![M-ERA.NET logo]

M-ERA.NET Call 2025

Guide for Proposers

Main document

Version 1.1

24 June 2025

Content

1. Introduction to M-ERA.NET

What is M-ERA.NET ?

M-ERA.NET is a strong European network of public funding organisations supporting and increasing coordination and convergence of national and regional funding programmes on research and innovation related to materials and battery technologies to support the European Green Deal[1].

M-ERA.NET Mission

Technological innovation is the driving force behind M-ERA.NET's contribution to achieve the environmental and growth objectives necessary for the green transition, supporting the circular economy and the Sustainable Development Goals (SDGs) set in the 2030 Agenda for Sustainable Development[2] by the general assembly of the United Nations.

M-ERA.NET aims to strengthen the European Research Area (ERA) on advanced materials[3]. With annual joint calls M-ERA.NET funds ground-breaking research, facilitates knowledge exchange, promotes sustainable solutions in the field of materials science, and fosters transnational collaboration among researchers, academia, industry and other stakeholders. In addition, efforts are directed towards consolidating strategic programming, reducing fragmentation of funding, engaging in international cooperation and facilitating the exploitation of knowledge along the entire innovation chain.

M-ERA.NET plays a pivotal role in aligning national and regional priorities with industry needs, European policy priorities and global challenges. The initiative emphasises a holistic approach to product development, addressing challenges at the design, materials and manufacturing levels. This includes improving durability, reducing energy and material consumption, substituting hazardous materials and developing products that are lighter, easier to maintain, repair, upgrade, remanufacture or recycle. The collaboration also extends to bio-degradable plastics and sustainable polymer design, aiming to mitigate health risks and reduce plastic waste. Furthermore, M-ERA.NET promotes digitalisation and materials modelling to tailor material properties, optimise production processes, and establish uniform data structures for seamless collaboration. Addressing climate challenges, the initiative supports research on efficient energy harvesting, storage devices, and high-

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[1] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

[2] https://sdgs.un.org/2030agenda

[3] https://www.m-era.net/news/updated-vision-and-policy-document-published

performance, environmentally friendly batteries. Overall, M-ERA.NET catalyses progress in materials research, driving advancements in functional materials, composites, surfaces, coatings and interfaces to shape sustainability and competitiveness in key industrial sectors.

M-ERA.NET Consortium

M-ERA.NET started in 2012 under FP7 with 37 partners from 25 European countries. It continued as M-ERA.NET 2 from 2016 to 2022 with 43 partners from 29 countries and is now running in its third phase as M-ERA.NET 3 until 2026 under the Horizon 2020 ERA-NET COFUND scheme with currently 49 public funding organisations from 35 countries. The diverse and experienced network comprises national and regional funding programmes from 25 EU member states and 5 associated countries and includes 5 non-European organisations.
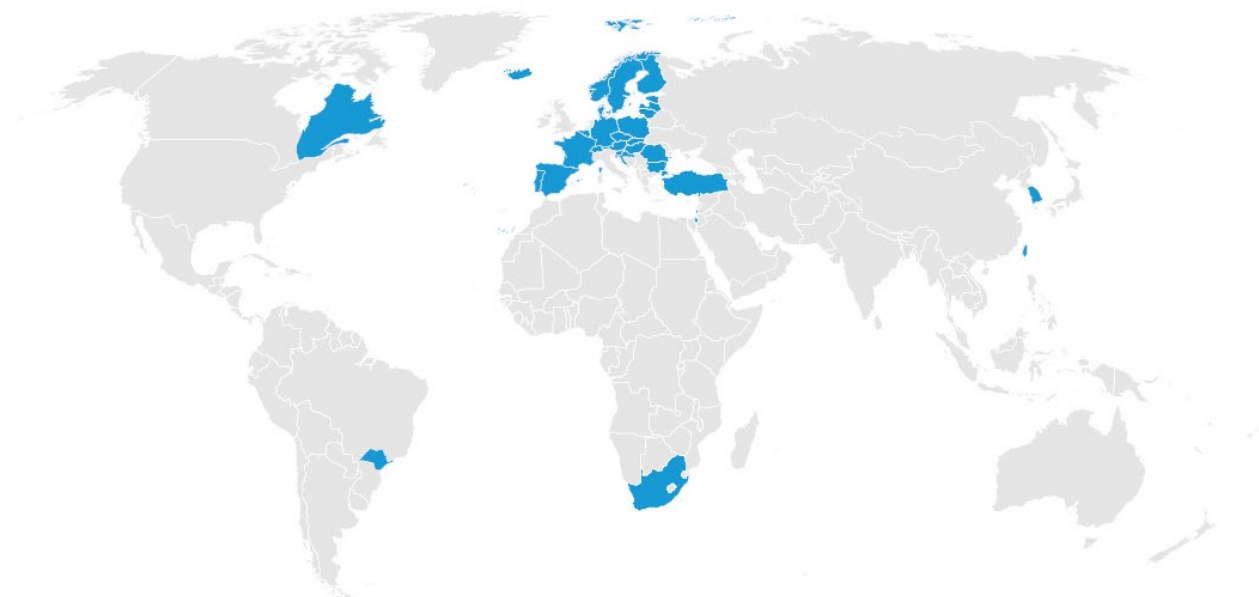
Figure 1: Participating countries and regions of the M-ERA.NET 3 consortium, see also
https://www.m-era.net/about/m-consortium

2. Structure of the M-ERA.NET Call 2025

The objective of the M-ERA.NET Call 2025 is to enable transnational R&D projects between partners receiving funding from regional/national programmes.

Fig. 2 shows the schematic workflow of the Call 2025. Benefits are combined in one approach: On the one hand the regional/national funding organisations apply their own well-established funding rules and procedures known to their applicants, and on the other hand M-ERA.NET provides transnational coordination expertise:

- The call is organised as a 2-step application (Pre- and Full-Proposal). The eligibility of applicants applying for funding will be checked by national/regional funding organisations according to the rules defined by their respective funding programmes.

- The centralised evaluation of Pre-Proposals and Full-Proposals will be carried out by independent international evaluators resulting in a ranking list for each stage.

- In stage 1 the M-ERA.NET call consortium will agree on a list of Pre-Proposals invited to submit a Full-Proposal. The decision is based on the ranking list of evaluated Pre-Proposals and available national/regional budgets.

- In stage 2 the M-ERA.NET call consortium will agree on a joint selection list based on the ranking list of evaluated Full-Proposals and available national/regional budgets.

- The final funding decisions will be made by the national/regional funding organisations.

Figure 2: Workflow of the Call 2025

3. Call Announcement

3.1. Objectives and Topics

The aim is to fund ambitious transnational RTD projects addressing materials research and innovation including materials for batteries and low carbon energy technologies.

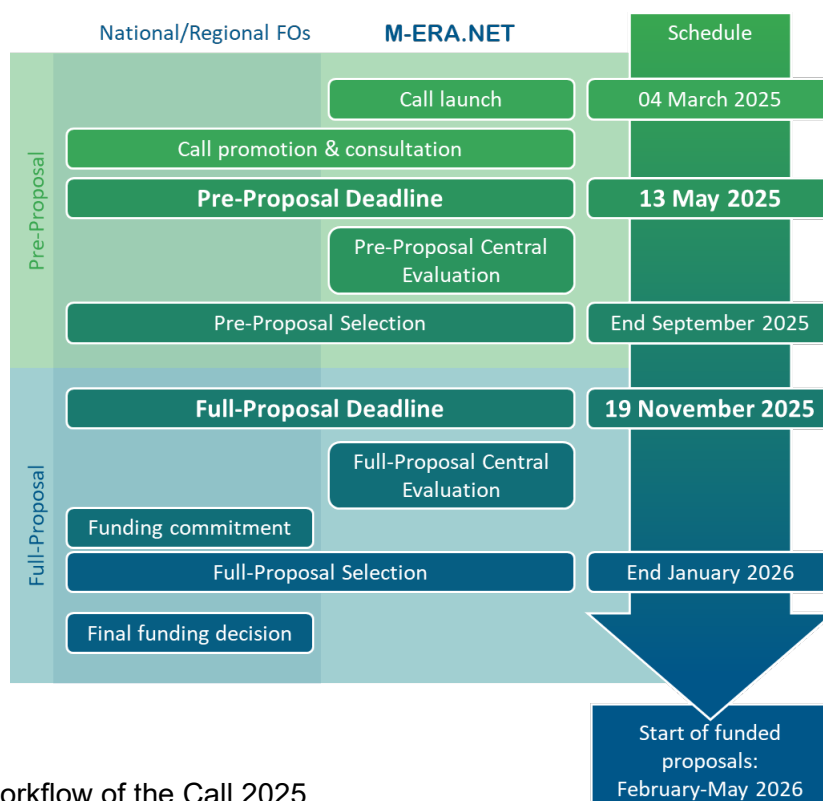**Horizontal objectives for the Call 2025**

Supporting the European Green Deal by increasing attention to clean energy technologies and future batteries:

M-ERA.NET aims to strengthen the contribution of materials RTD for clean energy-related applications, energy generation and harvesting, energy storage (battery technologies), electrolysers and fuel cells. M-ERA.NET will support the transition towards a circular economy by addressing aspects like eco-design, design for recycling, durability of products and process efficiency through reduced energy and materials consumption, resulting e.g. in light-weight products.

Supporting the achievement of the United Nations' Sustainable Development Goals (SDG):

M-ERA.NET will contribute to a wider public debate on the impact of materials research and its potential to achieve the SDGs. In particular, M-ERA.NET will support in particular SDG 6 ("Clean water and sanitation") through the development of materials and processes for water treatment, SDG 7 ("Affordable and clean energy") through fostering research on sustainable energy storage technology, SDG 9 ("Industrial innovation and infrastructure") by upgrading the technological capabilities of industrial sectors and SDG 12 ("Ensure sustainable consumption and production patterns") through an environmentally sound management of natural resources and reduced waste generation.

Creating socio-ecological benefits in the context of Responsible Research and Innovation (RRI):

M-ERA.NET joint calls will address EU areas of socio-ecological relevance, illustrating the leveraging effects materials research and innovation have on areas that reflect meaningful societal needs. M-ERA.NET will develop responsible research and innovation processes to systematically address socio-ecological, ethical and political dimensions of material research, development and use. Please refer to the topic descriptions and the M-ERA.NET RRI guidelines[4] included in the call documents.

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[4] https://www.m-era.net/other-joint-activities/responsible-research-and-innovation

Supporting the innovation chain, strengthening interdisciplinarity and widening:

Making the best use of the interdisciplinary network, the calls in M-ERA.NET will facilitate the generation of knowledge along the innovation chain, from excellent science and research to innovative industrial applications. M-ERA.NET as a platform uses an integrative approach across disciplines and across application fields, making the initiative an attractive and efficient tool for transnational joint projects that were unlikely to be realised before. Measures to ensure gender balance in the project consortia should also be considered.

Digitalisation and data management

M-ERA.NET aims to integrate digital technologies and data management frameworks to accelerate technological transfer to the market. Inclusion of digital tools and data spaces from design to validation are encouraged. An open operability and data sharing secure approach will encourage international cooperation in the field. In line with the principle "as open as possible, as close as necessary" it will ensure the provision of FAIR (Findable, Accessible, Interoperable and Reusable) results and supporting the need for uniform data structures, uniform data processing (exchange, evaluation, further processing) and uniform concepts for handling materials data in the so-called digital workflows across all borders. Special attention will be given to ethical considerations, security measures, and fostering inclusivity to ensure responsible and impactful digital transformation

Thematic priorities

The following six topics are defined for the Call 2025

1: Sustainable materials for energy applications

2: Innovative surfaces, coatings and interfaces

3: Advanced composites and lightweight materials

4: Functional materials

5: Materials addressing environmental challenges

6: Next generation materials for electronics

M-ERA.NET will support the research and innovation chain described through Technology Readiness Levels (TRL). **A more detailed description of the topics is available in Annex 1. A description of the TRLs can be found in Annex 2.** In addition, individual national/regional thematic programme focus and funding rules must be taken into account.

3.2. Funding rules

Each of the project partners that requests funding has to apply individually for regional/national funding, and is subjected to the rules of the respective regional/national programme. **This means that - depending on the respective national/regional funding rules - some project partners may have to submit additional proposals or information on national/regional level.**

To obtain detailed information on the specific funding rules and programme priorities we strongly recommend contacting the respective national/regional funding organisations (Contact details see Annex 3; first overview on the national / regional funding rules see Annex A to Guide for Proposers for details).

3.3. Eligible project structure and application

- Project consortia must consist of at least 3 partners (all requesting funding from a funding organisation listed in Annex 3) from at least 3 different countries (at least 2 EU member state or associated country[5]) participating in the M-ERA.NET Call 2025. In addition to the minimum consortium, the participation of further partners is possible, including applicants not asking for funding (self-funded).

- Coordinator is eligible and requests funding from a funding organisation listed in Annex 3.

- Proposers (SMEs, large companies, academic research groups, universities, public research organisations or other research organisations) must be eligible for funding according to their national/regional regulations (to be checked with funding organisations listed in Annex 3). If one or more partner(s) responsible for more than 15% of the total project efforts (measured in persons month) are deemed ineligible, the project will not be invited for Pre- or Full- Proposal evaluation.

- The total effort of one single applicant cannot exceed 60% of the total project efforts (measured in person months) in the proposal.

- The total effort of applicants from one country cannot exceed 70% of the total project efforts (measured in person months) in the proposal.

- Proposers must be involved in activities within the eligible TRL range of their respective funding agencies to the relevant Topic. Proposal should overall address appropriate TRLs for selected M-ERA.NET Call 2025 topics.

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[5] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf

- Mandatory proposal forms must be used (provided for download at https://www.m-era.net/joint-call-2025). The formatting conditions of the proposal forms aim to ensure the equity and fairness of the evaluation. Therefore, any restructuring and change of formatting conditions of proposal forms will result in the formal rejection of the proposal (this includes changing the font and its size, interline interval, spacing, margins, document size, tables, individual sections of the template).

- Proposers must fill in all tables, including the ethical issues and the checklist of submission. Incomplete tables will result in a formal rejection of the proposal.

- Proposal must be written in English.

- Proposers must select only one of the M-ERA.NET Call 2025 topics. The topic selected in the proposal template must correspond to the topic selected in the submission tool. In case of discrepancies, the topic selected in the submission tool will prevail.

- Maximum project duration is 36 months.

- Only Proposals recommended to stage 2 by M-ERA.NET after the Pre-Proposal stage will be allowed to submit a Full-Proposal.

- Proposers must provide their respective PIC[6]-numbers in the proposal; proposers without a validated PIC will be able to use a temporary PIC for submission.

- Conflict of Interest: the following individuals are not eligible for proposal submission: M-ERA.NET Steering Board members, researchers affiliated to Russian entities and/or exercising in Russia and researchers from participating Funding Organisations. In addition, proposers cannot act as evaluators of the M-ERA.NET Call 2025.

Typically, small to medium sized consortia (3-5 partners on average per proposal) are expected. However, there is no upper limit and consortia may involve as many partners as necessary for a convincing proposal, ensuring that all participants have a valid role. Each partner within the consortium should clearly add value to the objectives of the proposed project. Depending on the nature of the project, each partner in the consortium must demonstrate how they will exploit the expected results.

National/regional funding rules apply. Therefore, certain topics, TRLs or types of organisations might be ineligible to certain funding organisations (e.g., some national/regional programmes fund only industrial but no academic partners, low/high TRLs). It is highly recommended to contact the

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[6] Participant Identification Code: If you want to participate in a project proposal your organisation needs to be registered and have a 9-digit Participant Identification Code (PIC). Please find details here: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/participant-register

respective national/regional funding organisation before proposal submission (see Annex 3 for details).

A consortium agreement between the project partners is recommended for funded projects based on national/regional funding rules. However, the principles of the agreement should already be clear when submitting the proposal. The purpose of the consortium agreement is to clarify:

- the responsibilities of the partners;
- decision processes inside the project;
- management of any change of partners;
- how to exploit and/or commercialise the results (for each partner);
- IPR issues.

A template for the consortium agreement can be found at: https://www.desca-agreement.eu/desca-model-consortium-agreement/.

3.4. Project budget

No overall limits have been defined on M-ERA.NET level but national/regional limits regarding the available funding may apply. Budget shares in project consortia have to be in line with eligibility criteria (chapter 5.1.1. and 5.2.1.).

3.5. Project duration

The maximum project duration must not exceed 36 months. National/regional limits regarding the duration of projects will apply.

3.6. Dates and deadlines

Date	Step	Place
4 March 2025	Launch of the Call 2025	
13 May 2025 12:00 noon Brussels time	Deadline for submission of: a) Pre-Proposals and b) National/regional Funding Applications, if necessary*	a) Online (via IT tool) b) National/Regional funding organisations
Early October 2025	Feedback to applicants	
19 November 2025 12:00 noon Brussels time	Deadline for submission of: a) Full-Proposals and b) National/regional Funding Applications, if necessary*	a) Online (via IT tool) b) National/Regional funding organisation
Early February 2026	Feedback to applicants	
February 2026	Contract negotiations for selected proposals on national/regional level	National/Regional funding organisations
February – May 2026	Start of funded projects	

Please contact your national/regional funding organisation

4. Application process

The M-ERA.NET application process is implemented as a 2-step procedure: Pre-Proposal and Full-Proposal.

1. Before submitting a proposal, all project partners must contact their respective national/regional programme funding organisations in order to discuss the project line-up and the funding conditions.

2. **In stage 1, a Pre-Proposal is mandatory**. It has to be submitted by the coordinator through the M-ERA.NET submission tool until 13 May 2025, 12:00 noon Brussels time. The mandatory Pre-Proposal form available at https://www.m-era.net/joint-call-2025 has to be used. At the same time national/regional funding applications must be submitted to each of the involved funding organisation according to their specific rules (if applicable).

3. M-ERA.NET as well as national/regional funding organisations will carry out eligibility checks of the Pre-Proposals. Eligible Pre-Proposals are sent to central evaluation, organised by the M-ERA.NET call secretariat. The online central evaluation is performed by independent international evaluators, resulting in the M-ERA.NET ranking list of proposals. The Pre-Proposal stage will be used to ensure that only high-quality proposals, which are in line with national/regional requirements, are invited to the Full-Proposal stage. Applicants will be provided with feedback emails (only with comments, no scores will be communicated to proposers) after the M-ERA.NET Pre-Proposal selection meeting, including a recommendation to submit (or not) a Full-Proposal.

4. A proposal has to be recommended for Full-Proposal submission by M-ERA.NET to be eligible for stage 2.

5. **In stage 2, a Full-Proposal and an Annex 1 to the Full-Proposal are mandatory**. They must be submitted by the project coordinator through the M-ERA.NET submission tool until 19 November 2025, 12:00 noon Brussels time. The mandatory Full-Proposal form and the mandatory Annex 1 to Full-Proposal form available at https://www.m-era.net/joint-call-2025 have to be used. According to the specific rules of the involved funding organisations, a submission of a national / regional application may be required. Please check with your funding organisation.

6. M-ERA.NET as well as national/regional funding organisations will carry out eligibility checks of the Full-Proposals. Only eligible Full-Proposals are sent to central evaluation, organised by the M-ERA.NET call secretariat. The online central evaluation is performed by independent international evaluators, resulting in the M-ERA.NET ranking list of proposals.

7. At the M-ERA.NET Full-Proposal selection meeting proposals will be selected for funding based on the M-ERA.NET ranking list and available national/regional budget.

8. M-ERA.NET recommends selected projects for funding to the involved funding organisations. The national/regional funding organisations take the final funding decision.

4.1. Stage 1: M-ERA.NET Pre-Proposal

A Pre-Proposal submission is mandatory using the M-ERA.NET proposal template. The mandatory Pre-Proposal must be submitted by the project coordinator through the M-ERA.NET submission tool until deadline 13 May 2025, 12:00 noon Brussels time. M-ERA.NET Pre-Proposal templates of the Call 2025 must be used.

The electronic submission has to be done on project level (by the coordinator) and on partner level (by each project partner) via M-ERA.NET submission tool.

At the same time national/regional funding applications must be submitted to each of the involved funding organisation according to their specific rules (if applicable). Applicants are requested to contact the involved funding organisations before Pre-Proposal submission. To receive funding, the national/regional parts of the project must fulfil their national/regional criteria. This may create different submission and financing situations for partners from different countries.

4.2. Stage 2: M-ERA.NET Full-Proposal

Only Pre-Proposals invited to Full-Proposal submission are allowed to participate in stage 2. A mandatory Full-Proposal and a mandatory Annex1 to the Full-Proposal must be submitted by the project coordinator through the M-ERA.NET submission tool until deadline 19 November 2025, 12:00 noon Brussels time. M-ERA.NET proposal templates of the Call 2025 must be used.

At the same time national/regional funding applications must be submitted to each of the involved funding organisation according to their specific rules (if applicable).

> ***Changes from Pre- to Full-Proposal***
>
> ► *Project objectives stated in the Pre-Proposal cannot be changed.*
>
> ► *Changes in the consortium should be avoided. Modifications of the consortium are restricted to applicants from countries already part of the Pre-Proposal consortium. It is not accepted to introduce new countries into the existing consortium.*
>
> ► *In general, changes from Pre- to Full-Proposal should be avoided. In any case changes from Pre- to Full-Proposal stage have to be coordinated by the consortium leader with all involved funding organisations.*
>
> *This means that major changes regarding content, project duration, costs, funding or consortium have to be communicated and approved by all involved funding organisations at least 2 weeks before Full-Proposal deadline. The consortium leader is responsible to coordinate and ensure the acceptance of these changes by all involved project partners, funding organisations and the call secretariat.*

4.3. Confidentiality

Proposals and any information relating to them (including the names of the evaluators) will be kept confidential and only be accessible to the funding organisations participating in the M-ERA.NET Call 2025. Proposals will not be used for any purpose other than the evaluation of the applications, making funding decisions and monitoring of the project. International experts are required to sign a confidentiality agreement prior to evaluating proposals.

5. Evaluation

The M-ERA.NET selection process will be a 2-step procedure: Pre-Proposal and Full-Proposal. M-ERA.NET aims at providing a transparent, fast and straight forward assessment of the submitted proposals.

5.1. Pre-Proposal

5.1.1 Eligibility check

At M-ERA.NET level:

- requested M-ERA.NET Pre-Proposal form in English is uploaded to the M-ERA.NET submission tool until submission deadline 13 May 2025, 12:00 noon Brussels time. The Pre-Proposal form must be completed and the structure of the form must not be changed. Any restructuring and change of the formatting conditions of the proposal forms will result in the formal rejection of the proposal.
- maximum project duration is 36 months
- minimum of 3 applicants (all requesting funding from a funding organisation listed in the Guide for Proposers) from at least 3 different countries (at least 2 EU member states or associated countries[7]) participating in the Call 2025; applicants not asking for funding can participate in addition to the minimum consortium of 3 applicants from 3 different countries
- project coordinator is eligible and requests funding (from a funding organisation listed in the Annex 3)
- total effort of one single applicant cannot exceed 60% of the total project efforts (measured in person months) in the proposal
- total effort of applicants from one country cannot exceed 70% of the total project efforts (measured in person months) in the proposal
- Pre-Proposal is recommended for Full-Proposal submission by a minimum of 3 funding organisations from 3 different countries of the M-ERA.NET call consortium
- In case one or more project partners are considered ineligible the entire Pre-Proposal will not be invited to the Pre-Proposal evaluation if the not eligible partner(s) account for ≥15% of the total project effort (measured in person months).

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[7] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf

At national/regional level:

- presence of requested national/regional Pre-Proposal forms (if applicable)
- minimum number of eligible, independent applicants (if applicable, criteria of involved funding programmes apply)
- relevance to funding programme (if applicable, criteria of involved funding programmes apply)
- national/regional thematic priorities going beyond, or more in details than, the M-ERA.NET Call 2025 topics and associated TRL
- financial status of applicants, especially industrial applicants

5.1.2. Central evaluation of Pre-Proposals

Only eligible Pre-Proposals are sent to central evaluation carried out by independent international evaluators according to the EC rules for ERA-NET Cofund (see Figure 3):

- Individual written assessments: 3 individual and independent written assessments for each Pre-Proposal provided by selected and agreed experts. There is no scoring for the individual assessment reports.
- 1 peer review report (PRR): 3 individual assessments are compiled by one of the 3 experts (= rapporteur). The compilation consists of peer review report and a scoring.
- Pre-Proposal evaluation criteria, scoring and thresholds (described in Annex 4.1).
- Quality check of the peer review report by the M-ERA.NET call secretariat
- Ranking list of recommended projects is based on the scoring
- Involved funding organisations meet for a Pre-Proposal selection meeting to assemble and commit themselves to the list of Pre-Proposals to be invited to submit a Full-Proposal. The selection is based on the M-ERA.NET ranking list, national/regional priorities (if applicable) and available national/regional budgets.
- In case one or more project partners cannot be recommended, the entire Pre-Proposal will not be invited to the Full-Proposal phase if the not the recommended partner(s) account for ≥15% of the total project effort (measured in person months).
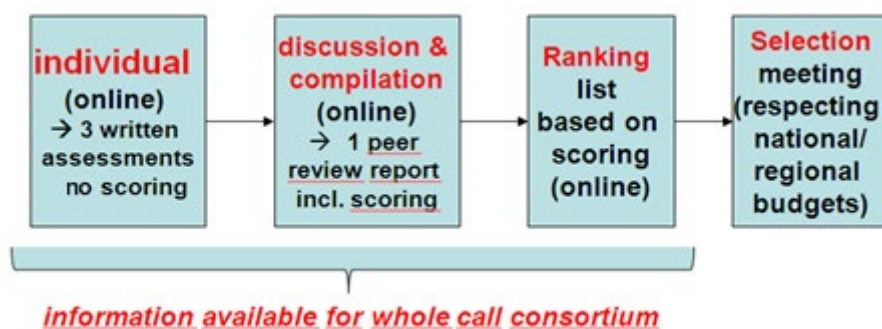
Figure 3:

Procedure of the centra evaluation applied for the Pre-Proposal and Full-Proposal stage

5.1.3. Result of Pre-Proposal phase

After the Pre-Proposal selection meeting of the involved funding organisations, the selection of Pre-Proposal results in one of the recommendations, to be communicated to the applicants:

- *Recommended for submitting the Full-Proposal*
- *Not recommended*

The results of the Pre-Proposals stage including a compiled peer review report (anonymised result of central international peer review process excluding the scoring) will be provided by the call secretariat via feedback emails to the project coordinators. All applicants will receive feedback provided by the involved funding organisations.

5.2. Full-Proposal

Full-Proposals will be selected by the following steps:

5.2.1 Eligibility check

Eligibility checks of Full-Proposals are performed before the central evaluation.

At M-ERA.NET level:

- stage 1 Pre-Proposal is recommended for Full-Proposal submission by M-ERA.NET
- requested M-ERA.NET Full-Proposal form and Annex1 to the Full-Proposal form in English are uploaded to the M ERA.NET submission tool until submission deadline 19 November 2025, 12:00 noon Brussels time. The Full-Proposals forms must be completed and the structure of the forms must not be changed. Any restructuring and change of the formatting conditions of the proposal forms result in the formal rejection of the proposal.
- project coordinator is eligible and requests funding (from a funding organisation listed in Annex 3)
- maximum project duration of 36 months

- minimum of 3 applicants (all requesting funding from a funding organisation listed in the Guide for Proposers) from at least 3 different countries (at least 2 EU member states or associated countries[8]) participating in the Call 2025; applicants not asking for funding can participate in addition to the minimum consortium of 3 applicants from 3 different countries

- total effort of one single applicant cannot exceed 60% of the total project efforts (measured in person months) in the proposal

- total effort of applicants from one country cannot exceed 70% of the total project efforts (measured in person months) in the proposal;

- In case one or more project partners are considered ineligible the entire Full-Proposal will not be invited to the Full-Proposal evaluation if the not eligible partner(s) account for ≥15% of the total project effort (measured in person months).

At national/regional level:

- programme regulations observed if applicable (e.g. presence of requested nat/reg proposal forms, financial standing of industrial applicants, etc.)

5.2.2. Central evaluation of Full-Proposal

Only eligible Full-Proposals are sent to central evaluation carried out by independent international evaluators according to the EC rules for ERA-NET Cofund (see Figure 3).

- Individual written assessments: 3 individual and independent written assessments for each Full-Proposal provided by selected and agreed experts. There is no scoring for the individual assessment reports.

- 1 peer review report (PRR): 3 individual assessments are compiled by one of the 3 experts (= rapporteur). The compilation consists of peer review report and a scoring.

- Full-Proposal evaluation criteria, scoring and thresholds (described in Annex 4.2).

- Quality check of the peer review report by the M-ERA.NET call secretariat

- Ranking list of recommended projects is based on the scoring

- Involved funding organisations meet for a selection meeting to assemble and commit themselves to the final list of selected proposals (= selection list). The selection is based on the M-ERA.NET ranking list and available national/regional budgets.

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8   https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/list-3rd-country-participation_horizon-euratom_en.pdf

5.2.3. Result of Full-Proposal phase

As a result of the M-ERA.NET central evaluation Full-Proposals will either be:

- Recommended for funding *or*
- Not recommended for funding

The results of the Full-Proposals stage including a compiled peer review report (anonymised result of central international peer review process excluding the scoring) will be provided by the call secretariat via feedback emails to the project coordinators and all applicants.

6. Decision and funding procedure

6.1. Decision process

The M-ERA.NET Full-Proposal selection meeting results in the M-ERA.NET recommendation for funding decisions at national/regional level. The recommended selection list will be forwarded to the involved programme owners who will be in charge of the final funding decisions.

In case one or more project partners are not recommended for funding, the entire Full-Proposal cannot be recommended for funding if the not the recommended partner(s) account for ≥15% of the total project effort (measured in person months).

Applicants may submit a complaint to the M-ERA.NET coordinator (office@m-era.net) until one week after the communication of the Full-Proposals assessment if any procedural error may be perceived to exist.

6.2. Funding

6.2.1. Contract

Funding contracts are signed directly between the project partners and their national/regional funding organisations.

6.2.2. Start of projects

Depending on the national/regional regulations, a pre-condition might be the existence of a consortium agreement that also includes IPR related issues.

It is highly recommended that the project start and end dates are synchronised for all project parties.

7. Monitoring

7.1. National/regional project review

The progress of each individual funding contract will be monitored by the respective national/regional funding organisation through individual project review processes and monitoring procedures.

7.2. Reporting to M-ERA.NET

Apart from the national/regional project review, the transnational cooperation aspects will be monitored at M-ERA.NET level, e.g. by using online questionnaires. This will also facilitate the identification of potential success stories.

At the end of the project lifetime, a final project report must be submitted to M-ERA.NET by the project coordinator using the M-ERA.NET reporting templates[9]. The reporting templates will be available on the Call 2025 web page.

7.3. Change in active projects

Any substantial change in an on-going project must be reported immediately to the involved funding organisations and the monitoring task force (email: monitoring@m-era.net)[10]. The project partners should be aware that changes may affect their funding.

8. Communication and dissemination

Funded projects will be displayed on the M-ERA.NET website, in the online project catalogue "Materipedia". The project consortium is invited to enhance their project communication activities using this tool.

A reference to M-ERA.NET is requested in publications, exhibitions, lectures, success stories and press information concerning results of the projects.

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[9] More details are provided in the „Tutorial for project coordinators on how to submit the final report", available on the call website

[10] A change request form will be available on the call website.

9. Support

Frequently Asked Questions (FAQ) are listed in the call website https://www.m-era.net/joint-call-2025. In addition, all funding organisations participating in the call will provide assistance to project proposers in the case of any questions.

Annex 1: Thematic priorities for the M-ERA.NET Call 2025

Topic 1:   **Sustainable materials for energy applications**

Topic 2:   **Innovative surfaces, coatings and interfaces**

Topic 3:   **Advanced composites and lightweight materials**

Topic 4:   **Functional materials**

Topic 5:   **Materials addressing environmental challenges**

Topic 6:   **Next generation materials for electronics**

Topic 1: Sustainable materials for energy applications

Technical Content and Scope

The main scope is the development of advanced materials that can play a key role in enabling new and cleaner energy storage, conversion, efficiency and utilisation. Sustainable advanced materials development should also address aspects such as circularity, end of life treatment, recyclability, Life Cycle Assessment (LCA), Techno-Economic Analysis (TEA) and RRI. Furthermore, methodologies supported by digitalisation (computational modelling, Artificial Intelligence (AI), design of experiments, etc.) are needed for accelerated materials design and optimisation for energy applications. These methodologies, together with experimental high throughput screening of materials, are expected to save time and cost in the materials discovery and design process versus traditional trial and error approaches.

Objectives and Transversal aspects

The proposals should address at least one of the following items:
- Multiscale and data-driven modelling including AI and ML tools for energy materials development and optimisation based on understanding material behaviour in their device.
- Materials for sustainable safe by design SSbD energy storage and conversion devices, i.e. batteries, fuel cells electrolysers, and molecular H_2 distribution.
- Novel materials based concepts for H_2 production, storage and distribution, combustion, conversion and power to X including synthetic fuels.
- Development of sustainable advanced catalysts to improve fuel cell and electrolyser efficiency.
- Improved active materials and electrolytes for solid state Li batteries and beyond Li-ion batteries for mobility and for stationary applications, eg: vanadium free redox-flow batteries.
- New photovoltaic materials and architectures for efficient and stable energy conversion in a broad range of applications.
- Materials for short, medium and long duration thermal energy storage.
- Materials for long duration energy storage.
- New material concepts for efficient energy harvesting, including thermoelectric, triboelectric, piezoelectric and hybrid technologies.
- Advanced materials low in critical elements for magnets in energy applications such as wind turbines and electric motors.
- Substitution of Critical Raw Materials (CRM) and/or hazardous materials with alternative new materials in products or processes.

In addition to the topics above, the project proposal may also include materials processing with reduced ecological footprint, utilisation of alternative fuels, in-operando experimental approaches, improving energy optimization through lightweight materials, and/or flexible design for repurposing and recycling. Such integration could be further enhanced by fostering collaboration between academia, civil society, industry, and relevant stakeholders to strengthen the whole innovation chain.

Expected impact

The proposal should address how it will contribute to the expected impact of the topic, defined as follows:

- The proposed research should lead to energy storage and conversion systems with higher efficiency, improved overall performance and lower cost through increases in, amongst others and not limited to, energy and power characteristics, safety, cyclability, volumetric and gravimetric energy density, capacity, power conversion efficiency and stability.
- Improved comparison between project results, cooperation between related research groups and possibly contribution to standardization efforts by providing open access to accrued raw data and metadata.
- Improvement of reusability and interoperability in developed software.

The proposal impacts should be substantiated with key performance indicators. All proposals should clearly state the Technology Readiness Level (TRL) at the project start and at the project end. The proposals should include a plan for the transition to higher TRLs at a later stage (i.e. beyond the project end date). Establishing an industrial and societal advisory board or the participation of one or more companies in the project consortium is encouraged.

Sustainability and RRI requirements

M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to RRI by investigating and addressing the environmental, social, ethical, political, or cultural dimensions of the proposed research:

All proposals should provide a preliminary assessment regarding (but not limited to):
- Resources: the use of resources overall, the environmental properties of the materials, the use of critical raw materials, energy, water, etc.
- The production process: use of solvents, hazardours elements, etc.
- Use phase: the sustainability of the conditions under which the material can be used (continuous energy use, releases to the environment, life span, etc.)
- End of life: the entry of the material into the circular economy, including re-use, remanufacturing or recycling considerations.
- Involvement of relevant societal stakeholders as appropriate

Describe any potential trade-offs between sustainability burdens and benefits. The proposal should include an activity where such aspects (relevant to the proposal) are further investigated, potentially with corresponding impacts on the design of the material(s).

Target groups

This topic is targeted at all groups in the innovation chain: disruptive, applied research, industrial research and development. In proposals targeting TRL 4 and higher, industrial partners and at least one project partner specialised on customer or end-user demands should be involved in the project consortium. Collaboration between research entities and industrial partners is encouraged also at lower TRL levels.

Keywords

Projects submitted to this topic should choose at least **3** keywords from the following list:

Advanced catalysts; Aqueous batteries; Artificial intelligence; Battery materials; Critical raw materials; Electrochemical storage; Electrolysers; Energy efficiency; Energy harvesting; Energy storage; Fuel cells; Heat storage; Hydrogen; Hydrogen distribution; Hydrogen storage; Life cycle assessment; Lightweight; Long duration energy storage; Magnets; Materials safety; Modelling; Phase change materials; Photovoltaic materials; Piezoelectric materials; Power to X; Redox-flow batteries; Solar cells; Thermochemical materials; Thermoelectric materials; Triboelectric materials; Wind turbines.

General keywords (such as Additive manufacturing / 3D printing; Durability; Nanomaterials; Recyclability…) and additional keywords (free text) can also be chosen in the submission platform. The ensemble of the keywords should allow for an overview of the scope of the project (consider describing different aspects of the project such as: main scientific area / domain, system / property / material of interest, applications / objectives and pertinent procedures / techniques).

Indicative TRL range: 1-6

Topic 2: Innovative surfaces, coatings and interfaces

Technical Content and Scope

Surface and coating technology is a key enabler for new solutions in numerous industrial sectors worldwide. This call will stimulate application driven development of innovative surfaces, thin films, coatings, interfaces and related process technologies, including a broad spectrum of industry needs and applications in various fields as specified in objectives and transversal aspects.

Projects that increase the synergy between industry and academia during and after the end of the project are welcome, including but not limited to: stimuli-responsive and adaptive coatings, surfaces with antimicrobial, anti-icing, anti-slippery, antiwear, anticorrosion, self-healing properties, thermal barrier and high temperature coatings applications, tribological low friction coatings and/or surface modification for energy saving and/or noise mitigation and barrier coatings.

The proposals should consider the energy efficient development, processing or production aspects including modelling and circular economy. Sustainable use of materials in an environmentally friendly manner with special attention to CRM and recyclability should be considered.

Objectives and Transversal aspects

The proposals should address at least one of the following items:
- Development of novel or optimization of innovative surfaces and multifunctional coatings, thin films, interfaces and/or interphases.
- Development or improvement of process technologies considering circular economy and energy efficiency to enable deposition of new coatings and/or surface modification.
- Development of new materials and processing for long-time stable antimicrobial coatings.
- Development of thin films and coatings for sensing applications, including biosensing.
- Multiscale modelling and/or new characterisation techniques of innovative surfaces, thin films, coatings and/or interfaces.
- Engineered functional interfaces between artificial and biological systems.
- Bioinspired, biomimetic, and/or bio-based surfaces
- Surface texturing modification process and properties
- Surfaces based on engineered living materials

To address transversal aspects, that are specifically related to the topic, project proposals should:

- Consider aspects such as fundamental understanding of the mechanisms, experimental assessment, and where applicable prototyping, up-scaling, manufacturing and validation demonstrating prototype in an operational environment with a view to final customer applications.
- Address complementary characterisation techniques (including New Approach Methods (NAMs)) and/or, where relevant, modelling techniques, AI and Machine Learning (ML) and/or how to rationalise data for future use in modelling processes (data base).
- Protocols to replicate the failure mechanism of the surface/coating interface in the lab to improve lifetime and develop future standards. Address how coatings and/or thin films will impact the recyclability of core material.
- Ensure relevance for different partners in the value chain by stating clear concepts for application(s) in targeted industrial sector(s).

Expected impact

The proposal should address how it will contribute to the expected impact of the topic, defined as follows:

- Innovative energy efficient process technologies related to interface optimisation, coating development and application as well as surface modification.
- Availability of high-end components, products with tailored properties or functionalities by innovative surfaces, coatings and interfaces. All addressed technologies and/or products should ensure having a minimal negative impact on health and safety.
- Achieving a positive ecological and energy impact by developing processes, coating materials, and thin film technologies following a circular economy and CRM strategies in accordance with SDG 7 (affordable and clean energy).
- Innovative products or technologies with tailored properties or functionalities by innovative surfaces, coatings and interfaces enabling positive societal impacts, on e.g. safety, economics, employment, life quality and avoid the release of hazardous substances.

The proposal impact should be substantiated with key performance indicators. All proposals should address environmental aspects, including reuse, remanufacturing or recycling considerations, and broader social or ethical impacts, when relevant. All proposals should clearly state the TRL at the project start and at the project end. The proposals should include a plan for the transition to higher TRLs at a later stage (i.e. after the project end date). Establishing an industrial and societal advisory board or the participation of one or more companies in the project consortium is encouraged.

Sustainability and RRI requirements

M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to RRI by investigating and addressing the environmental, social, ethical, political, or cultural dimensions of the proposed research:

Proposals should provide a preliminary assessment regarding (but not limited to):

- Resources: the use of resources should be considered at design phase, to minimize or substitute the use of harmful materials for the health and environment, or the use of critical raw materials.
- Green Production process: use of environmentally friendly solvents, avoiding hazardous elements, substances of concern, minimizing energy and water consumption during production, etc.
- Use phase: the reduction of energy consumed or wear during use phase, the sustainability of the conditions under which the material can be used (avoiding wear and releases to the environment, increasing life span, etc.).
- End-of-life: the entry of the material into the circular economy, including repairing, reuse, remanufacturing or recycling considerations.
- Involvement of relevant societal stakeholders as appropriate.

Describe any potential trade-offs between sustainability burdens and benefits. The proposal should include an activity where such aspects (relevant to the proposal) are further investigated, potentially with corresponding impacts on the design of the material(s).

Target groups

This topic is targeted at all groups in the innovation chain: basic research, applied research, industrial research, as well as at the end-user industry. The topic is particularly suitable for the establishment of a strong collaboration between research entities and industry, including Small and Medium Enterprises (SMEs). Participation of large enterprises may be considered due to their powerful research units or as potential end users of the technology or of the product proposed. Interdisciplinary/transdisciplinary projects along the value chain are encouraged and should enable a broader cross-sectorial use. In proposals targeting TRL 4 and higher, industrial partners and at least one project partner specialised on customer or end-user demands should be involved in the project consortium. Collaboration between research entities and industrial partners is encouraged also at lower TRL levels.

Keywords

Projects submitted to this Topic should choose at least **2** keywords from the following list:

Advanced coatings; Anticorrosion; Anti-icing; Antimicrobial coatings; Antiwear; Bio-based coatings; Bioinspired; Bio-interfaces; Biomimetic surfaces; Functionalisation; Innovative surfaces; Interfaces; Interphases; Modelling; Multifunctional coatings; Nano-engineered

coatings; Scale up; Self-healing; Sensing surfaces; Smart coatings; Structured surfaces; Surface characterisation techniques; Surface technologies; Textured surfaces; Thin films; Tribology.

General keywords (such as Additive manufacturing / 3D printing; Durability; Nanomaterials; Recyclability…) and additional keywords (free text) can also be chosen in the submission platform. The ensemble of the keywords should allow for an overview of the scope of the project (consider describing different aspects of the project such as: main scientific area / domain, system / property / material of interest, applications / objectives and pertinent procedures / techniques).

Indicative TRL range: 2 – 7

Topic 3: Advanced composites and lightweight materials

Technical Content and Scope

Advanced composites and lightweight materials can provide solutions to a number of important challenges. Current topics of interest in this context include reduced energy consumption, improved structural performance and durability. However, these materials can be challenging to design and process or manufacture, and present new difficulties related to circular economy. This call is focused on novel materials solutions that deliver the attractive features of these materials while minimising their drawbacks. Within this context, bio-inspired solutions are also welcomed.

Within the scope of this call, advanced composites are defined as engineered materials (incl. hybrids) composed of ≥2 constituents (for example: a polymer, metallic or ceramic matrix reinforced by a textile, fibre, particle, container or filler) that meet requirements which cannot be fulfilled by a single material. The constituents can be metallic, ceramic, mineral, synthetic, natural or bio-based, and may possess one or more nanoscale dimensions. In parallel, here lightweight materials are defined as single or multi-phase materials providing similar or better performance with reduced weight vs. existing state-of-the-art materials.

Proposals specifically targeting only one application among energy, electronics or environmental applications should be submitted to the corresponding call topic, with the exception of advanced composites and lightweight materials for wind energy

Objectives and Transversal aspects

This call topic is aimed at experimental and/or computational activities focused on advanced composites and lightweight materials having engineering applications.

Proposals should significantly advance one of the following:
- Strength- or stiffness-to-weight-ratio.
- Durability (e.g. vs. creep, fatigue, impact, fracture, use conditions, etc.).
- Thermal management properties.
- Self-healing or repairable behaviour.
- Self-monitoring capabilities.
- Electrical or electrochemical properties.
- Biocompatible, anti-microbial, bioactive, or biologically functional.
- End-of-life management.
- Fire retardant properties with environmentally friendly substances.
- Processability or manufacturability.

Proposals should also address one or more of the following transversal aspects:

- Considerations of cost and scalability.
- Separation / disassembly of composites to enable recycling or reuse.
- Elimination of substances of concern.
- Dependence on critical raw materials and vulnerable supply chains.
- New bio-based (renewable) constituents.
- Advanced computational methods

It is strongly recommended that the proposal covers materials, processing, applications, and circularity. Such integration may be further enhanced by collaborations between universities, institutes and industry, and by a consortium covering the whole value chain, as well as by providing an objective and meaningful assessment of sustainability.

Expected impact

The proposal should address how it will contribute to the expected impact of the topic, defined as follows:
- Socioeconomic, ecological and/or ethical benefits as a direct result of the significant advances to be realised in the proposed effort.
- Materials with responsible resource consumption using advanced design and manufacturing concepts (esp. avoiding substances of concern), in line with SDG 12 "responsible consumption and production".
- More competitive industrial products and processes.
- Improved knowledge sharing and the reinforcing of scientific and technological platforms within the international research & innovation community.

The proposal impacts should be substantiated with key performance indicators. All proposals should clearly state the TRL range covered during the project and include a plan for the transition to higher TRLs beyond the project end date. Establishing an industrial and societal advisory board or implicating one or more companies in the consortium is encouraged.

Sustainability and RRI requirements

M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to RRI by investigating and addressing the environmental, social, ethical, political, or cultural dimensions of the proposed research:

Proposals should provide a preliminary assessment regarding (but not limited to):
- Resources: the use of resources overall, the environmental properties of the materials, the use of critical raw materials, energy, water, etc.
- Production process: use of solvents, hazardous elements, substances of concern, etc.

- Use phase: the sustainability of the conditions under which the material can be used (releases to the environment, life span, etc.)
- Circularity, such as re-use, re-manufacturing or recycling considerations
- Ethical and privacy concerns related to the enabling of studies involving animal or human subjects (where applicable)
- Involvement of relevant societal stakeholders as appropriate

Proposals should describe any potential trade-offs between sustainability burdens and benefits. The proposal should include an activity where such aspects (relevant to the proposal) are further investigated, potentially with corresponding impacts on the design of the material(s).

Target groups

This topic is targeted at all groups in the innovation chain: disruptive, applied research, industrial research and development. In proposals targeting TRL 4 and higher, industrial partners and at least one project partner specialised on customer or end-user demands should be involved in the project consortium Collaboration between research entities and industrial partners is encouraged at lower TRL levels.

Keywords

Projects submitted to this Topic should choose at least **3** keywords from the following list:

Acoustic; Alloy; Automation; Bio-based materials; Biocompatible; Biological; Casting; Ceramic matrix composite; Combustion; Compostable; Concrete; Dielectric; Elastomer; Fiber; Filler; Fire safety; Gel; Geopolymer; Insulation; Joining; Laser processing; Lightweight; Liquid / Resin moulding; Magnetic; Mechanical; Metal matrix composite; Meta-material; Mineral; Natural material; Optical; Piezo; Plasma processing; Polymer matrix composite; Porosity; Porous; Powder metallurgy; Printing; Self-healing; Sensing; Sintering; Solution processing; Solvent-free processing; Textile; Thermal; Thermoplastic; Thermoplastic processing; Thermoset; Thin layer processing.

General keywords (such as Additive manufacturing / 3D printing; Durability; Nanomaterials; Recyclability…) and additional keywords (free text) can also be chosen in the submission platform. The ensemble of the keywords should allow for an overview of the scope of the project (consider describing different aspects of the project such as: main scientific area / domain, system / property / material of interest, applications / objectives and pertinent procedures / techniques).

Indicative TRL range: 2-5

Topic 4: Functional Materials

Technical Content and Scope

Functional materials are essential for advancing nearly all technologies and contribute significantly to Europe's economy and job market. Innovative functional materials at nano and micro scales should be developed through novel synthesis processes, aligning with the UN Sustainable Development Goals. These materials should minimize reliance on non-renewable resources and critical raw materials while promoting recycling and sustainable solutions, particularly by avoiding hazardous substances. Proposals submitted to this topic are encouraged to incorporate advancements in materials design, production, and integration, supported by modelling, characterization, high-throughput screening, and advanced manufacturing for precise property control.

Projects focused on a specific area covered by another call topic, rather than on functional materials themselves, should be submitted to the relevant, more specialized topic.

Objectives and Transversal aspects

Proposals within the scope of this topic should target the development of advanced functional materials or materials systems in at least one of the following areas:
- Innovative functional materials, e.g. self-healing materials, low dimensional materials, bio-based materials, catalyst materials, superconductors and photonic materials.
- Functional structures, e.g. metamaterials, topological structures, heterostructures.
- Materials with special functions for sensing, detection, and actuation.
- Materials for smart wearables, implants, theragnostics, and other health applications.
- Materials for smart and zero-energy buildings, e.g. thermal insulation systems and efficient heat radiation or cooling solutions.
- Materials for harsh conditions e.g. regarding high temperatures, pressures, magnetic fields and/or radiation.
- Materials for energy-efficient separation, liquid/gas purification and process optimisation.
- Smart materials for packaging, functional textiles, stretchable materials, and others.
- New strategies to replace hazardous or CRM in commercial products.
- Green and sustainable fabrication routes for advanced functional materials.

To establish a whole value chain, a proposal should impact the different stages of material development, starting with materials selection and design, through process/synthesis and potential integration into a final product. Interactions between industrial and academic actors are encouraged. LCA is encouraged but not required; regardless, proposals should evaluate manufacturing and end-of-life issues.

Expected impact

The proposal should address how it will contribute to the expected impact of the topic, defined as follows:

- Support European industrial leadership through the development of innovative solutions based on novel functional materials using sustainable technologies, towards a circular economy.
- Improved competitiveness and strengthened industrial leadership by improving performance, reducing costs, optimising production processes and offering new applications of end user products based on functional materials.
- Strengthened innovation excellence of the European academia and research institutes in functional materials to address societal and industrial challenges.
- Improved citizens' quality of life.

The proposal impacts should be substantiated with key performance indicators. All proposals should clearly state the TRL at the project start and at the project end. The proposals based on original and innovative approaches may start with TRL 1. The proposals should include a plan for the transition to higher TRLs at a later stage (i.e., beyond the project end date). Those projects could include an LCA elaborated in collaboration with the industrial partners.

Sustainability and RRI requirements

M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to RRI by investigating and addressing the environmental, social, ethical, political, or cultural dimensions of the proposed research:

Proposals should provide a preliminary assessment regarding (but not limited to):

- Resources: the use of environmentally friendly materials and green technologies, the use of critical raw materials, water, etc.
- Production process: energy consumption, use of solvents, hazardous elements, substances of concern, etc.
- Use phase: the sustainability of the conditions under which the material can be used (releases to the environment, life span, etc.).
- End-of-life: the entry of the material into the circular economy, including re-use, re-manufacturing or recycling considerations.
- Involvement of relevant societal stakeholders as appropriate.

Describe any potential trade-offs between sustainability burdens and benefits. The proposal should include an activity where such aspects (relevant to the proposal) are further investigated, potentially with corresponding impacts on the design of the material(s).

Target groups

This topic is targeted at all groups: disruptive research, applied research, industrial research and development. In proposals targeting TRL 4 and higher, industrial partners and at least one project partner specialised on customer or end-user demands should be involved in the project consortium. Collaboration between research entities and industrial partners is encouraged at lower TRL levels.

Keywords

Projects submitted to this topic should choose at least **3** keywords from the following list:

2D materials; Bio-based materials; Catalysis; Construction; Eco-design; Electro/photochromic materials; Energy-efficient processes; Healthcare; Heterostructures; Magnetic properties; Membranes; Metal-organic frameworks; Metamaterials; Optical properties; Photonic properties; Piezoelectricity; Plasmonics; Polymers; Porous materials; Processing technologies; Quantum technologies; Safe and Sustainable by Design (SSbD); Self-healing; Sensors; Thermal properties; Thermoelectric properties; Topological structures; Triboelectric properties; Tribological properties; Upcycling; Wearables.

General keywords (such as Additive manufacturing / 3D printing; Durability; Nanomaterials; Recyclability…) and additional keywords (free text) can also be chosen in the submission platform. The ensemble of the keywords should allow for an overview of the scope of the project (consider describing different aspects of the project such as: main scientific area / domain, system / property / material of interest, applications / objectives and pertinent procedures / techniques).

Indicative TRL range: 1-5

Topic 5: Materials addressing environmental challenges

Technical Content and Scope

It is a main objective of M-ERA.NET to address current and future environmental challenges and to support the Green Deal and the SDGs, where this topic covers specifically numbers 6, 7, 9, 12, and 13.

The topic will support the transition towards a circular economy by addressing design, synthesis, shaping, production, use and recovery of advanced materials covering: SSbD materials; biodegradable, bio-based materials; substitution or reduction of hazardous substances, fossil-based and/or critical materials; sensing and removal of hazardous substances; materials recycling.

The reduction of resources and waste and increased materials recyclability, in accordance with a sustainable development, is becoming a necessity related to decarbonization and circular economy.

Objectives and Transversal aspects

The goal is to develop and/or integrate new materials, advanced processing and digital technologies, all along the value chain, that enable more efficient and safer concepts tackling environmental challenges. The use of novel materials in environmental applications should be developed, targeting to provide sustainable solutions that aim at least one of the following areas:

- SSbD, also including:
  - product and material life extension (self-healing; reparability, etc.)
  - resource optimization (materials; water; energy, etc.)
  - waste reduction
  - life cycle perspective
- Biodegradable, bio-based materials
  - biodegradable polymers
  - new chemistries that reduce sources of (micro)plastic (e.g. for packaging, in agriculture, etc.)
- Substitution or reduction of hazardous substances, fossil-based and/or critical materials, e.g. alternative to per- and polyfluoroalkyl substances (PFAS).
- Materials for sensing and removal of hazardous substances
- Clean and efficient materials recycling
  - designed for easy dismantling and sorting
  - clean recovery and recycling technologies (reduce hazardous side-streams from recycling, e.g. use of alternative solvents)

> o use of European secondary material sources to reduce the dependency on imported materials and to limit supply risks (recycled materials with processing compatibility with first use materials, etc.)

To strengthen the whole innovation chain, it is strongly recommended that the project proposal covers materials, processing, application, and recycling. Such integration could be further enhanced by fostering collaboration between academia and industry, and by a consortium covering the whole circular value chain and life-cycle. All the proposed technologies should be assessed by their economical, ecological, societal and safety impact (e.g. following the concept and recommendation released by [Joint Research Centre (JRC)).](#)

Expected impact

The proposal should address how it will contribute to the expected impact of the topic, defined as follows:

- Increased material circularity.
- Sustainable and cost-efficient processing methods (synthesis, processing, recycling) for high quality materials and components.
- Less pollution of water / air / soil.
- Contribution to zero waste by reducing waste production and improving the valorisation of waste.
- Increased substitution of fossil-based materials (e.g. with bio-based materials), of CRM and of materials with hazardous components.

The aim is to increase the European competitiveness by offering sustainable, safe, energy efficient and low carbon materials production and recycling technologies that are able to create new business opportunities and models for the EU industry.

The proposal impacts should be substantiated with key performance indicators. All proposals should clearly state the TRL at the project start and at the project end. The proposals should include a plan for the transition to higher TRLs at a later stage (i.e., beyond the project end date). Establishing an industrial and societal advisory board or the participation of one or more companies in the project consortium is encouraged, as well as considering the inclusion of a societal stakeholder.

Sustainability and RRI requirements

M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to RRI by investigating and addressing the environmental, social, ethical, political, or cultural dimensions of the proposed research:

All proposals should provide a preliminary assessment regarding (but not limited to):

- Resources: the use of resources overall, the environmental properties of the materials, the use of critical raw materials, energy, water, etc.
- The production process: use of solvents, hazardous elements, etc.
- Use phase: the sustainability of the conditions under which the material can be used (continuous energy use, releases to the environment, life span, etc.).
- End of life: the entry of the material into the circular economy, including, repairing, re-use (2nd life), re-manufacturing or recycling considerations.
- Inclusion of relevant societal stakeholders as appropriate.

Describe any potential trade-offs between sustainability burdens and benefits. The proposal should include an activity where such aspects (relevant to the proposal) are further investigated, potentially with corresponding impacts on the design of the material(s).

Target groups

This topic is targeted at all groups in the innovation chain: disruptive, applied research, industrial research and development. In proposals targeting TRL 4 and higher, industrial partners and at least one project partner specialised on customer or end-user demands should be involved in the project consortium. Collaboration between research entities and industrial partners is encouraged also at lower TRL levels.

Keywords

Projects submitted to this Topic should choose at least **2** keywords from the following list:

Bio-based materials; Biodegradation; Circularity; CRM substitution; Degradable materials; Emerging pollutants; Hazard materials substitution; Life-cycle perspective; Material life extension; Material recyclability; Product life extension; Safe and Sustainable by Design (SSbD); Soil treatment; Sustainable processing; Waste recycling; Waste reduction; Water treatment.

General keywords (such as Additive manufacturing / 3D printing; Durability; Nanomaterials; Recyclability…) and additional keywords (free text) can also be chosen in the submission platform. The ensemble of the keywords should allow for an overview of the scope of the project (consider describing different aspects of the project such as: main scientific area / domain, system / property / material of interest, applications / objectives and pertinent procedures / techniques).

Indicative TRL range: 2-6

Topic 6: Next Generation Materials for Electronics

Technical Content and Scope

Disruptive evolution of electronics always came hand-in-hand with the development and integration of advanced materials, illustrating the transformative potential of materials in our daily life. The European Union is becoming more and more aware of the need of creating a diverse and dynamic microelectronics ecosystem and, at the same time, is concerned about the sustainability challenges related to deploying electronics applications like Internet of Things (IoT), Industry 4.0, AI and Advanced Computing that will require a huge production of electronic components. This challenge also opens a window of opportunity to research in developing and designing the next generation of materials for responsible and beneficial electronics to reduce electronic waste, enhancing the recyclability of the electronic components moving towards greener production processes. This aligns with the Green Deal that seeks to accelerate technological progress reducing the carbon footprint and promoting a circular economy.

The topic supports proposals on materials research and its application, with special focus on specific properties for electronics. This may include materials informatics for SSbD, biomimetic design principles, circularity of materials (e.g. magnetic, bio-based, biodegradable, etc.).

Objectives and Transversal aspects

Proposals should address at least one of the following items:
- Nanoscale materials as alternatives to silicon (low-dimensional materials, 2D materials, heterostructures, etc.).
- Materials for sensors, actuators, transducers, processors.
- Materials for thermal management in electronics.
- Wearable, flexible, stretchable, and/or conformable materials for responsible electronics.
- Implantable, ingestible and bioresorbable materials.
- Materials for ultralow-power or for high-power-control electronics.
- Materials for More-than-Moore electronics (spintronics, photonics, valleytronics, quantum and neuromorphic computing, etc.).
- Hybrid and heterogeneous integration: combination of conventional with advanced materials.
- High throughput manufacturing approaches for electronic components (printing technologies, additive manufacturing techniques, laser-induced processes, etc.).
- Substitution of hazardous materials with cleaner materials.

Proposals including and considering materials by design, using modelling and/or AI approaches, targeting health applications or focusing on energy management are welcome.

Expected impact

The proposal should address how it will contribute to the expected impact of the topic, defined as follows:
- New electronic materials and emerging technologies that can help the EU to solve societal challenges and enable sustainable growth.
- Training of researchers and expanding skills of workforce for the growing European electronics industry.
- Development of new materials and technologies for electronics to improve quality of life (human-machine interface, health management, materials for imaging, etc.).
- Reduction of the carbon footprint of developed technologies.

The proposal impacts should be substantiated with key performance indicators. All proposals should clearly state the TRL at the project start and at the project end. The proposals based on original and innovative approaches may start with TRL 1. The proposals should include a plan for the transition to higher TRLs at a later stage (i.e., beyond the project end date). Establishing an industrial and societal stakeholder advisory board or the participation of one or more companies in the project consortium is encouraged.

RRI requirements

M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to RRI by investigating and addressing the environmental, social, ethical, political, or cultural dimensions of the proposed research:

Therefore, all proposals should provide a preliminary assessment regarding (but not limited to):
- Sustainability aspects along materials, processing, and products covering the environmental, economic and social dimension.
- Resources: the use of resources overall, the environmental properties of the materials, the use of critical raw materials, energy, water, etc.
- The production process: use of solvents, hazardous elements, etc.
- Use phase: the sustainability of the conditions under which the material can be used (continuous energy use, releases to the environment, life span, etc.).
- (When relevant) end of life: the entry of the material into the circular economy, including re-use, re-manufacturing or recycling considerations.
- Inclusion of relevant societal stakeholders as appropriate.

Describe any potential trade-offs between sustainability burdens and benefits. The proposal should include an activity where such aspects (relevant to the proposal) are further investigated, potentially with corresponding impacts on the design of the material(s).

Target groups

This topic is targeted at academic research groups, SMEs, or large enterprises. In proposals targeting TRL 4 and higher, industrial partners and at least one project partner specialised on customer or end-user demands should be involved in the project consortium. Collaboration between research entities and industrial partners is encouraged also at lower TRL levels.

Keywords

Projects submitted to this Topic should choose at least **2** keywords from the following list:

Bioelectronics; Digital microfluidics; Field-effect transistors; Flexible electronics; Heterogeneous integration; High-power-control electronics; Laser processing; Magnetic materials; Molecular electronics; Photodetectors; Printed electronics; Responsible electronics; Sustainable semiconductor processing; Ultralow-power electronics; Unconventional electronics.

General keywords (such as Additive manufacturing / 3D printing; Durability; Nanomaterials; Recyclability…) and additional keywords (free text) can also be chosen in the submission platform. The ensemble of the keywords should allow for an overview of the scope of the project (consider describing different aspects of the project such as: main scientific area / domain, system / property / material of interest, applications / objectives and pertinent procedures / techniques).

Indicative TRL range: 2-6

Annex 2: Technology Readiness Level

All proposals should clearly state and motivate at what level on the Technology Readiness Level (TRL) scale the project is situated at the beginning and after the project is finished. In order to increase the potential for new business opportunities and commercial exploitation of the results:

• Proposals aiming at TRL below 4 should include a plan for the transition to higher TRL's at a later stage (i.e. beyond the project end date) and demonstrate industrial involvement. This can be realised by establishing an industrial or end-user advisory board (or alternatively by the participation of one or more companies in the project consortium when feasible).

• For proposals aiming at TRL 4 or above, industrial partners should be involved in the project consortium.

Where the topic description refers to the concept of **"Technology Readiness Level"** (TRL), the following definition in accordance with Horizon Europe applies:

TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

TRL 5 – technology validated in a relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)

TRL 7 – system prototype demonstration in an operational environment

TRL 8 – system complete and qualified

TRL 9 – actual system proven in an operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Project proposals should clearly indicate the TRL position at the beginning of the project and after the project is finished and consider to the indicative TRL range indicated in each topic as summarised in the table below.

Topic	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
Topic 1: Sustainable materials for energy applications	■	■	■	■	■	■	■		
Topic 2: Innovative surfaces, coatings and interfaces	■	■	■	■	■	■	■	■	
Topic 3: Advanced composites and lightweight materials	■	■	■	■	■	■			
Topic 4: Functional materials	■	■	■	■	■	■			
Topic 5: Materials addressing environmental challenges	■	■	■	■	■	■	■		
Topic 6: Next Generation Materials for Electronics	■	■	■	■	■	■	■		

Annex 3: Funding organisations participating in the M-ERA.NET Call 2025

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Austria	national	Austrian Research Promotion Agency (FFG)	Name: Fabienne Nikowitz Phone:+43 57755 5081 e-mail: fabienne.nikowitz@ffg.at
Belgium	regional: Flanders	Flanders Innovation & Entrepreneurship (VLAIO)	Name: Maarten Rockele Phone: +32 2 432 43 27 e-mail: maarten.rockele@vlaio.be
			Name: Elsie De Clercq Phone: +32 2 432 42 78 e-mail: elsie.declercq@vlaio.be
	regional: French-Speaking Community	Fund for Scientific Research – FNRS (F.R.S.-FNRS)	Name: Florence Quist Phone: +32 2 504 93 51 e-mail: international@frs-fnrs.be
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	regional: Wallonia	Service public de Wallonie (SPW)	Name: Pierre Demoitié Phone: +32 81 77 86 85 e-mail: pierre.demoitie@spw.wallonie.be
Brazil	regional: Sao Paulo	São Paulo Research Foundation (FAPESP)	Name: Virginia Sanches Subinas Phone: + 55 11 3838 4000 e-mail: chamada_meranet@fapesp.br
Bulgaria	national	Bulgarian National Science Fund (BNSF)	Name: Milena Aleksandrova Phone: +359 884 171 363 e-mail: aleksandrova@mon.bg

Country	National / regional coverage	Funding organisation	Contact person:
Canada	regional: Québec	PRIMA Québec	Name: Michel Lefèvre Phone: +1-514-284-0211 #227 e-mail: michel.lefevre@prima.ca
Croatia	national	Ministry of Science and Education and Youth (MSEY)	Name: Mateo Ante Bosnić Phone: +385 01 4594 166 e-mail: mateoante.bosnic@mzom.hr
Czech Republic	national	Technology Agency of the Czech Republic (TA CR)	Name: Kateřina Volfová Phone: +420 778 463 138 e-mail: katerina.volfova@tacr.cz
Denmark	national	Innovation Fund Denmark (IFD)	Name: Sofie Hougaard Phone: +45 2112 1767 e-mail: sofie.hougaard@innofond.dk internationale@innofond.dk
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Estonia	national	Estonian Research Council (ETAG)	Name: Margit Suuroja Phone: +372 731 7360 e-mail: margit.suuroja@etag.ee
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			Name: Elise Contraire e-mail: elise.contraires@nouvelle-aquitaine.fr
Germany	regional: Freestate of Saxony	Saxon State Ministry for Science, Culture and Tourism (SMWK)	Name: Gabriele Süptitz Phone +49 351 564 64210 e-mail: Gabriele.Sueptitz@smwk.sachsen.de EuProNet@smwk.sachsen.de
Hungary	national	National Research, Development, and Innovation Office (NKFIH)	Name: Elod Nemerkenyi Phone: +36-1-896-3987 e-mail: elod.nemerkenyi@nkfih.gov.hu
Italy	regional: Calabria	Regione Calabria	Name: Roberta Saladino e-mail: roberta.saldino@regione.calabria.it universitaricerca@pec.regione.calabria.it
Israel	national	The National Technological Innovation Authority (Innovation Authority – IIA)	Name: Rachel Loutaty Phone: --- e-mail: Rachel.l@iserd.org.il

Country	National / regional coverage	Funding organisation	Contact person:
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	national	Ministry of Innovation, Science and Technology (MOST)	Name: Avi Raveh Phone: +972 (2) 5411136; +972 (55) 8864207 e-mail: AviR@most.gov.il
Latvia	national	Latvian Council of Science (LZP)	Name: Maija Bundule Phone: +371 26514481 e-mail: maija.bundule@lzp.gov.lv
Lithuania	national	Research Council of Lithuania (LMT)	Name: Saulius Marcinkonis Phone: +370 676 17256 e-mail: saulius.marcinkonis@lmt.lt
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Norway	National	The Research Council of Norway (RCN)	Name: Lenka Hannevold Phone: +47 98 23 04 53 e-mail: lha@rcn.no
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Country	National / regional coverage	Funding organisation	Contact person:
	national	National Science Centre (NCN)	Name: Anna Kotarba Phone: --- e-mail: anna.kotarba@ncn.gov.pl
Slovak Republic	national	Slovak Academy of Sciences (SAS)	Name: Martin Novák Phone: +421 2 5751 0 119 e-mail: mnovak@up.upsav.sk
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Slovenia	national	Ministry of Higher Education, Science and Innovation (MVZI)	Name: Doroteja Zlobec Phone: +386 (0)1 478 46 24 e-mail: Doroteja.zlobec@gov.si
South Africa	national	Department of Science, Technology and Innovation (DSTI)	Name: Anita Mnisi Phone: +27 26 63 6328 e-mail: Anita.Mnisi@dsti.gov.za
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South Korea	national	Korea Institute for Advancement of Technology (KIAT)	Name: Youngji TAK Phone: + 32 493-37-95-11 e-mail: yjtak@kiat.or.kr
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Country	National / regional coverage	Funding organisation	Contact person:
Spain	national	Agencia Estatal de Investigación (AEI)	Name: Beatriz Gómez Miguel e-mail: beatriz.gomez@aei.gob.es
			Name: Jorge Sotelo Santos e-mail: era-mat@aei.gob.es
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	regional: Asturias	Asturian Agency for Science, Business Competitiveness and Innovation (SEKUENS Agency)	Name: Ana E. Fernández Monzón Phone: +34 985 98 00 20 e-mail: anae@sekuens.es
	regional: Basque Country	EUSKO JAURLARITZA – GOBIERNO VASCO (EJ-GV)	Name: Catalina Chamorro Silgado Phone: +34 945 018 210 e-mail: cat-chamorro@euskadi.eus
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Switzerland	National	Swiss Federal Office of Energy (SFOE)	Name: Stefan Oberholzer Phone: +41 58 465 89 20 e-mail: stefan.oberholzer@bfe.admin.ch
Taiwan	national	National Science and Technology Council (NSTC), Taiwan	Name: Dr. Ching-Mei Tang Phone: --- e-mail: cmtom@nstc.gov.tw

Country	National / regional coverage	Funding organisation	Contact person:
			Name: Ian Liau e-mail: ianliau@nycu.edu.tw
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Türkiye	national	The Scientific and Technological Research Council of Türkiye (TÜBİTAK)	Name: Burcu Koç Haskılıç Phone: +90 312 298 94 67 e-mail: burcu.haskilic@tubitak.gov.tr
			Name: Tayyip Kösoğlu Phone: +90 312 298 18 06 e-mail: tayyip.kosoglu@tubitak.gov.tr

Commitment per funding organisation:

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Indicative call budget (Mio €)
	Sustainable materials for energy applications	Innovative surfaces, coatings and interfaces	Advanced composites and lightweight materials	Functional materials	Materials addressing environmental challenges	Next generation materials for electronics	
Austria: FFG (KLWPT)	X	X	X		X		3.20
Belgium (Flanders): HERMESFUND / VLAIO	X	X	X	X	X	X	1.00
Belgium (French Speaking Community): F.R.S.- FNRS	X	X	X	X	X	X	0.20
Belgium (Wallonia): SPW	X	X	X	X	X	X	1.00
Brazil (Sao Paulo): FAPESP	X	X	X	X	X	X	0.60
Bulgaria: BNSF	X	X	X	X	X	X	0.46
Canada (Québec): PRIMA	X	X	X	X	X	X	0.40
Croatia: MSEY	X	X	X	X	X	X	0.15
Czech Republic: TA CR	X	X	X	X	X	X	1.50

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Indicative call budget (Mio €)
Denmark: IFD	X	X	X	X	X	X	1.00
Estonia: ETAG	X	X	X	X	X	X	0.30
Finland: AKA	X	X	X	X	X	X	1.50
Finland: Business Finland	X	X	X	X	X	X	1.00
France: ANR	X			X		X	1.00
France (Nouvelle-Aquitaine): RNA	X	X	X	X	X	X	0,45
Germany (Saxony): SMWK	X	X	X	X	X	X	4.00
Hungary: NKFIH	X	X	X	X	X	X	0.30
Italy (Calabria): Regione Calabria	X	X	X	X	X		0.50
Israel: IIA	X	X	X	X	X	X	0.75
Israel: MOST	X	X	X	X	X	X	0.20
Latvia: LZP	X	X	X	X	X	X	1.00
Lithuania: LMT	X	X	X	X	X	X	0.30

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Indicative call budget (Mio €)
Luxembourg: FNR	X	X	X	X	X	X	0.50
Malta: XM	X	X	X	X	X	X	0,30
Norway: RCN	X	X	X	X	X	X	3,70
Poland: NCBR	X	X	X	X	X	X	2.50
Poland: NCN	X	X	X	X	X	X	1.50
Slovak Republic: SAS	X	X	X	X	X	X	0.36
Slovenia: MVZI	X	X	X	X	X	X	2.40
South Africa: DSTI	X	X	X	X	X	X	0.40
South Korea: KIAT	X	X	X	X	X	X	1.00
Spain: AEI / FECYT	X	X	X	X	X	X	1.00
Spain (Asturias): SEKUENS	X	X	X	X	X	X	0.25
Spain (Basque Country): EJ-GV	X	X	X	X	X	X	0.50
Sweden (VINNOVA)	X	X	X	X	X	X	1,00

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Indicative call budget (Mio €)
Switzerland (SFOE)	X						0.60
Taiwan: NSTC	X	X	X	X	X	X	0.75
Türkiye: TÜBITAK	X	X	X	X	X	X	1.00

Annex 4.1: Pre-Proposal evaluation criteria, scoring, thresholds

Evaluation criteria:

Criteria for Pre-Proposal evaluation are predefined by the EC for ERA-NET Cofund:

- (a) Excellence
- (b) Impact
- (c) Implementation

Sub-criteria, scoring and thresholds are defined by the call consortium.

Pre-Proposal evaluation criteria:

Main Criteria	*Sub Criteria*	*Score (points)*
Excellence	Clarity and pertinence of research objectives and hypotheses	*max. 1.5*
	Novelty, originality, position of concepts and approaches in relation to the state of the art (ambition, innovation potential, ground-breaking objectives)	*max. 2.0*
	Appropriateness of the methodology, credibility of the proposed approach and soundness of the concept, including TRL and the approach to RRI	*max. 1.5*
Impact	Relevance to the specific call topic: ability of the proposal to address the research issues covered by the chosen research theme	*max. 2.0*
	Contribution at the European or international level to the expected impacts listed in the Guide for Proposers under the relevant topic	*max. 2.0*
	Engagement of the proposed research with circularity, environmental as well as ethical, political, social and/or cultural dimensions	*max. 1.0*
Implementation	Competences, experience and complementarity of each of the consortium members and the consortium as a whole (including complementarity, balance, inter- or transdisciplinarity)	*max. 2.0*
	Quality of the collaboration (added value of the transnational cooperation)	
	Quality and effectiveness of the work plan (work packages and tasks distribution among partners)	*max. 2.0*
	Organisation and overall management of the project, including risk management	
	Overall appropriateness of the proposal budget and other resources to be committed by individual partners (overall person month balance)	*max. 1.0*

Ethical issues: Pre-Proposal includes Horizon Europe "Ethical Issues Table". In case ethical issues apply (applicants mark respective issues in the table) M-ERA.NET recommends that the national/regional organisations observe these issues (e.g. post-evaluation review) for their respective funded projects.

Scoring and Thresholds

Individual assessment report (IAR): Each criterion will be composed by sub-criteria. The individual evaluators have to provide an evaluation consisting of written statements for each of the sub-criterion. Scores are not provided for the IAR.

Peer review report (PRR): The rapporteur will compile a peer review report, to be accepted by all 3 evaluators. PRR will include scoring of each sub-criterion to be provided by the rapporteur and agreed by all evaluators. Each criterion will be scored between 0.0 and 5.0 in multiples of 0.5 points.

Threshold: The threshold for individual criteria will be 3.0; the overall threshold, applying to the sum of the individual scores will be 10.0.

Ranking: In case of equal overall scores, proposals can be sorted by:
- comparing individual main criteria (compare scores of "Excellence" criterion, if still equal compare scores of "Impact" criterion, if still equal compare scores of "Implementation" criterion)
- available national/regional budgets

Annex 4.2: Full-Proposal evaluation criteria, scoring, thresholds

Evaluation criteria:

Criteria for Full-Proposal evaluation are predefined by the EC for ERA-NET Cofund:
- (a) Excellence
- (b) Impact
- (c) Implementation

Sub-criteria, scoring and thresholds are defined by the call consortium.

Full-Proposal evaluation criteria:

Main Criteria	Sub Criteria	Score (points)
Excellence	Clarity and pertinence of research objectives and hypotheses	*max. 1.0*
	Extent of the proposal's ambition and innovation potential beyond the current state of the art. Originality of the strategies to reach the project's objectives, use of novel concepts and approaches.	*max. 2.0*
	Soundness of the methodology proposed to reach the project's objectives, credibility of the proposed TRL range and coherence of the approach to RRI.	*max. 2.0*
Impact	Contribution at the European or international level to the expected impacts listed in the Guide for Proposers under the relevant topic	*max. 1.0*

	Enhancing innovation capacity and integration of new knowledge to facilitate replicability and valorization of the project results.	*max. 1.5*
	Strengthening the competitiveness and growth of companies by developing innovations meeting the needs and values of European and global markets; and, where relevant, by delivering such innovations to the markets	
	Engagement of the proposed research with circularity, environmental as well as ethical, political, social and/or cultural dimensions	*max. 1.0*
	Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, engage with stakeholders and user groups, and to manage research data where relevant	*max. 1.5*
Implementation	Quality and effectiveness of the work plan, assessment of risks, and appropriateness of the effort assigned to work packages, and the resources overall	*max. 1.5*
	Quality of the consortium as a whole including complementarity, balance, inter- or transdiciplinarity and appropriateness of the management structures and procedures	*max. 1.5*
	Quality and relevant experience of the individual participants	*max. 1.0*
	Appropriate allocation of tasks, ensuring that all participants have a valid role and allocation and justification of the resources to fulfil that role (including overall person month balance)	*max. 1.0*

Ethical issues: Full-proposal includes Horizon Europe "Ethical Issues Table". In case ethical issues apply (applicants mark respective issues in the table) M-ERA.NET recommends that the national/regional organisations observe these issues (e.g. post-evaluation review) for their respective funded projects.

Scoring and Thresholds

Individual assessment report (IAR): Each criterion will be composed by sub-criteria. The individual evaluators have to provide an evaluation consisting of written statements for each of the sub-criterion. Scores are not provided for the IAR.

Peer review report (PRR): The rapporteur will compile a peer review report, to be accepted by all 3 evaluators. PRR will include scoring of each sub-criterion to be provided by the rapporteur and agreed by all evaluators. Each criterion will be scored between 0.0 and 5.0 in multiples of 0.5 points.

Threshold: The threshold for individual criteria will be 3.0; the overall threshold, applying to the sum of the individual scores will be 10.0.

Ranking: In case of equal overall scores, proposals can be sorted by:
- comparing individual main criteria (compare scores of "Excellence" criterion, if still equal compare scores of "Impact" criterion, if still equal compare scores of "Implementation" criterion)
- available national/regional budgets

Annex 5: RRI Guidelines (v1.2)

M-ERA.NET guidelines for Responsible Research and Innovation (RRI) in the context of materials science

1. What is RRI and why do we need it?

For M-ERA.NET, RRI is about making sure science and new technologies help people and the planet. It asks scientists to think about who might benefit or face challenges from their work and to prepare for possible problems. RRI encourages involving others, like future users or communities, to understand their needs and concerns. It also pushes researchers to reflect on their goals and change plans if new issues come up. By focusing on sustainability and fairness, RRI helps ensure that science and innovation supports global goals like protecting the environment and creating a better future for everyone. Rather than providing strict rules, RRI offers a flexible framework with techniques and tools to guide researchers in considering the ethical, environmental, and social aspects of their work.

Acknowledging that science is separate neither from society nor the environment but part of them confers a social responsibility on science. It is important, therefore, that funders, researchers and other key groups involved in the development of science, technology and innovation think about: (i) the potential directions of research being taken; (ii) who might benefit and who might not from new inventions; and (iii) how consideration of the potential social, environmental and ethical issues can be considered *throughout* the science and innovation process. Responsible research and innovation (RRI) is not about adjudicating what is ʹgood or ʹbadʹ, ʹpositive or ʹnegativeʹ, or ʹresponsible or ʹirresponsibleʹ. Instead, RRI offers techniques, tools and frameworks to think about questions of social responsibility and ensure scientists, funders and technologies do not lose sight of the context in which they do science, technology and innovation.

2. M-ERA.NETʹs approach to RRI

M-ERA.NETʹs approach to RRI recognises that the materials resulting from the programme need to be designed for a *sustainable* society in the near to medium future. A sustainable society is one that respects and operates within the ecological boundaries of the planet and considers current and future generations in its decision-making. M-ERA.NETʹs approach to RRI thus highlights the need to address the social, environmental, political, cultural or ethical dimensions of the proposed research. We operationalise this approach through four dimensions that researchers, funders and technologists should engage with to maintain focus on the social context of their work:

- *Anticipation* suggests that actors should map the plausible intended and unintended effects of their work. Anticipation is not about exhaustively predicting all outcomes but about building a sense of preparedness so that potential downsides can be addressed as they are foreseen and arise.
- *Inclusion* encourages researchers, funders and developers to engage with future users, interest groups or potentially concerned groups or those affected most by the problems we tackle, to gain insights about the application contexts and what desirable trajectories would

be. Engagement here should move beyond dissemination or outreach to pursue a two-way exchange of information, with the understanding that knowledge that is not' scientific in the traditional sense of the word might still be valuable.

- *Reflexivity* asks researchers, funders and developers to create specific opportunities to consider the underlying assumptions and values driving their funding programmes and projects.
- *Responsiveness* reminds us that science and innovation are processes of exploration and learning. It urges scientists, funders and developers to change course if any of the above dimensions (anticipation, inclusion or reflexivity) generate new knowledge, identify public concerns, or reveal potential harms.

As the involvement of societal groups is essential in RRI it is often connected to co-creation, co-design and co-production – methodologies in which R&I projects are structured to include stakeholders from the beginning (e.g. users or interest groups) – and is related to the general Open Science agenda, prominent in Horizon Europe. Additionally, M-ERA.NET has fundamental commitments to sustainability in line with frameworks such as the UN Sustainable Development Goals, and the European Green Deal. This means that methods analysing the current or future ecological impacts of materials and their supply chains are appropriate. In sum RRI provides a framework to ask *how* research and innovation should be carried out in order to ensure that we achieve the sustainability goals in an open and inclusive way.

Sustainability and RRI in the M-ERA.NET calls

The specific requirements for each topic in the current call are detailed in a section labelled 'sustainability and RRI requirements'.

However, RRI is not a one-size-fits-all approach but must be adapted to the actual social, environmental and ethical issues raised by the R&I activities funded in the programme. Foundational, exploratory research will require a different approach to applied, high-TRL research. Disruptive, pathbreaking research may require a more substantive approach to RRI than tentative, incremental research. And the specific issues raised by the biological sciences differ to those raised by the physical sciences. This means that *the commitment* to RRI is clear and fixed in the programme, but there is an openness about the issues addressed and the specific ways to practice responsibility – these must be adapted to each project.

3. How can you include RRI in your proposal?

Recalling the above explanation, the diversity of material science and the range of local contexts engaged within M-ERA.NET means that there cannot be a one size fits all approach. Overall, the goal is to demonstrate that you have engaged and seriously considered the tensions associated with materials science.

While RRI may focus on broadly recognised issues, the approach taken should be specific to the project. Nevertheless, these three points provide general principles from which to develop your approach to RRI:

1. M-ERA.NET′s philosophy is to have **RRI as an integrated part of the project** involving all project participants.

2. Developing a **shared understanding of the project′s RRI aspects** as early as possible is important. With ′RRI aspects′ we mean implications or characteristics of your research that touch upon environmental, societal and ethical values. This implies having conversations about their importance and potential actions to address RRI aspects. Such understanding will evolve in a learning process that should be encouraged throughout the project.

> **Web resources for including RRI in your project:**
>
> https://thinkingtool.eu/ The Societal Readiness Thinking Tool guides you through the steps of including RRI in a project.
>
> The Digital Life Centre offers practical advice that may help develop your approach.
>
> Further examples specific to material science will in the future be provided on the RRI webpage of M-ERA.NET.

3. Considering RRI-related issues and acting upon them, must be done as a cross-cutting part of the project or a separate work package. RRI in the project needs to be **coordinated** and should have a **lead**.

4. But what should you actually do?

The following list provides examples of different RRI perspectives applicable for materials science research projects. **Please be aware that these guidelines and reflections neither represent the only RRI approach nor a complete list of examples of measures when implementing RRI in materials proposals.** You should identify the points relevant for your project.

1. Address **environmental impacts and sustainable solutions**, in line with the **Do No Significant Harm principle[11],** by including, for example:
   a. lifecycle analysis (LCA)
   b. ecotoxicology studies
   c. Safe and Sustainable by Design (SSbD) methodologies
2. Involve **relevant stakeholders in the project at the earliest stage as possible**, and provide opportunities for them to contribute to your work.
   a. Co-design methodologies are important to generate trust and **allow stakeholders to contribute knowledge** of the social, environmental or commercial problem you are trying to address in your project.
   b. Think also about the appropriate **timing** of different stakeholders′ inclusion: certain kinds of knowledge may be more useful than others at different points of your project.
   c. It will likely be valuable (but not obligatory) to include **expertise beyond the natural and physical sciences** – such as lawyers, social scientists or philosophers – to provide anticipatory and reflective methodologies or to address key challenges.

---

[11] For more information on this principle see Horizon Europe′s Programme Guide, page 37: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

d. Think about **how** the involvement of such researchers and their knowledge can be formalised within your project. Are they best placed as scientific collaborators, as members of an advisory board, or as consultants to deliver only specific tasks? Please check if your approach is in line with the national/regional funding rules before designing your proposal.

3. **Create good deliberative spaces** for a range of partners, stakeholders and participants to anticipate, discuss and reflect on the social, political, ethical or environmental context of your research. RRI experts may be able to help you with this in project design and implementation. A number of different approaches are possible, e.g.:
   a. Focusing on your day-to-day research work (″philosopher in the lab approach")
   b. At bi-annual/annual consortium meetings
   c. By using stage-gate approaches where explicit decisions about technological choices are taken.

4. Consider **who will benefit** and who may experience new risks from your project.
   a. Does your project address a specific societal or environmental problem or need?
   b. Does your discription of the problem fit with other people′s understanding of it? Can you gain access to these alternative understandings?
   c. In addition to societal benefits, also consider benefits to the research community through the generation of knowledge, access to infrastructure, the creation of networks and funding.
   d. Reflect on the most the appropriate form of intellectual property (IP) to suit your project goals. Do classical IP strategies deliver the broadest benefit? Can new strategies (e.g. Open Material Transfer Agreements) be adopted at certain points of the research process?
   e. Could commercial or non-commercial organisations benefit from your research? If so, how?
   f. Consider also the risks and ways that these can be ameliorated. For instance, what are the risks of potential risks of data being released? How can you take care to ensure these data are interpreted appropriately?

5. Reflect on/consider adapting **your choice of research methods** regarding, for example:
   a. ethical issues,
   b. in vivo/in vitro experiments,
   c. use of new approaches such as SSbD.
   d. Are there ways that your project can advance common practices on these issues?

6. Engage with important aspects of **your research environment** such as:
   a. gender, ethnicity and intersectional equality, diversity and inclusivity
   b. Open Science and other publication practices
   c. career progression and precarity
   d. equity between partners in your research consortium

7. Show how the project (and product) satisfy requirements for **production safety** and efficiency.

5. How does M-ERA.NET support and evaluate RRI?

RRI requires a multi-level approach that pays attention to the different sites of research and innovation (e.g. universities, companies, policy arenas), different stages of research (i.e. across the

TRL spectrum) and different research cultures. Responsibility must be shared, and RRI is therefore a cross-cutting issue for M-ERA.NET. It is considered in development of the annual work programme and the resulting funding calls.

At the level of research projects, ***M-ERA.NET requires that all proposers explain how their projects demonstrate a commitment to investigating and addressing the social, environmental, ethical, political or cultural dimensions of the proposed research***. Integration of RRI should lead to an improved awareness of the possible benefits, risks, and uncertainties of material science across a broad cross-section of society. This may include (but is not limited to) any of the approaches described in the above section.

RRI should not be thought of as ʹdistinct from the scienceʹ, but central to it. ***RRI components will therefore be evaluated by experts as integral components within the scope of all evaluation criteria (Excellence, Impact, and Implementation)***. RRI does not detract from the overall scoring but contributes to it: Proposals that explicitly aim to advance processes of anticipation, reflection, inclusion and responsiveness by developing new analyses or methodologies will be rewarded in the review process and the scores will be adjusted accordingly. The kinds of questions the reviewers will ask regarding RRI are:

- Is the RRI approach proposed proportionate to the content of the scientific proposal?
- Is there appropriate RRI expertise in the project?
- Is RRI work adequately resourced? Is it clear *how* the objectives will be achieved?
- Does RRI extend across the lifespan of the project? (e.g. as a sub-project, an advisory board or to be considered in annual meetings)
- Is it clear how the RRI work is organised? (e.g. as a WP, a cross-cutting issue, outsourced etc.)
- Is it clear who is doing the RRI work?
- Are there clear opportunities for the RRI work to shape scientific course?
- Does the work advance RRI scholarship or generate new knowledge of the social, political, ethical or environmental dimensions of material science?

Acknowledgement

M-ERA.NET's approach to RRI builds on previous frameworks published by the UK's EPSRC, the Research Council of Norway, the European Commission and funding programmes such as ERA CoBioTech and ERA EuroNanoMed III.

Annex 6: Checklist for Proposers

The proposal conforms to the call guidelines.	☐
Every project partner has been in direct contact with his/her national/regional funding agency and has checked that their collaboration and their project contributions are eligible for funding.	☐
All project partners have checked the national/regional programme procedures and regulations. All project partners are aware of documents requested by the national/regional funding organisations. ***IMPORTANT REMINDER: All consortium partners must check if applications (at Pre-Proposal and/or Full-Proposal stage) have to be submitted also to their national/regional funding organisations.***	☐
All partners who are not eligible for 100% funding are able to provide financial resources for their own contribution.	☐
A PIC[12] is available for all project partners.	☐
The consortium is aware that a duly signed and stamped consortium agreement (CA) between the project partners is recommended for funded projects based on national/regional funding rules, including agreements on intellectual property rights (IPR) and agreements on scientific publications. At the time of proposal submission it is recommended to provide the principles ruling the CA but not the CA itself.	☐

Please go https://www.m-era.net/joint-calls/joint-call-2025 to submit the:
   1. Pre-Proposal form online.
      Deadline for submission: 13 May 2025, 12:00 noon Brussels time
   2. Full-Proposal form + Annex 1 to the Full-Proposal form online.
      Deadline for submission: 19 November 2025, 12:00 noon Brussels time

For further information on M-ERA.NET please go to: http://www.m-era.net

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[12] Participant Identification Code: If you want to participate in a project proposal your organisation needs to be registered and have a 9-digit Participant Identification Code (PIC). Please find details here: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/participant-register

Abbreviations and Clarifications:

AI – Artificial Intelligence
CRM - Critical Raw Materials
ERA – European Research Area
FO – Funding Organisation
HEU – Horizon Europe
LCA - Life Cycle Assessment
PIC – Participant Identification Code
RTD - Research and Technological Development;
RRI - Responsible Research and Innovation
SDGs - Sustainable Development Goals;
SMEs - Small and Medium Enterprises
SSbD – Safe and sustainable by Design
TEA - Techno-Economic Analysis
TRL - Technology Readiness Level
"*Disruptive research"* also encompasses "*basic and fundamental research*"

Important notice:

The national / regional regulations are provided in the **Annex A** as a separate

document on the Call 2025 webpage.

Amendments

In version 1.1:
- Changes of contact details at IFD / Denmark (page 44) and NCN / Poland