

## RRI issues and approaches to consider when discussing the topic descriptions

### Examples of RRI related topics

The first part of embedding RRI into the topic descriptions is to think about *specific issues*. Below are some specific issues you may want to ask yourselves or the researchers to address in their applications?

Issue	Description
Societal Needs	We often speak of societal need but without specificity. Can you ask researchers to be concrete in their justifications? How will it be evidenced? Who determines what societal demand is?
Environment	How should environmental issues (targeted effects and side-effects) be addressed; including effects on climate, pollution and biodiversity. Should this ERA-Net fund research on solutions based on hazardous materials at all? Should reducing collateral production of potentially toxic products (e.g. free nanoparticles or solvents) and promoting the biodegradability of materials be a goal of all topics? Should the applicants be expected to assess life cycle implications of the solutions on which they work?
Sources, circularity and feedstocks	Should projects that do not take a circular approach be funded at all in this ERA-Net? Should each future call of M-era.Net contain objectives and scopes for advanced materials-enabled solutions that are resilient; and/or rely heavily on recycling, re-use, and reduced use of virgin raw materials - by design? How should circularity be demonstrated and assessed?  When not taking a circular approach, should applicants focus on where the input materials are sourced from and whether alternative sources could have been used? And if the sources are rare; what effects may resource scarcity have on the economy and society? Are there social issues (for instance labour safety) related to the extraction of the source materials? Are the socio-political issues to consider related to the choice of source materials?
Uncertainty and the Precautionary Principle	Are there important scientific uncertainties with potential important consequences related to the research? If so, how will they be addressed, and should the Precautionary Principle be applied?
Social inequities	If the project aims to develop a technology, will that technology create new vulnerabilities? How will new (circular) practices challenge income potentials among the most vulnerable groups? Will it take the livelihood from the very weakest groups and transfer it to groups with higher education? Will it destabilise power structures, in a positive or negative way? Are there key competences that are required for the safe use of these technologies, and can these be assumed to be available? How can the projects address such issues, if relevant?
Environment, Health and Safety (EHS)	Do lab safety issues etc. need to be specifically mentioned for the call?
Health	If human subjects are involved, human research ethics (including data protection) is a natural requirement. Are there implications for consumer safety or affordability? Should all topics integrate a study of health effects of release of nanoparticles into the environment.
Legal and regulatory issues	Where AI is involved, are there privacy issues that should be addressed? Are there other legal and regulatory issues that should be addressed as integrated to the call?
Sustainability	Buzzword of the 21st Century! What guidance should be written into the topic description to ensure applicants are concrete in their use of the term? To what extent should we focus only on the technologies of the future (such as electric vehicles and corresponding solutions) versus the technologies of today?

### Examples of RRI process dimensions

The second part of embedding RRI into the topic descriptions is to focus on *process*. What design elements / project structures do you think are necessary to ensure projects have capacity to consider issues substantively?

Process	Description
Responsive Design	Allowing for an experimental and responsive approach to research, where the project can change based on learning with stakeholders and other actors. Some projects use a Stage Gating approach.
Interdisciplinary and trans-disciplinary research	Ensuring appropriate inter/trans-disciplinarity in the topic description; the willingness to let one's research actually be influenced by other disciplines or stakeholders
Assessment/Appraisal	Inclusion of assessment or appraisal methodologies, such as sustainability assessment, integrated assessment, technology assessment or life cycle analysis.
User-driven design	Probably for TRL 6 and higher. Here, user driven design, focus groups, etc. can be expected.
Foresight and horizon scanning	Probably for TRL 1-5: Here, anticipation of potential implications of the research, regulatory pathways, uncertainty identification, etc. would be relevant.
Inclusion and engagement methodologies	Science communication and outreach are standard practice now, but RRI calls for two-way engagement with a range of stakeholders and public groups, e.g. through co-creation methodologies. How can this be supported or flagged? Can you formulate the call description to ensure applicants engage in inclusive strategies from the outset?
Advisory Boards	These are an under-utilised but efficient way of ensuring that RRI-type issues are considered across the breadth of the project. Ensure you mandate particular make-up.
Open Science	Openness and sharing of data and results should be practised as far as possible. Consider how desires for openness might relate not just to outputs but also the content of research (e.g. material transfer agreements).

### General considerations

- Control question: What would your critics say (has there been critical media coverage)? Should you change how you define the topic areas as a response to their assumed criticism?
- Taking an RRI approach, could we rethink how the calls are framed overall? Inclusive agenda setting?
- Where should RRI be integrated; integrated into the description of scope, objectives, and/or impact?
- Evaluation criteria, peer review process, monitoring/follow-up of projects, participatory evaluation. There must be a proportionate budget for RRI related activities, otherwise it lacks credibility
- Learning, collaborative evaluation processes between the projects and the ERA Net (SEG and administration) regarding RRI
- What will success look like at the end of this programme?