

CALL FOR SUBMISSIONS MILESTONE-BASED PROGRAM NUCLEAR FUSION

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WHAT IS THIS ABOUT?

The German Federal Agency for Breakthrough Innovation (SPRIND), on behalf of the Federal Ministry of Research, Technology and Space (BMFTR), is implementing a competitive, milestone-based funding program for companies in the field of nuclear fusion.

The program targets start-ups and young companies with a place of business in Germany that pursue an independent technological approach to energy generation through nuclear fusion and aim to develop and realise a fusion power plant in Germany.

The central structural principle of the program is the *individual development roadmaps of participating companies*. The program does not prescribe a uniform technological development path. The nature, timing and scope of public funding are aligned with the development, financing and risk-reduction steps required for each respective approach.

The guiding objective is to build the *first fusion power plant in Germany*. At the same time, the relevant ecosystems in Germany and Europe shall be built up and strengthened. The aim is to create the technological, economic and organisational conditions for the fastest possible realisation of the first privately held fusion power plant in Germany.

Based on previous expert assessments and Germany's already strong ecosystems, the German government's Fusion Action Plan provides support to evaluate primarily the construction of technology demonstrators for laser fusion or a stellarator. Should new findings during the course of the milestone-based program lead to a significantly different assessment, support for further concepts may also be reviewed in coordination with the BMFTR.

WHO IS SPRIND?

SPRIND, the German Federal Agency for Breakthrough Innovation, is a federal agency tasked with identifying, funding and scaling breakthrough leap innovations. Its main goal is to provide agile and proactive support to realize disruptive innovations that change our lives.

SPRIND uses various financing, funding and procurement instruments—from equity investments and grants to innovation procurement (Pre-Commercial Procurement)—to support start-ups in particular in developing disruptive innovations.

FRAMEWORK AND BACKGROUND

Germany has long-standing scientific expertise in nuclear fusion as well as industrial capabilities and companies that could be of high importance for future value chains in the field of nuclear fusion.

At the same time, companies have emerged in Germany and Europe in recent years that pursue independent technological approaches with the goal of developing commercially viable fusion power plants. The German government aims to leverage this starting position and advance the development of a fusion power plant in Germany.

To this end, the Fusion Action Plan implements several complementary measures, including:

- the Fusion 2040 funding program – research on the path to a fusion power plant,

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- the Fusion Hubs,
- institutionally funded research activities, and
- support for privately funded development roadmaps through this milestone-based program Nuclear Fusion.

The milestone-based program thus complements existing research funding measures with an instrument specifically focused on company-driven implementation of concrete development paths to a fusion power plant.

OBJECTIVES AND BASIC PRINCIPLES

The overarching goal of the milestone-based program is to create the technological, economic and organisational conditions for the *fastest possible realisation of the first privately held fusion power plant in Germany*.

To achieve this ambitious goal in global competition, the program is built on the following basic principles:

Company-driven roadmaps: The individual development roadmaps of the companies serve as the starting point and structuring element. They describe the development path from the current state to the Technical Design Report of a demonstration plant.

Milestone-based financing: Funding is linked to concrete, verifiable technical, economic and organisational milestones. Achieving a milestone is a prerequisite for continuation but does not constitute an automatic entitlement to further funding. Every significant continuation or adjustment of funding is decided based on consideration of:

- the development progress achieved,
- the further roadmap,
- the technical assessment,
- the company's and financing situation,
- the international state of science and technology, and
- available program funds.

Competition: Multiple approaches may be supported in parallel. During the program, a down-selection on fewer approaches may become necessary.

Technology breadth: Based on current and previous expert assessments and Germany's already strong ecosystems, the German government's Fusion Action Plan provides support primarily for evaluating the construction of technology demonstrators for laser fusion or a stellarator. Should new findings during the course of the milestone-based program lead to a significantly different assessment, support for further concepts may also be reviewed in coordination with the BMFTR.

Mobilisation of private capital: Public funds shall leverage private capital and in particular address development risks that impede rapid privately funded development.

Value creation: IP, expertise, supplier relationships, project structures and industrial capabilities shall be built up as directly as possible with the participating companies and their value chains.

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Through the support of companies within the milestone-based program, several objectives are pursued simultaneously:

- leveraged private co-financing
- validation of the technological and commercial concepts pursued by the start-ups and young companies by the market
- validation of the company structures and entrepreneurial actions of the start-ups and young companies in the private market
- Building up of intellectual property (IP), expertise and necessary structures and supplier relationships directly with the supported start-ups and young companies that are relevant for the realisation of a fusion power plant in Germany

This is intended to ensure that parallel to technical results, entrepreneurial and economically strong, scalable companies are created, and that the provided public capital is used sparingly, efficiently, economically and with clear leverage effect.

FINANCIAL FRAMEWORK

Up to €500 million will be provided until 2029. In the long term, the total volume of public support is intended to increase to up to €2.5 billion. Financing is provided from the Special Fund for Infrastructure and Climate Neutrality (Sondervermögen Infrastruktur und Klimaneutralität - SVIK).

The provision of all funds is subject to the *availability and budget allocation of corresponding funds*.

The program is designed for the long term. Continuation of funding after 2029, particularly for Phase 2 financing, is planned, but is also subject to budget reservation. From the presented financial framework, neither individual participants nor individual program phases give rise to a claim to a specific funding amount.

ELIGIBILITY

Eligible companies must, at the time of admission to the program, fulfil the following requirements:

1. Place of business and value creation in Germany: A significant place of business and the value creation resulting from milestone-based program funds shall be predominantly located in Germany.
2. Business purpose: The primary business purpose is directed towards energy generation through nuclear fusion.
3. Power plant goal: The company credibly pursues the goal of developing and realising a fusion power plant in Germany.
4. Technological independence: The company possesses its own technical competence and relevant intellectual property or assured access to the IP required for its fusion approach.
5. Scientific and technical competence: The company has the required scientific and technical competence to implement the proposed roadmap.
6. Organisational and scaling capability: The company has a viable organisational structure with scaling perspective. This includes particularly competencies in

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operational management, finance, and partnership and supply chain management. The organisational structure may be further developed during Phase 1. No later than before a decision on financing a larger technology demonstrator, it must be demonstrated that the organisation is suitable for its implementation.

7. Financing competence: The company has the required competence to structure and execute extensive private and public financing.
8. Controlling and financial reporting: Professional controlling and financial reporting must be in place or developed appropriately during the first program phase.

Previous financing successes and reliable commitments from private financing partners are taken into account in the evaluation, but do not constitute an independent participation requirement.

Several companies may jointly submit a roadmap or partially overlapping roadmaps (e.g. shared technology demonstrator), provided that responsibilities, IP allocation, financing and governance are clearly presented.

There is no entitlement to admission to the program.

ADMISSION OF FURTHER PARTICIPANTS AFTER PROGRAM START

Admission of further participants after the initial program start is possible in principle. For this, all general participation requirements must first be fulfilled. In addition, at least one of the following requirements must be met:

1. The technology readiness level is at least comparable to the development status of companies already participating in the program.

Or

2. There is a substantially new technological approach that suggests a development path that is significantly faster or otherwise substantially improved compared to existing approaches.

The company must convincingly demonstrate these requirements based on a complete roadmap.

The roadmap is otherwise evaluated technically and economically according to the same principles as the applications of the initial participants.

Later admission is additionally subject to available program funds.

Admission of new participants may, particularly with limited funds, lead to a reduction or termination of support for other participants. Such a decision is made based on an overall evaluation including the technical development and the economic and financial situation.

CONFIDENTIAL INFORMATION AND REVIEW

The application must contain all information required for a reliable assessment of technical and scientific plausibility, milestones, financing plan and participation requirements.

Where confidential information or trade secrets are required for this purpose, they must be made available to SPRIND in an appropriate form. A positive evaluation cannot be based

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on aspects for which sufficient information for independent review is not provided. SPRIND limits the sharing of confidential information to external reviewers to the extent required for the respective evaluation. Where possible, they are selected (partially) technology-specific, so that individual reviewers do not necessarily need to receive all information.

External reviewers must be independent, must have no direct economic interest in the outcome of the evaluation, and are bound to confidentiality regarding the information made available to them.

Specific concerns about potential bias of individual reviewers can be addressed and discussed with SPRIND.

RELATIONSHIP TO OTHER FUNDING AND FINANCING MEASURES

Participation in the milestone-based program does not fundamentally preclude the use of other public funding or financing instruments.

This applies in particular to complementary measures under Fusion 2040 – research on the path to a fusion power plant, the Fusion Hubs, and other relevant programs.

The respective funding and participation conditions remain unaffected.

Costs or financing components already financed by other public funds may not be financed again through the milestone-based program. The roadmap must therefore transparently present which development components are to be financed through the milestone-based program and which may or can be financed through other instruments.

APPLICATION PROCESS

Applications must be submitted via the portal provided by SPRIND by **13 January 2027 at 18:00 (CET)**. All submissions received by this deadline will be considered. At this point, the documents must be complete and final for external evaluation. During the submission phase, SPRIND offers the opportunity for exchange and provides initial feedback on the submission documents upon request.

Submission *via the portal* must include at least the following:

1. Integrated roadmap to the TDR of the demonstration plant
2. Scientific description of the fusion approach
3. Design and development concept for the demonstrator, including external feedback on key design choices
4. Documentation of existing financing partners and strategic partnerships, where available
5. Company profile and proof of participation requirements

Further documents, particularly on financing aspects, may also be made available in common data rooms if needed and do not need to be submitted via the portal. Existing, current data rooms, e.g. for investors, can also be used for the milestone-based program and do not necessarily need to be reworked. It must be ensured that reviewers have access to all relevant information.

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Documents must be in English, consistent in content, and allow for a reliable technical and economic evaluation.

After evaluation of the submissions, the participants admitted to the milestone-based program will be announced. First financing under the milestone-based program can be implemented from 2027.

CONTACT

Start-ups and young companies preparing a submission are requested to contact SPRIND as early as possible. Due to the particular design of the program, individual exchange during the preparation phase is intended. In particular, it can be addressed which documents and content are suitable in detail to prove the required prerequisites in each case.

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PROGRAM DETAILS

Preliminary Note

These documents describe the program as well as the requirements and procedure for submission. The documents to be submitted are deliberately not predetermined in terms of form and scope. The goal is to account for the different technological approaches, development stages, company structures and individual roadmaps of the applicants. Early contact with SPRIND is recommended.

Admission to the program or the achievement of individual milestones does not constitute a claim to a specific form, amount or continuation of financing. The legally binding financing agreements are decisive in each case.

Glossary

It is assumed that the development up to a commercial fusion power plant comprises several technological intermediate and expansion stages. The relevant terms for uniform use within the milestone-based program are defined below.

Technology Demonstrator: Facility for concept validation, demonstration of ignition and demonstration of critical/specific technologies and components. A scientific energy gain of $Q_{\text{science}} > 1$ should be the goal. Deviation from this may be permitted if it is demonstrated why an alternative configuration achieves equivalent de-risking for the path to the power plant.

Demonstration Plant: Facility for demonstrating net energy gain (at least in the form of usable heat, sufficient for a theoretical technical energy gain of $Q_{\text{engineering}} > 1$). As a *technological validation of the overall system*, it enables integrated demonstration of all systems relevant to a fusion power plant (in particular a closed tritium cycle) and can, if appropriate, be integrated with the technology demonstrator in a shared facility.

FOAK: First-of-a-Kind facility (FOAK): Facility for demonstrating electricity generation on an industrial scale (at least 100 MW net output) with a planned technical availability of more than 60%. It enables the *commercial validation of the overall system*. The facility generates initial revenues but is not yet competitive in terms of its electricity generation costs. The FOAK is constructed by an industrial consortium; it shall demonstrate the availability of all necessary technologies and thus create all prerequisites for the commercial marketing of fusion energy.

Commercial or N-th-of-a-Kind facility (NOAK): Facility for demonstrating economically competitive electricity generation in commercial operation. It enables "*economic scaling*". Over the lifetime of the facility, a commercial energy gain ($Q_{\text{com}} > 1$) is achieved.

1. Program Structure

The milestone-based program is broadly divided into two phases and is oriented towards a clearly defined final milestone: the submission of a reliable Technical Design Report (TDR) including a Cost Book for a demonstration plant by 2037 at the latest. The participating start-ups and young companies shape their own path based on their individual

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development roadmaps. The proposed interim milestones must be clearly defined, objectively evaluable and relevant to the further development path.

In Phase 1, critical sub-technologies shall be developed in parallel for several approaches. Where these are required for further risk reduction and the creation of the TDR for a demonstration plant, details on a technology demonstrator as an intermediate step shall be elaborated. Phase 2 serves particularly the implementation of required technology demonstrators. If there is a large support requirement for financing technology demonstrators, the participant field will most likely need to be reduced by Phase 2 at the latest. The decision on which technology demonstrators will be supported within the milestone-based program shall in principle be made in 2029.

From a financing perspective, an individual mix of various financing instruments shall support the projects in the best possible way while simultaneously leveraging private capital. Especially in Phase 1, it is expected that SPRIND equity investments will primarily be used.

1.1 Phase 1 – Demonstration of Critical Sub-Technologies and Preparation of a Technology Demonstrator

At the beginning of the program, several start-ups and young companies are selected based on the evaluation process described in these documents and supported in parallel in implementing their individual roadmaps. The milestones to be achieved are derived from the companies' individual roadmaps but must withstand the initial review.

Objectives of this program phase:

- Achievement of significant scientific and technical milestones
- Reduction of central development risks
- Further development of reliable power plant concepts
- Preparation of required technology demonstrators
- Development of company, supply chain and project structures
- Mobilisation of additional private capital

The decision on the individual transition to Phase 2 and thus the possible co-financing of a technology demonstrator (see also Glossary) is made based on a TDR for the technology demonstrator as well as evidence of the critical elements required for it.

1.2 Phase 2 – Implementation of Technology Demonstrators and Preparation of a Demonstration Plant

In Phase 2, larger technology demonstrators can in particular be co-financed. The respective technology demonstrator shall address those essential physical, technological or systemic questions whose clarification is required for the preparation of a reliable TDR of the demonstration plant (see also Glossary).

A physical energy gain of $Q_{\text{science}} > 1$ is not mandatorily set as an independent goal of a technology demonstrator, provided it is demonstrated that the planned demonstration enables comparable or higher-value de-risking for the further path to the power plant. The design of the technology demonstrator must be suitable for increasing trust in the technology among further key stakeholders (investors, supply chain, energy industry) such that the remaining risk can be shared together and with decreasing public support.

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Successful participation in Phase 1 does not confer a claim to public co-financing of a technology demonstrator. This financing is decided separately. It is expected that the number of participants in the milestone-based program in Phase 2 will likely need to be reduced due to budget constraints, even without formally missing technical milestones.

In principle, at least one technology demonstrator for laser fusion and one for stellarator-based fusion are targeted for support. Deviation from this objective is possible for technical, economic or financial reasons.

Based on current and previous expert assessments and Germany's already strong ecosystems, the German government's Fusion Action Plan provides support primarily for evaluating the construction of technology demonstrators for laser fusion or a stellarator. Should new findings during the course of the milestone-based program lead to a significantly different assessment, support for further concepts may also be reviewed in coordination with the BMFTR.

1.3 Final Milestone of the Program

The final milestone of the program is the submission of a reliable Technical Design Report (TDR) and a Cost Book (based on German cost standards) for a demonstration plant (see Glossary).

The goals at this point are:

- the essential technological risks for subsequent realisation are sufficiently reduced,
- the required industrial and organisational structures are established,
- reliable supply chains and partnerships are developed, and
- the prerequisites for predominantly private financing of the following development phases are created.

The goal of the demonstration plant is:

- the demonstration of net energy gain at least in the form of usable heat
- the design for a theoretical technical energy gain of at least $Q_{\text{engineering}} > 1$
- the integrated testing of the essential systems required for a later fusion power plant (in particular a closed tritium cycle)

Not subject to the milestone-based program are the construction of the demonstration plant itself, the construction of a First-of-a-Kind fusion power plant (FOAK) for electricity generation on an industrial scale, and the subsequent construction of commercially competitive Nth-of-a-Kind facilities (NOAK). However, the program shall create the prerequisites for these subsequent phases.

The milestone-based program runs until 31 December 2037 at the latest. If no TDR for a demonstration plant is available by this date, an extension of the program requires a separate decision.

The submission of the TDR does not constitute a claim to financing of the demonstration plant or further facilities from the milestone-based program.

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2. Requirements for the roadmap

The central application document is an integrated technological and economic roadmap to the TDR of the demonstration plant.

The demonstration plant must be able to demonstrate initial net energy gain and enable integrated testing of all systems relevant to a fusion power plant. The final milestone is the submission of a TDR for such a demonstration plant. This must demonstrate that all required sub-technologies have the necessary maturity for the construction of the demonstration plant.

The roadmap must be sufficiently detailed and reliable to enable independent technical and economic evaluation.

In addition to smaller milestones describing the course of development, relevant technical termination milestones are defined and marked as such. The milestones must be suitable for demonstrating significant technological progress (SMART¹).

Following a positive selection decision, the proposed milestones form the basis for further structuring of financing. SPRIND may require changes or concretisations of individual milestones as part of the selection and financing structuring process.

The points described below must be covered in the roadmap and supplementary explanations and documents.

2.1 Scientific Description of the Fusion Approach

The fusion approach must be described in a scientifically understandable way.

The following shall in particular be presented:

- Approach and its physical foundations,
- the current scientific and technical development status,
- essential (own and external) experimental results and their significance,
- outstanding scientific questions,
- relevant scientific publications (peer-reviewed) or comparable evidence of positive scientific resonance.
- Delineation from alternative approaches and essential unique selling points

2.2 Technical Development Roadmap and Milestones

The roadmap must present the essential technical development steps to the TDR of the demonstration plant. It should show how physical and technical or engineering risks are addressed in parallel, what path dependencies exist, and at which points parallelisation is sensible to accelerate the overall program. The descriptions must explain why the chosen development path is selected and how it contributes to the goals of the milestone-based program.

¹ Specific, Measurable, Achievable, Reasonable, Time-Bound.

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The roadmap must contain information on:

- the essential physical and technical risks,
- the planned measures for their reduction,
- dependencies between individual development steps,
- essential technological decision points,
- required technology demonstrators,
- their respective goals and expansion stages, and
- the remaining risks after achieving the respective milestones.

The proposed milestones must in particular:

- be clearly described,
- be verifiable based on objective criteria,
- be accompanied by a schedule, and
- be justified with regard to their relevance for the further development path

(SMART²). They must provide information on:

- initial state and target state
- measurable success criteria and, where applicable, parameter tolerances
- essential dependencies – which decisions can be made after a milestone
- necessary resources and external prerequisites
- consequences upon achievement
- consequences upon non-achievement
- reference to subsequent technical and financial milestones

For risky path dependencies, alternative development paths may be shown if the overall goal remains unchanged.

Particularly critical development steps are marked as termination milestones. For these, clear success criteria, measurement parameters, parameter tolerances where applicable, and consequences of non-achievement must be stated. Ambitious technological risks are permitted provided they are transparently presented and controlled through reliable decision points.

Granularity and level of detail of milestones may decrease accordingly for the phase after the technology demonstrator, taking into account the current state of knowledge.

2.3 Technology Demonstrators

It is expected that before the elaboration of a demonstration plant, all approaches will require the intermediate stage of a technology demonstrator to both de-risk and further specify the specific implementation of the underlying approach as well as critical technologies.

In order for private financing opportunities to increasingly take effect in later phases for more market-oriented developments, it is crucial that facilities upstream of the fusion

² Specific, Measurable, Achievable, Reasonable, Time-Bound.

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power plant, in particular the technology demonstrators, can demonstrate as many fundamental properties of the later fusion power plant as possible. Therefore, both from a technical and from a financing perspective, it must be argued which properties and objectives the technology demonstrator must have in the context of the respective individual roadmap.

The following must in particular be presented:

- which physical, technical and systemic questions the technology demonstrator shall answer,
- why the chosen demonstration scope is required and appropriate,
- to what extent the technology demonstrator can be repurposed for later component, material or system tests or how it can potentially be further expanded,
- which findings and decisions become possible after successful implementation,
- which questions relevant for a later TDR are not covered by the technology demonstrator,
- how these are to be validated otherwise.

It is explicitly permitted to plan and implement technology demonstrators together with other market participants, provided this is technically and economically sensible.

For the design of technology demonstrators, the following guiding principles shall apply, derived from the general objective of the milestone-based program:

- Central physical and technical questions for the submission of the TDR of a demonstration plant as the final milestone of the milestone-based program must be answered by the technology demonstrator. It is emphasised that $Q>1$ does not need to be an explicit goal provided it is technically and scientifically understandable that the demonstration instead pursued implies $Q>1$, while at the same time the time and budget framework can be used for other relevant evidence (see also Glossary).
- The critical elements, the exact nature of the technical demonstration and what is demonstrated in the technology demonstrator are defined by the participating fusion companies themselves in the roadmap. Which physical and technical questions are central must be reflected with science, plant builders/potential power plant operators and the financial market. This must be done by the companies themselves and documented accordingly.
- Trust in the technology and thus the subsequent engagement of the private sector (implementation as well as financing companies) must be significantly increased by the technology demonstrators, so that government support for following developments can be reduced to a minimum.
- The technology demonstrator can fulfil these requirements in several expansion stages as well.
- In addition to the completeness of the technology aspects to be demonstrated, speed is also an optimisation parameter. In international competition, private funds flow to the most advanced technology at the respective state of the art. If the demonstration comes too late, financing options are reduced. The speed requirement will compete with other objectives (completeness of demonstration, repurposing, budget). Here, a competitive comparison must support the argumentation.

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- The technology demonstrator should ideally be designed so that it can be used in the long term, e.g. for further company activities (such as further development or testing of individual components) or by research groups.
- If the technology demonstrator is to be operated with public funds in the long term, or if the construction of the facility within the milestone-based program is financed by more than 50% public federal aid, the technology demonstrator must – after an initial use phase in which all steps necessary for the creation of the TDR of the demonstration plant have been demonstrated and any IP generated has been secured – also be made accessible to public research. In these cases, a concept for scientific repurposing including the required operating costs must be submitted.
- If a technology demonstrator is operated with public financing (e.g. within a research institute), the company that contributed to the co-financing shall receive a usage right. A billing model shall be established that takes into account the initial investments but transitions to paid usage in the long term after compensation.
- In this case, it must also be clarified which facility will take over further operations. At the latest by the decision on co-financing the technology demonstrator with public funds, the future operator must be involved.
- If no scientific repurposing is planned, it must be presented how the facility will be handled in the long term and how any decommissioning and disposal will be financed. In the case of scientific repurposing, a concept for later decommissioning and disposal must also be submitted.
- Should requirements arise from scientific repurposing that conflict with the above objectives, compromise solutions shall be sought where possible. However, the path to the commercial power plant and the mobilisation of the private sector have priority. If it can be demonstrated for the repurposing that this contributes further to power plant development, the relevance of these requirements also increases for the primary design of the technology demonstrator.
- Retrofitting, where technically possible, that prioritises enabling rapid implementation of the relevant steps towards the demonstration plant and subsequently focuses on further scientific use shall be part of the solution space. Additional public funds may be made available for this where applicable.
- Requirements for the technology demonstrator that arise only from scientific repurposing may not impede aspects relevant to the above objectives. In particular, they may not significantly delay the timeline to competitive disadvantage.

2.4 Supply Chain and Value Chain

Due to the high complexity of a fusion power plant, significant steps of the roadmap will also depend on parallel external developments in research and the industrial supply chain. A concept for building the supplier and value chain for a demonstration plant must be presented, addressing:

- required external technologies and components,
- their required availability over time,
- existing and planned strategic partnerships,
- concrete development and supply agreements, where available,

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- necessary capacity building in the supply chain (when, which milestone triggers the build-up),
- existing gaps in the supply and value chain and measures to close them.
- Scientific cooperations for technologies not yet commercially available
- Possibilities for joint infrastructure or development projects, also with other market participants
- Role of the participant in the Hubs, interaction and joint projects, potentially also joint projects with competitors within the Hubs.

For technologies not currently available from commercial suppliers, scientific or other development partners should be identified where applicable.

2.5 External Infrastructures and Critical Materials

The foreseeable need for relevant external resources must be presented, in particular:

- Required access to large-scale scientific facilities, laser facilities, neutron sources or other test facilities
- Expected demand for tritium and lithium-6 until the end of the milestone-based program
- Concepts for procurement and availability
- Concept for neutron testing (when, where and how can/should which tests be carried out)
- Significant timing, regulatory or supply-side risks

The explanations here should on the one hand contribute to risk assessment, but also help define interfaces with other publicly supported activities and potentially derive further support measures.

2.6 IP Strategy

The following must be presented:

- Existing intellectual property rights and know-how position
- Essential dependencies on external IP
- Strategy for building and protecting further IP
- Freedom to Operate or, where applicable, access to patents or patented technology via suppliers

2.7 Financing Roadmap

The technological roadmap must be linked to a consistent financing roadmap backed by milestones.

Financial milestones on the path to the power plant shall present which financial resources must be available at what point in time. They represent an initial structuring of financing and, where applicable, plans for the establishment and integration of separate project companies or similar (Special Purpose Vehicle, SPV). They answer the question of which

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financing instruments are suitable to what extent for which phase. The financing roadmap should be closely linked to the technical milestones and updated accordingly.

The following must in particular be presented:

- existing funds and the current capital structure,
- forecasted capital requirements over time as clearly identifiable ‘buckets’ across capital expenditures, research and development, overhead costs, materials costs in a comprehensive financial model,
- planned private financing rounds,
- suitable public and private financing instruments, including guarantees and debt,
- aspects that may be covered by adjacent fusion-related measures,
- the relationship between technical progress and financing milestones,
- approximate financing requirements of key partners and suppliers, including suitable types of financing,
- potential spin-offs or revenues arising from individual technologies,
- potentially complex financing structures and/or special purpose vehicles (SPVs),
- governance structure of the group, including decision making bodies and procedures,
- executive leadership and ‘key persons’ within the organization capable of delivering the technological and financial roadmaps and ultimate facilities.

Beyond the duration of the milestone-based program, the roadmap should also provide initial financing concepts for the demonstration power plant and the subsequent FOAK stage. This should include, where applicable, strategic investors, offtake agreements, anchor customers, and other long-term financing approaches.

The roadmap should indicate which technical advances are likely suitable to enable additional private financing.

The proposed financing roadmap and structuring shall represent an ambitious and plausible initial plan, which may be adapted in exchange with SPRIND to the possibilities of the milestone-based program.

Financing components for which other public financing or funding instruments are possible or planned must be indicated. Inadmissible double financing of the same costs is excluded.

3 Evaluation of Applications

The evaluation is conducted in two interconnected areas:

1. Technical evaluation, and
2. Economic and financial evaluation.

The evaluation involves independent external experts.

3.1 Technical Evaluation

The following aspects will be assessed in particular:

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Scientific and Technical Plausibility

- Comprehensibility of the underlying approach,
- reliable assessment of the current maturity level,
- maturity and quality of scientific and experimental evidence.

Quality of the Development Path

- Plausibility of the path to the TDR,
- completeness of essential development steps,
- quality, measurability and decision relevance of milestones,
- appropriate consideration of critical dependencies.

Speed and Development Efficiency

Evaluated is the extent to which the proposed development path is suitable for achieving the overarching program goal with high speed and appropriate resource deployment.

Risk Structure

The goal is a risk-balanced portfolio of milestones while simultaneously optimising for the activation of private funds. The chosen path should take risks to ensure high speed, but also show verifiable interim criteria and consider fallback solutions. Such an approach often leads to higher costs. A balance must be found that is also supported by private investors.

Evaluated are:

- Completeness and transparency regarding main technical and scientific risks,
- appropriate handling of risks, quality of the planned risk reduction strategy,
- reliability of termination and decision criteria,
- inclusion and quality of existing alternative development paths.

Technology Demonstrators

Are the technology demonstrators convincingly justified in scope and timing (see also requirements above)?

- Contribution to technical and scientific de-risking,
- relevance for the TDR,
- relevance of expected findings for supply chains, industry and investors,
- where applicable, economic and scientific repurposability.

Value Chain and Partnerships

- Completeness of the presentation of required supply chains,
- quality and maturity of value chains and secured strategic partnerships,
- industrial feasibility,
- consideration of critical dependencies.

Technological Differentiation and IP

- technological independence,

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- relevant unique selling points,
- existing IP,
- plausibility of the IP strategy,
- suitability of the IP to support long-term company development.

3.2 Economic and Financial Evaluation

The following are evaluated in particular:

- Capital requirements and financing plan,
- appropriateness of the proposed financing instruments,
- consistency between technical and financial milestones,
- economic plausibility of the development path,
- ability to mobilise private capital,
- existing or reliably expected private financing,
- company organisation and governance,
- organisational capabilities to implement the proposed development path,
- controlling and financial reporting.

3.3 Selection Decision

The decision on admission to the program is based on the overall technical and economic-financial evaluation. A positive technical evaluation does not constitute a claim to admission or financing. In addition to the quality of the individual application, the available program budget, the composition of the participant field, the maintenance of effective technological competition and the expected impact of the public funds deployed may be taken into account.

4 Type and Scope of Financing

The objective of financing within the milestone-based program is to enable participants, on the one hand, with a level of flexibility appropriate to the complexity of the projects. On the other hand, participants shall also validate their technical milestones and their company structures as well as their fundamental entrepreneurial actions early on in the private market. This ensures that parallel to technical results, entrepreneurial and economically strong, scalable companies are created and that the provided public capital is used sparingly, efficiently, economically and with clear leverage effect. Public funds from the milestone-based program shall in particular be channelled into participating companies through financing instruments that do not constitute pure, non-repayable grants.

Overall, this is intended to prevent participating companies from becoming permanently dependent on public grants, resulting in public funds displacing private investments and the state bearing the downside risk exclusively without participating in the upside.

The goal is accordingly, on the one hand, to leverage private capital and, on the other hand, to respond as flexibly and individually as possible to the requirements of individual roadmaps, companies and the timing of financing needs. Within the milestone-based program, different instruments can in principle be used in individual combinations.

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For this purpose, in the first phase in particular equity investments, convertible loans, loans as well as grants from SPRIND can be used. To the extent these financing instruments constitute state aid within the meaning of Art. 107(1) TFEU, they are granted only within the framework of the applicable state aid law requirements, in particular – where applicable – on the basis of the General Block Exemption Regulation (GBER³).

In addition, it is intended to explore additional financing instruments, in particular guarantees and sureties, together with other public financing and funding institutions.

If, particularly in the second phase, significant financing gaps remain for the construction of a technology demonstrator, it is in principle intended to close these – where necessary and permissible under state aid law – also through further public subsidies. This may in particular include financing that cannot be granted on the basis of the GBER due to its amount or structure.

Such financing requires a separate state aid law review. To the extent the measure in question constitutes state aid within the meaning of Art. 107(1) TFEU and is neither exempt from the notification obligation nor based on an already approved aid scheme, a notification to and approval by the European Commission pursuant to Art. 108(3) TFEU may be required before its implementation.

The specific structure is determined separately for each participant.

The goal is to limit the cumulative financing through the milestone-based program per participant to approximately 50% of the total investments required to achieve the final milestone by the end of the milestone-based program. For this calculation, aid-free funds where the state acts at market conditions (e.g. participations on a *pari passu* basis) are weighted only with a factor of 0.2. Aid is weighted in full, i.e. with a factor of 1. It is intended to award at least 30% of the milestone-based program funds aid-free in the long term. By the end of Phase 1, funds shall primarily be used in the form of equity investments.

The specific application of different financing instruments is based on the applicable legal and state aid law requirements.

5 Ongoing Program Management

After admission to the program, regular exchange of information takes place between SPRIND and the participants. In particular for assessing milestone achievement, reliable documents must be submitted. In principle, participants are obligated to inform SPRIND in good time of significant changes. Details on reporting and information exchange are communicated to participants in the milestone-based program.

For the grants awarded within the milestone-based program, SPRIND has the necessary audit and verification rights vis-à-vis the participants pursuant to § 44 BHO (German Federal Budget Code).

³ Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty on the Functioning of the European Union (General Block Exemption Regulation – GBER), as amended.

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SPRIND regularly reviews during the program whether the conditions for further support are met. External independent experts may be involved in this.

6 Milestone Achievement and Further Financing

The achievement of agreed milestones is reviewed according to their respective nature. Participants are obligated to provide the necessary information. The evaluation is conducted with the involvement of independent external experts.

To the extent milestone shortfalls are not also clearly assessed as such by the fusion companies themselves, the technical evaluation, as well as the determination of other aforementioned technical reasons, is made based on an external and independent evaluation.

Successful achievement of a milestone confirms the corresponding development progress. However, it does not constitute an automatic claim to the continuation or expansion of financing.

Before a further financing decision, the following may in particular be reviewed again:

- the currency and plausibility of the roadmap,
- the technological lead achieved,
- remaining risks,
- the development of competing approaches,
- private financing,
- further capital requirements, and
- available public funds.

7 Termination of Participation

Participation in the milestone-based program and thus further support may be terminated in particular if:

1. a significant agreed milestone (termination milestone) is not achieved;
2. participation requirements are no longer met;
3. new scientific or technological findings significantly change the fundamental plausibility of the approach;
4. no reliable solution path exists for significant technical problems that have occurred;
5. the further roadmap significantly loses competitiveness compared to alternative approaches (e.g. due to insufficient speed or unfavourable implementation prospects);
6. due to limited program funds, a concentration on a smaller number of approaches becomes necessary; or
7. other essential prerequisites for economic and purpose-oriented use of further public funds are no longer met.

Points 6 and 7 become particularly relevant in the transition to Phase 2, as limited program funds and efficient use of these funds may only allow support for a limited number of technology demonstrators. Public co-financing for the construction of technology demonstrators requires a separate decision. The participant field may be reduced.

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The goal is, to the extent technically and financially justifiable, to maintain effective competition between several approaches.

8. Consequences of Termination of Participation

Upon termination of participation, a company receives no further funds from the milestone-based program. Existing SPRIND equity investments are not expanded further. A re-application after changed circumstances is in principle possible.

9. Adjustment of Roadmaps

Roadmaps can in principle be adjusted during the course based on new findings or framework conditions. With justifiable justification, individual milestones can in particular be adjusted in content or scope or delayed, provided the overall goal remains achievable. Adjustments must be confirmed and approved by SPRIND and with the involvement of external reviewers.

10. Prerequisites for Financing Larger Technology Demonstrators

A separate decision is made on the financing of a larger technology demonstrator. In this context, the following aspects are additionally evaluated in particular:

- Contribution of the technology demonstrator to the creation of the TDR of a demonstration plant,
- scientific and technical maturity and quality of the technical design,
- completion of required design and planning work,
- reliable determination of costs for planning, construction, operation and decommissioning,
- independent cost review,
- risk assessment and risk minimisation measures,
- overall financing plan including operating costs,
- private co-financing of the technology demonstrator,
- contribution of evidence from the technology demonstrator for subsequent financing with reduced public support,
- concept for decommissioning or repurposing,
- location and permitting strategy,
- project management and governance,
- internal project controlling.

If participating companies in competition are significantly apart in terms of timeline, this should be seen as part of the evaluation basis. Thus, a decision to build a technology demonstrator can be made even if other participants of the milestone-based program have not yet achieved the prerequisites necessary for the decision. As a decision basis for which technology demonstrator receives significant public co-financing, a completed technical design for the technology demonstrator must be available and the most critical elements that are design-determining for the technology demonstrator must be sufficiently technically demonstrated.

The critical elements as well as the exact nature of the technical demonstration are defined by the participating start-ups and young companies themselves in the roadmap – also

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depending on what the technology demonstrator will demonstrate overall. However, they must withstand external technical evaluation and comparison with available external roadmaps. Depending on the scientific maturity of the underlying fusion concept, the fundamental approach must also, if necessary, be sufficiently substantiated with available means, simulations and facilities so that the planned properties and parameters of the technology demonstrator are scientifically comprehensible and the provision of co-financing can be justified.

Preparatory measures for technology demonstrators (including rental/construction of premises, infrastructure preparations, ordering of long-lead items) can be started by participants if they are not financed by funds from the milestone-based program. This must be proven by the participants. If milestone-based program funds are disbursed in the form of equity investments, it must be proven that work and developments in the amount of the equity investment have been financed that do not fall under this exclusion.

Within the milestone-based program, the following can be supported: the complete design of the technology demonstrator, the demonstration of physical aspects and further technology developments that contribute to the design of the technology demonstrator, and the demonstration of the critical elements.

11. Formal Notes

- The initial consideration of the submitted roadmap and the associated admission to the milestone-based program does not constitute for potential participants or third parties any claims to financing, assurance of remaining in the milestone-based program, or to a specific selection among the various funding and financing instruments available to SPRIND for fulfilling its tasks – pursuant to the Act on the Functioning of the Federal Agency for Breakthrough Innovation and on the Flexibilisation of its Legal and Financial Framework (SPRIND Freedom Act). SPRIND's financing and funding instruments comprise equity investments, convertible loans and the awarding of grants, which can be used to finance projects with breakthrough innovation potential.
- In the case of potential financial support, SPRIND must consider its special framework conditions. In particular, SPRIND will only provide potential financial support if and to the extent that the requirements of national law and EU law applicable to it – in particular EU state aid law – are met, regularly with the condition of participation on market terms (in principle *pari passu* with an independent private investor).
- Combination with other private or public funds is permitted, provided this does not violate state aid law (in particular no inadmissible cumulation beyond the state aid law maximum intensities), the same eligible costs or projects are not double financed (prohibition of double funding) and no dysfunctional or legally impermissible governance structure is created. Each provision of financing is furthermore subject to the reservation of budget allocation and availability of the required funds in the federal budget.
- All information must be complete and correct to the best of knowledge at the time of submission.
- Essential assumptions, uncertainties and dependencies must be explicitly indicated.
- Essential assumptions regarding the cost basis must be stated.
- SPRIND may request supplementary information, explanations or evidence during the evaluation process.