

Innovation Fund

Structure of the 3rd call for large-scale projects (LSC 2022) and RePowerEU topics

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Outline

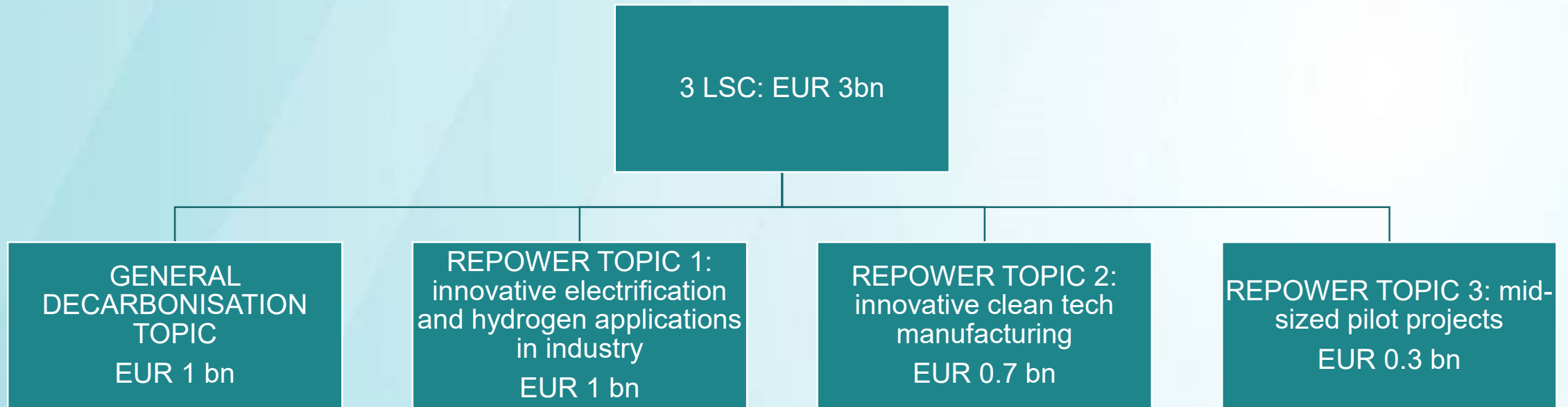
1. Structure of the 3rd call for large scale projects (2022 LSC)
2. General decarbonisation topic
3. RePowerEU topic: Innovative industry electrification and hydrogen
4. RePowerEU topic: Innovative clean-tech manufacturing
5. REPowerEU topic: Mid-sized pilots topic

1. Structure of the 2022 LSC

- In the 2022 LSC, thanks to **increased budget** and to **reflect the REPower priorities**, the Innovation Fund will become **more focused** by creating 3 dedicated topics:
 - **REPower topic innovative electrification and hydrogen applications in industry - INNOVFUND-2022-LSC-02-INDUSTRY-ELEC-H2**
 - **REPower topic innovative clean tech manufacturing** (such as electrolysers and fuel cells, renewable energy equipment, energy storage and heat pumps) - **INNOVFUND-2022-LSC-03-MANUFACTURING**
 - **REPower topic mid-sized pilot projects** that focus on validating, testing and optimising highly innovative solutions - **INNOVFUND-2022-LSC-04-PILOTS**
- **Fully bottom-up approach** is preserved in the **general decarbonisation window INNOVFUND-2022-LSC-01-GENERAL** to serve existing project pipeline and all areas eligible under IF, as defined in ETS Directive

1. Structure of the 3rd large-scale call

- Budget made available for **3LSC: €3bn** + 20% flexibility reserve
- Topics have a budget reserved for them. But budget reserved, but not spent on a given topic, can be used for other topics (“waterfalls approach”)



1. Structure of the 3rd large-scale call

The topics allow to cater for specific **policy priorities**

The topics definitions aim to **benefit numerous/all sectors** eligible under the IF

The topics reserve a **dedicated budget envelope**

The topics make **competition among projects more focused**

RePowerEU topics apply **weighting of award criteria** in order to reflect policy priorities (fast project maturity, higher degree of innovation) and amplify scores of projects that perform best in this respect.

RePowerEU topics have specific conditions (in scope or, in case of PILOTS in award criteria).

Topics were designed not to overlap and for **one** project application can be made to only **one** topic.

2. General Decarbonisation Topic

The following **activities can be funded** under this topic:

- activities that support innovation in low-carbon technologies and processes in sectors listed in **Annex I to the EU ETS Directive**, including environmentally safe carbon capture and utilisation (**CCU**), as well as **products substituting carbon-intensive ones** produced in sectors listed in Annex I
- activities that help stimulate the construction and operation of projects that aim at the environmentally safe capture and geological storage of CO₂ (**CCS**)
- activities that help stimulate the construction and operation of innovative **renewable energy** and **energy storage technologies**.

Carbon capture and utilisation can be funded if the capture of CO₂ occurs within one of the activities listed in Annex I, or if the utilisation of CO₂ results in products substituting carbon-intensive ones from the sectors listed in Annex I, even if carbon is captured outside the activities of Annex I.

3. REPowerEU Topic: Innovative industry electrification and hydrogen

- **A.** Activities that support the **innovative direct electrification of industry** replacing conventional fossil fuels use, both in sector-specific and cross-sectoral uses.
- **B.** Activities that support **innovative hydrogen production and applications** (i.e. hydrogen use as an energy carrier/reducing agent/feedstock) in industry.
 - **B.1 those where the main innovation lies in the use of hydrogen in industrial applications.** As the focus in this topic is to reduce the use of and the dependence on fossil fuels, the use of fossil fuel-based hydrogen is excluded from this topic.
 - **B.2 those where the main innovation lies in renewable hydrogen production** and production of hydrogen-derived renewable fuels (i.e. renewable fuels of non-biological origin) and feed-stocks.
- Projects can include either one or both of the activities described under B.1 and B.2.

3. REPowerEU Topic: Innovative industry electrification and hydrogen

Definition of renewable hydrogen (in Glossary)

Renewable hydrogen

Hydrogen that qualifies as renewable fuel of non-biological origin (RFNBOs) and achieves 70% emissions savings according to the criteria and rules of Directive (EU) 2018/2001, including the methodologies set out in the Delegated Regulations supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council.

Draft text is available:

Here: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/7046068-Production-of-renewable-transport-fuels-share-of-renewable-electricity-requirements-en>.

and

Here: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12713-Renewable-energy-method-for-assessing-greenhouse-gas-emission-savings-for-certain-fuels-en>

This definition applies in case of renewable hydrogen to be consumed in transport and outside transport (industry, buildings).

Projects about production or consumption of renewable hydrogen need to state the **intention to comply with RFNBO methodology** and project promoter has to ensure that hydrogen qualifies as renewable under the final Delegated Regulations.

3. REPowerEU Topic: Innovative industry electrification and hydrogen

A. EXAMPLES of technologies and activities where innovative direct electrification replaces conventional fossil fuel use:

Sector specific activities where fossil fuels have to be replaced

- steam reforming, cracking, as well as other routes for the production of commodity chemicals
- melting in glass furnaces
- drying and melting in ceramics plants
- calcination of limestone for cement production

Technologies used across a range of industrial activities

- electro-technologies for process heat, such as electromagnetic heating (infrared radiation, induction, microwave radiation)
- electric furnaces (e.g. plasma furnace)
- mechanical vapour recompression other innovative applications of Power to Heat
- innovative application of industrial heat pumps

Excluded activities: the use of state-of-the art industrial heat pumps, or other currently commercially available electrification technologies

3. REPowerEU Topic: Innovative industry electrification and hydrogen

B. EXAMPLES of technologies and activities of innovative hydrogen use and production

B.1 that support innovative hydrogen applications (i.e. use of hydrogen as an energy carrier, or as a reducing agent, or as a feed-stock) **in industry:**

- renewable hydrogen replacing the use of carbon-intensive hydrogen in refineries,
- renewable hydrogen replacing the use of fossil fuels and carbon-intensive hydrogen used as feedstock in chemical industry, such as the production of ammonia, methanol and other chemicals
- renewable hydrogen replacing fossil fuels in zero-carbon steel making processes (in DRI-EAF route)
- renewable hydrogen replacing fossil fuels for high-temperature heat in the industry (e.g. glass, ceramics)

3. REPowerEU Topic: Innovative industry electrification and hydrogen

B. EXAMPLES of technologies and activities of innovative hydrogen use and production

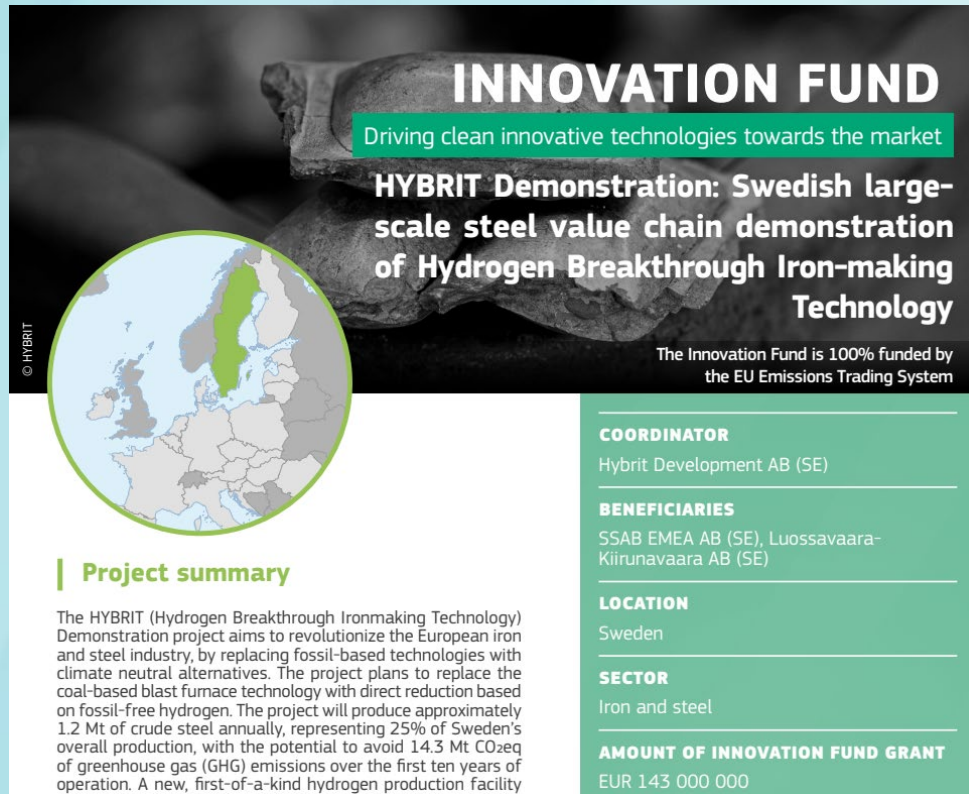
B.2 that support innovative renewable hydrogen production

- captive or by-product or merchant production of renewable hydrogen for industrial applications
- captive or by-product or merchant production of renewable hydrogen for transport applications (e.g. in maritime sector) or buildings
- captive or by-product or merchant production of renewable hydrogen for a mix of different applications (e.g. in industry and in transport)
- production of **hydrogen-derived renewable fuels**
- innovative **storage or transport infrastructure as part of integrated renewable hydrogen production project.**

Excluded activities: projects whose main innovation lies solely in hydrogen use in transport or buildings or power generation or combined power and heat or storage.

Innovation in hydrogen...	Production of H2 and H2-derived fuels (regardless of which sector will offtake it)	Consumption /use of H2 in industry	Consumption /use of H2 in transport or buildings, or power generation or CHP	Transport/storage of H2 as part of integrated project and depending on type of H2 produced	Transport infrastructure for H2 as stand-alone projects	Storage of H2 as stand-alone projects
Renewable H2	INDUSTRY-ELEC-H2	INDUSTRY-ELEC-H2	GENERAL DECARBONISATION	INDUSTRY-ELEC-H2	Not eligible	GENERAL DECARBONISATION
Fossil H2 with CC(U)S	GENERAL DECARBONISATION	GENERAL DECARBONISATION	GENERAL DECARBONISATION	GENERAL DECARBONISATION	Not eligible	GENERAL DECARBONISATION
Low-carbon H2 other than fossil H2 with CC(U)S e.g. H2 from biomass or hydropower	GENERAL DECARBONISATION	INDUSTRY-ELEC-H2	GENERAL DECARBONISATION	GENERAL DECARBONISATION	Not eligible	GENERAL DECARBONISATION
Fossil H2	Not eligible				Not eligible	GENERAL DECARBONISATION

3. REPowerEU Topic: Innovative industry electrification and hydrogen



INNOVATION FUND
Driving clean innovative technologies towards the market

HYBRIT Demonstration: Swedish large-scale steel value chain demonstration of Hydrogen Breakthrough Iron-making Technology

The Innovation Fund is 100% funded by the EU Emissions Trading System

COORDINATOR
Hybrit Development AB (SE)

BENEFICIARIES
SSAB EMEA AB (SE), Luossavaara-Kiirunavaara AB (SE)

LOCATION
Sweden

SECTOR
Iron and steel

AMOUNT OF INNOVATION FUND GRANT
EUR 143 000 000

Project summary

The HYBRIT (Hydrogen Breakthrough Ironmaking Technology) Demonstration project aims to revolutionize the European iron and steel industry, by replacing fossil-based technologies with climate neutral alternatives. The project plans to replace the coal-based blast furnace technology with direct reduction based on fossil-free hydrogen. The project will produce approximately 1.2 Mt of crude steel annually, representing 25% of Sweden's overall production, with the potential to avoid 14.3 Mt CO₂eq of greenhouse gas (GHG) emissions over the first ten years of operation. A new, first-of-a-kind hydrogen production facility will be built, with a capacity of 600 MW.



INNOVATION FUND
Driving clean innovative technologies towards the market

HH - Holland Hydrogen

The Innovation Fund is 100% funded by the EU Emissions Trading System

COORDINATOR
Rotterdam Hydrogen Company B.V.

BENEFICIARY
Shell Hydrogen Operations & Production B.V.

LOCATION
Rotterdam, The Netherlands

SECTOR
Hydrogen

GHG EMISSION AVOIDANCE
5.1 Mt CO₂ eq

AMOUNT OF INNOVATION FUND GRANT
EUR 89 000 000

Project summary

Holland Hydrogen (HH) plans to build a 400 megawatt (MW) electrolyser in the Port of Rotterdam, in the sub-municipality of Pernis, to produce green hydrogen, using renewable electricity from offshore wind farms in the North Sea. HH will be developed in two 200 MW phases and will be the first electrolyser project of this scale. Overall, the project will demonstrate a complete, end-to-end, integrated renewable hydrogen system proof-of-concept at an industrial scale, developed with world-leading sustainability standards. The project will be built with state-of-the-art technology and will be the first of its kind in Europe.

IF project fiches are available [here](#)

3. REPowerEU Topic: Innovative industry electrification and hydrogen



INNOVATION FUND
Driving clean innovative technologies towards the market

FUREC – FUse, REuse, ReCycle

The Innovation Fund is 100% funded by the EU Emissions Trading System

COORDINATOR
RWE Aktiengesellschaft

AFFILIATED ENTITY
RWE Generation NL

LOCATIONS
Buggenum & Geleen, The Netherlands

SECTOR
Hydrogen

GHG EMISSION AVOIDANCE
3.61 Mt CO₂ eq

AMOUNT OF THE INNOVATION FUND GRANT
EUR 108 000 000

Project summary

Project FUREC (FUse, REuse, ReCycle) transforms non-recyclable solid waste streams into hydrogen and provides circular feedstock to the chemicals industry.

First, the waste is converted into pellets in a waste treatment plant by sorting, drying and pelletising. The dry pellets are then sent



INNOVATION FUND
Driving clean innovative technologies towards the market

ELYgator - Kickstarting a renewable hydrogen value chain for industry and mobility: highly integrated, flexible large-scale 200 MW water electrolyser producing renewable hydrogen and oxygen

The Innovation Fund is 100% funded by the EU Emissions Trading System

COORDINATOR
Air Liquide Industrie BV

BENEFICIARY
Air Liquide Industrie BV

LOCATION
Terneuzen, The Netherlands

SECTOR
Hydrogen

GHG EMISSION AVOIDANCE
3.3 Mt CO₂ eq

AMOUNT OF THE INNOVATION FUND GRANT
EUR 99 000 000

Project summary

The ELYgator 200 megawatts (MW) electrolyser is larger than any electrolyser currently in use in Europe. With a capacity to produce 15 500 tonnes of renewable hydrogen annually, its impact in terms of relative greenhouse gas (GHG) emission avoidance will be about 200%, compared to the reference scenario in the first ten years of operation. This renewable hydrogen will supply the so-called "hard-to-abate" sectors, such as industry and mobility.

The project will demonstrate the feasibility and replicability of large-scale electrolysis and will combine two electrolysis

IF project fiches are available [here](#)

3. REPowerEU Topic: Innovative industry electrification and hydrogen

Award criteria	Minimum pass score	Maximum score	Weight
Degree of innovation	9	15	1
GHG emission avoidance potential			
Absolute GHG emission avoidance	n/a	2	1
Relative GHG emission avoidance	n/a	5	1
Quality of the GHG emission avoidance calculation, minimum requirements	3	5	1
Total GHG emission avoidance potential		12	
Project maturity			
Technical maturity	3	5	2
Financial maturity	3	5	2
Operational maturity	3	5	2
Total Project maturity		15	
Scalability	9	15	1
Cost efficiency			
Cost efficiency ratio	n/a	12	1
Quality of the cost calculation	1.5	3	1
Total Cost efficiency		15	
Total (without bonus)	n/a	87	
Bonus points			
Bonus point 1 [Net carbon removals]	n/a	1	1
Bonus point 2 [Other GHG savings]	n/a	1	1
Bonus point 3 [Commitment to use electricity from additional renewable sources]	n/a	1	1
Total (with bonus)	n/a	87 to 90	

4. REPowerEU Topic: Innovative Clean Tech manufacturing

The following activities can be funded under this topic: construction of manufacturing facilities and their operation to produce specific components for:

- **renewable energy installations** (in photovoltaics, concentrated solar power, on-shore and offshore wind power, ocean energy, geothermal, solar thermal, and others), including their connection to the electricity/heat grid;
- **electrolysers and fuel cells**;
- **energy storage solutions** for stationary and mobile use for intra-day and long duration storage;
- **heat pumps**.

This topic is targeted at **the innovation in manufacturing of components**.

Components, in line with GHG methodology guidance, are to be understood to **include also final equipment** such as wind turbines, solar panels, batteries, heat pumps or electrolysers.

4. REPowerEU Topic: Innovative Clean Tech manufacturing

- Topic is targeting those **components that are a significant factor** in the performance and/or cost of the final equipment.
- Activities relating to the **recycling of critical materials** to be used in the above equipment categories or components thereof may also be funded under this topic.
- Equipment and components can be **sold on the EU market and in third countries**.
- The topic seeks to enhance the Union's innovation and technological leadership in clean tech manufacturing. Activities that can be funded include those where the main innovation lies in the **product as well as in the production processes**.
- Innovation can concern one or several steps of the manufacturing process.

Excluded activities: use of innovative components (including the final equipment) in power/heat generation/energy storage/production of hydrogen. (but see Topic General)

Excluded activities: testing new components/final equipment (but see Topic Pilots)

4. REPowerEU Topic: Innovative Clean Tech manufacturing



INNOVATION FUND

Driving clean innovative technologies towards the market

TANGO: Italian PV Giga factory

The Innovation Fund is 100% funded by the EU Emissions Trading System



COORDINATOR
Enel Green Power Italia SRL

LOCATION
Catania, Italy

SECTOR
Solar energy

AMOUNT OF INNOVATION FUND GRANT
EUR 117 675 100

Project summary

The TANGO project will develop an industrial-scale pilot line in the South of Italy for the manufacture of innovative, high-performance photovoltaic (PV) modules, increasing production capacity by 15 times, from 200 MW to 3 GW per year. Production will include bifacial



INNOVATION FUND

Driving clean innovative technologies towards the market

NorthSTOR+ – Industrializing Green Optimized Li-ion Battery Systems for ESS

The Innovation Fund is 100% funded by the EU Emissions Trading System



COORDINATOR
Northvolt Systems Poland sp z o.o

BENEFICIARY
Northvolt Systems AB

LOCATIONS
Gdansk and Tczew, Poland & Stockholm, Sweden

SECTOR
Manufacturing of components for production of renewable energy or energy storage

GHG EMISSION AVOIDANCE
34.6 Mt CO₂ eq

AMOUNT OF THE INNOVATION FUND GRANT
EUR 75 451 457

Project summary

The NorthSTOR+ project aims to both validate the technology development of an innovative, stationary energy storage system (ESS) and to industrialise the production of the solution at a mass-scale. The final product, the Voltainer, features Lithium-ion ESS based on a battery cell which was

IF project fiches are available [here](#)

4. REPowerEU Topic: Innovative Clean Tech manufacturing

INNOVATION FUND
Driving clean innovative technologies towards the market

ReLieVe - Recycling Li-ion Batteries for electric Vehicles

The Innovation Fund is 100% funded by the EU Emissions Trading System

COORDINATOR
Eramet SA

LOCATION
Dunkirk, France

SECTOR
Manufacturing of components for production of renewable energy or energy storage

GHG EMISSION AVOIDANCE
4.2 Mt CO₂ eq

AMOUNT OF THE INNOVATION FUND GRANT
EUR 67 600 000

Project summary

The ReLieVe (Recycling of Li-ion Batteries for electric Vehicles) project aims to create an innovative end-to-end, European-based integrated solution for the closed loop recycling of 50 000 tons of end-of-life lithium-ion batteries and production waste from battery manufacturing

1st SSC:

- **Helexio line:** Demonstrating manufacturing for innovative BIPV roof components
- **CarBatteryReFactory:** Assembly plant for serial production of industrial energy storage systems based on second-life car batteries and disruptive full-pack technology
- **Green Foil project:** Low CO₂ footprint battery foil/current collector for Li-ion batteries production

4. REPowerEU Topic: Innovative Clean Tech manufacturing

Award criteria	Minimum pass score	Maximum score	Weight
Degree of innovation	9	15	2
GHG emission avoidance potential			
Absolute GHG emission avoidance	n/a	2	1
Relative GHG emission avoidance	n/a	5	1
Quality of the GHG emission avoidance calculation, minimum requirements	3	5	1
Total GHG emission avoidance potential		12	
Project maturity			
Technical maturity	3	5	2
Financial maturity	3	5	2
Operational maturity	3	5	2
Total Project maturity		15	
Scalability	9	15	1
Cost efficiency			
Cost efficiency ratio	n/a	12	1
Quality of the cost calculation	1.5	3	1
Total Cost efficiency		15	
Total (without bonus points)	n/a	102	
Bonus points			
Bonus point 1 [Net carbon removals]	n/a	1	1
Bonus point 2 [Other GHG savings]	n/a	1	1
Bonus point 3 [Commitment to use electricity from additional renewable sources]	n/a	1	1
Total (with bonus points)		105	

4. REPowerEU Topic: Mid-sized pilots

The following activities can be funded under this topic:

- Construction and operation of **pilot projects that focus on validating, testing and optimising** highly innovative, **deep decarbonisation solutions** in sectors eligible for Innovation Fund support.
 - Pilot projects can thus concern: industrial sectors listed in Annex I to the EU ETS Directive, including environmentally safe (CCU) that contributes substantially to mitigating climate change, as well as products substituting carbon-intensive ones produced in sectors listed in Annex I to the EU ETS Directive or construction and operation of innovative energy or CO₂ storage solutions or construction and operation renewable energy installations.
- Activities that can be funded are those that **tackle technical risks** of innovative technologies and solutions, e.g. **optimising process** and operational parameters of the innovation, and/or **improving the characteristics of the final products**.

4. REPowerEU Topic: Mid-sized pilots

- In this topic, **a higher degree of innovation is expected** than in the other topics
 - to be demonstrated under *Degree of Innovation* award criterion, points will be doubled.
- Pilot projects should prove an **innovative technology or solution** in an operational environment, but are not expected yet to reach large scale demonstration or commercial production.
- BUT the projects can entail **limited production/operation** for testing purposes, including delivery to/from potential customers for validation.
- **Project viability** rather than project profitability is to be demonstrated
 - to be assessed under the *Financial Maturity* award criterion
- The **maximum amount of Innovation Fund grant** for an individual project under this topic is limited to **EUR 40 million**.

4. REPowerEU Topic: Mid-sized pilots

- **Projects should focus on deep decarbonisation**, i.e. technology that has the potential to be fully compatible with a 2050 climate neutrality objective. The pilot installation itself should have a very low level of residual emissions or result
 - to be demonstrated under *Relative GHG reduction* award criterion that project achieves, for industrial installations covered by the EU ETS, at least 75% reductions below the relevant ETS benchmark. For other projects, the relative emission avoidance should be at least 75%.
- If the project is successful, the proposed **technology should move to the next stage** of a large-scale demonstration or first-of-a-kind commercial production
 - to be demonstrated under *Scalability* award criterion
- It is expected that projects will be more costly and thus less stringent formula **for cost-efficiency criterion** is applied: $12 - (12 \times (\text{cost efficiency ratio} / 2000))$
- The project must operate **at least 3 years after entry into operation** (instead 5 for other LSC projects).

4. REPowerEU Topic: Mid-sized pilots

Award criteria	Minimum pass score	Maximum score	Weight
Degree of innovation	9	15	2
GHG emission avoidance potential			
Absolute GHG emission avoidance	n/a	2	1
Relative GHG emission avoidance	n/a	5	1
Quality of the GHG calculation	3	5	1
Total GHG emission avoidance potential (without bonus points)		12	
Project maturity			
Technical maturity	3	5	1
Financial maturity	3	5	1
Operational maturity	3	5	1
Total Project maturity		15	
Scalability	9	15	1
Cost efficiency			
Cost efficiency ratio	n/a	12	1
Quality of the cost calculation	1.5	3	1
Total Cost efficiency		15	
Total (without bonus points)	n/a	87	
Bonus points			
Bonus point 1 [Net carbon removals]	n/a	1	1
Bonus point 2 [Other GHG savings]	n/a	1	1
Bonus point 3 [Commitment to use electricity from additional renewable sources]	n/a	1	1
Total (with bonus points)	n/a	87 to 90	