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PIANOFORTE Partnership

European Partnership for Radiation Protection Research

Horizon-Euratom – 101061037

D 3.4 - General stakeholder recommendations for the PIANOFORTE open calls

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Abstract

Within the PIANOFORTE partnership WP3 a particular attention will be paid to involvement of a wide set of radiation protection stakeholders involved into various project activities in coming years as European Joint Partnership project evolves. Stakeholders should be involved not only during the preparation of the PIANOFORTE research calls, but also into the process of defining the basic criteria for the future calls and, above all, be involved by sharing their present research activities with the partnership consortium. This in order to avoid duplication of research in radiation protection and related research fields throughout ERA and ensure that the research performed meets the societal needs as stated in national and international recommendations, such as the new ICRU/ICRP recommendations¹.

Ensuring that the research defined by topics included in PIANOFORTE Open Calls is relevant, responsive, novel and not multiplied just for the sake of “researching” without serious validation protocols and justification, is the reason why the stakeholder involvement inputs collected during the CONCERT project and the associated research calls are particularly valuable and should build the basis for the activities described in this deliverable.

Involving all the relevant stakeholders at the different stages of the implementation of research projects, as well as an efficient dissemination, knowledge management and uptake of results should be ensured. The target group of this deliverable is therefore two-fold: it is a description on how PIANOFORTE aims to integrate existing research (agendas) in to the PIANOFORTE process, and it describes some ideas how the applicants to PIANOFORTE’s open calls should take this general philosophy to heart as well

Introduction

The Partnership for European research in radiation protection and detection of ionizing radiation: towards a safer use and improved protection of the environment and human health partnership (2022-2027) will contribute improving the protection of the public, workers, patients and the environment from medical, occupational and environmental exposure to ionizing radiation. It brings together 58 partners representing 22 European Union countries, as well as the United Kingdom and Norway.

The partnership will contribute to prioritize European policies, such as European Cancer Beating Action Plan, the protection of health from environmental risks (Green Pact for Growth), and finally the improvement of anticipation and resilience in disaster situations (implementation of the Sendai Framework for Disaster Risk Reduction). To this end, this European partnership promotes multidisciplinary research activities and innovations in a collaborative approach bringing together scientists, authorities and all relevant stakeholders including civil society. Research projects, focused on clearly identified priorities, will be selected through three competitive open calls, open to the entire European radiation protection research community, planned in the following years (see Figure D3.4-04 of this deliverable). EC asked EJP to include more stakeholders in PIANOFORTE EJP than there were in CONCERT, particularly from industry and R&I field (also facilitated with the links to NRP-12 of the Euratom call).

Stakeholder project interaction within partnership (WP3)

¹ 2 ICRP Publication 103 Protection Quantities and ICRU Report 39/51 Operational Quantities; Journal of ICRU, 2020, <https://doi.org/10.1177/1473669120966212>

Particular attention in the partnership will be paid to the involvement of all relevant stakeholders in the priority setting of the scientific topics that will be the subject of calls for proposals and with respect to the question of translating this research into actual impact for strengthened radiation protection through dissemination of project's results into a wide network of various stakeholders.

Throughout the scope of WP 3 (T3.3 & 3.4) assuring communication, dissemination and all sorts of engagement activities the following potentially relevant stakeholder's networks groups (but not limited to these only) in addition to project consortium stakeholder members have been identified:

- European policy makers (EC, Article 31 Group of Experts, HERCA, WENRA and others).
- International organizations and associations - Experts in radiation protection and other related disciplines (IAEA, ICRP, NEA, WHO, ILO, UNSCEAR, IRPA, ENA, ERA, ICRU, IRU and others).
- National policy makers and regulatory authorities – ministries, regulatory bodies, including those at regional and municipality levels - from all European member states and countries.
- Implementers – national representatives from nuclear and non-nuclear industries, medical professional associations, clinical associations in hospitals, waste disposal sites, etc.
- Education & Training Community - academia (universities, research centers, institutes).
- Civil society and affected communities: national, regional, local public organizations gathering impacted public groups, such as but not limited:
 - medical patient's protection and other medical professional organizations,
 - citizens (e.g. citizens science networks; representatives of communities living in areas near legacy sites and of municipalities with nuclear facilities or any other),
 - NGOs.
- Media, all technological types of media – journalists or other persons working in or for media
- Including private portal initiatives and local media
- IT and communication technologies enterprises involved into European Digital Strategy (EU4Digital market) and data collection including the Smart cities initiative and GDPR²

The given groups obviously may have different interests and needs regarding the RP scope of the partnership, therefore, to acknowledge all these, the PIANOFORTE partnership would like to actively involve different representatives in the project's activities not only into the research part and planned open calls.

WP3 objective is thus to meet and integrate the expectations of the wide set of radiation protection stakeholders as best as possible.

For this purpose, the PIANOFORTE stakeholder database will be established. It will be confidentially managed and data stored according to the EU and PIANOFORTE data protection rules².

On contrary, all analyzed results and important project outcomes will be shared with stakeholders in form of reports (deliverables) or other IT means.

The invitation letter is already sent to all EU MS PoMs and PLATFORMS and registration link for all abovementioned stakeholders is already posted to PIANOFORTE web:

<https://pianoforte-partnership.eu/stakeholders>

² Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation),

<https://eur-lex.europa.eu/eli/reg/2016/679/oj>

General stakeholder Guidance for the Open Call project activities

PIANOFORTE EJP is a project based on the Euratom programme which is a part of the EU's efforts to further develop technological leadership and promote excellence in nuclear research and innovation, in particular ensuring the highest standards of safety, security, safeguards, radiation protection, safe spent fuel, radioactive waste management and decommissioning in the nuclear field. Radiation protection research has led to improvements in medical technologies (e.g. diagnosis and radiotherapy) from which many citizens benefit. This research is leading to further improvements in nuclear medicine as well as in other sectors such as industry, agriculture, environment and security. The Euratom programme will expand research into non-power applications of ionizing radiation e.g. links with the Horizon Europe Health activities and Europe's beating cancer plan. It will also develop synergies with other areas (e.g. artificial intelligence, robotics and smart IT solutions).

CONCERT outcomes as a starting base for first Open Call

The starting base for the PIANOFORTE open calls topics and new open calls criteria will be input from its members, the scientific community and stakeholder recommendation, all based on the final revised outputs from the EJP CONCERT partnership, particularly the research needs established through the Strategic Research Agendas (SRA) of radiation protection platforms and the joint research needs and priorities (CONCERT - D8, D2.6 Part 1) from which the Joint Research road map (D3.7) emerged. It has to be pointed out that all (or most) platforms' SRA's have wide stakeholder participation in the setting of research needs for each platform and these stakeholder groups are to be involved into the further PIANOFORTE activities and future research calls.

Based on the experience of how stakeholders were involved in the EJP CONCERT3 programme and its funded research projects (throughout the two Open Calls), and the existing Horizon Europe guidance, this document formulates recommendations that should inform the Call guidance on how the partnership projects should approach stakeholder involvement activities in the future Open calls.

Future Open Call criteria are to be drafted for further consideration considering that there should be a research verification of the soundness and comprehensiveness of results generated in the past research projects and that there is no duplication of research over the already established and applicable research results.

Research priority outcomes from the EJP CONCERT upgraded with the newly refreshed SRA are to be continued and further enriched by PIANOFORTE research outcomes worked out in WP2.

The stakeholder construct from WP3 as a whole is based on the CONCERT EJP outcome explained in C-D5.1; C-D5.2 and C-D5.3. During CONCERT a Public survey in particular, concerns the development of survey activities for a more efficient interaction with civil society and the use of social media for public communication together with the development of a dedicated public/specialists website material (C-D5.4) giving to all EJP participants special insight info of ongoing research and results to be discussed and disseminated among the working parties and prepared to be presented to public. The public survey aimed to gauge the perception of radiation risk amongst a wide range of people who are not radiation specialists and their opinion on information that would be helpful to a general audience to understand radiation risk. The collected information has given us the better view into the possible stakeholders whose interest is RP and who are developing the new IT and AI

³ CONCERT EJP Deliverables : <https://concert-h2020.eu/deliverables>

technologies based on RP applicable research results. All of this data should be available at PIANOFORTE website material links. But, it is to be mentioned that CONCERT public survey did not address research needs or opinions concerning participation in research. Any follow-up surveys within PIANOFORTE will try to learn from the results from the CONCERT survey and build on it.

WP3 – Stakeholder engagement

Stakeholder involvement in PIANOFORTE aims to be systematic, along the entire research process. Synergies should be identified, and stakeholder involvement activities in funded R&I projects should be aligned, where possible. Coordination and fluent stakeholder communication and active involvement will be supported.

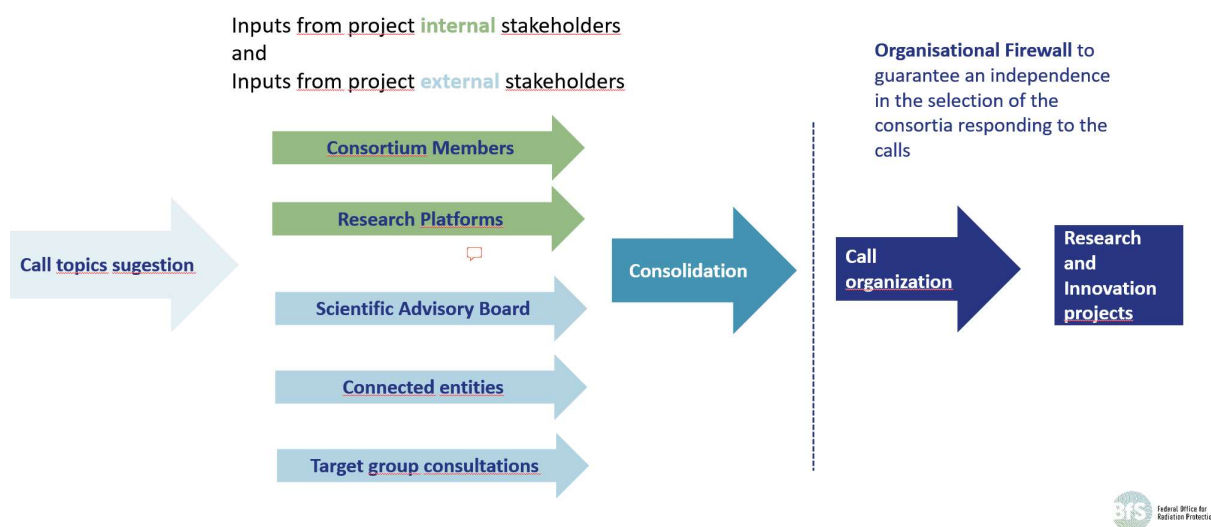


Figure D3.4-02_ Systematic stakeholder involvement in PIANOFORTE

Stakeholder mapping and the establishment of stakeholder networks for their direct engagement in tailoring the Call2 and Call3 research priorities and/or criteria constitute an important pillar of PIANOFORTE’s interaction with external stakeholders. Activities outlined in the stakeholder engagement plan (SEP – WP3T.4) include, among others, an e-survey and topical online (or F2F) consultations and meetings.

Open Calls and criteria

Open Calls should urge PIANOFORTE partners and affiliated entities together with other newly gained stakeholders to foster broad international collaborative research, technological collaboration and human expertise resource mobility. Again, this approach should be interpreted twofold: below we describe the activities within PIANOFORTE to make sure that stakeholder needs learnt in other programs are reflected within the PIANOFORTE prioritisation process. At the same time it is absolutely crucial to adequately translate the overall philosophy of the radiation protection community to put “user needs” first also in the research proposals of the open calls.

This necessity to conduct research with stakeholder needs in mind that has led the PIANOFORTE construction should therefore also be one strong vision of the overall call structure – equally besides scientific excellence and relevance. Any stakeholder activities within the funded research programs should align with the ongoing stakeholder engagement in the partnership. A transparent overview of planned stakeholder activities should be available to the open call applicants so that they can think of integrating the discussion opportunities in their research proposal. It is important to think the open research proposals as (small) parts of an effective chain from “problem” of the citizens” to “solution” for the citizens. Therefore the open calls should mandate a concrete suggestion for problems (definition: for which stakeholder group) and solution (suggestion for transfer) of the suggested research.

The involvement of different stakeholder groups should be planned according to PIANOFORTE objectives under the project general objective to improve the radiological protection of members of the public, patients, workers and environment in all exposure scenarios and provide solutions and recommendations for optimized protection in accordance with the BSS.

This objective will be reached by multi- and inter-disciplinary research and innovation and citizen⁴ involvement activities in a collaborative approach of scientists, regulators and other stakeholders. Research projects focusing on identified research and innovation priorities will be selected through competitive open calls.

Within PIANOFORTE EJP Programme three comprehensive open RTD call envelopes are to be launched from 2022 to 2025 (maybe 2027).

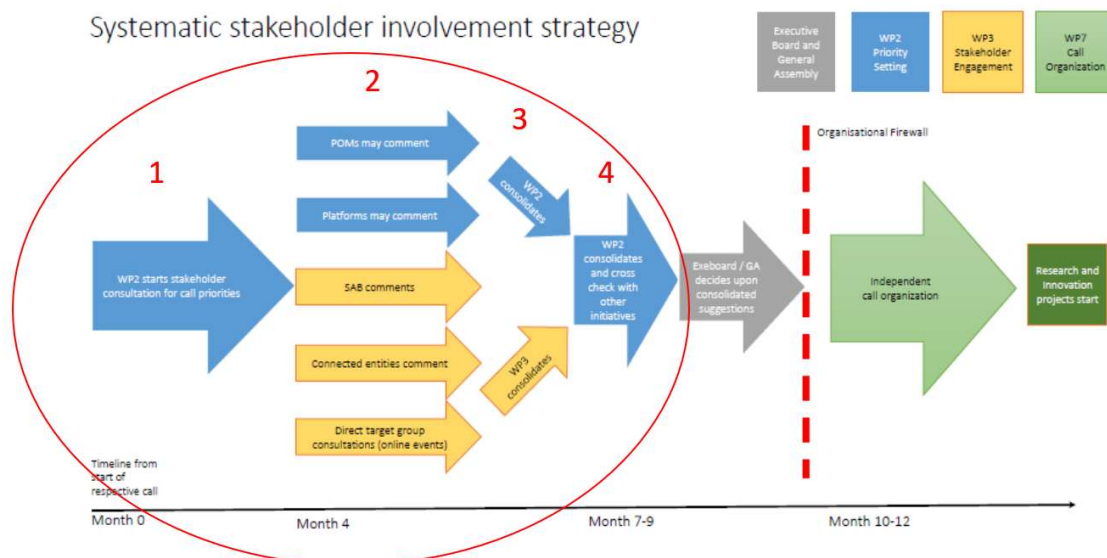


Figure D3.4-03_ Prioritization algorithm as it was given in project proposal

⁴ Citizens’ engagement is considered a key element for the achievement of EU Missions. Moreover, according to the EU Open Science principles, the sharing of knowledge, data and tools should be done “as early as possible in the Research and Innovation (R&T) process, in open collaboration with all relevant knowledge actors, including academia, industry, public authorities, end users, citizens and society at large” (<https://op.europa.eu/en/publication-detail/-/publication/9570017e-cd82-11eb-ac72-01aa75ed71a1>).

Call 1 will be launched not later than in the first quarter of 2023 (M10) and direct stakeholder involvement is expected in throughout the process of prioritization. RP platforms, the SAB, POMs and other stakeholders will have the opportunity to provide their views on the topics proposed for Call 1. As priority setting for Call 1 has to be time-effective the first list of topics will be largely based on the game changers identified in the Joint Radiation Protection Roadmap. Lessons learned and best practices of CONCERT will be a baseline for setting up Call 1.

Call 2 will be launched in March 2024.

There will be limited feedback from the first PIANOFORTE projects available at that time, it is recommended to use the partial outcomes and experience from Call 1 projects for setting the priorities for Call 2.

Call 3 should be launched in March 2025 but not later than end of 2025 allowing to be finish end of 2027. It is important to take stock of the outcomes from Call 1 and experience from Call 2.



Figure D3.4-04_ Open calls timeline as it was given in the PIANOFORTE project proposal

Possible general criteria were proposed by WP2 at PIANOFORTE kick off meeting in Paris in June 2022. It was recommended to make use of general criteria based on research prioritization literature.

Relevance	Who is affected? Who considers the problem important? Is it of community concern/ demand? Size of problem?
Avoidance of duplication	Addresses need or gap unlikely to be addressed through other funding mechanisms?
Urgency / timeliness	What should be done first?
Political acceptability/ commitment	Interest and support from POMs, national authorities, EC?
Feasibility	Complexity of the problem vs. resources required?
Impact	What will the stakeholders get out of it? Use of research results, link to practices or policy decisions? Overall reduction of the problem?

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Figure D3.4-05_ Possible general⁵ criteria - recently updated and sent to Platforms for evaluation/approval
 All members of the future PIANOFORTE stakeholder group (network) and SAB should be introduced with PIANOFORTE specific scientific objectives.

- To innovate in ionising radiation based medical applications combating cancer and other diseases by new and optimized diagnostic and therapeutic approaches improving patient health and safety and supporting transfer of the R&I outcome to practice.
- To improve scientific understanding of the variability in individual radiation response and health risk of exposure.
- To support regulations and implementation of the BSS and improve practices in the domain of low dose exposures of humans and the environment by better understanding and reducing uncertainties in risk estimates.
- To provide the scientific basis to recommendations, procedures and tools for assuring better preparedness to response and recovery from a potential radiological event or nuclear accident and to improve the know-how to manage legacy sites.

Some newly organized stakeholders are expected to be active in the future too.

Stakeholders should be informed via PIANOFORTE web pages and through direct engagement of SAB and other consortium members in disseminating the information to international and national actors.

• 1.Improvement in the understanding of the <u>link between exposure characteristics and ionising radiation effects</u>	Directly reflected in call priorities
• 2. Better knowledge of the main <u>characteristics of the variability in the radiation response</u>	
• 3. Progress in the integration of the different components of radiobiology paving the way to advanced <u>integrative radiobiology</u>	
• 4. Improvement of <u>techniques used to direct radiological population monitoring</u> and <u>indirect monitoring through environment sampling</u>	
• 5. Implementation and use of <u>big data and artificial intelligence</u> techniques	
• 6. Trained young researchers and career upgrades of researchers and experts in radiation protection	Possibly also directly reflected in call priorities
• 7. Creation of a network of radiation protection research facilities	
• 8. Creation of a FAIR database that will allow future use of data gathered during PIANOFORTE	
• 9. Raising awareness among the radiation protection research community of the importance and added value of the inclusion of social sciences in research projects	Added values of the calls
• 10. Strengthening the integration between the six research platforms in radiation protection	
• 11. Support of the implementation of the Basic Safety Standards Directive in the Member States	Added values of the calls
• 12. Improved practices and recommendations for radiation protection professionals	
• 13. Transfer of new <u>optimised</u> medical procedures into clinical practices	Added values of the calls
• 14. Elements to pave the way to <u>personalised</u> medicine	
• 15. Improvement of the radiation protection of patients and of the general public in normal and accidental situations	Added values of the calls
• 16. Better knowledge on radiation risks	

Figure D3.4-06_ Expected outcomes and added values.

⁵ PIANOFORTE Kick off meeting, 16.June 2022. Paris – WP2 lead presentation

During the “learning from experience” process the objectives of research topics should take into consideration synergies with other research areas covering the EU sustainability plan, Green EU, EU Beating cancer Plan, SAMIRA programme, Fusion EJP group, RadWaste EJP, Space programs, particularly research topics linked with RP research contributing to sustainable development and mitigating climate change.



Figure D3.4-07_ EU Mission areas supporting Europe’s transformation into a “greener, healthier, more inclusive and resilient continent”. EU Beating Cancer Plan, as a driving research in RP during medical applications is outlined in thick red.

Upgrading the contact with the Article 31 group⁶

⁶ https://inis.iaea.org/collection/NCLCollectionStore/_Public/37/115/37115820.pdf

As the Article 31- group of experts advises the European Commission on all relevant issues related to radiation protection. PIANOFORTE EJP will continue to work with it, as this is one of the most relevant stakeholders.

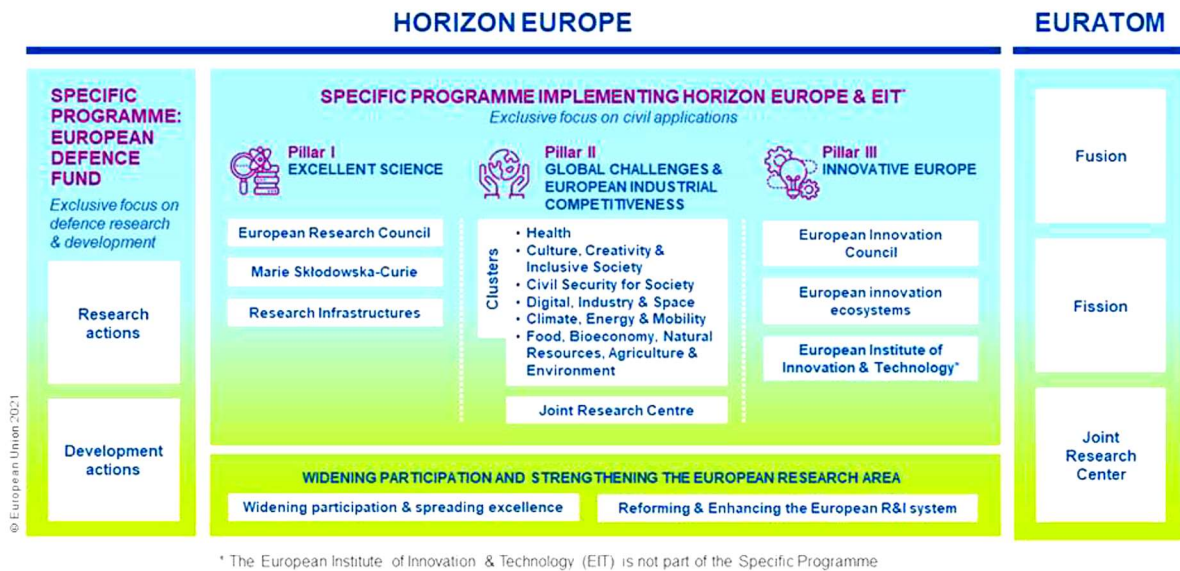


Figure D3.4-08_ HORIZON Europe and Euratom R&T scheme is presented to express the complexity of the research scheme in EU and to stress out the need for RP EJP existence.

These research needs are slightly upgraded during 2019-2022 period and now this stakeholder group representing all EU countries supports all national relevant RP research fields (some fusion issues if connected to RP research are also included) and group highly contributes to European harmonization of RP⁷.

Euratom research funded projects on Radiation Protection – research continuity in RP

On May 17th 2022 during meeting⁸ of group of Experts referred to in Article 31 of the Euratom treaty the present overview of the research funded projects on RP was given. The PIANOFORTE partnership-Horizon Europe (2021-2027) was introduced as a continuation of the joint stakeholder research partnership established by CONCERT EJP (2014.- 2020).

Recent and ongoing research projects relevant to PIANOFORTE are listed below.

- Currently/recently funded Euratom Research Radiation Protection Projects - H2020 (2014-2020)
- | | | |
|---------------------|----------------------|-------------------------|
| HARMONIC | 1.06.2019-30.11.2024 | Total cost: ~7 m. Euros |
| EURAMED-rocc-n-roll | 1.09.2020-31.08.2023 | Total cost:~2 m. Euros |
| SINFONIA | 1.09.2020-31.08.2024 | Total cost:~6 m. Euros |

⁷ Paragraph 6;6.1 & 6.2 of [https://inis.iaea.org/collection/NCLCollectionStore/ Public/37/115/37115820.pdf](https://inis.iaea.org/collection/NCLCollectionStore/Public/37/115/37115820.pdf)

⁸ Elena Righi-Steele, HoU; Unit C.4-Euratom research DG research & Innovation European Commission.

TOURR	1.10.2020-31.09.2020	
RadoNorm	1.09.2020-31.08.2025	Total cost:~22 m. Euros

Recently closed:

CONCERT closed	1.06.2015-31.05.2020	Total cost:~32 m. Euros
MEDIRAD closed	1.06.2017-28.02.2022	Total cost:~10 m. Euros
TRANSAT closed	1.09.2017-28.02.2022	Total cost:~ 5 m. Euros (Fusin-Fission)

- Incoming Euratom Research Partnership for European research in Radiation Protection and detection of ionizing radiation **PIANOFORTE** - Horizon Europe (2021-2027) (ongoing)

PIANOFORTE EJP (from 01.06.2022)

- Incoming Fusion-Fission

TITANS Tritium Impact and Transfer in Adv. Nuclear reactorS (from 01.09.2022)

SECURE Safe use and reliable supply of medical radionuclides (from 01.10.2022)

This project will affect WP3 Task 3.5)

- Euratom Research in Fusion (not RP issue but will be a multitopic joint research programme including RP)

EUROfusion Cofund action on the implementation of activities described in the Roadmap to Fusion during Horizon Europe through a joint programme of the members of the EUROfusion consortium (1.1.2021 – 31.12.2025)

EUROfusion will intensify its efforts in the development of **multi-disciplinary** nuclear competences and increase the number of qualified researchers and engineers in nuclear materials, rad-hard instrumentation, nuclear safety, **radiation protection**, decommissioning, and radioactive waste management.

- SNETP The Sustainable Nuclear Energy Technology Platform
- EURAMET The European Partnership on Metrology (HORIZON EU)

In the last five year's project period a considerable funding was available for the medicine related research project from which some of them are partly or fully based on RP research (occupational and/or patient exposure burden from medical use of ionizing radiation).

Apart of the Euratom funded research projects there are several large projects involving the use of ionizing radiation for medical diagnostic and radiotherapy/radiosurgery treatments financed by HORIZON 2020 through EU4Health programme⁹ and large Europe's Beating Cancer Plan¹⁰.

- EC SAMIRA Action Plan¹¹ – the Strategic Agenda for Medical Ionising Radiation Applications (2021).

SIMPLERAD Study on the implementation of the Euratom and the EU legal bases with respect to the therapeutic uses of radiopharmaceuticals.

QuADRANT Constant improvement in quality and safety of radiology, radiotherapy and nuclear medicine through clinical audit

EU-JUST-CT European co-ordinated action on improving justification of computed tomography.

⁹ EU4Health programme: <https://eu4health.eu/>

¹⁰ Europe's beating Cancer Plan: https://health.ec.europa.eu/system/files/2022-02/eu_cancer_plan_en_0.pdf

¹¹ EC SAMIRA Action Plan : https://ec.europa.eu/commission/presscorner/detail/en/IP_21_265

SAMIRA Study on the Implementation of Council Directive 2013/59/Euratom requirements for medical equipment with respect to monitoring and control of patient's radiation exposures.
i-VIOLIN Implementing verifiable oncological imaging by quality assurance and optimisation.

- JRC Research Centre Research programme related to RP (more than 12 granted projects related to RP)
- RP Research based on Euratom Secondary Legislation:
Drinking water (Radon Action Plans connected; tritium)
Food and feed regulation – environmental impact and post Chernobyl and Fukushima (accidents and emergencies)
Spent fuel and radioactive waste management Directive
- Radioecology¹² research and educational projects under various funding schemes.
- RP research activities and R&D under the EU Platform funding schemes:
EURADOS, NERIS, SHARE, EURMED, etc..
- EURAMET
- Research activities on RP under other international organizational schemes:
IAEA; IRPA; ICRU; NEA-CRPH ; WHO ; HERCA etc + EU member states national objectives and priorities

Europe's Beating Cancer Plan¹³ caused the development of a new EC document: *Proposal¹⁴ for a COUNCIL RECOMMENDATION on strengthening prevention through early detection: A new EU approach on cancer screening replacing Council Recommendation 2003/878/EC* which was adopted on 20.09.2022. Annex to the Proposal for a Council Recommendation (CR) on Strengthening prevention through early detection: *A new approach on cancer screening replacing CR 2003/878/EC* was accepted to. For our stakeholder WP3 of PIANOFORTE a document entitled *Stakeholder consultation on Proposal for a Council Recommendation (CR) on Strengthening prevention through early detection - Synopsis report¹⁵* is of an importance showing the regulatory road of how to implement the relevant research results into a real life.

The above presented set of EC documents covers RP in medicine introducing the main changes concerning the use of radiological imaging in cancer screening as follows:

- expansion of the age range and the recognition of Digital Breast Tomosynthesis (DBT) for breast cancer screening,
- introduction of implementation studies to test the feasibility of low dose CT for lung cancer screening.

The recommendation puts also a strong general emphasis on quality and staff training (E&T), and the particular recognition of key aspects relating to ensuring quality and safety of screening programmes and techniques using ionising radiation, based on the BSS Directive¹⁶.

¹² See <https://radioecology-exchange.org/>

¹³ Europe's beating Cancer Plan: https://health.ec.europa.eu/system/files/2022-02/eu_cancer-plan_en_0.pdf

¹⁴ [Proposal for a Council Recommendation \(CR\) on Strengthening prevention through early detection: A new approach on cancer screening replacing CR 2003/878/EC \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022P0001&from=do)

¹⁵ [Stakeholder consultation on Proposal for a Council Recommendation \(CR\) on Strengthening prevention through early detection - Synopsis report \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022P0001&from=do)

¹⁶ [European Health Union: cancer screening \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D0001&from=do)

What partnership projects should look for considering the stakeholder activities

PIANOFORTE EPJ will through its Tasks under WP3 aspire to have a good overview and, if possible, a corresponding link to abovementioned projects (outcomes of finished or scope and mission of ongoing and new) because of building up a quality base of research topics which are covered by stakeholder activities involved in the project consortiums, boards and reviewers.

All research institutions, universities and other stakeholder groups which are involved in the abovementioned projects form a targeted existing stakeholder group for PIANOFORTE. Their involvement should help avoiding the duplication of research throughout new PIANOFORTE Open Calls if the research topics included into the partnership platforms SRA's are already performed and covered by the abovementioned projects covering ERA. If there is a need or some other strongly argued reason to do the validation of research topics, it is recommended to join the stakeholder performing that research into the PIANOFORTE rather than to incorporate duplicated validation into the new open calls.

Stakeholders directly involved in the partnership should be grouped throughout activities of the project's WP5: Infrastructures and data management for radiation protection research and benefit from all research EJP activities

Important goals are to promote harmonization of quality standards, practices and protocols in all areas relevant to implementation of the research roadmap and to develop a strategic work plan for utilisation, novel uses and inter-operability of key RPR infrastructures.

WP6 activities in Knowledge management, communication, dissemination and impact creation are extremely important during the resetting, upgrading and evaluating the research priorities for open calls. The on-line communication tool will enable stakeholders to be involved in the knowledge management and dissemination of research outcomes which can be used for creation of impact to a whole society (applicable technological important and R&D relevant project outcomes). The on-line tool will have a great social media echo if properly managed and presented so that a young population can be attracted into the RP community understanding the goals and reasons why RP is one of the pillars of our modern society.

Stakeholder involvement in EJP PIANOFORTE and funded research projects

In accordance with PIANOFORTE objectives and the Horizon Europe guidelines, projects should strive towards involving citizens, public authorities, business, industry, and academia in the design, development, and implementation of project products, methods and services, as this "engages and empowers citizens, enhances the resilience of communities, increases the relevance, *acceptance and uptake* of innovation, and helps foster lasting changes in social practices" (European Commission, 202217).

Projects should clarify the methods applied and the level of involvement of each stakeholder or stakeholder group, in each phase of the research process: from lower levels of interactions such as provision of information or consultation, to higher levels of interaction, such as dialogue, collaboration,

¹⁷ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/programme-guide_horizon_en.pdf

or empowerment through partnerships or citizen science projects. Projects are encouraged to aim for forms of involvement with higher levels of interaction.

Impact of the ICRU/ICRP new operational quantities in radiation protection on all future EJP PIANOFORTE Open Calls and research outcomes

A vivid discussion of the Group of Experts of the Art.31 EURATOM about potential policy implications and research needs under the key research area affected by ICRU/ICRP report relevant to dosimetry regarding new operational quantities in RP resulted in pre-published EC RP 197 publication (2022)¹⁸ covering relevant research input to be harmonized and uniquely accepted by all stakeholders involved in RP.

It is recommended that the hint for the researchers applying the Open Calls should be clearly stated in the call that it is recommendable to use the unique, harmonized, calibrated, certified and accredited measurement methods and. If acceptable, new ICRP/ICRU quantities in dosimetry in order to gain the harmonized research outcomes data base based on clear definition and distinction of doses. ... relevant citations¹⁹:

“Calculations of hypothetical contributions to the dose are mere planning tools and do not represent actual exposures. Hypothetical dose contributions have to be clearly distinguished and marked as such. In most cases, they also have large uncertainties which – whenever meaningful possible – should be given”

“What cannot be recognized as a deviation from normality, and proved, has to be considered as normal”

“If something can be measured it does not yet mean that it is relevant for safety or even dangerous”

First statement is of a relevance for any RP research covering medical use of ionizing sources and exposures including the exposures of tissue and cell samples (EU Beating Cancer Plan - https://health.ec.europa.eu/system/files/2022-02/eu_cancer-plan_en_0.pdf).

The last two statements are cited because they are of a great relevance for the environmental and radiobiological research and research attention on them is to be stated into the Open Calls Guidance.

Avoiding the duplication of RP research

One of important goals of the new PIANOFORTE Open Calls package is to avoid the duplication of ongoing or already well performed RP research and repetition of multiple validations of project statistical outcomes in order to confirm uncertainties which are not meaningful in future RP practice.

For instance, there are numerous already ongoing EU projects covering indoor radon issues. While it is an important public health problem, it might be considered of lower priority for PIANOFORTE, given the ongoing research efforts.

¹⁸ EC RP 197; Working Party on Research Implications on Health and Safety Standards of the Article 31 Group of Experts; Proceedings of a scientific seminar held via WebEx on 9 November 2021; Directorate-General for Energy, Directorate D-Nuclear Energy, Safety and ITER, Unit D3-Radiation Protection and Nuclear Safety 2022

¹⁹ Fachverband Fuer Strahlenschutz e.V Mitgliedschaft der IRPA: Radiation protection today – success, problems, recommendation for the future. 2018. (<https://www.researchgate.net/publication/328190296>)

According to available research literature data and echoes coming from stakeholders working in practical RP fields, research on doses to the lens of the eye should be moved towards the research of neurosciences and other, wider, systemic effects focused on multiple radiation health effects²⁰ Opposite to this, fusion energy impact on human health is not yet sufficiently addressed by the RP research community.

Relevant RP research inputs from fusion research and sibling technologies

EU scientific Seminar²¹ on Radiological protection considerations for fusion reactors will be held in Luxembourg in November 2022. The outcomes of the seminar will be eligible to be discussed within the PIANOFORTE stakeholder group in order to gain links and possible not yet performed research input into the PIANOFORTE second Open Call not duplicating the RP research under the fusion flag.

E&T policy and strategy in radiation protection related themes

The CONCERT project introduced E&T courses dedicated to students and education related stakeholders. This Initiative was performed through 14 applications (C-D7.9).

It is recommended that PIANOFORTE EJP should support such educational initiatives strengthening them to be broadened and accessible to “other” types of stakeholders (not only universities) training the RP experts foreseen in the new Euratom BSS directive.

This will harmonize the RP needed knowledge all over the EU and will ease the mobility of RP specialists, students and related experts of involved stakeholders.

It is suggested that PIANOFORTE EJP Open Calls incorporate a need to support the researchers proposing the Open Call projects, to present the reasonable way of project knowledge dissemination not only via Open Access literature but via small internal courses, web based short symposia, courses or else forming the PIANOFORTE E&T additional educational data base accessible to any stakeholder (involved or not in the project) for further use in educational and training processes locally.

Suggestion to PIANOFORTE ExB is to support the construct harmonized educational Guidance building it out as the EJP project evolves. The S&H SRA is to be used constructing the harmonized EU training for expert curriculum and in PIANOFORTE involved S&H stakeholders should propose²² and finalize the Guidance as one of the efforts already supported by actions of WP 5 linking it with the outcomes from WP4, especially WP4 Task 3: *Promoting harmonization of quality standards, practice and protocols.*

²⁰ <https://doi.org/10.1016/j.envint.2020.106213>

²¹ Working Party on Research Implications on Health and Safety Standards of the Article 31 Group of Experts; Directorate-General for Energy, Directorate D- Nuclear Energy, Safety and ITER, Unit D3- Radiation Protection and Nuclear Safety, 2022

²² During the CONCERT EJP an example of building up and harmonizing the RP educational curriculum was successfully performed by IMROH, UNI Zagreb-RGN and SCK·CEN under the Project HRPE „Development of a training curriculum for radiation protection experts in Croatia“ financed by Belgian Government and IMROH and performed by SCK·CEN during the 2020 and 2021 under the complicate COVID_19 restrictions.

Ethical Issues

Ethical issues are to be addressed in all of the research and E&T protocols (universities and/or RP experts) as it is stated in European Commission Ethics Issue; Table template (version 1.1; July 11th 2014).

Conclusions

This document aims to help various stakeholders inclusive those which have not yet joined the PIANOFORTE EJP network to reach the decision of their involvement in the RP research enriching with new and validated knowledge the ERA and helping the industry and medicine to gain and produce new high technological products based on the peaceful and innovative use of ionizing radiation.

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