



M-ERA.NET Call 2021

Guide for Proposers

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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.

M-ERA.NET Mission

Technological innovation is the foundation of the efforts undertaken to achieve the environmental and growth objectives set in the Sustainable Development Goals by the general assembly of the United Nations. In that respect, there needs to be more research and development in high-tech products that dominate the manufacturing productions to increase efficiency (material use, recyclability, energy efficiency) and more progress needs to be made regarding integrating renewable energy and its storage into end-use applications in buildings, transport and industry. The development and manufacturing of high-performance, reliable, safe and low-cost batteries is a key to a sustainable mobility and energy supply. The numerous fields of application lead to an increased use of batteries and thus to an increased consumption of resources. Measures must be taken to conserve resources and increase the efficiency of their exploitation.

New materials are crucial for finding solutions for light weighting, for enhancing the durability of products, improving process efficiency with reduced energy and materials consumption, substituting hazardous or hardly recyclable materials, and developing products easier to maintain, repair, upgrade, remanufacture or recycle (eco-design).

Transnational RTD projects funded by M-ERA.NET will combine materials research with industrial needs by stimulating new products and production processes, and by developing synergies that can be very effective in achieving industrial symbiosis, in particular with the aim of preventing by-products from becoming waste.

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 50 public funding organisations from 36 countries. The diverse and experienced network comprises national and regional funding programmes from 25 EU member states and 5 associated countries and includes 6 non-European organisations.

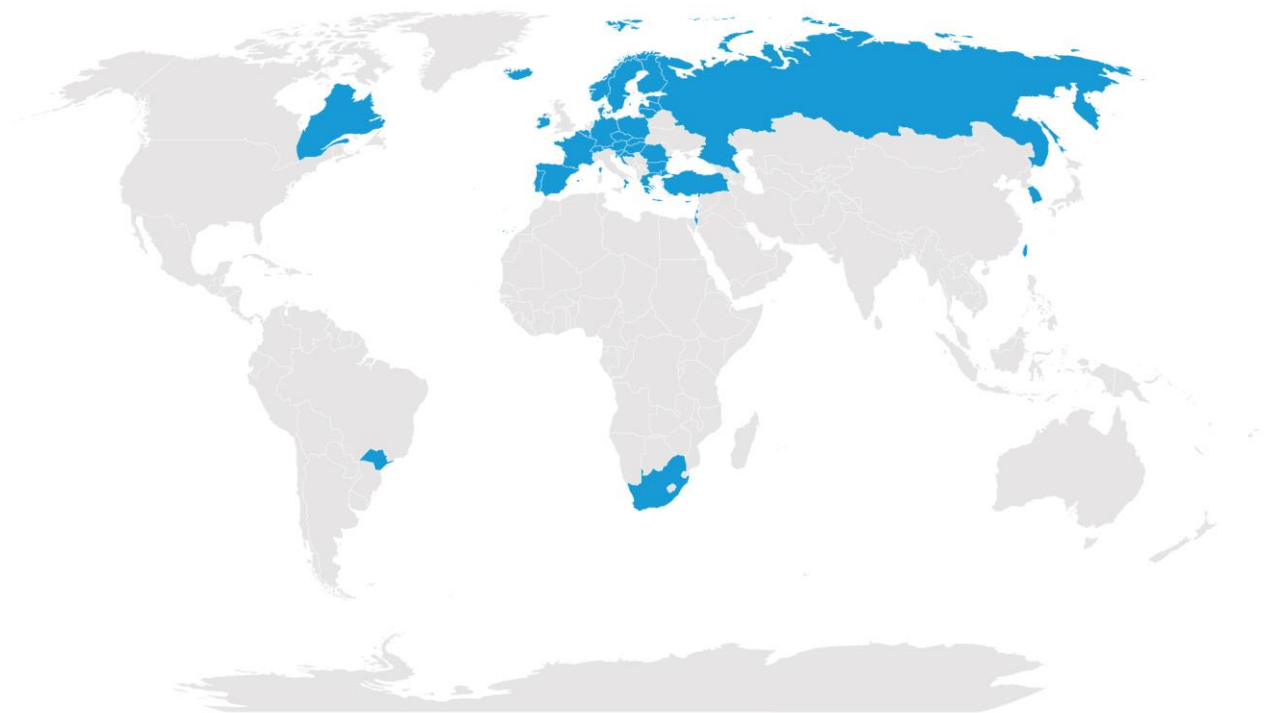


Figure 1: Participating countries and regions of the M-ERA.NET 3 consortium, see also

<https://www.m-era.net/about/m-consortium>

2. Structure of the M-ERA.NET Call 2021

The objective of the M-ERA.NET Call 2021 is to enable transnational R&D projects between partners receiving funding from regional/national programmes.

Fig. 2 shows the schematic workflow of the Call 2021. 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-procedure. The eligibility of funding applications will be checked by national/regional funding organisations according to the rules defined by their respective funding programmes, targeting a reasonable balance of requested and available national/regional budgets.
- There will be a centralised evaluation by independent international evaluators resulting in a ranking list.
- The M-ERA.NET Steering Board will agree on a joint selection list at the Selection Meeting
- The final funding decisions will be made by the national/regional funding organisations.

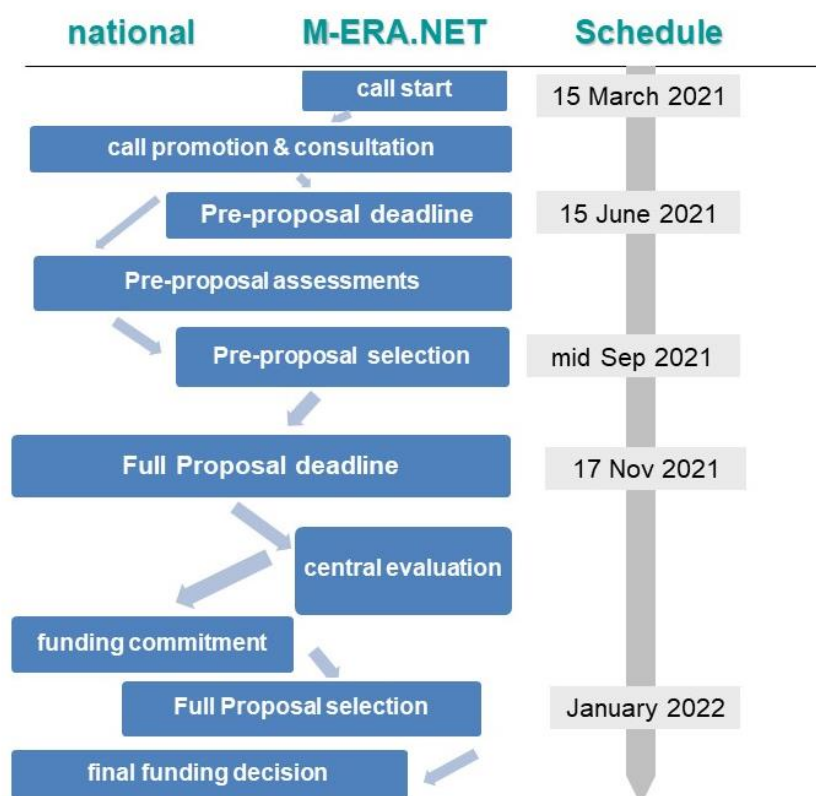


Figure 2: Workflow of the Call 2021

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 2021:

- **Support the European Green Deal by increasing attention to clean energy technologies and future batteries:**

M-ERA.NET aims to strengthen the contribution of materials R&D for clean energy-related applications and batteries technologies. M-ERA.NET will support the transition towards circular economy by addressing aspects like eco-design, durability of products, process efficiency with reduced energy and materials consumption.

- **Support the achievement of Sustainable Development Goals:**

M-ERA.NET will contribute to a wider public debate on the impact of materials research and its potential to achieve the Sustainable Development Goals. In particular, M-ERA.NET will support SDG 7 (“Affordable and clean energy”) through fostering research on sustainable energy storage technology and SDG 9 (“Industrial innovation and infrastructure”) by upgrading the technological capabilities of industrial sectors.

- **Socio-ecological benefits in the context of RRI:**

M-ERA.NET 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.

- **Support for the Innovation chain:**

Making 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.

- **Strengthen interdisciplinarity:**

M-ERA.NET is the platform for 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.

Thematic priorities

The following six topics are defined for the Call 2021:

Topic 1: Modelling for materials engineering, processing, properties and durability

Topic 2: Innovative surfaces, coatings and interfaces

Topic 3: High performance composites

Topic 4: Functional materials

Topic 5: New strategies for advanced material-based technologies in health applications

Topic 6: Materials for Additive Manufacturing

Transversal priority: research on future batteries

Research on batteries is a key objective of the Call 2021 and clearly addressed in the scope of multiple topics. Battery-related objectives and impact are explicitly highlighted in the respective detailed topic descriptions.

M-ERA.NET will support the research and innovation chain described through the 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.** Individual national/regional thematic programme focus and funding rules (see chapter 3.2.) must be taken into account.

General considerations

- In general, special focus on materials science, processing, and engineering that allows the EC to meet its **sustainable development goals** is strongly recommended. Sustainability aspects of the targeted solutions and/or materials must be addressed in the proposal. Proposals should avoid as far as possible the use of hazardous compounds and demonstrate that the materials and processes involved in the research will be safe and will have a minimum impact on the environment.
- Unless expressly justified, proposals should comply with **the open data science directive** from the EC. It is expected that proposals include intellectual property rights management and proper knowledge transfer and exploitation strategy. It is expected that part of the deliverables of the project include open source codes, data management and curation methodology, and/or demonstrative examples of the technologies proposed.
- Issues of **societal concerns** should be addressed in a systematic way, if possible with an added value by interacting with Social Sciences and Humanities research or citizens.
- **Gender balance measures** should also be considered.

3.2. Funding rules

Each project partner has to apply individually for regional/national funding. For each project partner the funding rules of the respective regional/national programmes apply. **This means that depending on the respective national/regional funding rules some project partners have to submit additional national/regional proposals or information on national/regional level.**

To obtain detailed information about the specific funding rules and programme priorities we strongly recommend contacting the respective national/regional funding organisations (see Annex 3 for details).

3.3. Eligible project structure and application

- Minimum requirement: Project consortia must consist of at least 3 partners (all requesting funding from a funding organisation listed in Annex 3) from at least 2 different countries (at least 2 EU member state or associated country¹) participating in the M-ERA.NET Call 2021. In addition to the minimum consortium the participation of further partners is possible.
- Coordinator must request funding from a funding organisation listed in Annex 3.
- Proposal must address appropriate TRLs for selected M-ERA.NET Call 2021 topics.
- Mandatory proposal forms must be used (provided for download at <https://www.m-era.net/joint-call-2021>)
- Proposal must be written in English.
- Proposal must be recommended for Full-Proposal submission by M-ERA.NET after Pre-Proposal stage.
- 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).
- Proposers must provide their respective PIC²-numbers in the proposal; proposers without a validated PIC will be able to use a temporary PIC for submission.

¹ http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cp/h2020-hi-list-ac_en.pdf

² 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>

- Conflict of Interest. the following individuals are not eligible for proposal submission: M-ERA.NET Steering Board members, researchers from participating Funding Organisations³; proposers cannot act as evaluators of any Call 2021 proposals.

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 he / she will exploit the expected results.

National/regional funding rules apply. Therefore, in some cases only certain topics, TRLs or types of organisations are eligible (e.g., some national/regional programmes fund only industrial but no academic partners, low/high TRLs). It is highly recommended to contact the 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: <http://www.desca-agreement.eu/>

3.4. Project budget

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

³ As an exception, *Forschungszentrum Jülich GmbH (JÜLICH)* is eligible to apply since measures were already established to avoid any possible conflict of interest with *Project Management Jülich* as a beneficiary of M-ERA.NET 3, which is a largely independent unit within the research centre *Forschungszentrum Jülich GmbH (JÜLICH)*.

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
15 March 2021	Launch of the Call 2021	
15 June 2021 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
End September / October 2021	Feedback to applicants	
17 November 2021 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 2022	Tentative communication of full-proposal assessment	a) Online (via IT tool) b) National/Regional funding organisation
Mid-February 2022	Tentative communication of selection of full-proposals recommended for funding	a) Online (via IT tool) b) National/Regional funding organisation
End February 2022	Contract negotiations for selected proposals on national/regional level	National/Regional funding organisations
March – May 2022	Start of funded projects	

* *contact your national/regional funding organisation*

4. Application process

The M-ERA.NET application process will be 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. The mandatory Pre-Proposal form available at <https://www.m-era.net/joint-call-2021> 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. National/regional funding organisations will carry out assessments of Pre-Proposals and respective national/regional funding applications. The Pre-Proposal stage will be used to ensure that only high quality proposals which are in line with national requirements are invited to the Full-Proposal stage. Applicants will be provided with feedback after the review of their Pre-Proposal, 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 after Pre-Proposal stage 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 an online application form available at www.m-era.net. The mandatory Full-Proposal form and the mandatory Annex 1 to Full-Proposal form available at <https://www.m-era.net/joint-call-2021> have 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.
6. Only eligible Full-Proposals will be subject to a central evaluation. The centralised evaluation is performed by independent international evaluators according to the EC rules for ERA-NET COFUND, resulting in the M-ERA.NET ranking list of proposals.
7. At the M-ERA.NET selection meeting proposals will be selected for funding based on the M-ERA.NET ranking list, the national/regional funding commitment and the available EU top-up funding.
8. M-ERA.NET recommends the funding of selected projects to the involved funding organisations. The regional/national funding organisations take the final funding decision.

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

The mandatory Pre-Proposal gives an overview on the whole project. It is mandatory and has to be submitted in English by the project coordinator through the M-ERA.NET submission tool. In addition to the Pre-Proposal (online submission) the corresponding national/regional funding application form may be requested by the respective funding organisation according to their respective programme rules. After eligibility check and assessment of Pre-Proposals, the project coordinator will be informed if the Pre-Proposal is recommended (or not) for the submission of Full-Proposal.

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

The mandatory Full-Proposal gives an overview of the whole project and describes all national/regional project parts. In addition, the mandatory Annex 1 to the Full-Proposal describes the partner profiles, CVs of the whole consortium, and if relevant, Letter of Intent (LoI). To receive funding, the national/regional parts of the project must fulfil their national/regional criteria. This will create different submission and financing situations for partners from different countries.

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 organisations involved in the funding. 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

M-ERA.NET aims at providing a transparent, fast and straight forward assessment of the submitted project proposals.

5.1. Pre-Proposal

5.1.1 Eligibility check and evaluation criteria

At M-ERA.NET level:

- requested M-ERA.NET Pre-Proposal form in English is uploaded to the M-ERA.NET submission tool on or before submission deadline
- maximum project duration is 36 months
- minimum of 3 applicants (all requesting funding from a funding organisation listed in Annex 3) from at least 2 different countries (at least 2 European or associated country⁴) participating in the Call 2021; applicants not asking for funding can participate in addition to the minimum consortium of 3 applicants from 2 different countries
- entities must belong to a country/region participating in the M-ERA.NET Call 2021. Consortia cannot include applicants from countries/regions not participating in the Call 2021
- project coordinator is eligible and requests funding (from a funding organisation listed in 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

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)
- financial status of applicants, especially industrial applicants

⁴ http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cp/h2020-hi-list-ac_en.pdf

5.1.2. Result of national / regional assessment and ranking

Only project consortia fulfilling the abovementioned requirements will be invited to the Full-Proposal stage.

5.1.3. Result of Pre-Proposal phase

At national / regional level the assessment of Pre-Proposal results in one of the recommendations, to be communicated to the applicants:

- *Recommended for submitting the Full-Proposal (including requirements and/or potential comments for improvement).*
- *Not recommended (motivated - mandatory comments).*

5.2. Full-Proposal

Full Proposals will be selected by the following steps:

5.2.1 Eligibility check

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

At M-ERA.NET level:

- pre-proposal is recommended for Full-Proposal submission by M-ERA.NET
- presence of requested M-ERA.NET Full-Proposal form and Annex1 in English (see <https://www.m-era.net/joint-call-2021>) on or before deadline
- maximum project duration of 36 months
- minimum of 3 applicants (all requesting funding from a funding organisation listed in Annex 3) from at least 2 different countries (at least 2 European or associated country⁵) participating in the Call 2021; applicants not asking for funding can participate in addition to the minimum consortium of 3 applicants from 2 different countries
- entities must belong to a country/region participating in the M-ERA.NET Call 2021. Consortia cannot include applicants from countries/regions not participating in the Call 2021
- project coordinator is eligible and requests funding (from a funding organisation listed in Annex 3)

⁵ http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cp/h2020-hi-list-ac_en.pdf

- 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;

At National/regional level:

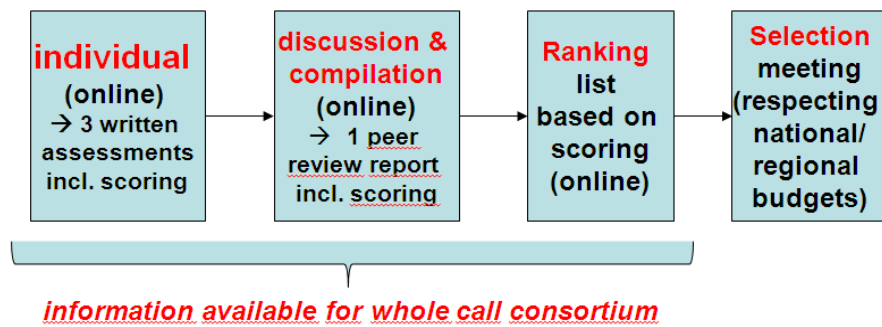
- programme regulations observed if applicable (e.g. presence of requested nat/reg proposal forms, financial standing of industrial applicants, etc.)
- recommendations and requirements given in the Pre-Proposal stage are fulfilled, if applicable.

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.

The M-ERA.NET Call 2021 Evaluation Procedure:

- individual written assessments: 3 individual and independent written assessments including scoring for each full-proposal provided by selected and agreed experts
- compilation of individual assessments: 3 individual assessments are compiled by one of the 3 experts (= rapporteur). The compilation consists of peer review report and scoring. All experts who provided individual written assessments confirm the compilation and consistency of peer review report and scoring. Evaluators will have the possibility to exchange opinions.
- quality check of the peer review report by the M-ERA.NET call secretariat
- a binding 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, the available national/regional budgets and the the available EU top-up funding..
- The names of the independent experts will be kept confidential.



The M-ERA.NET Call 2021 Evaluation Criteria for Full-Proposal:

The Full-Proposals will be evaluated according to the following criteria:

- **Excellence**
- **Impact**
- **Quality and efficiency of the implementation**

Evaluation criteria, scoring and thresholds are described in **Annex 4**.

6. Decision

6.1. Decision process

The M-ERA.NET 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.

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. Outcomes of the review committee will be provided one week later.

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. Payments and start of projects

Depending on the national/regional regulations, a pre-condition for transferring the first funding instalments 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. As the national funding contracts may not all become effective at the same time, the project parties:

- Usually do not receive the instalments at the same time,
- Usually are not reviewed/monitored on national/regional level at exactly the same time.

However, the M-ERA.NET consortium will help to minimise these gaps.

7. Monitoring

7.1. National/regional project review

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

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.

A mid-term and a final project report must be submitted to M-ERA.NET by the project coordinator using the M-ERA.NET reporting templates. The reporting templates will be available on the Call 2021 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 call secretariat. The project partners should be aware that changes may affect their funding.

8. Dissemination

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

9. Support

Frequently Asked Questions (FAQ) are listed in the call website (<https://m-era.net/joint-call-2021>). 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 2021

- Topic 1: Modelling for materials engineering, processing, properties and durability**
- Topic 2: Innovative surfaces, coatings and interfaces**
- Topic 3: High performance composites**
- Topic 4: Functional materials**
- Topic 5: New strategies for advanced material-based technologies in health applications**
- Topic 6: Materials for Additive Manufacturing**

Topic 1: Modelling for materials engineering, processing, properties and durability

Technical content/scope

Physics-based simulations are of paramount importance in understanding material behaviour and/or processing. Currently, materials science may also benefit from emerging data-driven procedures in the field. Moreover, hybrid approaches, coupling data-driven and physics-based models, can be of great interest in improving the predictive power of materials modelling.

In this call, proposals addressing the following subjects are expected:

- Properties (i.e. genome material approaches) and/or constitutive relations discovery, based on physical hypotheses and/or models of fundamental relations,
- Artificial intelligence for materials science, engineering and monitoring, e.g. data-driven, machine learning, data mining and assimilation,
- Combination of both approaches above,
- Space-time multiscale modelling and multi-physics coupling, bridging the gap between different time and/or length scales,
- Model order reduction, meta-models using appropriate ontology approaches and uncertainty quantifications,
- Multi-scale and multi-physics modelling to simulate a whole device including interfaces.

Proposals can benefit from the interaction of numerical simulation and experiments: computational modelling approaches may be based on either first principles or experimental data, and may address the whole spectrum from basic science to current technological problems (TRL target for project deliverables within levels 1-6).

Proposals dealing with high throughput screening to predict the performance of new materials (e.g. highly recyclable, secondary) and/or their substitution in key technologies and products to avoid the use of critical raw materials are also welcome.

Moreover, further development of the “digital twins” approach to predict materials behaviour is encouraged, with the ambitious target to bring “digital twins” towards industrial applications. Data capture from sensors can be an alternative source to generate digital twins.

Developing new methods and algorithms for simulations of the physics of materials by focusing on purely theoretical or atomistic aspects is also encouraged.

Unless expressly justified, proposals should comply with the open data science directive from the European Commission. It is expected that proposals include intellectual property rights management and proper knowledge transfer and exploitation strategy. It is expected that part of the deliverables of the project include open source codes, data management and curation methodology, and/or demonstrative examples of the technologies proposed.

Objectives

Any proposal related to all other call topics are eligible provided it relies on modelling approaches as described in this topic technical scope. Moreover, the proposals may focus on one or several of the following domains (related but not limited to):

- Interfaces, coatings and surfaces,
- Fracture, tribology, corrosion and fatigue phenomena,
- Materials under extreme conditions,

- High performance composites,
- Light-weight materials
- Materials modelling health monitoring through sensors
- Functional materials and meta-materials,
- 3D printing and additive manufacturing, for simulation of the physical processes and study of the resulting microstructure,
- Soft and bio-materials, including living materials,
- Batteries (Li, Na, redox flow, others)
- Other energy or low carbon materials: e.g. photovoltaics, fuel cells, hydrogen storage, thermoelectricity.

Proposals on battery-related modelling are encouraged as this topic has been identified as a key game changer to meet the European Commission sustainable development goals. This includes but is not limited to (1) multi-scale and multi-physics modelling to simulate a whole battery device and (2) modelling of interfaces (e.g. solid-solid, post Li-ion, redox flow, or solid-electrolyte) in batteries or energy storage and conversion devices.

In general, special focus on materials science, processing, and engineering that allows the European Commission to meet its sustainable development goals is strongly recommended. Sustainability aspects of the targeted solutions and/or materials must be addressed in the proposal. Proposals should avoid as far as possible the use of hazardous compounds and demonstrate that the materials and processes involved in the research will be safe and will have a minimum impact on the environment.

Expected impact

The proposals shall address their expected impact in terms of

- Understanding the phenomena associated with the synthesis, characterization and processing, structure, properties, performance and durability of materials,
- Improving predictive power of simulations in materials science and materials process engineering,
- Building or strengthening a collaborative international research network with shared research outputs such as methods, codes, data, publications and protocols,
- Assessing positive impact of the proposed research in terms of energy efficiency, raw materials efficient use, and low carbon footprint.

In summary, discovering and designing new/advanced materials, providing improved predictive tools and facilitating the creation of interoperable databases, to increase the European competitiveness. Proposals that address the modelling of materials for sustainable development goals including low carbon and circular economy are encouraged.

The importance of stress related social or ethical impacts of the proposal must be discussed when relevant. Gender balance measures should also be considered. Technology Readiness Level (TRL) at the project start and at the project end should be clearly stated. 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 advisory board or the participation of one or more companies in the project consortium is encouraged. For proposals aiming above TRL 4, industrial partners should be involved in the project consortium.

Target groups

This topic targets all groups in the research and innovation chain: basic research, applied research, industrial research and development. The topic is particularly suitable for the establishment of a strong collaboration between research entities, SMEs and large enterprises.

Keywords

multiscale materials modelling, materials databases, constitutive modelling, computational simulation, computational materials science, processing-structure-properties relationships, multi-physics, experimental validation, multiple length and time scales, manufacturing processes, new materials, data science, machine learning for materials, artificial intelligence, digital twins.

Indicative targeted TRL: 1-6

Topic 2: Innovative surfaces, coatings and interfaces

Technical content/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 electrodes and other interfacially relevant inner battery components. Including a broad spectrum of compounds (from electrodes and batteries up to antipathogen coatings).

The proposals should consider the development, processing or production aspects aiming at flexible and energy-efficient technologies with sustainable use of materials in an environmentally friendly manner with special attention on CRM.

Objectives

The proposals shall address at least one of the following items:

- Development of innovative surfaces, thin films, coatings and/or interfaces.
- Development of optimised interfaces e.g. for chemical linkage and interphases e.g. like interpenetrating networks.
- Development of new materials and processing for long-time stable antipathogen coatings. Direct interaction with human /bio surfaces will be addressed in Topics 5.
- Development or improvement of process technologies considering circular economy to enable deposition of new coatings and/or surface modification.
- Development of environmentally friendly interfaces in battery cells and innovative battery cell components, including post Li-ion battery.

Project proposals should:

- Consider aspects such as fundamental understanding of the mechanisms, experimental assessment, prototyping, up-scaling, manufacturing and validation demonstrating prototype in operational environment with a view to final customer applications.
- Address complementary characterisation techniques and/or where relevant modelling techniques and/or how to rationalise data for future use in modelling processes (data base)
- Ensure relevance for different partners in the value chain by stating clear concepts for application(s) in targeted industrial sector(s).

Expected impact

The proposals shall address how they will contribute to the expected impact of the topic, defined as follows:

- Availability of high-end components, products with tailored properties or functionalities by innovative surfaces, coatings and interfaces and/or
- Innovative process technologies related to interface optimisation, coating development and application and surface modification and/or
- Availability of battery cell components for improved battery lifetime and recyclability.
- All addressed technologies and/or products should include minimum health and safety impact.

- Achieving a positive ecological and energy impact in terms of avoidance of hazardous materials and compounds by developing processes, coating materials, technology and product life cycles following a circular economy and CRM strategies in accordance to SDG7
- Proposals should aim to develop innovative products or technologies based on functionalised surfaces, coatings and interfaces that are likely to have a positive societal impact, on e.g. safety, economics, employment, life quality and avoid the release of toxic materials, in line with RRI concepts.
- The proposal should demonstrate in a convincing way synergies between industry and academia.

All proposals should address environmental aspects, including re-use, re-manufacturing or recycling considerations, and broader social or ethical impacts when relevant. All proposals should clearly state the Technology Readiness Level (TRL) at the project start and at the project end (see 1.3.). 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 advisory board or the participation of one or more companies in the project consortium is encouraged. For proposals aiming above TRL 4, industrial partners and at least one project partner, specialised on customer demands, should be involved in the project consortium.

Target groups

This topic is targeting at all groups in the innovation chain: basic research, applied research, industrial research and experimental development as well as at the end-user industry. The topic is particularly suitable for the establishment of a strong collaboration between research entities and SMEs. Participation of large enterprises should be considered due to their powerful research units or as potential end users of the technology or of the product proposed.

Interdisciplinary projects along the value chain are encouraged and should enable a broader cross-sectorial use.

Issues of societal concerns should be addressed in a systematic way, if possible with an added value by interacting with Social Sciences and Humanities research or citizens.

Keywords

Innovative surfaces, functional coatings, antipathogen coatings, bio-interfaces, thin films, interfaces, interphases; advanced coating, functionalisation, surface technologies, structured surfaces, textured surfaces, battery cell components, post Li-ion battery.

Indicative TRL range: 2-7

Topic 3: High performance composites

Technical content/scope

Within the scope of this call, composites are defined as engineered materials, and coatings, including hybrids, composed of two or more constituents, for example, a polymer or metallic matrix reinforced by a fibre, particle, container or a filler that meets the requirements which cannot be otherwise fulfilled by one component alone. The matrix, fibres, particles and fillers can be from mineral, synthetic or biological sources. Fibres, particles, containers, and fillers can be on the nanoscale.

Objectives

This call topic is aimed at high performance composites having functional properties for engineering applications such as transportation, construction, packaging, energy (including electrochemical energy storage), etc.

Regarding the properties of materials, the composites should combine at least two of the following:

- High strength and stiffness to weight-ratio.
- Durability (e.g., good resistance to creep, fatigue, humidity, etc.)
- Tailored thermal or electrical properties.
- Self-healing functionalities
- Electronic and/or ionic conductivity.
- Electrochemical energy storage properties.
- Biocompatible or anti-microbial properties.
- Biodegradable and compostable properties.
- Recyclability/Reuse for circular economy.
- Fire retardant properties with environmentally friendly substances.

In addition, the research proposals should address one or more of the following material design and manufacturing issues (descriptive of process):

- Molecular design, functionalisation and characterisation for improved reinforcement/matrix interaction.
- Development of new bio-based resins and/or bio-based fibres or fillers, and their composites.
- Materials use optimization. Use of recycled materials to develop composites.
- Methodology and validation tools for design-optimisation.
- Determination of long-term properties (e.g., creep, fatigue, ageing, etc.).
- Retaining economic value and energy of materials as long as possible to promote the circular economy.
- Scalable and rapid manufacturing techniques, such as fast curing, low viscosity resins, thermoforming, and roll-to-roll processing, among others.
- Automation, robotisation and cost-efficient manufacturing techniques.
- Novel composites architectures and constituent designs, including, e.g., thin tapes.
- Composites suitable for various processing techniques.
- Functional (Bio)polymers in energy and environment applications.
- Fibre-based battery materials
- Joining, assembly and repair, including solutions for optimising the interface between dissimilar materials.

To strengthen the whole innovation chain, it is strongly recommended that the project proposal covers materials, processing, application, and recycling development of composites. Such integration could be further enhanced by fostering collaboration between universities and industry, and by a consortium covering the whole value chain. Issues of societal concerns should be

addressed in a systematic way, for instance by collaboration with social science and humanities researchers and/or citizens.

Proposals must consider Responsible Research and Innovation strategies, i.e., considering the socio-economic and environmental effects, employing, e.g., appraisal methodologies such as LCA and LCC tools.

Expected impact

The proposals shall address how they will contribute to the expected impact of the topic, defined as follows:

- Addressing the Sustainable Development Goals SDG7 Affordable Clean Energy and/or SDG9 Industry Innovation and Infrastructure;
- More competitive industrial products and processes, using advanced composite materials design and manufacturing concepts, in particular avoiding the use of toxic compounds in the final product as well as in the processing;
- Socio-ecological benefits provided by products with higher integration level of functionality, lighter products to transport, lighter dynamic applications to decrease energy consumption, efficient and/or effective energy storage, and by using materials that will result in a lower environmental impact;
- Because the composites industry is characterised by a large number of scattered players, including SME manufacturers and equipment suppliers, the project(s) is expected to establish a strong network inside Europe, thereby improving the sharing of knowledge and reinforcing both technological and scientific platforms.

All proposals should address environmental considerations, including reuse, remanufacturing or recycling, social or ethical impacts when relevant. All proposals should clearly state the Technology Readiness Level (TRL) at the project start and at the project end (see 1.3.). 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 advisory board or the participation of one or more companies in the project consortium is encouraged. For proposals aiming above TRL 4, industrial partners should be involved in the project consortium.

Target groups

This topic is targeted at all groups in the innovation chain: basic research, applied research, industrial research and development. Collaboration between research entities and industrial partners is encouraged also at low TRL (<4) levels.

Keywords

synthetic composites, hybrid material systems, polymer matrix, metal matrix, ceramic matrix, bio-based composites, functional properties, electrochemical energy storage, in-service behaviour, design methodology, process technology, recycling, material behaviour modelling, long-term properties.

Indicative targeted TRL: 1-6

Topic 4: Functional materials

Technical content/scope

Advanced functional materials are an important economic and employment generator in Europe. Functional materials and their interfaces are the bottleneck for almost all technologies. Design and simulation of materials and microstructures with tailored properties and appropriate process technologies are needed to achieve high performance in industrial applications. European product innovation relies strongly on deep theoretical knowledge on functional materials and more efficient technologies with new physical properties and performance. Improved materials are expected to contribute to reduce our dependence on oil, gas and coal. In terms of circular economy, there is increasing concern regarding the replacement of critical raw materials, toxic materials, recycling and long-term stability. The European Strategic Energy Technology Plan (SET Plan) recognizes this situation and emphasises cost-competitive low carbon energy and energy efficiency technologies. The SET Plan Materials Road Map reinforces the pivotal enabling role of advanced materials and clearly outlines the medium to long-term strategy for the coming years.

Objectives

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:

- Materials for sensing and actuation: smart materials, stretchable materials and metamaterials with controlled electrical, magnetic, thermal, optical, and mechanical properties, photonic materials, where possible enabling low power or autonomous device/systems.
- Materials for smart and zero-energy buildings: thermal insulation materials and efficient heat radiation solutions, smart windows.
- Electrochemical energy conversion: new materials for supercapacitors, fuel cells, electrolyzers and photo catalysis.
- Membranes for energy efficient separation and process intensification
- Next generation materials for batteries: solid state batteries, and materials and systems enabling high-power and/or high-energy, long-cycle-life operation, recyclable and biodegradable battery materials, bio-sourced materials, materials for flexible batteries, materials for structural batteries.
- Dynamic, self-healing smart materials to enable longer service lifetime like detecting defective components and local spots to be repaired in batteries and triggering self-healing processes.
- Waste-energy harvesting materials and solutions: new energy harvesting materials based on advanced thermoelectric, caloric, piezoelectric, phase change, triboelectric and others. New designs and architectures for increased energy efficiency.
- Photovoltaics: new concepts and architectures for efficient solar cells, novel solar cell materials.
- “Soft chemistry” and other low energy materials synthesis routes

Expected impact

The proposals will address how they will contribute to the expected impact of the topic, defined as follows:

- Ensure the future European sustainable energy supply through technological development based on novel multifunctional materials.
- Support the European strategic policy targets in terms of greenhouse gas emission reduction and developing affordable sustainable energy sources and usage.

- Improved competitiveness and strengthened industrial leadership.
- Strengthened innovation excellence of the European academia and research institutes.
- Breakthrough outcomes in energy storage, conversion and harvesting.

All proposals should address environmental, including reuse, remanufacturing or recycling considerations, toxicity, social or ethical impacts. All proposals should clearly state the Technology Readiness Level (TRL) at the project start and at the project end (see 1.3.). 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 stakeholder advisory board or the participation of one or more companies in the project consortium is encouraged. For proposals aiming above TRL 4, industrial partners should be involved in the project consortium.

Target groups

This topic is targeted at all groups: disruptive research, applied research, industrial research and development.

Issues of societal concerns should be addressed in a systematic way, if possible with an added value by interacting with Social Sciences and Humanities research, diverse stakeholders or citizens.

Keywords

Advanced functional and multifunctional materials, dynamic materials, electronic / magnetic / optical / photonic / thermoelectric / photovoltaic / piezoelectric / thermal / triboelectric / tribological / structural / redox materials, processing technologies, sensors, catalysts, electrochromics, photochromics, waste energy harvesting materials, materials for batteries, fuel cells, supercapacitors, electrolyzers, membranes, self-healing materials, self-healing for batteries, reusable and recyclable materials, materials synthesized by energy efficient processes and soft chemistry.

Indicative targeted TRL: 1-6

Topic 5: New strategies for advanced material-based technologies for health applications

Technical content/scope

Wellness and healthy ageing of the European population require new or improved solutions to health-related issues. Many of these solutions will come from the development of new advanced materials and coatings as key components of diagnostics, clinical or surgical treatments, and therapeutics (e.g. prosthesis, medical devices, drug delivery systems, implants, regenerative and reparative medicine, cell and gene therapies, real-time monitoring in vivo sensors, and others). These materials and coatings will be in contact with the human body at different levels.

The purpose of this call topic is to provide opportunities to raise critical knowledge and advance material-based technologies towards the market related to materials and coatings for applications in health. This action is aligned with societal challenges regarding “Health, Demographic Change and Wellbeing” as defined in Cluster 1 – Health of the Horizon Europe framework. It is also in agreement with the recognition of advanced materials as a Key Enabling Technology for strengthening the competitiveness of the European industry.

Objectives

The objective is to develop materials and coatings for implants, prostheses, real-time monitoring in-vivo biosensors, and scaffolds to replace, restore and regenerate physiological functions, tissues and organs. The investigated materials and coatings should target at least one clinical indication. Such materials and coatings may include functionalised, adaptable or stimuli-responsive elements, hierarchical structures to modulate 3D cell growth and structural or topographic modifications to direct specific cell responses. The development of the materials with properties-by-design can be supported/designed by *in silico* techniques.

Proposals should at least address one of the following:

- Interactions between the newly developed materials or coatings and the biological environment/surrounding tissues.
- Mechanical, physical, and chemical properties of the materials and coatings which are relevant for the foreseen application.
- Aspects such as biodegradation, biological performances, toxicity, and inflammatory/immune response at short, medium and long term.

Proposals are expected to take into account the following:

- The potential market and exploitation routes including a robust risk and contingency plan, as well as the overall scalability and relevant regulatory issues.
- When appropriate, the in vitro testing and/or assays in animals must be conducted following the national ethical rules of each relevant partner involved.
- Where relevant, alternatives to animal testing (methods and models) need to be incorporated in the study design.

Moreover, the proposals are strongly encouraged to consider:

- Cross-collaboration between material scientists, engineers, biologists, clinicians, immunologists, regulatory scientists, toxicologists, social scientists and industrial partners.

Expected impact

The proposals shall address how they will contribute to the expected impact of the topic, defined as follows:

- Understanding the complexity of material/biology interfaces over time;

- Achievement of new or improved materials or coatings performance for at least one clinical target;
- Higher competitiveness of the European health industry through more reliable products, scalable and reproducible processes, and awareness of the regulatory protocols;
- Increased collaborations between material science RTD performers, industrial and medical stakeholders in the health sector;
- At the end of the project the technology being addressed is expected to reach at least TRL 3 (see 1.3.).

All proposals should address social or ethical impacts (e.g. use of patient samples, animal studies, associated with potential contexts of use). Environmental green processes should be also considered. All proposals should clearly state the Technology Readiness Level (TRL) at the project start and at the project end (see 1.3.). The proposals should outline a plan for the transition to higher TRLs at a later stage (i.e. beyond the project end date). The participation of one or more companies in the project consortium is encouraged. Establishing an multi-stakeholder advisory board (e.g. clinicians, patient organizations, industrial experts) is recommended.

Target groups

This topic is targeted at all groups in the innovation chain: basic, applied and industrial research. Collaboration between research entities including clinical centres and industrial partners is encouraged.

Keywords

biomaterials, coatings, biointerfaces, biodegradation, implants, medical devices, prostheses, real-time monitoring in-vivo biosensors, scaffolds, regulatory science, toxicology, regenerative medicine

Indicative targeted TRL: 1-4

Note: TRL4 in biomaterials include in vitro/in vivo but not pre-clinical tests (which are included in TRL5)

Topic 6: Materials for additive manufacturing

Technical content/scope

Additive Manufacturing (AM) comprises of disruptive processes to directly build 3D parts and components based on a digital model by successively adding material. AM is a rapidly developing industrial field because of its material efficiency and almost limitless design freedom. However, the commercial exploitation of 3D AM processes is currently restricted due to the limited availability of feedstock, the lack of standards and in-process quality certification. Within this call topic, proposals should focus on the development of materials and related processes for use in AM, leading to the required performance, reliability and economics of manufactured components.

The use of living biological materials as part of the AM process is not covered by this call topic, but AM may be a suitable production process for these materials addressed in topic 5.

Objectives

The objective is to develop innovative materials such as metals, ceramics, polymers, composites and multi-materials designed for use in AM processes (e.g. modifying composition, micro-structure, morphology, powder size distribution, etc.) and enhanced production processes in order to improve or modify properties of manufactured products. The final goal of proposed projects should be to demonstrate the ability of new materials and processes to achieve finished components exhibiting improved performance, preferably with reduced overall costs, energy consumption and longer lifespans as compared to the state-of-the-art.

Project proposals should address materials and production processes for production of parts. This could include e.g. modelling of materials and processes (including microstructures), mechanical and corrosion properties, surface finishing, internal stress and warpage reduction, electrical and thermal conductivity, and materials specifically designed to exploit the potential of AM including the ability to effectively produce graded or multi-material structures. Proposals should also systematically address energy, environmental and end-of-life related aspects of the research as well as how the project results support recycling, zero waste and circular economy.

Proposals falling under the scope of this topic should address one or several of the following areas:

- Development of materials and processes designed to improve mechanical performance and quality of AM parts and enhance the process productivity;
- Development of novel materials and processes to enable innovative applications for AM parts (e.g. batteries, implants), which could include multifunctional, hierarchically structured or composite materials;
- New strategies to improve the quality of the parts by including instrumentation, process monitoring, post-processing, collecting material data, modelling, simulation and setting up a digital twin;
- Improvement of lifespan of products by repair or remanufacturing with different AM technologies;
- New technologies for reconditioning of feedstock material for re-use;
- New feedstock materials for decreasing the dependency on critical raw materials as defined by the EU commission;
- New feedstock materials using waste from other processes;
- New materials for parts with complex geometry or for lightweight structures in demanding high-quality applications, e.g. aerospace or medical.

Expected impact

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

- The availability of new material compositions for the production of high-quality AM parts/components suitable for different applications;
- The availability of new feedstocks (e.g. powder, slurry, wire, filament) specifically developed to enhance functionality, quality and performance of AM parts to reduce the cost;
- The availability of new process technologies for the production of AM parts with novel materials and material combinations, including composites and multi-materials;
- The availability of hybrid processes directly combining AM with other manufacturing techniques;
- Reducing the use of hazardous or scarce substances, reducing collateral production of potentially toxic products and promoting biodegradable and biogenic materials.

All proposals should address environmental considerations, including resource and energy efficiency, re-use, re-manufacturing, recycling or circular economy aspects. All proposals should consider social or ethical impacts and societal needs.

All proposals should clearly state the Technology Readiness Level (TRL) at the project start and at the project end (see 1.3.). The proposals should include a plan for the transition to higher TRLs at a later stage (i.e. beyond the project end date).

Establishing a stakeholder advisory board or the participation of one or more companies in the project consortium is encouraged. For proposals aiming above TRL 4, industrial partners should be involved in the project consortium.

Target groups

This topic is targeted at all groups in the innovation chain: basic research, applied research, industrial research, development and innovation. Collaboration between research entities, SMEs and large enterprises is encouraged as well as participation of international organisations in project consortia.

Keywords

additive manufacturing, productivity, production, part quality, mechanical performance, material properties, warpage, internal stress, biodegradable, biogenic, polymers, metals, ceramics, composites, multi-materials, lightweight structures, feedstock, lifespan, sustainability, resource efficiency, energy efficiency, recycling, modelling, simulation.

Indicative targeted TRL: 2-7

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 advisory board (or alternatively by the participation of one or more companies in the project consortium when feasible).
- For proposals aiming at TRL above 4, 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 H2020⁶ 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 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 operational environment

TRL 8 – system complete and qualified

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

In the project proposal, it should be indicated what is the TRL position in the beginning of the project and after the project is finished.

Topic	TRL 1	TRL 2	TRL 3	TRL 4	TRL 5	TRL 6	TRL 7	TRL 8	TRL 9
Topic 1: Modelling for materials engineering, processing, properties and durability									
Topic 2: Innovative surfaces, coatings and interfaces									
Topic 3: High performance composites									
Topic 4: Functional materials									
Topic 5: New strategies for advanced material-based technologies in health applications									
Topic 6: Materials for additive manufacturing									

⁶ https://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2018-2020/annexes/h2020-wp1820-annex-g-trl_en.pdf

Annex 3: Funding organisations participating in the M-ERA.NET Call 2021

Country	National / regional coverage	Funding organisation	Contact person:
Austria	national	Austrian Research Promotion Agency (FFG)	Name: Fabienne Nikowitz Phone: +43 57755 5081 e-mail: fabienne.nikowitz@ffg.at
Belgium	regional: Flanders	Fonds voor Wetenschappelijk onderzoek-Vlaanderen (FWO)	Name: Toon Monbaliu Phone: +32 2 550 15 70 e-mail: eranet@fwo.be
		Fund for Innovation and Entrepreneurship. Flanders Agency for Innovation and entrepreneurship (VLAIO)	Name: Paul Schreurs Phone: +32 2 432 42 85 e-mail: paul.schreurs@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
			Name: Joël Groeneveld Phone: +32 2 504 92 70 e-mail: international@frs-fnrs.be
	regional: Wallonia	Service public de Wallonie (SPW)	Name: Pierre Demoitié Phone: +32 81 33 45 40 e-mail: pierre.demoitie@spw.wallonie.be

Country	National / regional coverage	Funding organisation	Contact person:
Brazil	regional: Sao Paulo	Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)	Name: Alexandre Roccoatto Phone: + 55 11 3838 4000 e-mail: chamada_meranet@fapesp.br
			Name: Virginia Sanches Subiñas; Phone: + 55 11 3838 4000 e-mail: chamada_meranet@fapesp.br
Bulgaria	national	Bulgarian National Science Fund (BNSF)	Name: Milena Alexandrova Phone: +359 884 171 363 e-mail: aleksandrova@mon.bg
Canada	regional: Québec	PRIMA Québec	Name: Michel Lefèvre Phone: +1-514-284-0211 #227 e-mail: michel.lefevre@prima.ca
Croatia	national	Ministarstvo Znanosti I Obrazovanja (MZO)	Name: Mateo Ante Bosnić Phone: +385 01 4594 166 e-mail: mateo.ante.basnic@mzo.hr
Czech Republic	national	Technology Agency of the Czech Republic (TA CR)	Name: Katerina Volfova Phone: +420 234 611 629 e-mail: katerina.volfova@tacr.cz
Denmark	national	IFD – Innovation Fund Denmark	Name: Sune Dalgaard Ebbesen Phone: +45 6190 5030 e-mail: sune.dalgaard.ebbesen@innofond.dk
Estonia	national	Estonian Research Council	Name: Margit Suuroja Phone: +372 731 7360 e-mail: margit.suuroja@etag.ee

Country	National / regional coverage	Funding organisation	Contact person:
Finland	national	Academy of Finland / Suomen Akatemia	Name: Jukka Tanskanen Phone: +358 295 33 5071 e-mail: jukka.tanskanen@aka.fi
			Name: Saila Seppo Phone: +358 29 533 5109 e-mail: seppo@aka.fi
	national	Innovaatorahoituskeskus Business Finland	Name: Sampo Tukiainen Phone: +358 50 598 6142 e-mail: sampo.tukiainen@businessfinland.fi
France	national	Agence Nationale de la Recherche (ANR)	Name: Manuel de Anda Villa Phone: +33 1 78 09 80 15 e-mail: manuel.deandavilla@agencerecherche.fr
	regional: Nouvelle Aquitaine	Region Nouvelle-Aquitaine (RNA)	Name: Emmanuelle Pallier Phone: +33 5 55 45 00 80 e-mail: emmanuelle.pallier@nouvelle-aquitaine.fr
			Name: Hélène Boiserie Phone: +33 5 56 56 38 53 ; (0)6 71 56 92 89 e-mail: Helene.boiserie@nouvelle-aquitaine.fr
Germany	national	Projektträger Jülich (PtJ) on behalf of Bundesministerium für Bildung und Forschung (BMBF)	Name: Christian Schröder Phone: +49 2461 61 3368 e-mail: c.schroeder@fz-juelich.de
			Name: Show-Ling Lee-Müller Phone: +49 2461 61 4471 e-mail: s.l.lee-mueller@fz-juelich.de

Country	National / regional coverage	Funding organisation	Contact person:
	regional: Saxony	Sächsisches Staatsministerium für Wissenschaft und Kunst (SMWK)	Name: Gabriele Süptitz Phone +49 351 564 64210 e-mail: Gabriele.Sueptitz@smwk.sachsen.de
Hungary	national	National Research, Development, and Innovation Office (NKFIH)	Name: Elod Nemerkenyi Phone: +36-1-896-3987 e-mail: elod.nemerkenyi@nkfi.gov.hu
Iceland	national	The Icelandic Centre for Research - Rannís	Name: Kolbrún Bjargmundsdóttir Phone: +354 515 5814) e-mail: kolbrun@rannis.is
Israel	national	Ministry of Science and Technology (MOST)	Name: Sharon Yagur-Kroll Phone: +972 (2) 5411862 e-mail: sharonyk@most.gov.il
	national	Israel Innovation Authority (IIA)	Name: Rachel Loutaty Phone: +972 3 5118152 e-mail: Rachel.l@iserd.org.il
Latvia	national	State Education Development Agency Valsts izglītības attīstības aģentūra (VIAA)	Name: Maija Bundule Phone: +371 67785423 e-mail: maija.bundule@viaa.gov.lv
Lithuania	national	Lietuvos mokslo taryba (LMT)	Name: Saulius Marcinkonis Phone: +370 676 17256 e-mail: saulius.marcinkonis@lmt.lt
Luxembourg	national	National Research Fund / Fonds National de la Recherche (FNR)	Name: Christiane Kaell Phone: +352 261925-34 / +352 691 362 817 e-mail: christiane.kaell@fnr.lu

Country	National / regional coverage	Funding organisation	Contact person:
Norway	national	The Research Council of Norway - RCN	Name: Lenka Hannevold Phone: +47 98 23 04 53 e-mail: lha@rcn.no
Poland	national	National Centre for Research and Development (NCBR)	Name: Krzysztof Jabłoński Phone: +48 22 25 66 702 e-mail: krzysztof.jablonski@ncbr.gov.pl
	national	National Science Centre (NCN)	Name: Anna Kotarba Phone: +48 695 211 482 e-mail: anna.kotarba@ncn.gov.pl
Portugal	National	Fundacao para a Ciencia e a Tecnologia	Name: Ana Margarida Santos Phone: +351 213 917 644 e-mail: anamargarida.santos@fct.pt
Romania	national	Unitatea Executiva pentru Finantarea Invatamantului Superior, a Cercetarii, Dezvoltarii si Inovarii (UEFISCDI)	Name: Domnica Cotet Phone: +4021 30 23 880 e-mail: domnica.cotet@uefiscdi.ro
			Name: Cristina Cotet Phone: +4021 30 23 884 e-mail: cristina.cotet@uefiscdi.ro
Russian Federation	national	Foundation for Assistance to Small Innovative Enterprises (FASIE)	Name: Olga Levchenko Phone: +7 (495) 231-3851 e-mail: levchenko@fasie.ru
Slovak Republic	national	Slovenska Akademia Vied	Name: Martin Novak Phone: +421 2 5751 0 119 e-mail: mnovak@up.upsav.sk

Country	National / regional coverage	Funding organisation	Contact person:
Slovenia	national	Ministrstvo za izobraževanje, znanost in sport	Name: Doroteja Zlobec Phone: +386 (0)1 478 46 24 e-mail: Doroteja.zlobec@gov.si
South Africa	national	Department of Science and Technology (DST)	Name: Tugela Matubatuba Phone: +27 12 843 6860 e-mail: tugela.matubatuba@dst.gov.za
			Name: Ntombi Mchuba Phone: +27 12 843 6370 e-mail: Ntombi.mchuba@dst.gov.za
South Korea	national	KIAT (Korea Institute for Advancement of Technology)	Name: Jason Kang Joosuk Phone: +32-2-431-0591 e-mail: kangjs@kiat.or.kr
			Name: Felix Choi Hongreol Phone: +82-2-6009-3200 e-mail: felix3254@kiat.or.kr
Spain	national	Agencia Estatal de Investigacion (AEI)	Name: Beatriz Gómez Miguel Phone: --- e-mail: beatriz.gomez@aei.gob.es
			Name: Jorge Sotelo Santos Phone: --- e-mail: era-mat@aei.gob.es
	national	Centro para el Desarrollo Tecnológico Industrial (CDTI)	Name: Marina Sopeña Phone: (+34) 91 581 56 07 e-mail: marina.sopena@cdti.es

Country	National / regional coverage	Funding organisation	Contact person:
	regional: Asturias	IDEPA - Instituto de Desarrollo Económico del Principado de Asturias (Regional Economic Development Agency)	Name: Ana E. Fernández Monzón Phone: --- e-mail: anae@idepa.es
	regional: Basque Country	Basque Government – GV/EJ	Name: Catalina Chamorro Silgado Phone: +34 945 018 210 e-mail: cat-chamorro@euskadi.eus
			Name: Judith de Prado Olivenza Phone: +34 944 209 488 e-mail: jdeprado@innobasque.eus
Sweden	national	Verket för innovationssystem (Vinnova)	Name: Anders Marén Phone: +46 (0) 8-473 31 88 e-mail: anders.maren@vinnova.se
Switzerland	National	Federal Departnemt of the Environment, Transport, Energy and Communications (DETEC)	Name: Stefan Oberholzer Phone: +41 58 465 89 20) e-mail: stefan.oberholzer@bfe.admin.ch
Taiwan	national	Ministry of Science and Technology (MOST)	Name: Yu-Ming Chang Phone: +886-2-33665277 e-mail: ymchang@ntu.edu.tw
			Name: Dr. Ching-Mei Tang Phone: +886- 2-2737-7557 e-mail: cmtom@most.gov.tw
			Name: Randy Chang Phone: +886-2-27898975 e-mail: mcchang76@gate.sinica.edu.tw

Country	National / regional coverage	Funding organisation	Contact person:
Turkey	national	The Scientific and Technological Research Council of Turkey (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		
	Modelling for materials engineering, processing, properties and durability	Innovative surfaces, coatings and interfaces	High performance composites	Functional materials	New strategies for advanced material-based technologies in health applications	Materials for Additive Manufacturing	Thematic restrictions	Indicative call budget (MEUR)
Austria: FFG	X*	X*	X	X*		X	Yes, see note 1	2.00
Belgium (Flanders) FWO	X	X	X	X	X	X	No	0.70
Belgium (Flanders): VLAIO	X	X	X	X	X	X	No	1.00
Belgium (French Speaking Community): FNRS	X	X	X	X	X	X	No	0.20
Belgium (Wallonia): SPW	X	X	X	X	X	X	No	1.00
Brazil (Sao Paulo): FAPESP	X	X	X	X	X	X	No	0.40
Bulgaria: BNSF	X	X	X	X	X	X	No	0.23
Canada (Québec): PRIMA	X	X	X	X	X	X	No	0.70
Croatia: MZO	X	X	X	X	X	X	No	0.15

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6		
Czech Republic: TA CR	X	X	X	X	X	X	Yes see note 2	2.00
Denmark Innofond	X	X	X	X	X	X	No	1.00
Estonia ETAG	X	X	X	X	X	X	No	0.10
Finland Aka	X	X	X	X	X	X	Yes see note 3	1.00*
Finland Business Finland	X	X	X	X	X	X	No	1,00
France: ANR	X	X	X	X		X	No	2,00
France (Nouvelle-Aquitaine): Nouvelle-Aquitaine Region	X	X	X	X	X	X	No	0.50
Germany: PtJ (on behalf of BMBF)	X	X		X		X	Yes, see note 3	5.00
Germany (Saxony): SMWK	X	X	X	X	X	X	No	3.00
Hungary: NKFIH	X	X	X	X	X	X	No	0.30
Iceland RANNIS	X	X	X	X	X	X	No	0.33
Israel: MOST	X	X	X	X	X	X	No	0.50
Israel: IIA	X	X	X	X	X	X	No	0.75

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6		
Latvia: VIAA	X	X	X	X	X	X	No	0.80
Lithuania: LMT	X	X	X	X	X	X	No	0.30
Luxembourg: FNR	X	X	X	X	X	X	No	0.50
Norway: RCN	X	X	X	X	X	X	No	2.50
Poland: NCBR	X	X	X	X	X	X	No	3.00
Poland: NCN	X	X	X	X	X	X	No	0.50
Portugal FCT	X	X	X	X	X	X	No	0.70
Romania: UEFISCDI	X	X	X	X	X	X	No	1.50
Russia: FASIE	X	X	X	X	X	X	No	0.45
Slovak Republic SAS	X	X	X	X	X	X	No	0.36
Slovenia MIZS	X	X	X	X	X	X	No	0.84
South Africa: DST	X	X	X	X	X	X	No	0.40
South Korea KIAT	X	X	X	X	X	X	No	1.00

	Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6		
Spain AEI	X	X	X	X	X	X	No	1.70
Spain CDTI	X	X	X	X	X	X	No	0.80
Spain (Asturias): IDEPA	X	X	X	X	X	X	No	0.40
Spain (Basque Country): GV/EJ	X	X	X	X	X	X	No	0.50
Sweden Vinnova	X	X	X	X	X	X	No	3.00
Switzerland: DETEC	X	X	X	X			Yes, see note 4	0.65
Taiwan: MOST	X	X	X	X	X	X	No	0.75
Turkey: TÜBITAK	X	X	X	X	X	X	No	0.70

*Note 1: Research must be relevant for future battery technologies (only in topics 1, 2, 4 marked with *); no restriction in topics 3 and 6.*

Note 2: Research on regenerative medicine (under topic 5) is not supported.

Note 3: Research must be relevant for future battery technologies.

Note 4: Research must be energy related with a focus on future battery technologies.

Annex 4: Full-Proposal evaluation criteria, scoring, thresholds

Evaluation criteria:

3 main criteria are pre- defined by the EC for ERA-NET Cofund:

(a) excellence (b) impact (c) quality and efficiency of the implementation

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

Main Criteria	Sub Criteria	Score (points)
Excellence	<i>Clarity and pertinence of the objectives;</i>	<i>max. 1.5</i>
	<i>Credibility of the proposed approach and soundness of the concept</i>	<i>max. 2.0</i>
	<i>Extent that proposed work is ambitious, has innovation potential, and is beyond the state of the art (e.g. ground-breaking objectives, novel concepts and approaches)</i>	<i>max. 1.5</i>
Impact	<i>Contribution at the European or international level to the expected impacts listed in the work programme under the relevant topic</i>	<i>max. 2.5</i>
	<i>Enhancing innovation capacity and integration of new knowledge</i>	<i>max. 1.0</i>
	<i>Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets; and, where relevant, by delivering such innovations to the markets</i>	
	<i>Any other environmental and socially important impacts (not already covered above)</i>	
	<i>Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, and to manage research data where relevant</i>	<i>max. 1.5</i>
Quality and efficiency of the implementation	<i>Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables</i>	<i>max. 1.0</i>
	<i>Appropriateness of the management structures and procedures</i>	<i>max. 1.0</i>
	<i>Quality and relevant experience of the individual participants</i>	<i>max. 1.0</i>
	<i>Quality of the consortium as a whole (including complementarity, balance)</i>	<i>max. 1.0</i>
	<i>Appropriate of the allocation of tasks, ensuring that all participants have a valid role and allocation and justification of the resources to fulfil that role</i>	<i>max. 1.0</i>

Ethical issues: Full-proposal includes H2020 “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 scored between 0.0 and 5.0 representing the sum of the scoring of the individual sub criteria.

Sub-criteria have individual maximum scores with a resolution of 0.1 points. There are no thresholds for sub-criteria. The awarded scores for each sub-criterion have to be justified with written statements by the evaluators.

Peer review report (PRR): the rapporteur will compile a peer review report, to be accepted by all 3 evaluators. The final scoring of the main criteria will take into consideration the scores from the individual assessments. Each criterion will be scored between 0.0 and 5.0 in multiples of half (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.

Annex 5: Checklist for Proposers

The proposal conforms to the call guidelines.	<input type="checkbox"/>
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.	<input type="checkbox"/>
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.	<input type="checkbox"/>
All partners who are not eligible for 100% funding are able to provide financial resources for their own contribution.	<input type="checkbox"/>
A PIC ⁷ is available for all project partners.	<input type="checkbox"/>
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.	<input type="checkbox"/>

Please go to <https://www.m-era.net/joint-call-2021> to submit the:

1. Pre-Proposal form online.

Deadline for submission: 15 June 2021, 12:00 noon Brussels time

2. Full-Proposal form + Annex 1 to the Full-Proposal form online.

Deadline for submission: 17 November 2021, 12:00 noon Brussels time

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

⁷ 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>

