authors' own compilation.

Table 14 below is meant as a guideline in order to navigate through the different European instruments related to CO₂ emission reduction in the steel sector. In particular, the table provides information on the main European funding instruments based on the project's financial dimension. The project sizes showed in the table reflect a typical small (€<7.5 M), medium (between €7.5 M and €100 M) and large scale (€>100 M) GHG emission avoidance demonstrator. The €7.5 M limit (CAPEX) is also set in the IF to separate small-scale from big-scale demonstrators. The €100 M limit is the expected upper limit of the CSP instrument.

The different colours mean the following:

- green: the project size is within the scope of the instrument;
- red: the project size is outside the scope of the instrument; and
- yellow: the instrument is still under discussion at political level.

Table 14: Guidelines on the main financial instruments available to steel sector by project size

	Project with funding <7.5 M€	Project funding between 7.5 and 100 M€	Project funding between 100 M€ and 250 M€	Projects with funding > 250 M€
Horizon Europe (HEU) and related relevant PPPs (P4P, Clean Hydrogen)	Pillar 2 calls to be published at the beginning of 2021.			
Clean Steel Partnership (CSP)	Expected calls on April/May 2021;			
Research Fund for Coal and Steel (RFCS)	Usual call every year; Average project dimension 1.5 M€ funding.			
Innovation Fund (IF)	IF small-scale instrument (no calls currently open. Calls expected to be launched on beginning 2021).			

European Green Deal (EGD) Calls	CSA projects starts from 2 M€	Topic Area 3 (of interest of the Steel Sector). Work Programme available. 10 -40 M€ project dimension. Deadline on January 2021	
InvestEU	The InvestEU Fund is expected to mobilise more than 372 B€ of public and private investment through an EU budget guarantee of 26,2 B€ that backs the investment of financial partners such as the EIB Group and others.		
Important Projects of Common European Interest (IPCEI)	<ul style="list-style-type: none"> - Two types of IPCEI actions interesting for the GREENSTEEL project: <ul style="list-style-type: none"> 3. IPCEI - Hydrogen for climate action 4. IPCEI – Low carbon industries (still in preparation) - Currently the maximum amount for a single MS, based on the two already active IPCEI (Microelectronics and Batteries), amount to 400 M€. - Funding up to 100% of the relevant cost, even if industry co-financing is highly expected. - IPCEI follows the State aid rules (2014/C 188/02). 		
National and Regional	Considering the wide variety of rules, these instruments have to be specifically verified on a case-by-case base.		
EIB		Loans > 25M€	No defined upper limit
ERBD	Loans available in the range 3-250 M€ (average amount €25 M). Full details are negotiated with the client on a case-by-case basis-		
Banks	Conventional instruments and green bonds		

Source: authors' own compilation. Note: green = funding available; yellow = funding rules under definition; red = funding not allowed.

Sequencing

Sequencing is the possibility to continue funding a project which has already been funded previously with the same or a similar instrument. Based on the collected information, sequencing has not generally been highlighted as a key bottleneck to be addressed thoroughly in the rules, either at EU or at national/regional level.

Only in very few cases is sequencing regulated by the instrument rules. Consequently, even though sequencing is important for funding long-term technological development, the use of this tool depends much more on the specific technical nature of the project and its own evolution than on the detailed definition of rules for the funding instrument.

Examples of blending and sequencing

Finally, two hypothetical test cases of blending and sequencing involving European and national/regional instruments (from Germany and Italy) are provided below based on a project dimension of €50-100 M.

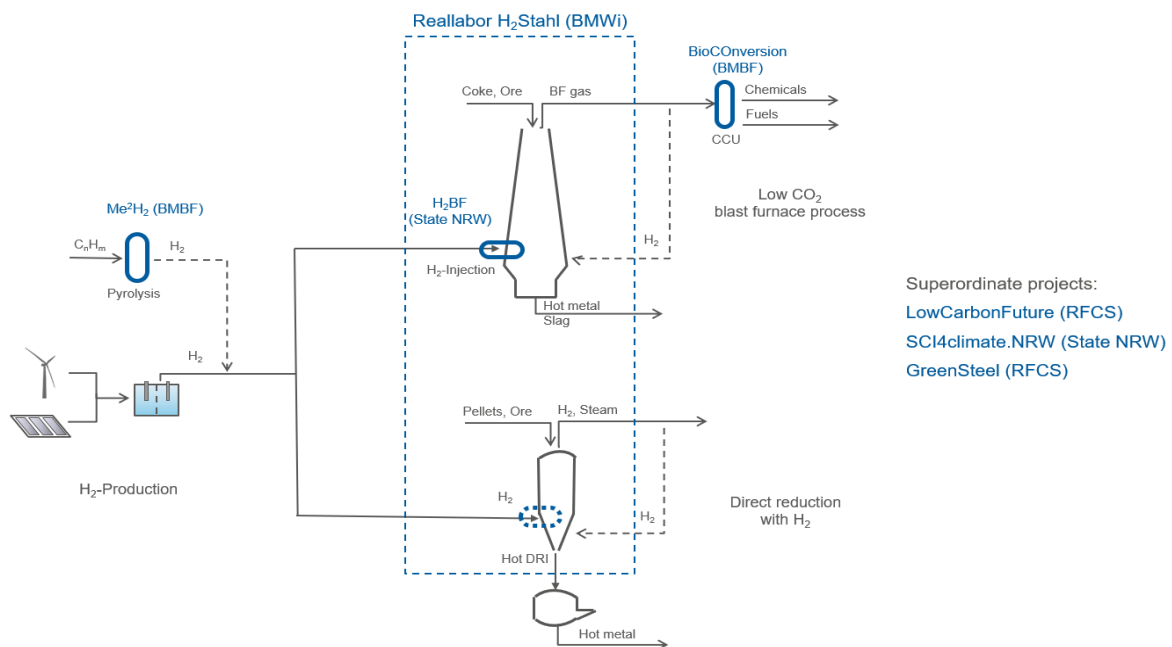
Germany
Project funding dimension
ca. €30-50 M funding (about €50-100 M total budget)
TRL
6-9
Past or ongoing projects to be taken as reference
H2BF – <i>CO₂-Minderung durch H₂-Injektion in den Hochofen – Projektphase 1</i> (CO ₂ mitigation by H ₂ injection into the blast furnace – Project phase 1) H2Stahl – <i>Reallabor Wasserstofftechnologien zur schrittweisen Dekarbonisierung der Stahlindustrie</i> (Real laboratory Hydrogen technologies for the gradual decarbonisation of the steel industry)
European instruments covering at least 20% of the investment
-
National/regional instruments covering at least 20% of the investment
National - Public: <i>Reallabore der Energiewende</i> (Real laboratories of the energy transition) by the German Federal Ministry for Economic Affairs and Energy National - Private: none Regional - Public: <i>progres.nrw</i> by the North Rhine-Westphalia Ministry of Economic Affairs, Innovation, Digitisation and Energy Regional - Private: none
Blending and sequencing
Sequencing of projects: <ul style="list-style-type: none">the first project phase (H2BF project) investigates a partial adjustment at TRL 6. H2BF has an overall budget of €2.7 M for a duration of 14 months. The funding amounts to 40% for industrial

partners via the *progres.nrw* programme by the North Rhine-Westphalia Ministry of Economic Affairs, Innovation, Digitisation and Energy (regional funding).

- The second project phase (H2Stahl project) includes an increasing adjustment at TRL 7-9 as well as an alternative process at TRL 5. H2Stahl funding amounts to 40% for industrial partners via the *Reallabore der Energiewende* instrument by the German Federal Ministry for Economic Affairs and Energy (national funding) for both research activities and investments into plant adjustments.

Blending of (partial) projects: in the first project phase (H2BF project) additional research needs compared to H2Stahl are discovered, leading to a different research project being carried out in parallel. This project is funded by *progres.nrw* (regional funding).

Table 15: Blending and sequencing visualisation



Source: authors' own compilation.

Italy
Project funding dimension
€50 M
TRL
7-8
Past or ongoing projects to be taken as reference
-
European instruments covering at least 20% of the investment
Public: CSP; IF; EGD

Private: EIB; EBRD
National/regional instruments covering at least 20% of the investment
National - Public: instruments by the Italian Ministry for Economic Development National - Private: national banks and industry own resources Regional - Public: instruments by the region Apulia Regional - Private: regional banks
Blending and sequencing
Expected blending and sequencing of the various instruments: <ul style="list-style-type: none"> • EU public instruments: CSP, IF large-scale demonstrator and EGD; • EU private instruments: EIB and EBRD; • national/regional public instruments: instruments by the Italian Ministry for Economic Development and the region Apulia; • national/regional private instruments: national/regional banks and industry own resources.
Overall comments
<p>The risk related to a first-of-a-kind demonstrator is to be mitigated by public financial support.</p> <p>For small and large-scale demonstrators to be deployed in the period 2021-35 and 2036-50, funding instruments should provide long-term visibility as well as stability.</p> <p>In breakthrough industrial projects OPEX is also an important cost (in addition to CAPEX). Currently the only instrument covering OPEX is the IF and support to OPEX should therefore be reinforced.</p> <p>The identified national/regional instruments have no regular calls and do not allow for easily blending and sequencing with EU instruments. As a consequence, improved coordination at EU and MS level is desirable.</p>

Furthermore, six real examples of large-scale demonstrator projects (ArcelorMittal, Salzgitter AG, Marcegaglia, Sidenor, Aperam, and SSAB, LKAB and Vattenfal) which have already been carried out with financing from various instruments, such as those offered by the EIB, the Investment Plan, EFSI and national instruments, are extensively reported in Annex 2.

The Clean Steel Partnership: the step forward.

The CSP is designed to face two major challenges:

- climate change; and
- sustainable growth in the EU.

The CSP long-term vision intends to support the EU leadership in the transformation of the steel industry into a climate-neutral sector and to accelerate the decarbonisation of the steel industry by tackling important R&D&I challenges. Considering that CO₂ emissions from the steel sector will not sufficiently decrease compared to 1990 levels without major technological breakthroughs, the CSP intends to bring a range of breakthrough technologies for clean steel production up to large-scale demonstration by 2030. The partnership also intends to remove R&D&I and systemic bottlenecks such as the transition from the pilot phase to industrial-scale deployment, high technology risks, large capital requirements and higher production costs.

The CSP intends to provide an EU critical mass to upscale breakthrough technology and facilitate joint vision development, agenda setting and synergies of EU different funds. At the base of the operating mechanism of the CSP initiative, major private investment would match public funding, e.g. HEU and the RFCS as well as national and regional programmes, relying on co-financing actions, avoiding duplication, clarifying overlaps, fostering collaboration and maximising synergies. The investment needs to deploy the activities foreseen by the CSP are estimated as follows:

- for the period from 2021 to 2030, collective investments needed from the public and private side are estimated at €2.55 B;
- expected public and private investment within the financing scope of the CSP will amount to at least €1.4 B in the period 2021-27. Additional €0.6 B should be invested between 2021 and 2027 outside the financing scope of the partnership (e.g. other HEU calls, MS funding, etc.), while €0.55 B should be invested outside the financing scope of the partnership between 2028 and 2030. All decarbonisation efforts support CSP objectives and are as such in the scope of the CSP.

The CSP governance will be established between the EC and ESTEP.

In light of the above and the current context, **the CSP is the preferred and recommended high level initiative** to pursue the objectives outlined in the present report. Through blending and synergy actions, the CSP intends to provide a concrete roadmap, identifying the actors, timing, costs, investments and funding mechanisms to support the transition towards the deployment of breakthrough decarbonisation technologies to enable the EU to remain a global leader in the steel industry and to reinforce its knowledge-based competitive advantage.

5. Funding versus investment needs

The steel industry contributes considerably to CO₂ industrial emissions, which will not sufficiently decrease compared to 1990 levels without major technological breakthroughs.

In the frame of a competitive European steelmaking production, decarbonising the steel sector is crucial not only to reduce emission, but also to contribute to a more circular economy, which will generate GHG emission reductions. Besides, reducing CO₂ emissions will fundamentally alter the profile of pollutant emissions and have significant impacts on reducing pollution levels.

The financial needs for CO₂ emission reduction in the steel sector have been calculated based on the information collected from projects on decarbonisation techniques already running up to a demonstration level (TRL 8), which has been detailed in other deliverables of the GREENSTEEL project.⁴⁹ In particular, the financial needs are estimated at an order of magnitude between ten and a few hundred euro/tonne of crude steel for production with decarbonisation techniques. This amount means a financial need for a typical plant size at demonstration up to industrial level ranging between 10 and several hundred million euro, if particular advanced techniques are combined with a significant production. Such an amount is very relevant, also considering the risks and barriers related to these investments (taxation, fees, unknown market scenarios, regulations, technologies, social acceptance, etc). As a result, institutional funding as well as broader policies are of outmost importance to accompany producers in the decarbonisation of production.

Usually, the funding schemes analysed in this report do not reach the required level of funding. To help producers achieve the objective of decarbonising production with European support, however, a public-private-partnership, the CSP, is being launched at EU level to tackle two major challenges, i.e. climate change and sustainable growth in the EU. The CSP is in line with the EGD, the Clean Planet for All vision and the Paris agreement (European Parliament, 2015); it takes an integrated approach to fighting climate change and aims at moving towards climate neutrality by 2050, a zero-pollution ambition towards a toxic-free environment and a circular economy (European Commission, 2018b). In addition, the CSP supports the EU commitment to the UN sustainable development goals and contributes to sustainable growth based on knowledge and innovation, as promoted by the HEU framework.

The implementation of CO₂ emission technologies at industrial scale requires large quantities of investments. All in all, CO₂-low new production technologies will require around **€50 to 60 B** (EUROFER, 2019) investment and will result in capital and operating costs expected to range between €80 and 120 B per year. The analysis of EU funding programmes available as grants (combining HEU, CSP, RFCS and IF) shows that in total only about €2 B of financial support would be effectively available for CO₂ emission reduction in the steel sector for the period 2021-30. This amount is high but **not enough to finance breakthrough technologies and meet the EU challenge to be climate-neutral by 2050.**

⁴⁹ D1.2. Technologies Assessment and roadmapping; D2.6. Synopsis report of consultation activities. D2.2. Investment needs.

6. Concluding remarks

The EU aims at becoming climate-neutral by 2050, building an economy with net-zero GHG emissions. This objective is at the heart of the EGD and in line with the EU's commitment to global climate action under the Paris agreement. The EU can lead the way by investing into realistic technological solutions, empowering citizens and aligning actions in key areas such as industrial policy, finance and research, while ensuring social fairness for a better future for all.

The EU steel industry produces a basic material that is essential and will continue to be so for modern societies. The most significant GHG in the steel industry is CO₂ and the steel industry is one of the biggest industrial CO₂ emitters. In addition, global steel production is forecasted to grow from 1.7 B t in 2018 to 2.8 B t in 2050, with the EU being the second largest producer of steel in the world after China. Therefore, CO₂ emissions from the steel industry need to be significantly reduced.

Even though abating CO₂ emissions is difficult in sectors such as steel and the climate transition in the steel sector is faced with policy, technology and market risks, new technological solutions are being developed. The steel industry is working on a number of breakthrough technology developments in order to drastically reduce the overall CO₂ emissions from the production of steel. The main ongoing projects follow the overarching approach to maintain or even increase the level of circularity of the steel industry and are related to the following technologies:

- hydrogen as a reducing agent;
- CCU;
- CCS;
- process integration;
- biomass as a reducing agent; and
- electrolysis.

Each of these technologies has a role to play in cutting CO₂ emissions with a view to reaching climate neutrality by 2050. Their implementation at industrial scale, however, requires large quantities of investments. New low-CO₂ production technologies will require around €50 to 60 B (EUROFER, 2019) investment and will result in capital and operating costs between €80 and 120 B per year. The price per tonne of primary steel will increase by 35% up to 100%. In other words, large investments in innovation and integrated breakthrough technologies for the European steel industry are crucial to achieve the EU's climate and energy targets, and boost the competitiveness of the sector whilst giving it a first mover advantage in the global stage.

That is why the steel industry, generally operating with low profit margins in very competitive markets and which, to add insult to injury, has now been hit hard by the Covid-19 pandemic, needs financial support for the implementation of CO₂-low production technologies.

Both EU and national financial support schemes for the decarbonisation of industrial installations must be made available at a sufficient scale for the entire transition period from 2021 to 2050.

The analysis of EU financial support conducted in the framework of this activity has found that even by combining significant financial mechanisms - such as HEU, CSP, RFCS, LIFE and IF - only about **€2 B would be available as grants for CO₂ emission reduction in the steel sector for the period 2021-30**. This is, of course, a large amount of money, but unfortunately far from

enough to turn breakthrough technologies into technically-achievable and economically-viable solutions, which would allow the sector to achieve the objective of a climate-neutral EU by 2050.

In addition, based on the currently available information, the analysis of national and regional funding instruments has found that **approximately €400 M per year would be available for reducing CO₂ emissions in the steel sector** (for the period 2021-22), for all eleven of the European countries considered.

Finally, current national and regional instruments are quite often not sufficiently coordinated in terms of scope, timeline and funding availability, and long-term visibility and stability of those instruments must be ensured in order to better allow blending with the new set of EU instruments to properly support CO₂ emission reduction in the steel sector.

In conclusion, the 2050 climate challenge can only be met if private capital is sufficiently supported by a consistent and coordinated framework of public funding opportunities at EU, MS and regional level. In addition, the steel industry and other stakeholders will need to cooperate in order to overcome the technological and economic challenges they face with regard to the implementation of CO₂-low production technologies.

Information collected with regard to public and private EU, national and regional instruments is summarized in Table 17.

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Annex 1

The present annex presents the SME Instrument and the EIC Accelerator in more details.

The **SME Instrument** provides full-cycle business innovation support. It has three phases, including a coaching and mentoring service:

- Feasibility study - Phase 1, helping SMEs to get a grip on the R&D, technical feasibility and commercial potential of a ground-breaking, innovative idea and develop it into a credible business plan for scaling it up. Phase 1 funding is a lump sum of €50 K;
- From concept to market - Phase 2, focusing on strategic business plans, expected outcome of the project, criteria for success and expected impacts on the company in both qualitative and quantitative terms. Funding is provided through grants (with a funding rate of 70%) amounting between €0.5 M and €2.5 M;
- Commercialisation - Phase 3, helping SMEs take advantage of additional EU support extended via a range of business support services offered on the EIC Community Platform.

From 2019 onwards the **EIC Accelerator** (previously known as SME Instrument) is part of the EIC pilot that supports top-class innovators, entrepreneurs, small companies and scientists with funding opportunities and acceleration services.

The EIC Accelerator supports high-risk, high-potential SMEs and innovators to help them develop and bring onto the market new innovative products, services and business models that could drive economic growth. Selected companies receive funding and optional equity, and are offered business coaching and mentoring to scale up their innovation idea. They get extra acceleration services to connect with investors, corporates and likeminded entrepreneurs. The EIC Accelerator client will gain visibility and boost the chances of success in European and international markets.

The EIC Accelerator is designed for SMEs with radically new ideas underpinned by a business plan for rolling out marketable innovation solutions and with ambitions to scale up. It targets for-profit SMEs only, including young companies and start-ups, from any sector - there are no set topics. From 5 June 2019 only single companies (as opposed to consortia) can apply for the EIC Accelerator. Companies that apply must be established in an EU MS or a H2020 associated country. Large corporates, research centres or scientists cannot apply directly but they can participate in projects as subcontractors or third parties and do not need to be established in an EU MS or associated country.

From 5 June 2019 the EIC Accelerator offers blended finance in the form of an optional investment in equity in addition to the grant, to single for-profit SMEs. Grants will finance activities from TRL 6-8. Applicants will be asked to indicate if they want blended finance and the amount requested for equity. The maximum investment in the form of equity is €15 M. Running projects can under certain circumstances request additional blended finance potentially combined with a top-up of their grant.

Starting on 18 March until 19 May 2020, applicants will be able to apply for the Green Deal topic, specifically concentrating on those innovations that fuel the societal transition towards sustainability while supporting EU's competitiveness and leadership in clean technologies. The topic targets high-risk, high-potential SMEs (including start-ups) from any sector provided that they contribute to one or more of the Green Deal goals as mentioned in the draft work programme.

The budget amounts to €1.2 B (EIC Accelerator only).

Further details are provided in article 43 of the Proposal for a Regulation of the European Parliament and of the Council establishing Horizon Europe:

“Article 43 – EIC Accelerator

1. The beneficiary of the EIC Accelerator shall be a legal entity qualifying as a start-up, an SME or as a mid-cap, established in a Member State or associated country. The proposal may be submitted by the beneficiary, or by one or more natural persons or legal entities intending to establish or support that beneficiary.

2. A single award decision shall cover and provide funding for all forms of Union contribution provided under EIC blended finance.

3. Proposals shall be evaluated on their individual merit by independent experts and selected in the context of an annual open call with cut-off dates, based on Articles 24 to 26, subject to paragraph 4. Award criteria shall be:

- excellence;
- impact;
- the level risk of the action and the need for Union support.

5. With the agreement of applicants concerned, the Commission or funding bodies implementing Horizon Europe may directly submit for evaluation under the last evaluation criterion a proposal for an innovation and market deployment action which already fulfils the first two criteria, subject to the following cumulative conditions:

- the proposal shall stem from any other action funded by Horizon 2020 or this Programme, or from a national programme similar to the EIC's Pathfinder and acknowledged as such by the Commission;
- be based on a previous project review assessing the excellence and the impact of the proposal and subject to conditions and processes further detailed in the work programme.

6. A Seal of Excellence may be awarded subject to the following cumulative conditions:

- the beneficiary is a start-up or an SME,
- the proposal was eligible and has passed applicable thresholds for the first two award criteria referred to in paragraph 4,
- for those activities that would be eligible under an innovation action.

7. For a proposal having passed the evaluation, independent experts shall propose a corresponding EIC blended finance, based on the risk incurred and the resources and time necessary to bring and deploy the innovation to the market. The Commission may reject a proposal retained by independent experts for justified reasons, including compliance with the objectives of Union policies.

8. The grant or the reimbursable advance component of the blended finance shall not exceed 70% of the costs of the selected innovation action.

9. Implementation modalities of the equity and repayable support components of the EIC blended finance shall be detailed in Decision [Specific programme].

10. The contract for the selected action shall establish specific milestones and the corresponding pre-financing and payments by instalments of the EIC blended finance.

Activities corresponding to an innovation action may be launched and first pre-financing of the grant or the reimbursable advance paid, prior to the implementation of other components of the awarded EIC blended finance. The implementation of those components shall be subject to the achievement of specific milestones established in the contract.

11. In accordance with the contract, the action shall be suspended, amended or terminated if milestones are not met. It may also be terminated where the expected market deployment cannot be met.

The Commission may decide to increase the EIC blended finance subject to a project review by external independent experts”.

Annex 2

The present annex provides real examples of funding instruments used by the steel sector.

Example 1: EIB - ArcelorMittal.

The EIB, with the support of the EC, has granted a €75 M loan to ArcelorMittal for the construction of two ground-breaking projects at ArcelorMittal Ghent, Belgium, to considerably reduce carbon emissions by converting waste and by-products into valuable new products, helping to develop low-carbon steelmaking technologies, in line with the EU's climate objectives.

Details of the projects include:

- **Steelanol** - a €165 M industrial-scale demonstration plant that will capture waste gases from the blast furnace and biologically convert them into recycled-carbon ethanol, the first commercial product of ArcelorMittal's Carbalyst® family of recycled carbon chemicals. The ethanol produced can be blended for use as a liquid fuel. The technology was developed by LanzaTech, with whom ArcelorMittal has entered a long-term partnership, together with Primetals and E4tech. Once complete, the plant is expected to produce up to 80 M litres of recycled-carbon ethanol a year. The new installation will create up to 500 construction jobs over the next two years and 20 to 30 new permanent direct jobs. The project is expected to be completed in 2022.
- **Torero** - a €50 M large-scale demonstration plant to convert waste wood into bio-coal, partially replacing the coal currently injected into the blast furnace. In the early stage, the Torero plant will be able to convert up to 60,000 tonnes of waste wood into around 40,000 tonnes of bio-coal every year. This volume will be doubled in a second stage of the project, after the start of the first Torero reactor. The new installation will create around 70 external jobs and around ten new permanent direct jobs for the operation of this installation. The plant, which is being developed in partnership with Torr-Coal, Renewi, Joanneum Research Centre, Graz University and Chalmers Technical University, is expected to be operational by the end of 2022.

Example 2: EIB, H2020 and national instrument - Salzgitter AG.

Salzgitter AG is one of Europe's largest steel producers and the global market leader in the large-diameter pipes business. The Group operates cutting-edge and resource-efficient production sites in Germany and abroad. It consists of more than 150 subsidiary and holding companies and, headed by Salzgitter AG, is structured as a holding comprising the five business units of Strip Steel, Plate/Section Steel, Trading, Mannesmann and Technology.

The EIB is providing €150 M to Salzgitter AG. The company will use the fresh funds to strengthen its competitiveness and increase sustainability through technological innovation and digital transformation. The financing of the EU bank is backed by a guarantee from the EFSI. EFSI is a core component of the Investment Plan for Europe – also known as the Juncker Plan – under which the EIB and the EC are working together as strategic partners to boost the competitiveness of the European economy.

The EC executive vice-president Valdis Dombrovskis, responsible for An Economy that Works for People, said: "I am pleased that the EU, via the Juncker Plan, is helping the steel industry to

become more modern, digital and sustainable. By investing in research and development with this EIB financing, Salzgitter will improve its productivity and quality, ultimately benefitting the consumer”.

The EIB vice-president Ambroise Fayolle, responsible for operations in Germany and EFSI, said: “The transaction will strengthen Salzgitter’s expertise and technical know-how in particular in the field of lightweight high strength steels for the transport industry, which is identified by the EU as a key enabling technology for advanced material. The investment will assist to safeguard about 750 jobs in Salzgitter’s research, development and innovation, and indirectly support the company’s workforce in Europe of over 20,000 people”. And the vice-president added: “I very much welcome this new cooperation with Salzgitter, which is backed by the Juncker Plan, as this demonstrates Europe’s clear and strong engagement to support the industry in its digital transformation process”.

Salzgitter AG chief financial officer Burkhard Becker said: “The cooperation with the EIB is an important factor for our group’s R&D budget financing. Salzgitter AG’s long-term success is based on acting responsibly and conducting sustainable business. The EIB financing enables us to continue our intensive research and development activities towards innovative and sustainable steel making”.

The operation is also partially financed by national and EU grant support (H2020).

Example 3: EIB and EFSI - Marcegaglia Group.

On 29 July 2019, the EIB and Marcegaglia Group signed a seven-year loan agreement having a total value of €100 M for the digitisation and energy efficiency of its production plants.

The loan, which is the first granted by the EIB to the Mantua steel group and is included in EFSI, will also be used to build two thermal energy plants and some photovoltaic plants for the independent production of electricity and heat, which can meet 75% of the internal needs, with a significant reduction in costs and GHG emissions into the air.

In 2019 Marcegaglia Group launched a plan of measures for an amount of approximately €600 M over the next five years to strengthen the activities of the main plants in its production chain in Italy and abroad.

Example 4: EIB and EFSI - Sidenor.

The EIB has taken a further step in fostering innovation in the steel industry financing Sidenor, one European leader in the production of specialised steel, to carry out its strategic innovation plan centred on improving cost efficiency, modernising and digitalising its facilities, and developing new products with higher added value.

The EIB granted (22 July 2019) to Sidenor a €50 M loan under EFSI.

Sidenor will use the EIB funding to acquire state-of-the-art technologies to enhance the quality of its steels and improve its production efficiency to meet the latest market demand. These investments will also enable Sidenor to reduce its environmental impact by producing more sustainably with less energy consumption.

Related works will be carried out up to 2021 in the company’s plants, located mainly in the Basque Country, and will help to safeguard jobs in the steel sector.

European Commissioner Miguel Arias Cañete, responsible for Climate Action and Energy, said: “With this investment, the EU is providing tangible support to achieve our decarbonisation objectives while helping the transition and competitiveness of our industry. Addressing emissions from carbon-intensive industry is a key priority in this context and also fosters Europe’s global leadership of climate-friendly technologies”.

Example 5: EIB - Aperam.

The EIB and Aperam signed (25 February 2019) a financing contract where the EIB will make available to Aperam an amount of €100 M. The purpose of this contract is the financing of investments in the cold rolling, and annealing and pickling line at Aperam’s plant.

This financing contract with the EIB will support Aperam’s strategy to enlarge product range, to incorporate the most demanding applications, to increase efficiency and cost competitiveness, and to continuously enhance its health, safety and environmental impact.

EIB vice-president Ambroise Fayolle said: “The EIB is proud to continue supporting Aperam in its plant modernisation investments in France (Nord Pas-de-Calais) and Belgium (Châtelet), and also now to contribute to upgrading its Genk (Belgium) plant with advanced stainless steel manufacturing technology. Innovation, at the heart of competitiveness, is the best response against the challenges currently facing the stainless steel industry and the EIB is there to support it.”

Example 6: National instruments – HYBRIT (2021-27)⁵⁰.

HYBRIT (Hydrogen Breakthrough Ironmaking Technology) is the largest running decarbonisation project in Sweden in the area of the iron and steelmaking.

In 2016, SSAB (global leader in high-strength steels), LKAB (Europe’s largest iron ore producer) and Vattenfall (one of Europe’s largest electricity producers) joined forces to create HYBRIT, an initiative that endeavours to revolutionise steelmaking. HYBRIT aims at replacing coking coal, traditionally needed for ore-based steel making, with hydrogen.

In order to achieve the goal, a joint venture between SSAB, LKAB and Vattenfall, called HYBRIT, was also formed, which is a ground-breaking effort to reduce CO₂ emissions and decarbonise the steel industry.

During 2018, work started on the construction of a pilot plant for fossil-free steel production in Luleå, Sweden. The goal is to have a solution for fossil-free steel by 2035. If successful, HYBRIT means that Sweden’s CO₂ emissions can be reduced by 10% and Finland’s by 7%.

The total cost for the pilot phase is estimated to be SEK1.4 B. The Swedish Energy Agency contributes more than SEK500 M to the pilot phase and the three owners, SSAB, LKAB and Vattenfall, will each contribute one third of the remaining costs. The Swedish Energy Agency has earlier contributed SEK60 M to the pre-feasibility study and a four-year-long research project. The pilot phase is planned to last until 2024, after which it will move to the demonstration phase in 2025-35.

⁵⁰ For further details, please see www.hybritdevelopment.com.

Already before a solution for fossil-free steelmaking is in place, SSAB aims at cutting its CO₂ emissions in Sweden by 25% by as early as 2025, through conversion of the blast furnace in Oxelösund, Sweden, to an electric arc furnace. Between 2030-40, the aim is to also convert the blast furnaces in Luleå, Sweden and Raahе, Finland to eliminate most of the remaining CO₂ emissions and to reach the target of being fossil-free by 2045.

Overall, the expected impact on CO₂ emission reduction is 25% by as early as 2025 and 100% by as early as 2040 for SSAB in Sweden and Finland.

To carry out the HYBRIT initiative, however, significant national contributions are still required from the state, research institutions and universities. Good access to fossil-free electricity, improved infrastructure, rapid expansion of high voltage networks, research initiatives, faster permit processes, the government's active support for the pilot and demonstration facilities and long-term support at EU level are also needed.

Annex 3

Figure 15: Combination of funding for the steel industry - Horizon 2020 and ESIF

Combining H2020 and ESIF money in the same project is allowed by derogation from the non-cumulative principle of Art. 129 Fin. Regulation (Art 65(11) CPR & 37 H2020 RfP), but this is not intended as double funding. Two Union grants may not cover the same cost item.



Source: European Commission, 2014b.

Annex 4

Table 16: Overview of the differences between Horizon 2020 and the structural funds

Horizon 2020	EU Structural funds
DIFFERENCES	
Non-territorial, mainly transnational approach based on excellence and impact; H2020 does not take into account geographic specificities in allocating funding.	Place-based approach supporting economic and social cohesion; co-funding rates vary according to the region and programme. .
Individual R&D&I projects: tackling the whole cycle of innovation, taking into account strategic approaches at EU level, e.g. through European Innovation Partnerships and the SET-Plan. Co-Fund actions: focus on co-funding specific R&I calls or programmes (pre-commercial procurement/public procurement of innovation, PPP, peer-to-peer, ERA-NETs, etc.).	Largely focused on improving the R&I capacities and R&I eco-systems with the objective of regional growth and place-based economic transformation towards higher added value and more knowledge-intensive activities (RIS3). Increase of support to R&I activities as such too, e.g. business-university cooperation and closer-to-the-market activities (prototyping, pilot lines, early product validation actions, advanced manufacturing capabilities and first production).
Directly managed (EC/executive agency) and awarded directly to final beneficiaries or managed by a Union body or multi-country entity; in case of programme co-funding, with dedicated implementation structure (indirect management).	Shared management with national and regional public intermediaries (managing authorities, implementing agencies and intermediate bodies) defining the implementation details and allocating the funding to final beneficiaries.
Not counted for EU state aid purposes.	Counted for EU state aid purposes.
Competitive calls for proposals addressed to multi-country consortia (participation beyond the EU is possible) without geographic pre-allocation; (European Research Council and Marie Skłodowska-Curie Actions also address individuals; SME Instrument also addresses single SMEs).	Policy-related prioritisation based on cohesion considerations and RIS3 priorities to individual firms/bodies and consortia within the territory covered by the operational programme (and only within the EU). Increasing use of competitive attribution through calls and aid schemes based on project selection criteria (depending on MS).
OPPORTUNITIES	

<p>Focus on: promoting industrial leadership and tackling major societal challenges; maximising the competitiveness impact of R&I; and raising and spreading levels of excellence in R&I. Actions to close research and innovation included. Objective of spreading excellence and widening participation. Award of the ‘Seal of excellence’ to certain types of action (including the SME Instrument) proposals that fulfil excellence criteria but cannot be supported from H2020, to be taken up by national/regional programmes to facilitate access to project funding.</p>	<p>Besides improving the innovation eco- systems, cohesion policy partly increasing the capacity of regions and MSs to participate in H2020, and partly funding R&D&I activities in a MSs/regions that can build on FP7 and H2020 projects. Possibility for regional programmes to take up good practices and project formats that were tested under H2020, e.g. public procurement of innovative solutions, pre-commercial public procurement, stage-gating for projects (like in the SME Instrument), knowledge-triangle settings like in the Knowledge and Innovation Communities of the European Institute of Innovation and Technology, ‘proof-of-concept’ type of actions like under the European Research Council, and social and public sector innovation approaches. Support from H2020 for the policy development at national and regional levels.</p>
<p>Similar cost options that may facilitate combining funds: lump sums, flat rates, unit costs, etc.</p>	

Source: authors’ own compilation.

Annex 5

The main HEU provisions related to cumulative blending and sequencing are reported below (see Proposal for a regulation of the European Parliament and of the Council establishing Horizon Europe - the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination):

“TITLE II - RULES FOR PARTICIPATION AND DISSEMINATION [...]

CHAPTER II – Grants [...]

Article 23 – Cumulative funding

An action that has received a contribution from another Union programme may also receive a contribution under the Programme, provided that the contributions do not cover the same costs. The rules of each contributing Union programme shall apply to its respective contribution to the action. The cumulative funding shall not exceed the total eligible costs of the action and the support from different Union programmes may be calculated on a pro-rata basis in accordance with the documents setting out the conditions for support”.

“Article 43 – EIC’s Accelerator [...]

5. With the agreement of applicants concerned, the Commission or funding bodies implementing Horizon Europe may directly submit for evaluation under the last evaluation criterion a proposal for an innovation and market deployment action which already fulfils the first two criteria, subject to the following cumulative conditions:

- the proposal shall stem from any other action funded by Horizon 2020 or this Programme, or from a national programme similar to the EIC's Pathfinder and acknowledged as such by the Commission;
- be based on a previous project review assessing the excellence and the impact of the proposal and subject to conditions and processes further detailed in the work programme”.

“CHAPTER V - Blending operations and blended finance

Article 41 – Blending operations

Blending operations decided under this Programme shall be implemented in accordance with the InvestEU Programme and Title X of the Financial Regulation.

Article 42 – Horizon Europe and EIC Blended finance

1. The grant and reimbursable advance components of Horizon Europe or EIC blended finance shall be subject to Articles 30 to 33.

2. EIC blended finance shall be implemented in accordance with Article 43. The support under the EIC blended finance may be granted until the action can be financed as a blending operation or as a financing and investment operation fully covered by the EU guarantee under InvestEU. By derogation from Article 209 of the Financial Regulation, the conditions laid down in paragraph (2) and, in particular, paragraph (a) and (d), do not apply at the time of the award of EIC blended finance.

3. Horizon Europe blended finance may be awarded to a programme co-fund where a joint programme of Member States and associated countries provides for the deployment of financial instruments in support of selected actions. The evaluation and selection of such actions shall be made in accordance with Articles 19, 20, 23, 24, 25 and 26. The implementation modalities of the

Horizon Europe blended finance shall comply with Article 29, by analogy Article 43(9) and with additional conditions defined by the work programme.

4. Repayments including reimbursed advances and revenues of Horizon Europe and EIC blended finance shall be considered as internal assigned revenues in accordance with Articles 21(3)(f) and 21(4) of Financial Regulation.

5. Horizon Europe and EIC blended finance shall be provided in a manner that does not distort competition.

Annex 6

Table 17: GREENSTEEL database of funding programmes for CO₂ emission reduction in the steel sector

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
COMET – Competence Centre for Excellent Technologies (Austria)	Link	Building up key research competences by cooperation between science and industry; providing a network of hubs offering high quality research	Not specified	Public	Grant	No budget earmarked for the steel sector	SMEs, large companies, universities, universities of applied sciences, competence centres, research facilities	Research programmes	Blending allowed	Programme not tied to a specific TRL
General Programme (Austria)	Link	Supporting the development of new products, processes and services to improve the competitiveness of companies based in Austria	€100 M per year (max. funding per project: €3 M)	Public	Grant and loan	No budget earmarked for the steel sector	Companies of any size	R&D	Blending allowed	Programme not tied to a specific TRL
Bridge (Austria)	Link	Supporting the utilization and further development of basic research through cooperation between science and industry	Not specified	Public	Grant	No budget earmarked for the steel sector	Research institutions, companies	Basic research (and potential for exploitation)	Blending not allowed	Programme not tied to a specific TRL

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Beyond Europe (Austria)	Link	Supporting Austrian companies, research and university institutes, and other organisations to create and extend collaborations	€4.6 M (3 rd call)	Public	Grant	No budget earmarked for the steel sector	Austrian companies, research and university institutes, other organisations	Exploratory projects and cooperative R&D development projects	-	Programme not tied to a specific TRL
Stand-alone projects (Austria)	Link	Funding individual research in the area of non-profit oriented scholarly/scientific research	Not specified	Public	Grant	No budget earmarked for the steel sector	Researchers working in Austria	Basic research	Blending not allowed	Programme not tied to a specific TRL
Joint projects (Austria)	Link	Supporting bilateral research projects with closely integrated content	Not specified	Public	Grant	No budget earmarked for the steel sector	Researchers working in Austria	Basic research	Blending not allowed	Programme not tied to a specific TRL
Flagship Region Energy Programme (Austria)	Link	Promoting the efficient interaction of energy production, consumption, system management and storage	Up to €120 M in three flagship regions (€20-40 M per model region until 2021)	Public	Grant	No budget earmarked for the steel sector	Companies, research institutions, communities, areas	R&D projects, demonstration projects	Supplementary grants and funding possible (EU, national, regional)	Preferably TRL 8 to 9, but lower-level TRLs can also be submitted

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Energy Transition 2050 (Austria)	Link	Promoting the social and economic transition towards a low-carbon, sustainable future	€700 K (2020)	Public	Grant	No budget earmarked for the steel sector	Research institutes, companies	Priority 1, steel-related topics	-	-
Christian Doppler Gesellschaft (Austria)	Link	Promoting the link between economy and science	€750 K (per year)	Public and private	Grant and loan	No budget earmarked for the steel sector	Scientists at universities or non-university research institutions	Application-oriented basic research	-	Programme not tied to a specific TRL
GreenTech 100 (Austria)	Link	Supporting the transformation towards a green economy with a focus on renewable energy, energy efficiency and resource efficiency	€3.5 M	Public	Grant	No budget earmarked for the steel sector	Styrian universities, non-university non-profit research institutions, associations (scientifically oriented)	Fundamental research, industrial research or experimental development (non-profit)	-	Programme not tied to a specific TRL
Strategic Ecology Support (Belgium)	Link	Supporting ecology investment oriented towards environmental protection	-	Public	Grant	No budget earmarked for the steel sector	Companies	Remediation of damage to the environment, energy saving, use of renewable resources	-	-

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Energy Transition Fund (Belgium)	Link	Promoting innovative ideas in the field of energy, with a focus on three thematic axes: renewable energy in the North Sea and biomass, nuclear energy, and energy storage and transport	€25 M for each call (1-2 years)	Public	Grant	No budget earmarked for the steel sector	Steel Industry; industries of any size	Technical staff, materials, external collaborations, patents	Blending not allowed; sequencing allowed	Programme not tied to a specific TRL
Flanders Industry Innovation Moonshot (Belgium)	Link	Supporting the transformation of Flemish industries towards a low-carbon and circular economy by 2050	Target budget: €25M/call; 100% for fundamental research; 50% for industrial research; 25% development projects; 50% for feasibility studies	Public	Grant	No budget earmarked for the steel sector	Industries	Fundamental and industrial research, development projects, feasibility studies	-	5-9
BelSME (Belgium)	Link	Promoting SME competitiveness	€250 K	Public	Grant	No budget earmarked for the steel sector	SMEs	Fixed assets, technical staff, materials	Blending not allowed, sequencing not allowed	Programme not tied to a specific TRL

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Interreg (Belgium: Wallonia-Flanders; France)	Link	Promoting the circular economy and recycling	€3-4 M per project	Public	Grant	Circular economy recycling	Companies of any size	Fixed assets, technical staff, materials, patents	Inter-regional blending and sequencing allowed	7-9
Plan Marshall (Belgium: Wallonia)	Link	Promoting the circular economy and the environment	€3-4 M per project (65% for industrial partners)	Public	Grant	Subject to negotiation	RTOs, large companies, SMEs, academia	Fixed assets, technical staff, materials, patents	Blending and sequencing allowed only at regional level	3-8
VLAIO <i>Innovatiesteun aan bedrijven</i> (Belgium: Flanders)	Link	Supporting investment in any technical topic	€2 M in 2019; 25% for the development part and 50% for research part	Public	Grant	Research and development activities	RTOs and industries	Fixed assets, technical staff, materials, patents	-	1-9
VLAIO <i>Strategische transformatiesteun</i> (Belgium: Flanders)	Link	Supporting training and investment for the transition of companies in terms of innovation, sustainability and internationalisation	€32 M for 51 projects (33% SMEs, 67% large companies)	Public	Grant	Training and investment	Companies of any size	Fixed assets, technical staff, materials, patents	-	Skills, 7-9
<i>Ecologiepremie+</i> (Belgium: Flanders)	Link	Supporting investments in for performant	17 M€ (69% SME, 32% LC). 15-55% support.	Public	Grant	No budget earmarked for the steel sector	Companies of any size	Fixed assets, technical staff,	-	7-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
		ecological technologies	Maximum 1 M €/company					materials, patents		
<i>Strategische ecologiesteun</i> (Belgium: Flanders)	Link	Supporting investments in performant ecological technologies not part of the standard list in Flanders	€7.5 M (100% large companies, but also open to SMEs); 20-40% support	Public	Grant	No budget earmarked for the steel sector	Companies of any size	Fixed assets, technical staff, materials, patents	-	7-9
<i>Onderzoeksproject</i> (Belgium: Flanders)	Link	Supporting applied research	€187 M; Maximum 60% funding	Public	Grant	No specific technical focus, steel sector can participate	Companies, RTOs, possible subcontractors (57% SMEs 43% large companies)	Fixed assets, technical staff, materials, patents	-	Medium TRL
<i>Ontwikkelingsproject</i> (Belgium: Flanders)	Link	Supporting the implementation of an innovative idea into a business case	€8 M; minimum 25% and maximum 50% funding	Public	Grant	Implementation of innovative ideas into business cases	Companies, RTOs, possible subcontractors	Fixed assets, technical staff, materials, patents	-	6-9
Horizon Europe (HEU)	Link	Driving economic growth and creating jobs	€100 B	Public	Grant	€80 M (2021-30)	Undertakings and individuals	R&D&I, RIA, IA, CSA	CSP, RFCS, IF, LIFE	1- 9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Clean Steel Partnership (CSP)	Link	Supporting the decarbonization of the steel industry	€700 M (2021-27)	Public	Grant	€975 M (2021-20)	Undertakings and individuals	R&D&I small-scale demonstration projects	RFCS, HEU, IF, LIFE	5-9
Research Fund for Coal and Steel (RFCS)	Link	Supporting R&I in coal and steel sectors. Projects cover: (i) production processes; (ii) application, utilisation and conversion of resources; (iii) safety at work; (iv) environmental protection; and (v) reduction of CO ₂ emissions from steel production	€40 M Per year (€30 M for steel)	Public	Grant	€300 M (2021-30)	Undertakings and individuals	R&D&I research projects (up to 60%), pilot and demonstration projects (up to 50%) and accompanying measures (up to 100%)	HEU, CSP, IF, LIFE	3/5-7

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Innovation Fund (IF)	Link	Supporting the demonstration of innovative low-carbon technologies and promoting GHG emission avoidance	€10 B (2021-30)	Public	Grant	€500 M (for 20 different sectors) (2021-30)	Ells, renewable energy, IT	Demonstration & first-of-a-kind big (€>7.5 M) or small (€<7.5 M) projects. Big projects: up to 60% of additional costs related to innovative technologies; small projects: up to 60% of CAPEX	HEU, CSP, RFC, LIFE	7-9
LIFE	Link	Promoting environment and climate actions	€5.4 B (2021-27)	Public	Grant	€50 M (2021-30)	Climate, Environment, Nature	Demonstration and first-of-a-kind	HEU, CSP, RFCS, IF	6-9
European Green Deal Investment Plan (EGDIP)	Link	Promoting the protection of the environment and boosting the green economy within Europe	€503 B (2021-27)	Public	Grant	To be estimated, currently under evaluation at EU level	Climate- and environment-related objectives	Demonstration and first-of-a-kind	HEU, CSP, RFCS, IF	7-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Just Transition Fund (JTF)	Link	Helping the most vulnerable regions deal with the socio-economic impacts of the green transition	At least €150 B	Public and private	Grant and loan	No budget earmarked for the steel sector	Undertakings and individuals			1-5
Digital Europe (DE)	Link	Building the strategic digital capacities of the EU and facilitating the wide deployment of digital technologies, to be used by Europe's citizens and businesses	€9.2 B (2021-20)	Public	Grant	Not directly contributing to CO ₂ emission reduction	Undertakings and individuals	Roll-out & infrastructure	Draft orientation	Draft orientation
Connecting Europe Facility (CEF)	Link	Promoting growth, jobs and competitiveness through targeted infrastructure investment at European level (to support the development of high-performing, sustainable and efficiently-interconnected trans-European networks in the fields of	€28.7 B (2021-27)	Public	Grant	Not directly contributing to CO ₂ emission reduction	Undertaking and individuals	Roll-out & infrastructure projects in energy, telecom and transport sectors	CF	Infrastructure networks

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
		transport, energy and digital services								
Modernisation Fund (MF)	Link	Supporting 10 lower-income EU MSs in their transition to climate neutrality by helping to modernise their energy systems and improve energy efficiency	€14 B (2021-30)	Public and private	Grant, premium, guarantee, loan	No budget earmarked for the steel sector	Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia		InvestEU, JTF, CEF, ESIF	TRL defined by each MS
Cohesion Fund (CF)	Link	Strengthening the economic, social and territorial cohesion of the Union in the interest of promoting sustainable development	€41.3 B (2021-27)	Public	Grant	No budget earmarked for the steel sector	MSs whose GNI per capita is less than 90% of the EU average		ERDF, CEF, Interreg	
Erasmus+	Link	Supporting education, training, youth and sport in Europe	€14.7 B (2021-27)	Public	Grant	Not directly contributing to CO ₂ emission reduction	Undertakings and individuals	Skills, various (KA1, KA2, KA3, Jean Monnet, sport, etc.)	Up to 100%	Education, skills and training

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
ERA-NET	Link	Supporting the preparation and establishment of networking structures, and the design, implementation and coordination of joint activities	Depending on the amount allocated by each region and the EC	Public	Grant	Not directly contributing to CO ₂ emission reduction	Depending on the specific call	Dedicated to SMEs, depending on EC and regional criteria	EC	Depending on the specific call
SME Instrument (now EIC Accelerator)	Link	Supporting high-risk, high-potential SMEs to develop and bring to market new products, services and business models that could drive economic growth; supporting top class innovators, entrepreneurs and small companies with funding opportunities and acceleration services)	€1.2 (EIC Accelerator)	Public	Grant	Not directly contributing to CO ₂ emission reduction	SMEs	Dedicated to SMEs.CO SME, Innosup, EUROSTAS, SME instruments	Regional instruments	4-9
Important project of common European	Link	Providing a contribution to Union objectives and significant impact on economic growth,	Agreement among at least three MSs	Public	Grant	Possibly around €2 B (estimation based on two	By sector	R&D&I	National funding, structural funds and central EU	5-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
interest (IPCEI)		sustainability or value creation across the EU				existing IPCEI for R&D)			funding programmes	
Recovery Fund (RF)	Link	Mobilising investment and frontloading financial support in the crucial first years of recovery	€750 B (2021-27)			No budget earmarked for the steel sector	All MSs, particularly those particularly affected by the crisis			
European Investment Bank (EIB)	Link	Contributing to EU policy goals through long-term finance	€≥25 M	Private	Loan	Loans; InnovFin; InvestEU	Companies of any size	EC, EP and Council of EU	HEU, RFCS, IF	7-9
European Bank for Regional Development (EBRD)	Link	Supporting local commercial banks	€3-250 M; average €5 M	Private	Loan	Loans	SMEs, banks	EIB	HEU, RFCS, IF	8-9
European Fund for Strategic Investment (EFSI)	Link	Boosting investments	No specific limitation	Private	First-loss guarantee	First-loss guarantees	SMEs	EIB	HEU, RFCS, IF	9
European Regional Development Fund (ERDF)	Link	Supporting economic and social cohesion	No specific limitation	Private	Co-financing investments	Co-financing investments	Companies of any size	MSs and regions	HEU, RFCS, IF	8-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
InnovFin	Link	Promoting innovative business	No specific limitation	Private	Loan	Loans	Industry and manufacturing sectors	EIB; EC; InnovFin	HEU, RFCS, IF	6-9
InvestEU	Link	Promoting financial investments	Up to €150 M per project	Private	EU guarantee	EU guarantees	Industries of any size	EIB; EC;	HEU, RFCS, IF	9
Integrated National Energy and Climate Plan (Finland)	Link	Enabling Finland to achieve the energy and climate targets specified in prime minister Juha Sipilä's government programme and adopted in the EU for 2030, and systematically setting the course for reaching the 2050 targets	€100 M for investments in renewable energy and new technology for the period 2016-18	Public	Grant	No budget earmarked for the steel sector				No specific limitation
Finland's Innovation Fund (SITRA) (Finland)	Link	Providing financial support for new operating models and stimulating business that aims at sustainable well-being, supporting particularly activities contributing to the National Road Map		Public	Grant	No budget earmarked for the steel sector	All industries size			

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
		to a Circular Economy (2016-25)								
Coordination Mechanisms with MSs and regional authorities (Finland)		Maximise synergies with national policies, programmes and activities		Public	Grant		Finnish companies			
Business Finland	Link	It offers Finnish companies a unified customer journey for innovation activities, internationalisation, investments and tourism promotion.		Public	Grant		Finnish companies, SMEs, RTOs			
National Energy and Climate Plan (France)	Link	Supporting industry with innovation-based solutions	Information currently not yet available	Public	Grant	The measures explicitly detailed in the final version of the PPE and therefore in the PNIEC will have to be supplemented by additional measures to			Blending expected to be allowed	

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
						achieve all of the objectives by 2030				
National Low-Carbon Strategy (France)	Link	Reducing industry emission by using carbon-free resources	Information currently not yet available	Public	Grant	The measures explicitly detailed in the final version of the PPE and therefore in the PNIEC will have to be supplemented by additional measures to achieve all of the objectives by 2030			Blending expected to be allowed	
Ecological Transition Agency – R&D programme (France)	Link	Promoting development and experimental implementation and research	€25 M per year; maximum project value €0.3 M	Public	Grant	Too low funding available	Research organisms, enterprises, associations	Technical staff, materials, patents, external collaborations	Not allowed	4-7
Ecological Transition Agency – Investments for the Future	Link	Supporting demonstration-scale experiments and first industrialisation in the field of climate change, circular	€350 M per year; minimum project value €1 M	Public	Grant	€ 20 M per year	Mainly enterprises	Technical staff, materials, patents, external collaborations	Not allowed	6-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
programme (France)		economy and energy saving								
BNP Paribas (France)	Link	Supporting investment in climate-related activities	No specific limitation	Public	Grant	Green Bonds; Transition Bonds; Loans	Industries of any size	EU, national and local authorities	No limitation with public instruments	8-9
Credit Agricole Group (France - EU wide)	Link	Supporting investments in green and sustainable activities	No specific limitation	Public	Grant	Green Bonds; Transition Bonds; Loans	Industries of any size	EU, National and local authorities	No limitation with public instruments	89
KlimPro-Industrie (Germany)	Link	Promoting climate protection, high-tech implementation and sustainable development	€6.5 M per year	Public	Grant	No budget earmarked for the steel sector	Industry and research institutes, focus on SMEs	Basic and industrial research	Blending allowed	1-5

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Kopernikus (Germany)	Link	Promoting the energy transition	€400 M (2015-25)	Public	Grant	No estimation possible	Industry and R&D institutions	Four main projects for 10 years	-	1-9
Environmental Innovation Programme (Germany)	Link	Promoting the conversion of EII to a largely GHG-neutral production	€45 M (2019-23)	Public	Grant	No estimation possible	EII	Demonstration plants, industrial deployment	Combination of grants and loans allowed in specific cases	8-9
<i>Arbeitsgemeinschaft industrieller Forschungsvereinigungen</i> (Germany)	Link	Promoting applied R&D	Approx. €180 M per year	Public	Grant	No estimation possible	Non-profit R&D institutions, SMEs	Applied R&D	CORNET and EASME	1-5
Innovations for the Energy Transition (Germany)	Link	Promoting applied research, development and demonstration of energy technologies	€6.4 B (2018-22)	Public	Grant	No estimation possible	Industry and R&D institutions	R&D, demonstration plants	-	3-9
<i>Reallabore der Energiewende</i> (Germany)	Link	Bridging the phase between technology development and market penetration	Approx. €100 M per year (2019-22)	Public	Grant	No estimation possible	Industry and R&D institutions	Demonstration plants, industrial deployment	-	7-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
<i>Zentrales Innovationsprogramm Mittelstand</i> (Germany)	Link	Promoting applied R&D	Approx. €500 M per year; €555 M in 2020	Public	Grant	No estimation possible	Non-profit R&D institutions, SMEs	Applied R&D	If cooperation with international partners, each partner funded by the relating national institution	1-6
<i>Programm für Rationelle Energieverwendung, Regenerative Energien und Energiesparen</i> (progres.nrw) (Germany)	Link	Strengthening the competitiveness of SMEs in North-Rhine Westphalia	Unknown	Public	Grant	No estimation possible	Industry and R&D institutions	Applied R&D	-	1-5
Kreditanstalt für Wiederaufbau (KfW) (Germany)	Link	Supporting innovative projects	€<25 M	Private	Loan	No budget earmarked for the steel sector	SMEs	-	No limitation with public instruments	6-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
NRW.BANK (Germany)	Link	Introducing new, technologically-advanced products or production processes, or substantially improving existing products and processes	No specific limitation	Private	Loan	No budget earmarked for the steel sector	SMEs	EIB	No limitation with public instruments	6-9
<i>Contratto di Sviluppo</i> (Italy)	Link	Supporting strategic, productive and innovative industrial and environmental investment	€3.6 B (2014-20); up to 75%; interest rate subsidy	Public	Grant	€25M per year, on a call base (not regularly published)	Italian or foreign large companies	Personnel, investments, operational costs	CF, ERDF, MISE, Cura Italia	8-9
<i>Accordo per l'innovazione</i> (Italy)	Link	Supporting industrial research and experimental development	Specific analysis of the project	Public	Grant	>20% of eligible costs, which increases by regional resources	Companies of any size	Personnel, investments	Other state aids (EU, national and regional) within the limits set by articles 38 and 46 of the general block exemption regulation	6-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
National Fund for Energy Efficiency (Italy)	Link	Ensuring national energy efficiency targets	€125 M (2019-20); maximum €4 M per project	Public	Grant	€3 M per year on average	Companies operating in all sectors	Equipment, infrastructures, consultancy	Other state aids (EU, national and regional) within the limits set by articles 38 and 46 of the general block exemption regulation	6-9
Revolving Fund for Business Support and Investment in Research (Italy)	Link	Supporting growth, and important research and development projects	Based on specific calls, published on an irregular basis	Public	Grant	€5-40 M per project; >20% of eligible costs, which increases by regional resources	Companies of any size	Personnel, investments, materials	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	6-8

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Relaunch of areas affected by an industrial crisis (law 181/89) (Italy)	Link	Promoting industry relaunch in areas affected by industrial and sector crises	Depending on the specific funding dedicated to the instrument	Public	Grant	€>1 M	SMEs and large enterprises, also in the form of networks	Investments (e.g. CSM old offices in Taranto)	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	9
Aid to tackle the complex industrial crisis area affecting Taranto (Italy)	Link	Supporting reconversion and requalification projects	Depending on the specific funding dedicated to the instrument	Public	Grant	€>1 M	Entrepreneurial activities in the Taranto area	30-50% of investment funded	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	9
Tax credit for investments in capital goods (Italy)	Link	Supporting investments in technologically-advanced material capital goods	Not applicable	Public	Grant	Tax credit	Companies of any size	Technologically-advanced material capital goods (40%), intangible	Other incentives up to the value of the asset	1-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
								capital goods (15%)		
Tax exemption for environmental investments (law 388/2000) (Italy)	Link	Supporting environmental investments by SMEs	Old instrument, quite complex rules	Public	Grant	Tax credit	Only SMEs	Environmental investments	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	4-7
Axis IV CO ₂ emission reduction (Italy)	Link	Reducing the CO ₂ emission reduction gap compared to the Europe 2020 Strategy	€194 M (2014-20)	Public	Grant	Each single measure to be defined by the specific calls	PPP	Environmental investments	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	8-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Energy efficiency of SMEs (Italy: Veneto)	Link	Containing energy expenditure, reducing climate-altering gas emissions and using renewable sources based on energy saving opportunities	Up to €150 K	Public	Grant	Only for SMEs	Only SMEs	Machinery, plants, equipment, systems, technical staff	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	4-7
<i>Accordo di programma</i> (Italy: Italian regions)	Link	Promoting the competitiveness of big industries and/or specific regions by supporting innovation projects	€80 M per specific call, published on an irregular basis	Public	Grant	No upper limitation	Mainly large, but also small companies	Investment and technologies relevant to the project	Specific agreements between the Ministry of Economic Development and Italian regions (minimum 10% of eligible costs); blending with European instruments not allowed	5-7

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Development contracts for environmental protection (Italy: Southern Italy)	Link	Promoting the development of programmes for environmental protection which allow the reduction of energy consumption and climate-changing gas emissions from companies and production areas	€100 M (call published in 2019)	Public	Grant	€5-40 M per project; >20% of eligible costs, which increases by regional resources	Companies of any size	Personnel, investments, materials	Blending not allowed; sequencing to be evaluated on the specific projects' sequence (no duplication of funding)	6-8
Mediocredito italiano - Gruppo Intesa Sanpaolo (Italy)	Link	Investing in renewable energy or energy efficiency projects	No specific limitation	Public	Grant	Loans	Industries of any size	MISE	No limitation with public instruments	8-9
MECO (Luxembourg)	Link	Supporting industrial research and development	Small amounts available	Public	Grant	Low funding	Small and large companies	Technical staff, materials, patents, external collaborations	Blending not allowed; sequential projects allowed	No specific requirements

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
BRIDGE (Luxembourg)	Link	Supporting advanced technological research and innovation in Luxembourg	€0.4 M per year	Public	Grant	Low funding	Small and large companies (Luxembourgish and international)	Technical staff, materials, patents, external collaborations	Blending not allowed; sequential projects allowed	No specific requirements
<i>Demonstratie Energie-en Klimaatinnovatie</i> (Netherlands)	Link	Subsidising pilot and demonstrators of CO ₂ emission reduction innovative technologies	€86.1 M per year; €10-15 M per project	Public	Grant	CCUS, Energy innovation and energy efficiency	Industry and sub-contractors	Personnel, machines and equipment, consumables	No specific limitations	6-9
<i>Stimuleringsregeling Duurzame Energietransitie</i> (Netherlands)	Link	Subsidising technologies for production of renewable energy, then extended to energy transition with a focus on technologies for GHG emission reduction	€5 B	Public	Grant	Subvention per tonne of avoided carbon	Industry and sub-contractors	Subvention per tonne of avoided carbon	No specific limitations	8-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
<i>Klimaatakkoord</i> (Netherlands)	Link	Reducing CO ₂ emissions by 49% by 2030 and by 95% by 2050, compared to the year 1990, as well as increasing the share of renewable energy to 100% by 2050	-	Public	Grant	No specific budget for the steel sector	Additional information available in Section 3.1.8.			
<i>Demonstratie Energie-en Klimaatinnovatie</i> (Netherlands)	Link	Supporting investments aimed at innovative demonstration projects in the field of CO ₂ emission reduction in industry and flexibilization of the electricity system	-	Public	Grant	No specific budget for the steel sector	Additional information available in Section 3.1.8.			
Public Private Partnership with Knowledge and Innovation Covenant (Netherlands)	Link	Promoting investments in energy transition and sustainability, agriculture, water and food, and health, care and safety	€4.9 B per year	Public	Grant	No specific budget for the steel sector	Additional information available in Section 3.1.8.			

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
<i>Stimuleringsregeling Duurzame Energietransitie</i> (Netherlands)	Link	Promoting the development of a sustainable energy supply in the Netherlands	-	Public	Grant	No specific budget for the steel sector	Additional information available in Section 3.1.8.			
Fast Track (Poland)	Link	Supporting industrial research (R&D projects)	€250 M per year; maximum €20 M per project (scheduled up to 2023)	Public	Grant	€20 M per year	Enterprises and scientific units	Commercial investments not eligible; demonstrations eligible	Blending and sequencing not allowed	2-9
Demonstrator (Poland)	Link	Supporting pilot and demonstration installations	€125 M; maximum €25 M per project	Public	Grant	€10 M every two years	Enterprises and scientific units	Components for prototypes, pilots or demonstrations	Blending and sequencing not allowed	6-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
Innostal (Poland)	Link	Supporting industrial research and experimental development	€25 M on average in the period 2016-19; maximum €7.5 M per project	Public	Grant	€5 to 7 M per year on average	Enterprises and scientific units	Components for prototypes, pilots or demonstrations	Blending and sequencing not allowed	2-9
TECHMATS TRATEG (Poland)	Link	Supporting industrial research	€7.5 M per year (2019-20)	Public	Grant	Too low funding available	Enterprises and SMEs	Conceptual work, industrial research	Not relevant considering the low funding available	2-9
Innova-IDEPA (Spain: Asturias)	Link	Supporting experimental development and innovation projects on processes under a selection of RIS3 topics	€1.5 M (for 2019)	Public	Grant	No budget earmarked for the steel sector	SMEs; the project can be carried out individually or in collaboration	Experimental development	-	5-8
Differential R&D&I projects (Spain: Asturias)	Link	Supporting collaborative projects to develop the necessary knowledge to respond to the needs and challenges that the Asturian society will face in the medium	€1.5 M (for 2019)	Public	Grant	No budget earmarked for the steel sector	Consortium consisting of at least three independent companies, including a leading large company and an SME	Industrial research	-	3-8

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
		and long term in the areas and sectors related to the Regional Smart Specialisation Strategy								
R&D Projects (Spain: Asturias)	Link	Supporting R&D projects falling in the categories of industrial research, experimental development or feasibility studies and aiming at obtaining new or improved products, processes or services	€3.6 M (for 2020)	Public	Grant	No budget earmarked for the steel sector	SMEs and large companies; the project can be carried out individually or in collaboration	Industrial research, experimental development	-	3-6
HSBC Holdings plc	Link	Promoting sustainable finance	No specific limitation	Public	Grant	Green bond, transition bond, equity-linked bond, green structured bond	Industries of any size	EU, national and local authorities	No limitation with public instruments	8-9
Industriklivet (Sweden)	Link	Supporting demonstration and investment projects	2017-40	Public	Grant	HYBRIT has been funded under this	Industries	Investments	Blending allowed in specific cases	7-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
						scheme. See also Annex 3				
<i>Klimatklivet</i> (Sweden)	Link	Reducing emissions GHG	SEK 13.4 B	Public	Grant	Reduce the emission of CO ₂	-	Local and regional investment	-	7-9
Integrated National Energy and Climate Plan (Sweden)	Link	Promoting low-carbon technologies	-	Public	Grant	Steel could participate as EII	EIIs	Technologies and investments	-	Investment
<i>Industriklivet</i> - Process-related emissions (Sweden)	Link	Reducing process-related emissions	Approx. €150 M for the period 2020-22; approx. €175 M for the period 2023-27	Public	Grant	No budget earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-9
<i>Industriklivet</i> - Negative emissions (Sweden)	Link	Promoting negative emissions	Approx. €30 M for the period 2020-22; approx. €25 M for the period 2023-27	Public	Grant	No budget earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-9

Name of financing programme	URL	Focus area	Funding available in total	Public or private finance	Financial Instrument	Estimation of funding available for CO ₂ reduction in the steel sector	Beneficiaries	Type of eligible costs	Blending and sequencing	TRL
<i>Industriklivet</i> - Negative emissions (Sweden)	Link	Supporting companies with biogenic GHG emissions in, for example, the pulp and paper industry and cogeneration plants	Approx. €30 M for the period 2020-22; approx. €25 M for the period 2023-27	Public	Grant	No budget earmarked for the steel sector	All actors (industry, academia and research institutes)	R&D, pilot, demonstration, investment, feasibility studies	-	1-9
Energy Transitions (Sweden)	Link	Transforming the energy sector by eliminating emissions of CO ₂ and other GHGs through a comprehensive change in the energy mix, behaviour and infrastructure	Approx. €5 M 2021-24	Public	Grant	No budget earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-9
SIP STRIM-2020 (Sweden)	Link	Tackling the challenges of the mining and metal industry	Approx. €2 M	Public	Grant	No budget earmarked for the steel sector	All actors (industry, academia and research institutes)	All types of projects	-	1-7
Group of 7 Banks (Sweden)	N.A.	Promoting sustainable energy and energy saving	No specific limitation	Private	Loan		Industries of any size	Local authorities	No limitation with public instruments	7-9

Source: authors' own compilation.