CALL FOR SUBMISSIONS

WHO IS SPRIND?

SPRIND is Germany's Federal Agency for Disruptive Innovation. The agency's origins can be traced back to the 'Innovation Dialogues' which the former Chancellor Angela Merkel regularly held as a forum of exchange between Federal Government, business and research representatives. The concept of SPRIND was first presented in 2016 and the agency formally came into being at the end of 2019. Rafael Laguna de La Vera, a German software entrepreneur (Open X-Change), was appointed as SPRIND's Founding Director. SPRIND is a subsidiary of the German government and its task is to identify, develop, fund and scale breakthrough innovations. Inspired by DARPA its main goal is to deploy agile and proactive support, both financially and structurally. Unlike DARPA, however, SPRIND only supports civilian projects.

SPRIND Challenges are one way through which the agency sources and identifies breakthroughs. The Challenges are intended to serve as a nucleus around which radically new ideas can crystallize and form.

WHAT IS THE CHALLENGE ABOUT?

Since the industrial revolution, mankind has extracted and burned tremendous amounts of carbon in the form of oil, coal or natural gas. The greenhouse gases released in the process are dramatically changing the lives of people around the world. Weather extremes and their effects, such as droughts, floods or forest fires, have been increasing for years. They destroy livelihoods and threaten people's health, lives and well-being. The global community agrees that global warming must be limited to less than two degrees Celsius compared to pre-industrial levels of emissions. That is why countries like Germany have mapped out specific goals and steps on how they want to reduce greenhouse gas emissions in the coming years and decades. And indeed, progress is being made. Emissions are falling - but still much too slowly.

Climate experts agree that reducing CO_2 emissions alone will not suffice. We also must remove enormous amounts of greenhouse gases from the atmosphere and thus be able to reverse past emissions. By the middle of the century, several gigatonnes of CO_2 will have to be removed from the atmosphere every year. Scientists and innovators from all over the world have already shown that this is technically possible. However, these methods are too expensive, often very energy-intensive themselves and limited in their scalability.

Technological progress can help reduce the cost of removing CO_2 from the atmosphere. At present, however, it is uncertain whether these cost reductions will be enough to make CO_2 removal from the atmosphere economically viable on a gigatonne scale. However, we think it is the economic viability of technologies to remove CO_2 from the atmosphere that will be a basic prerequisite for achieving the target of contributing towards negative emissions. Therefore, the goal of the Challenge is to find ways to transform the removed CO_2 into products that store and bind carbon long-term. Our vision is, that the long-term utilization of $C(O_2)$ should represent an economic option for the use of sustainable carbon sources, which will enable the reduction of the atmosphere's CO_2 content and achieve our climate goals.

To this end, this Challenge supports approaches that implement a holistic concept, from the removal of atmospheric CO_2, through conversion and further processing, and its transformation into new products and value chains.

THE GOAL

The overarching goal of this Challenge is to find new ways to transform CO_2 from the atmosphere into products that bind and store it long-term. The long-term use of atmospheric CO_2 should create new value chains and commercialization options that enable the reduction of the atmosphere's CO_2content sustainably and economically in order to achieve our climate goals. To achieve this, the approaches of the Challenge teams must be able to demonstrate how they make a significant contribution towards removing several gigatonnes of CO_2 from the atmosphere each year over the next decades. In mapping out this vision, the primary goal is not to establish a C(O_2) circular economy, but to achieve negative CO_2 emissions. To reach this goal, the proposed products must have a negative CO_2 footprint.

The participants are free to choose any technology or scientific pathway which removes and processes CO_2.

During the Challenge, teams demonstrate their ability to achieve the Challenge goal. At the end of Stage 1, teams will have developed and demonstrated their scalable technology to a Technology Readiness Level (TRL) of 3 or 4. At the end of Stage 2, teams demonstrate that they have developed their technology to a TRL of 6.

THE PROCESS

The Challenge runs over the course of approximately 2.5 years (for details, Table 1). Interested teams are asked to submit their application to join the Challenge. A jury of world-renowned experts will support SPRIND in the evaluation of the applications and will select up to 10 teams who are invited to join. During the Challenge, teams work on their ability to achieve the Challenge goal.
The Challenge has two stages. Stage 1 is 12 months, whereas stage 2 runs over a total of 17 months. At the end of stage 1, the jury evaluates the teams' progress and selects up to five teams to continue participating in stage 2. At the end of stage 2, SPRIND with support of its dedicated jury will select and announce the winners.

Table 1: Timeline

DATE	EVENT
17.12.2021	Call for submissions open
28.02.2022	Deadline for applications
April 2022	Selection of participating teams by jury
May 2022	Start of stage 1
April 2023	Evaluation of Teams in stage 1 and decision on teams participating in stage 2
May 2023	Start of stage 2
September 2024	End of stage 2 and announcement of winning teams

WHAT IS IN IT FOR MY TEAM?

SPRIND funds the team's development work from the start of the Challenge. For stage 1, SPRIND provides up to €600,000 per team, depending on the financial requirements outlined by the teams in their application. This funding takes the form of an individual fixed price based on the team's cost estimate. SPRIND uses the instrument of pre-commercial procurement (PCP) for this programme (see participation agreement). Funding for the second stage may be higher. To help teams reach their full potential, SPRIND provides a coach to support the teams on their development journey. The coach gives advice and facilitates access to new cooperation partners and experts. Furthermore, the SPRIND team is available for additional support in the form of networks and other experts.

To ensure that the teams remain in the driver's seat when it comes to implementing their innovation, all intellectual property generated during the Challenge remains with the teams. SPRIND only receives a non-exclusive license.

SPRIND is able to support the teams even after the end of the Challenge if both, SPRIND and jury, see breakthrough potential.

WHO IS ELIGIBLE TO APPLY?

Teams from all legal entities such as universities, non-university research institutions, established companies, start-ups and incubators can apply. Incubators are welcome to forward the call for applications to their networks. A spin-off is possible during the term of the Challenge. Any intention or plans to do so should be outlined in the team's application.

Teams are eligible to apply if they have their main seat in the European Union or within countries belonging to the European Free Trade Association (EFTA). Individual team members or collaboration partners may be based outside this geographical area.

Applicants must ensure that the work in their project is not already funded by other public bodies.

HOW DOES THE APPLICATION PROCESS WORK?

Applicants are invited to complete our application form to enter the challenge.

https://www.sprind.org/en/challenges/carbon-to-value/submission

HOW WILL THE TEAMS BE SELECTED?

SPRIND is supported in its selection by a jury of internationally renowned experts from various research fields and disciplines. All submitted applications go through a pre-selection process within SPRIND. Selected applications are subsequently evaluated by the jury and invited for a pitch. Applications are evaluated with regards to:

- their potential to become a breakthrough innovation (approach),
- the effectiveness of the proposed work plan (implementation),
- the ability of the team to implement this plan,
- its economic efficiency

Table 2 shows how these criteria can be assessed.

Table 2: Selection criteria

APPROACH
Does the approach have the potential to become a breakthrough innovation?
Is the approach suitable for achieving the goal of the Challenge? More specifically, is the approach both scalable and able to bind $C(O_2)$ in economically viable products or raw materials long term?
Is the approach a significant improvement over current state-of-the-art?
IMPLEMENTATION
Is the work plan based on realistic assumptions?
Is it expected that the necessary work packages can be carried out by the team or the listed co-operations and/or contracted professional services?
Are the required resources, such as workshops, tools or lab facilities, available or planned for?
TEAM
Does the team have the necessary expertise, motivation and ambition for the Challenge?
ECONOMIC EFFICIENCY
Does the financial plan correspond with the planned activity?

WHAT WILL HAPPEN IN THE FIRST YEAR OF THE CHALLENGE, WHAT HAS TO BE ACHIEVED?

The teams can carry out further conceptual work or experiments as described in their work plan. The teams can contact the Challenge Coach at any time with questions about the development of their approach. At the end of stage 1, the participating team will summarise all relevant information underpinning the reasoning for and performance of their approach in a report. The report should describe whether the team has reached their stage 1 goal as outlined in the application. In addition, the team should briefly describe the intellectual property developed (know-how, data, inventions, etc.) and, if applicable, include a list of publications. Furthermore, the team should provide a proof of concept (TRL 3 or 4) as part of the first stage. The report must be submitted one month before the end of stage 1. The report is requirement, irrespective of whether or not teams apply for the next stage. The SPRIND Team will provide further information on the specific requirements and the application format for stage 2 to all teams in advance of the end of stage 1.

HOW DOES MY TEAM WIN THE CHALLENGE?

The teams participating in the Challenge must convince the jury of the potential of their proposed solution during the selection process and at the end of each stage. The jury will evaluate the teams based on their report and the Challenge Coach's assessment. The jury will base their evaluation on the concept, the progress made, the cost-effectiveness of the proposed solution and the team. Teams selected for the final second stage will have the chance to demonstrate the progress made. For the selection of the winners of the Challenge, the jury will assess the relevance of the technology that emerges from the teams' progress. The jury will consider qualities such as the long-term impact of CO_2 storage, the scalability of the approach and the economic impact of the product.

CONFIDENTIALITY

SPRIND will treat all submissions confidentially. It will only share information on submissions with the jury, reviewers and the Challenge Coach. SPRIND has confidentiality agreements with all external individuals involved as jury members, reviewers or coaches.

WHO CAN I CALL IN CASE OF FURTHER QUESTIONS AND QUERIES?

Applicants are invited to have a look at the participation agreement and the FAQs. If you do not find your question addressed, please contact challenge@sprind.org for additional clarification.