Marie Sklodowska-Curie Actions (MSCA)
Horizon Europe

DOCTORAL NETWORKS MSCA DN 2021
Novelties and rules for participation

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Content

- Submission and proposal structure
- Evaluation Process
- Award Criteria: how to write Excellence / Impact / Implementation sections
- General tips
- Useful resources

DN 2021: Submission and proposal structure

- **PART A**
- **PART B**
  - ✓ **B1 (30 pages)**
  - ✓ **B2**

DN 2021: Submission and proposal structure

DN specificities of Part A proposal template:

- **3 submission links**, 1 per modality (standard DN, Industrial Doctorates, Joint Doctorates);
- **Associated partners register in the tool like beneficiaries** (with a validated or temporary PIC);
- **Scientific panel and keywords selection** (similar to H2020, guidance on REA website);
- **Unit-cost budget table;**

DN specificities of Part B proposal template:

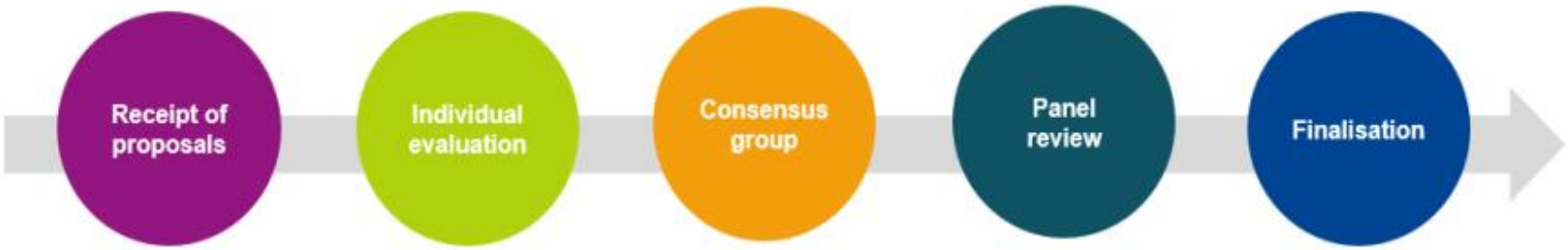
Part B1:

- Follows the **award criteria;**
- **Same page-limit** as in H2020;
- **Instructions** included in the template;
- **Harmonised** with RIA/IA corporate template whenever possible.

Part B2:

- **Description of participants** (similar to H2020);
- **Letters of commitment** (templates similar to H2020);

DN 2021: Overview of the evaluation process



Receipt of proposals

Admissibility/eligibility check

Allocation of proposals to evaluators

Individual evaluation

Experts assess proposals **individually**.

Minimum of three experts per proposal (but often more than three).

Consensus group

All individual experts discuss together to agree on a **common position**, including comments and scores for each proposal.

Panel review

The panel of experts reach an **agreement** on the scores and comments for all proposals within a call, checking **consistency across the evaluations**.

if necessary, resolve cases where evaluators were unable to agree.

Rank the proposals with the same score

Finalisation

The Commission/Agency reviews the results of the experts' evaluation and puts together the **final ranking list**.

DN 2021: Criteria and equal proposals

Criteria	Weight	Priority (ex.aequo)
Excellence	50%	1
Impact	30%	2
Implementation	20%	3

Novelties

From 2022:

- Limit on resubmission. Proposals that have obtained less than 80% may not be submitted again
- Public bodies, research organisations and higher education establishments will be required to have a gender equality plan (GEP) in place (this criteria applies to all Horizon Europe funding).

DN 2021: Award Criteria

EXCELLENCE	IMPACT	QUALITY AND EFFICIENCY OF THE IMPLEMENTATION
Quality and pertinence of the project's research and innovation objectives	Contribution to structuring doctoral training at European level and strengthening European innovation capacity	Quality and effectiveness of the work plan, assessment of risks, and appropriateness of the effort assigned to work packages
Soundness of the proposed methodology	Credibility of the measures to enhance the **career perspectives of researchers** and contribution to their skills development	Quality, capacity and role of each participant, including hosting arrangements and extent to which the consortium as a whole brings together the necessary expertise
Quality and credibility of the training programme	Suitability and quality of the measures to maximise expected **outcomes and impacts**, as set out in the dissemination and exploitation plan, including communication activities	
Quality of the supervision	The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts	
50%	**30%**	**20%**

DN 2021: Excellence Criteria

H2020		Horizon Europe
1.1. Quality, innovative aspects and credibility of the research programme	→	1.1 Quality and pertinence of the project's research and innovation objectives **1.2 Soundness of the proposed methodology** **Wider! Harmonised with RIA/IA**
1.2 Quality and innovative aspects of the training programme	→	1.3 Quality and credibility of the training programme
1.3 Quality of the supervision (including mandatory joint supervision for EID and EJD)	→	1.4 Quality of the supervision (including mandatory joint supervision for industrial and doctorate programmes)
1.4 *Quality of the proposed interaction between the participating organisations*	→	• It disappears as a section but its content must be incorporated in the previous subsections of this point. • There is a reference in point *3.2, Quality, capacity and role of each participant*

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DN 2021: Impact Criteria

H2020

2.1 Enhancing the career perspectives and employability of researchers and contribution to their skills development

2.2 Contribution to structuring doctoral/early-stage research training at the European level and to strengthening European innovation capacity,

2.3 Quality of the proposed measures to exploit and disseminate the results

2.4 Quality of the proposed measures to communicate the activities to different target audiences

Horizon Europe

2.1 Contribution to structuring doctoral training at the European level and to strengthening European innovation capacity,

2.2 Credibility of the measures to enhance the career perspectives and employability of researchers and contribution to their skills development

2.3 Suitability and Quality of the measures to maximize expected outcomes and impacts, dissemination, exploitation and communication activities

New

2.4 The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts (project's pathways towards impact)

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DN 2021: Implementation Criteria

H2020	Horizon Europe
3.1 Coherence and effectiveness of the work plan 3.2 Appropriateness of the management structures and procedures	3.1 Quality and effectiveness of the work plan, assessment of risks and appropriateness of the effort assigned to work packages
3.3 Appropriateness of the infrastructure of the participating organisations 3.4 Competences, experience and complementarity of the participating organisations and their commitment to the programme	3.2 Quality, capacity and role of each participant, including hosting arrangements and extent to which the consortium as a whole brings together the necessary expertise

DN 2021: Excellence – Research Objectives

1.1 Quality and pertinence of the project's research and innovation objectives (and the extent to which they are ambitious, and go beyond the state of the art)

Required sub-headings:

- Introduction, objectives and overview of the research programme. It should be explained how the individual projects of the recruited researchers will be integrated into – and contribute to – the overall research programme. All proposals should also describe the research projects in the context of a doctoral training programme. Are the objectives measurable and verifiable? Are they realistically achievable?
- Pertinence and innovative aspects of the research programme (in light of the current state of the art and existing programmes / networks / doctoral research trainings). Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious.

The action should be divided in **Work Packages** and described in the table below. The Work Packages should reflect the research objectives. Only brief headings and overviews of the Work Packages should be presented in Table 1.1. More details in terms of actual implementation should be provided in the tables under section 3.1.

Table 1.1: Work Package[5] (WP) List

WP No.	WP Title	Lead Beneficiary No.	Start Month	End month	Activity Type[6]	Lead Beneficiary Short Name	Researcher involvement[7]

- ❑ Start with an "**executive summary of your DN programme**"
- ✓ Explain What, why, who, how
- ✓ Introduce the relevance and timeliness of your research by citing policies
- ✓ Define a clear and focused research goal and specific **research objectives**
- ✓ Briefly explain novelty of your research objectives compared to the SoA (remember up todate bibliography)

- ❑ Highlight the originality **and innovative aspects** of the project:
- ✓ Why does Europe need this DN in this research area?
- ✓ Check for similar DNs: what are the synergies, what are the differences?

- ❑ **Work Packages**
- ✓ Break down the research programme into WPs that link to your research objectives

DN 2021: Excellence - Methodology

1.2 Soundness of the proposed methodology (including interdisciplinary approaches, consideration of the gender dimension and other diversity aspects if relevant for the research project, and the quality and appropriateness of open science practices)

Required sub-headings:

- Overall methodology: Describe and explain the overall methodology including the concepts, models and assumptions that underpin your work. Explain how this will enable you to deliver your project's objectives. Refer to any important challenges you may have identified in the chosen methodology and how you intend to overcome them.

- Integration of methods and disciplines to pursue the objectives: Explain how expertise and methods from different disciplines will be brought together and integrated in pursuit of your objectives. If you consider that an inter-disciplinary approach is unnecessary in the context of the proposed work, please provide a justification.

- Gender dimension and other diversity aspects: Describe how the gender dimension and other diversity aspects are taken into account in the project's research and innovation content. If you do not consider such a gender dimension to be relevant in your project, please provide a justification.

⚠ *Remember that that this question relates to the content of the planned research and innovation activities, and not to gender balance in the teams in charge of carrying out the project.*

⚠ *Sex, gender and diversity analysis refers to biological characteristics and social/cultural factors respectively. For guidance on methods of sex / gender analysis and the issues to be taken into account, please refer to https://ec.europa.eu/info/news/gendered-innovations-2-2020-nov-24_en*

- *Open science practices:* Describe how appropriate open science practices are implemented as an integral part of the proposed methodology. Show how the choice of practices and their implementation are adapted to the nature of your work, in a way that will increase the chances of the project delivering on its objectives. If you believe that none of these practices are appropriate for your project, please provide a justification here.

- *Research data management and management of other research outputs:* Applicants generating/collecting data and/or other research outputs (except for publications) during the project must provide maximum 1 page on how the data will be managed in line with the FAIR principles (Findable, Accessible, Interoperable, Reusable), addressing the following (the description should be specific to your project):

- ❑ Describe the **research methodology** used:
- ✓ What techniques, methods will be used in addressing the research objectives (visual….).
- ❑ Don´t ignore **gendered innovations**
- ❑ Enhance **multi/disciplinarity aspects**
- ❑ **Open Science (Open Access & Citizen Science)**
- ❑ **Research Data Management**

Novelty

Analysis of previous projects.

Previous project	Description	Project issues not covered (and covered by ACRONYM)

Show the state of the art in each of the participating disciplines. Show the potential to change things.

Example complete

DN 2021: Excellence - Methodology

Table 1.1: Work Package List

WP No	Work Package Title	Activity Type	Lead Participant No	Lead Participant Short Name	Start Month	End month	ESRs involvement Main / [Linked]
1	Radiation Environments, Facilities & Monitoring	Research	4	JYU	4	40	1-5 / [6-15]
2	Reliability (with and w/o radiation) & Testing	Research	6	UM2	4	40	6-11 / [1-5, 13-15]
3	Qualification requirements for integrated or complete systems	Research	3	AGIF	4	40	12-14 / [1-7, 9-11, 15]
4	Methodology & Guidelines	Research	1	CERN	10	46	15 / [1-14]
5	Training	Training	5	KUL	1	48	1-15
6	Communication and Outreach	Communication	5	KUL	1	48	1-15
7	Management	Management	1	CERN	1	48	N/A

ESR involvement within the multi-disciplinary field on research and applications

The network will specifically train young researchers in R&D topics that cover the **multiple disciplines** required in the fast evolving field of radiation effects on electronics used in a large variety of **inter-sectorial** applications: electronic system design, integrated circuit design, FPGA design, nuclear and semiconductor physics, modelling of radiation effects, reliability requirements, predictive tools for assessing reliability under radiation, qualification standards and methods; all of which are required for a large variety of industrial (communication, earth observation, launchers, avionics, cars, trains, nuclear installations) as well as scientific (accelerators, space) applications; and requiring new scientific insight, new training courses and future experts in the field.

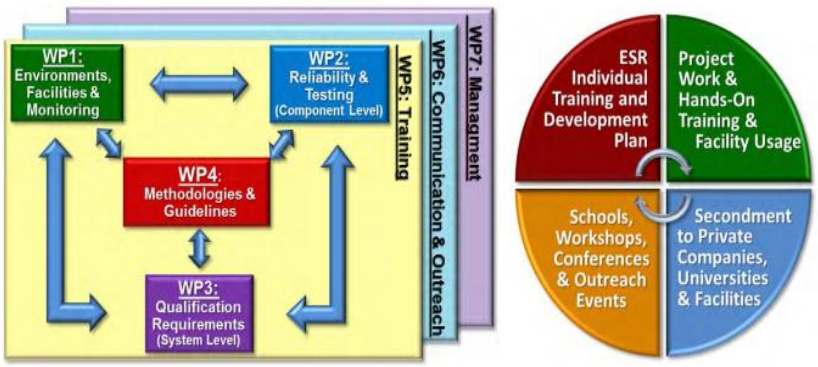


Figure 1.2: Application areas where reliability issues and radiation effects are of increasing importance.

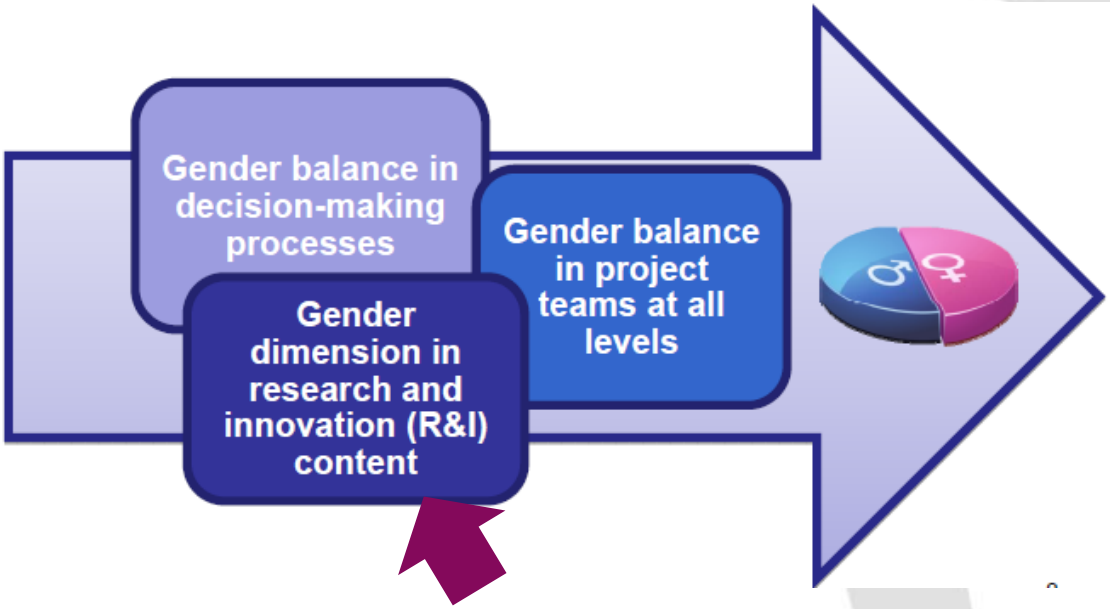
https://indico.cern.ch/event/443637/contributions/1935896/attachments/1150132/1650582/H2020-MSCA-ITN-2015_675077_SIGNED_PROPOSAL.pdf

DN 2021: Excellence – Gender dimension and diversity aspects

- Gender dimension and other diversity aspects: Describe how the gender dimension and other diversity aspects are taken into account in the project's research and innovation content. If you do not consider such a gender dimension to be relevant in your project, please provide a justification.

Gender + Diversity (race, age, sexuality, etc)

- Sex (biological quality)
- Gender (socio-cultural process)



Género–Integrarlo en la Investigación

La integración de la dimensión de género en la investigación es un **VALOR** ya que:

- Aporta en términos de excelencia, creatividad y oportunidad de negocio
- Ayuda a los investigadores a cuestionar las normas, los estereotipos y modelos de referencia
- Permite una comprensión profunda de las necesidades, comportamientos y actitudes de ambos sexos
- Mejora la relevancia social del conocimiento, las tecnologías y las innovaciones
- Ayuda a crear bienes y servicios más adecuados para los mercados potenciales

Tools:
- ✓ Gender in Research: https://www.yellowwindow.com/genderinresearch
- ✓ Gendered innovations http://genderedinnovations.stanford.edu

Algunas **SUGERENCIAS** para tu propuesta:

- *¿Hay alguna diferencia de sexo que deba investigarse y/o abordarse?*
- *¿Has cuestionado los supuestos de género que pueden influir en tus prioridades científicas, preguntas de investigación y métodos?*
- *¿Esperas que los resultados de tu investigación afecten de manera ≠ a hombres y mujeres, niñas y niños?*

- ✓ Incluye estudios específicos sobre género en las actividades de tu proyecto (c. elegible)
- ✓ Utiliza datos desagregados
- ✓ Aplica metodologías que permitan análisis diferenciado de género
- ✓ Incorpora refrencias a estudios/Proyectos sobre género
- ✓ Realiza actividades de formación sobre la dimensión de género (c. elegible)
- ✓ Incorpora investigadores con experiencia en género entre su personal de Investigación
- ✓ Si es relevante, tareas o WP específicos sobre gènero

DN 2021: Gender balance in project teams at all levels

- **Researcher's involve in the proposal.**
  ✓Part A_table (template)

- **Recruitment/promotion processes:**
  ✓Policy on gender balance of selection panels.
  ✓Policy on equality training for members of selection panels.
  ✓Development of gender-aware recruitment processes.
  ✓Attracting female fellows to male-dominated STEM disciplines .

Section: 3.1; 3.2

- **Supporting women/men in career progression:**
  ✓Career/professional development programs.
  ✓Mentoring programme .
  i.e: Mentoring M2M (UPC); MENTOS Mentoring Female Engineering Students (UPF

Section: 1.4; 2.1; or 3.1 & 3.2

DN 2021: Gender balance in decision-making process

- **Project Governance structures:**
  - ✓Consortium governance.
  - ✓Advisory board members.
  - ✓Etc.

Section: 3.2

- General aspects (all sections):
  - ✓ Suport/Synergies/ etc with other institutional gender activities:
  - ✓ Gender Equality Offices.
  - ✓ Gender Equality Plans.
  - ✓ Gender experts.
  - ✓ Gender projects.
- If gender is a key issue, include an specific Work Package on gender.
- Tool: http://www.rri-tools.eu/

DN 2021: Gender _key performance indicadors

Table 1: indicators for inspiration	
Gender Equality	
MoRRI	GE1: Share of research performing organisations (RPOs) with a gender equality plan
	GE2: Share of female researchers by sector
	GE3: Share of Research Funding Organisations (RFOs) promoting gender content in research
	GE5: Share of RPOs with policies to promote gender in research content
	GE10: Number and share of female inventors and authors
SDGs	5.5. Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life o 5.5.2: Proportion of women in managerial positions o 5.c: Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels o 5.c.1: Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment
	4.5: By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations o 4.5.1: Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated

Impact section

Source: GRACE, ***Grounding RRI Actions to Achieve Institutional Change in European Research Funding and Performing Organisations*** Project (SWAFS-2017 GA nº 824521)

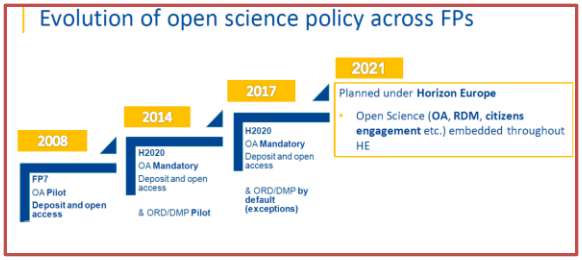
DN 2021: Open Sciences Practices

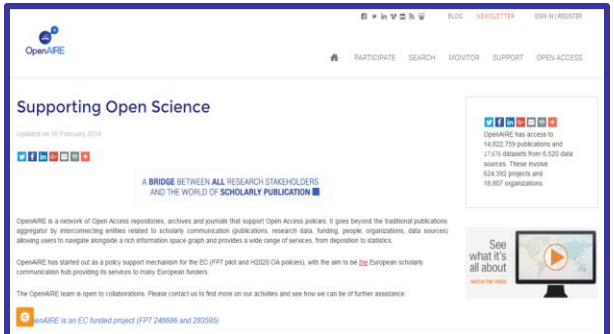
Open Science

Open science is an approach based on **open** cooperative work and systematic **sharing of knowledge and tools** as early and widely as possible in the process. Including active **engagement of society**

- **Mandatory immediate Open Access to publications:** beneficiaries must retain sufficient IPRs to comply with open access requirements;
- **Data sharing as 'open as possible, as closed as necessary':** mandatory Data Management Plan for FAIR (Findable, Accessible, Interoperable, Reusable) research data
- **Engagement of Society**

DN 2021: Open Science_Open Access





FECYT (national helpdesk) for doubts concerning Open Access: openairespain@fecyt.es.

- **Mandatory immediate Open Access to publications**: beneficiaries must retain sufficient IPRs to comply with open access requirements;
- **Hybrid journals** are not an eligible cost
- **Data sharing as 'open as possible, as closed as necessary':**
- Mandatory **Data Management** Plan for research data. (Include: type od data; staorage/repositories) Hoe to make it access, etc).
- Data should be **FAIR** (Findable, Accessible, Interoperable, Reusable)
- **Exceptions to open access** (duly justified in the DMP; legitimate interests or constraints)

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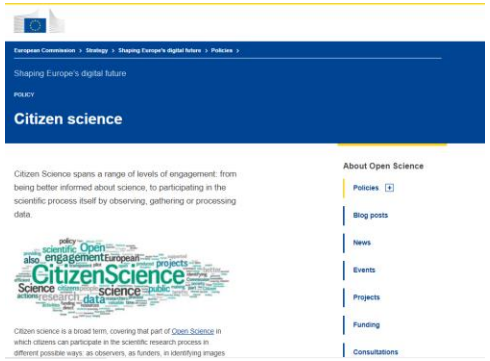
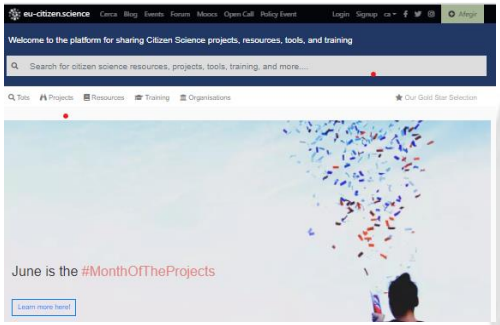
DN 2021: Open Science_Engagement of Society

- **Involving all relevant knowledge actors** including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science)
- Citizen-Science; Multiactor approach; Co-creation; Cross-fertlisation; End-used; Outeach Activieties; Mutual learning.

- Good practice: "To achieve the aim of maximising the project impact, the project has foreseen mechanisms that include the early stakeholders' engagement and the co-creation approach".



Enlace



Enlace

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DN 2021: Excellence - Training

1.3 Quality and credibility of the training programme (including transferable skills, inter/multidisciplinary, inter-sectoral and gender as well as other diversity aspects)

Required sub-headings:

- Overview and content structure of the doctoral training programme, including network-wide training events and complementarity with those programmes offered locally at the participating organisations (please include table 1.3a and table 1.3b).
- Role of non-academic sector in the training programme.

Table 1.3 a **Recruitment Deliverables per Beneficiary**

Researcher No.	Recruiting Participant (short name)	PhD awarding entities	Planned Start Month 0-45	Duration (months) 3-36
1.				
2.				
3.				
...				
Total				

Table 1.3 b **Main Network-Wide Training Events, Conferences and Contribution of Beneficiaries**

	Main Training Events & Conferences	ECTS[8] (*if any*)	Lead Institution	Action Month (*estimated*)
1				
2				
3				
4				

Example, not to complete

Deliver your skills training through two modes:

Local Training

Offered at ESR's main host e.g. Graduate Schools

Network-wide training

Specific network events workshops, summer schools

- ❑ Main purpose of DN: Training programme!
- ❑ List of training objectives including **these type of skills**:
  - ✓ Core research Skills (on the job, ESR project)
  - ✓ Advanced research Skills (delivered by consortium)
  - ✓ Transferable Skills (delivered by consortium – skills for non-academic careers)
- ❑ **Training to be delivered:**
  - ✓ Local training: offered at the host where the ESR will work
  - ✓ Network Wide training:
    - Open up some events to the wider research community. Typical to have a final conference for example.
  - ✓ Secondment Programme: visits by each ESR to other ben./P.O
- ❑ Complementarity between local and network training achieved via **Personal Career Development Plan** (PCDP)
- ❑ Explain the **contribution of the non-academic** beneficiaries and P.O in the training programme (delivery of some of the network-wide training)
- ❑ When? Where? Content? Duration? Who will deliver it?

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DN 2021: Excellence – Training_Examples

1.2.3 Network-Wide Training Events

Table 1.2b Network-Wide Training Events

Event	Transversal skill	Partner	Month
School 1	Team work Lab. practises and OHS		9
School 2	Scientific writing Clinical trials		13
Hands on training module 1: Time-resolved Fluorescence			13
Hands on training module 2: Time-resolved Microscopy			13
Workshop 1	Oral presentation		19
Hands on training module 3: Ophthalmic Imaging Instruments			19
Hands on training module 4: Clinical Ophthalmic Diagnosis Techniques			19
Workshop 2 (co-located with the mid-term meeting)	Online tools		24
Workshop 3	IP & Entrepreneurship		30
Workshop 4	CV writing and job interviews		36
Final Conference			42

XXX will organize 2 schools, 4 workshops, 4 hands-on modules and a conference. These events are timed in order to take into account **three phases** (see Gantt Chart):

- An initial **recruitment and planning phase** when the ESRs are become familiar with their projects and the host institutions (about the first 2 months of each ESR contract).
- A **training phase** when the ESRs acquire the skills they need for the success of their projects (months 3-30 of each ESR contract).
- A final phase devoted to **thesis completion** (the last 6 months of each ESR contract).

As all the ESRs are expected to be recruited by month 7 of the project (**milestone 5.4** in Table 3.1c), the training phase, when the schools, workshops, hands-on modules and secondments are scheduled, will take place within months 9-36 of the project.

The core of the two **five-day schools** will be a series of **interdisciplinary courses** presented by members of , which are experts in their fields, as well **as external invited lecturers, who will complement the network's training capacity**. They will present **introductory courses** (first school) and **intermediate courses** (second school). The courses will have **at least 6 hours of lectures** on (S1/S2 indicates first/second school):

- **Introduction to Biophotonics** (S1): interaction of light with cells & tissue, optical biosensors, optogenetics, lasers for bio-manipulation, tissue engineering. Lecturers:
- **Biomedical Imaging** (S1): overview of biomedical optics, light sources, detectors, substrates and optical components for biomedical imaging, illumination and imaging system design and modelling, different imaging modalities, the pros and cons of commercially devices. Lecturers:
- **Tissue Optics** (S2): light transport in tissue, measurement and analysis of reflectance and fluorescence spectra, modelling and video techniques, laser therapy. Lecturers:
- **Introduction to cardiac electrophysiology and optogenetics** (S1): excitable media, spiral and scroll waves, phase singularities and filaments, wave breakup and spatio-temporal chaos, mathematical models of cardiomyocytes, mono and bidomain modelling, heterogeneities and virtual electrodes, optical mapping of membrane potential and Ca concentration. Lecturers:
- **Super-resolution Optical Technologies** (S2): overview of different imaging modalities (SOFI, PALM/STORM, STED) and detection approaches, imaging devices such as microscopes, hand held probes and catheters, *in vitro* and *in vivo* studies. Lecturers:
- **Statistics, data analysis and classification tools** (S2): linear and nonlinear time series analysis, delay reconstruction, ordinal patterns, support vector machines, nearest neighbours classifier, feature selection, surrogate data and hypothesis testing, information flow, statistics for clinical studies (t-test, ANOVA, Bland and Altman plots etc). Lecturers:

Following the schools, the network will organize **four three-day workshops** that will take place about every six months. They will have a regular scientific program, with talks given by **selected invited speakers**. They will include oral contributions by the ESRs and a poster session. The workshops will provide the ESRs with intensive training in presentation skills.

At least one training session on a transferable skill will be organized in each school or workshop. The timing (see Table 1.2b) is such that the ESRs can start using the skills. Also, during each school or workshop a **social outdoors activity** will be organized to promote friendships among the ESRs that will foster future collaborations. In addition, in each school

DN 2021: Excellence – Training_Examples

#	Main Training Events & Conferences (OBLIGATORY FOR ALL ACTIVE ESRs)	ECTS	Lead Benef	Month
1	**Kick-Off Meeting and Initial Training Days – RADEF, University of Jyväskylä (FI):** *[including researchers, supervisors, scientists in charge and related industrial partners]* It will be organized at RADEF part of the University of Jyväskylä and will set and share the training goals of the RADSAGA network. Almost all the researchers will be recruited at that stage. Presentations of the individual research projects will be made by the supervisors, while the researchers will make poster presentations. The event will be preceding or following the Jyväskylä summer school, thus allowing the ESRs to participate. Visits of RADEF test facilities and electronic laboratories will be organized, with concrete lab demonstrations. It will be followed by blocked technical and scientific training courses, such as "Radiation Safety" or "Electron, photon and Ion Beam Based Methods in Materials Science" as well as a presentation by Industry related to the "challenges for electronic components in radiation environments".	5	JYU	10
2	**Initial Training – University of Montpellier 2 (FR)** Organized as RADFAC event, this meeting allows the RADSAGA ESRs not only to meet the RADECS community to give an overview about their on-going thesis project, to exchange ideas and recommendations, but at the same time also exchanging ideas with other European PhD students active in the field of radiation to electronics. It will be preceded or followed by a blocked general training course on "Radiation Effects on Electronics" including also practical training on tools relevant for the network (*e.g.* TCAD), as well as an environmental training course delivered by a RADSAGA external SME company (TRAD) specialized in radiation testing.	5	UM2	12
3	**Initial Workshop – CERN (EU)** *[published as dedicated RADECS workshop in order to attract additional participants]* It will serve to present the RADSAGA goals to the extended European scientific community active in radiation effects. This will be combined with a first public lecture as listed in Table 2.3a. Visits of CERN and available test facilities and electronic laboratories will be organized, with concrete lab demonstrations. Two days (outside the RADECS workshop context) will be allocated for transferable skills courses, such as "Presentation Training" and "Communication" followed by a specialized 3-day blocked training lecture on "Nanoelectronics under radiation" provided by the European expert J.L. Autran.	2	CERN	14
4	**PhD Summer School – University of Oslo (NO)** *[UiO is part of an International Research Training Group (IRTG) in collaboration with Germany]* This PhD research school offers bi-annual lecture/workshop weeks on topics relevant to high-energy physics and space applications, as well as related areas with particular requirements such as instrumentation for medical and subsea applications. The workshop weeks are organized as a series of lectures and hands-on exercises aiming to educate the ESRs in hardware and software skills useful for many aspects of their related research projects. A thematic focus that is of high mutual interest to both the ESRs of the RADSAGA training network and the PhD school partners will be established in the school planning (*e.g.* usage of COTS components in high-rel. applications)	5	UiO	20
5	**RADECS Short-Course – Geneva (CH)** *[one-day event part of the RADECS conference series and chaired together by AGIF and UM2]* A selection of the 5 most advanced projects will be selected for oral presentation. R. Schrimpf from the U.S. Vanderbilt University will deliver a special talk on related to the activities of his 'Radiation Effects and Reliability Group'. Industrial speakers within and beyond the network will also provide dedicated training, such as "Laser tests: a complementary tool to accelerator facilities for radiation sensitivity assessment". The week after the conference will also be dedicated to follow transferable skills training courses, such as "Introduction into Management".	1	AGIF and UM2	24
6	**RADFAC Student/Industry Days– RADEF, University of Jyväskylä (FI)** *[organized as dedicated RADFAC event]* This meeting allows the RADSAGA ESRs not only to meet the RADECS community to give an overview about their on-going thesis project, to exchange ideas and recommendations, but at the same time also exchanging ideas with other European PhD students active in the field of radiation to electronics. Industrial speakers within and beyond the network will also provide dedicated training, such as "Safety critical systems in Space and Aeronautic: How industry manages to ensure dependability with new microelectronic technologies."	2	JYU	30
7	**Specialized training event – University of Leuven (BE)** The 5 most advanced projects will be selected for oral presentation and respective discussion sessions with invited relevant experts. Invited speakers will cover both Industry (*e.g.* N. Seifert / INTEL or R. Baumann / TI) and scientific key persons in the field of radiation effects (V. Ferlet-Cavrois / ESA, C. Dyer / UK RA founder of Rad.Env.Effects and Hardening Team) as well as followed by a blocked session of transferrable skills training on entrepreneurship.	2	KUL	34
8	**RADSAGA Conference and Industrial Event - CERN** This conference will include presentation of all ESR projects, combined with key-note speakers partly constituted by the identified visiting scientists. A special industrial session will be organized together with a respective round-table discussion in order to elaborate on future steps to be taken in the field of RADSAGA. This will be combined with a public lecture with a respective discussion round table as listed in Table 2.3a. Visits of CERN and test facilities, as well as electronic laboratories will be organized.	2	CERN	40 - 42

Overview and content structure of the training (ETN)

The network-wide training is steered through a dedicated **RADSAGA Training and Outreach Office (TO)** as further described in section 3.2; is organized in different modules as listed in Table 1.2b, 1.2c and 1.2d and structured along well defined training steps as described in the following points:

- *Areas of training, supervision and individual plans*

Each researcher will be assigned to a **beneficiary as well as a scientific supervisor** with whom he/she will carry out together the career development meeting in the first few weeks of employment. The jointly prepared **Personal Career Development Plan (PCDP)** will contain a breakdown of the research project, detail the courses the researcher needs to take as well as a long-term planning. If necessary, the career plans will be submitted for revision in the event of changes. In addition, **co-supervision is fully promoted through all projects** with at least one second university directly involved in the scientific guiding process. Finally, each researcher will be assigned a contact person from the corresponding HR Department at the recruiting network participant.

- *Arrangements for access to a supervisor and monitoring mechanisms*

Individual contacts on a daily to weekly basis with the supervising scientists are the norm. In addition, the co-supervisors are fully committed to be available on a continuous basis by email and phone, as well as more detailed iterations during the respective secondment periods. Furthermore, the **Training and Outreach Office (TO) together with the Supervisory Board (SB) will request bi-annual status reports** and will help to remedy any situation where not sufficient ESR follow-up is provided.

- *Common training credit system throughout the network*

All the trainees of the network will be enrolled in a PhD program in the responsible doctoral schools at the respective universities. All organizations and supervisors have experience in joint PhD supervision with academic PhD supervisors. To guarantee an equal treatment and evaluation of the trainees in the network, **based on the European standard of ECTS, a respective credit system will be used for all courses and followed at the network management and training level**. From a total of 180 ECTS required during the network training, the following average figure will apply: R&D project: 100 ECTS –

Part B – Page 12 of 68

RADSAGA - ETN

Secondment: 40 ECTS – Courses, Schools, Network-wide training: 40 ECTS. This will also allow fostering a **unified credit system for all ESRs,** followed independently by the TO and as such allow to **possibly integrate such a training program more easily in future university PhD programs**.

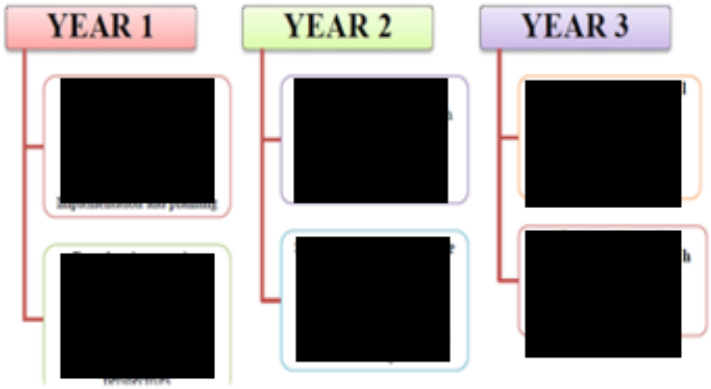
DN 2021: Excellence – Training_Examples

Table 2: Associations' networking activities and training

Orientation of [redacted] fellows	Network	Training focus
Academic	[redacted]	[redacted]
Policy oriented	[redacted]	
Operational oriented	[redacted]	

Table 3. Transferrable skills training (TST) for all [redacted]

TRANSFERRABLE SKILLS TRAINING – YEAR 1	
TOPICS	TRAINING GOAL & PROGRAM
TST-1 **Hygiene and Safety** *1 day lecture & online learning*	[redacted]
TST-2 **Integrity & Ethics in Research.** *1/2 day lectures & 3 afternoon workshops*	
TST-3 **Critical Scientific Reading** *2h, 1x month, 12 months.*	
TST-4 NEW **Intercultural Seminar** *1/2 day*	
TST-5 **French language** *2h/week 3 yrs*	
TST-6 **Annual Retreats.** *3 days, every year*	



Transferable skills modules	Description
Open Science and IP skills	[redacted]
Career preparation	
Entrepreneurship	[redacted]
Ethics	
Language and cult[redacted]	
1. [redacted] 2.	

Table 8 - Mandatory transversal skills courses [redacted]

PIPERS Project Career Kit

-EURAXESS-

HOME | VALUES AND MOTIVATIONS | SKILLS | CAREER OPTIONS | PLAN YOUR DEVELOPMENT | YOUR FEEDBACK

No limits: exploring careers for researchers

Welcome! The 'No limits' toolkit for researchers highlights resources to help you

- identify what's important for you in your career
- plan to build on your skills and knowledge
- consider a wide range of career options.
- make a plan to reach your professional development goals.

The toolkit includes advice, quizzes to help you explore your own needs and links to resources, information and opportunities.

GET DIRECTIONS!

or explore the toolkit by clicking on tabs above

TRAINING AND OTHER RESOURCES FOR THOSE WHO SUPPORT RESEARCHERS' PROFESSIONAL DEVELOPMENT

https://euraxess.ec.europa.eu/career-development/researchers/pipers-project-career-kit

DN 2021: Excellence – Training_Examples Transferable Skills

Transferable Skills in Knowledge and Intellectual abilities
Research methods : theory and practical application
Language training
Academic literacy and numeracy
Analysing and Synthesising
Problem solving
Creative thinking
Out of the box thinking
Innovation
Argument construction
IT skills / software packages
Knowledge and information management
Marketing
Patent writing skills
Scientific communication / presentations
Scientific poster making
Scientific article writing
Project website contributions

Transferable Skills in Engagement, influence and impact
Team working
People management
Conflict management
Supervision and Mentoring
Teaching skills, didactical skills
Influence and leadership
Communication methods
Cross-sectoral (e.g. industry-academia) communication and collaboration
Intercultural communication and collaboration
Interaction with the media
Public engagement, Scientific outreach activities
Research policy issues
Negotiation skills
Networking techniques

Transferable Skills in Personal Effectiveness
Research Integrity
Responsibility
Preparation and prioritisation
Time management
Work-life balance
Career management
Responsiveness to opportunities
Networking
Leadership skills
People management
Personnel management
Supervision skills
Chairing (scientific) meetings
Entrepreneurship
CV writing and job interview techniques
Management skills (e.g. Supervisory Board)
Organisational skills
Presentation skills

Transferable Skills in Research Governance
Health and safety
Ethical issues related to research
Legal requirements, standards
IPR (Intellectual Property Rights) issues
Respect and confidentiality
Research strategy
Project management, project planning and delivery
Risk management
Financial management
Proposal writing, fundraising
Financial management
Setting up a spin off
Commercialisation of research results
Entrepreneurship
Business administration

DN 2021: Excellence – Supervision

1.4 Quality of the supervision (including mandatory joint supervision for industrial and joint doctorate projects)

Required sub-headings:

- Qualifications and supervision experience of supervisors.
- Quality of the joint supervision arrangements (mandatory for DN-ID and DN-JD).

⚠ *To avoid duplication, the role and scientific profile of the supervisors should only be listed in the "Participating Organisations" tables (see section 5 below).*

⚠ *The following section of the European Charter for Researchers refers specifically to supervision:*

Supervision

Employers and/or funders should ensure that a person is clearly identified to whom researchers can refer for the performance of their professional duties, and should inform the researchers accordingly.

Such arrangements should clearly define that the proposed supervisors are sufficiently expert in supervising research, have the time, knowledge, experience, expertise and commitment to be able to offer the research doctoral candidate appropriate support and provide for the necessary progress and review procedures, as well as the necessary feedback mechanisms.

⚠ ***Supervision** is one of the crucial elements of successful research. Guiding, supporting, directing, advising and mentoring are key factors for a researcher to pursue his/her career path. In this context, all MSCA-funded projects are encouraged to follow the recommendations outlined in the Guidelines for MSCA supervision*[9].

- ❑ Demonstrate the **quality of the research supervisor (s)** / institution (s) with regards to training of researchers: nº of PhDs graduated, nº postdocs mentored….
- ❑ Describe the **joint supervision arrangements (mandatory in DN-ID and DN-JD).**
- ❑ Each researcher should have a non-academic co-supervision.

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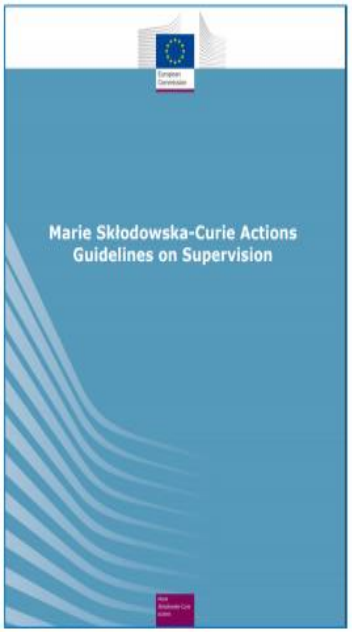
DN 2021: Guidelines on supervision



Marie Skłodowska-Curie actions guidelines on supervision - Publications Office of the EU (europa.eu)

- Appropriate level of supervision depends on the career stage of both parties and the expectations of the project
- Supervisors need to be committed and involved for the full duration of the fellowship
- Make sure the supervisor is on board with the career development plans
- 4 Levels
  - **1. Role of the supervisor**: General principles and integration of the researcher, Research support, Career development, Mentoring and wellbeing of the researcher, Communication and conflict resolution
  - **2. Role of the researcher**: General principles, Research, Wellbeing, Communication and conflict resolution
  - **3. Role of institution**
  - **4. Training and professional development for supervisors**

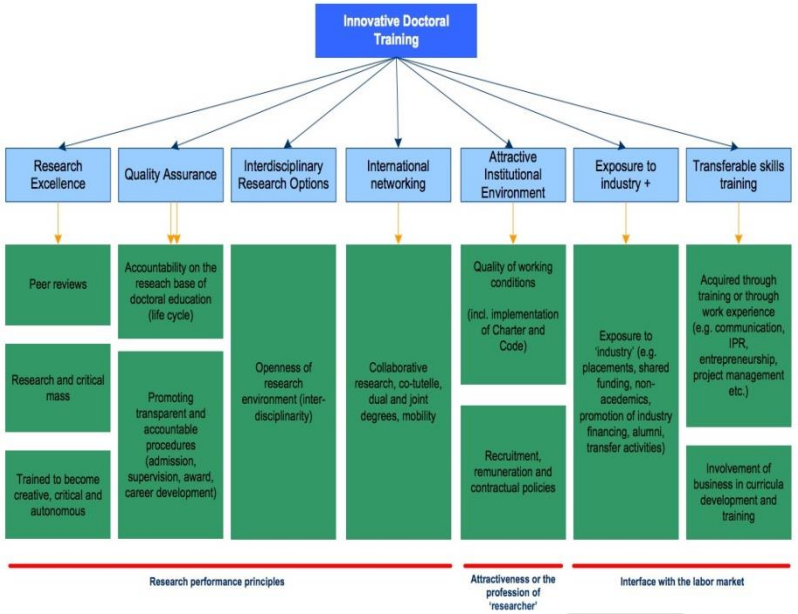
DN 2021: Impact - Structuring doctoral training (2.1)

Structuring doctoral training at the European level

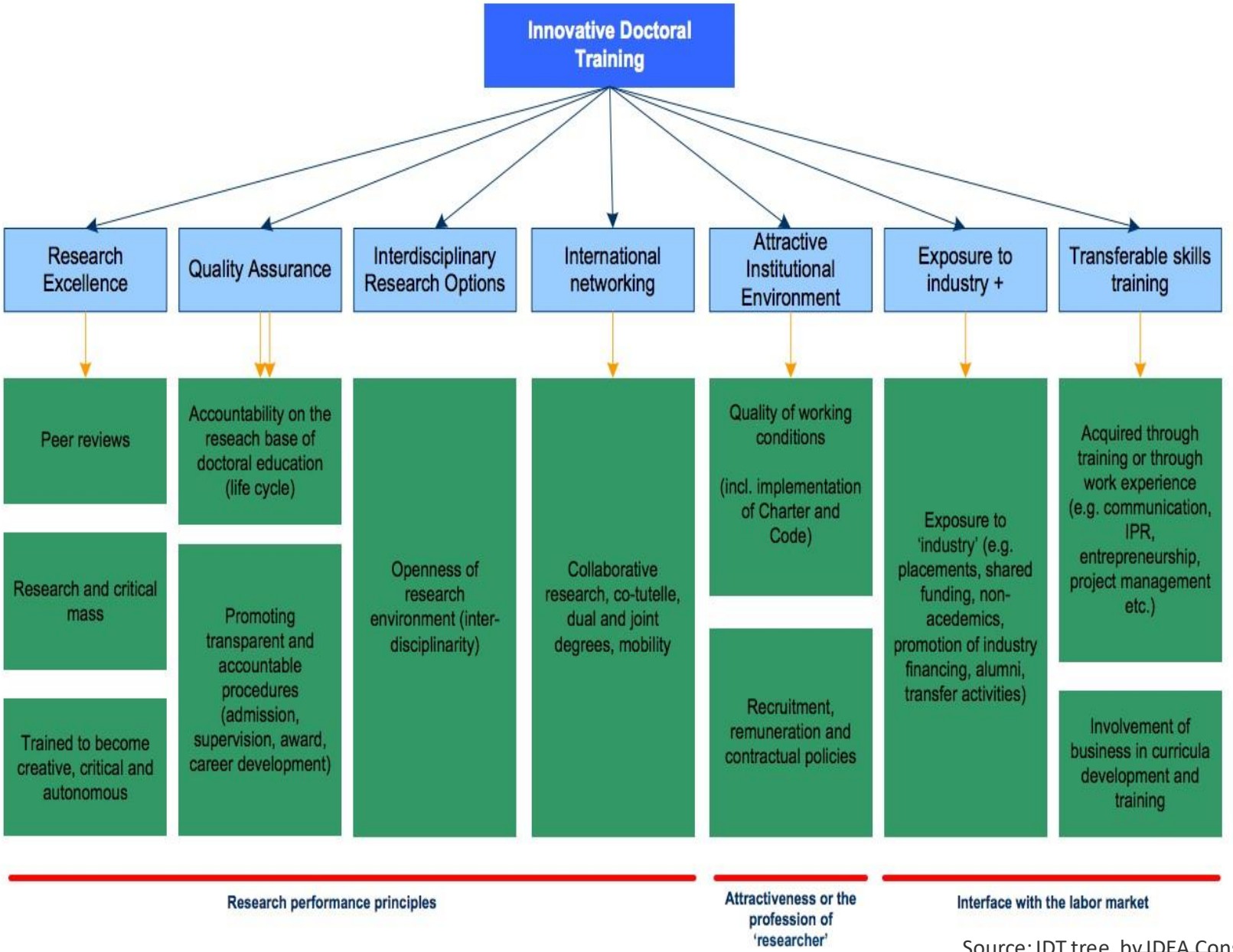
Strengthening European innovation capacity

Contribution of the non-academic sector to the doctoral training

Developing sustainable elements of doctoral programmes



Source: IDT tree, by IDEA Consult based on Report of Mapping Exercise on Doctoral Training in Europe: Towards a common approach (2011)



Source: IDT tree, by IDEA Consult based on Report of Mapping Exercise on Doctoral Training in Europe: Towards a common approach (2011). Euraxess China.

DN 2021: Impact - Structuring doctoral training (2.1)

Structuring doctoral training at the European level

Strengthening European innovation capacity

Contribution of the non-academic sector to the doctoral training

Developing sustainable elements of doctoral programmes

- Contribution to **Europe´s Economy and Society** by the Doctoral Programme and the Doctoral Candidates
- Linkage to the of **EU/HEU goals** or UN SDG or some aspects of the Green Deal, Digitalization…
- How it will help **bringing ideas to market and policy stakeholders**.
- The **role of the non-academic sector** in terms of research commercialization, training in entrepreneurship/tech transfer to the fellows.
- **Previous ITN** or other funded projects, beyond them

DN 2021: Impact - Structuring doctoral training (2.1)

Structuring doctoral training at the European level

Strengthening European innovation capacity

Contribution of the non-academic sector to the doctoral training

Developing sustainable elements of doctoral programmes

EXPOSURE of Fellows to the non-academic sector is meaningful

- **Employability** of the fellows in the non-academic sector
- **Stays** of the fellows in the non-academic sector.
- Excellence and impact of the research training. How the training goals can be only achieved with the **contribution of the non-academic**.
- The **contribution** of your non-academic sector participants.
- Improve the **inter-sectoral collaboration** in research training in this area.

DN 2021: Impact - Structuring doctoral training (2.1)

- Structuring doctoral training at the European level
- Strengthening European innovation capacity
- Contribution of the non-academic sector to the doctoral training
-

Developing sustainable elements of doctoral programmes

- Spreading of **best practices** in European **collaborative research training programmes**.
- Ongoing and **sustainable activities after the end** of the programme, e.g. an own grad school.
- The **uniqueness** and need for your Doctoral Network.
- **Lessons learned** of your programme at the end

DN 2021: Impact - Career perspectives (2.2)

- How the **training modules / activities** will provide **impact on the career perspectives** and **employability**. (Core scientific training, other scientific training and the transferable skills programme).

- **Development of career perspective** opportunities in both sectors.

  - In Academia
  - In Non-Academic Sector: SMEs, BioPharma, Engineering, Telecoms, Goverments…

- As individual level: short- and long-term impact career.

DN 2021: Impact - Dissemination, Exploitation, Communication (2.3)

Required sub-headings:

- Plan for the dissemination and exploitation activities, including communication activities. (*a more detailed plan will need to be provided as a mandatory project deliverable submitted at mid-term stage*)
- Strategy for the management of intellectual property, foreseen protection measures

	Dissemination	Exploitation	Communication
What	the public disclosure of the results by appropriate means	The use of results in further research and innovation activities	Taking strategic and targeted measures for promoting the action itself and its results
When	When results are available		From the project start on
Why	Knowledge transfer, enable further use of results	Enable use and uptake of results	Inform and reach out to society, show the benefits of research
How	Publications, posters,…	Patents, policy guidelines,…	Social media, events,…
Target audiences	Audiences who can continue using the results, e.g. scientific peers	Audiences who can make use of the results for scientific, societal, economic purposes or for policy making	Multiple audiences beyond the project's community, e.g. media, broad public

DN 2021: Impact - What goes under 2.3

Dissemination

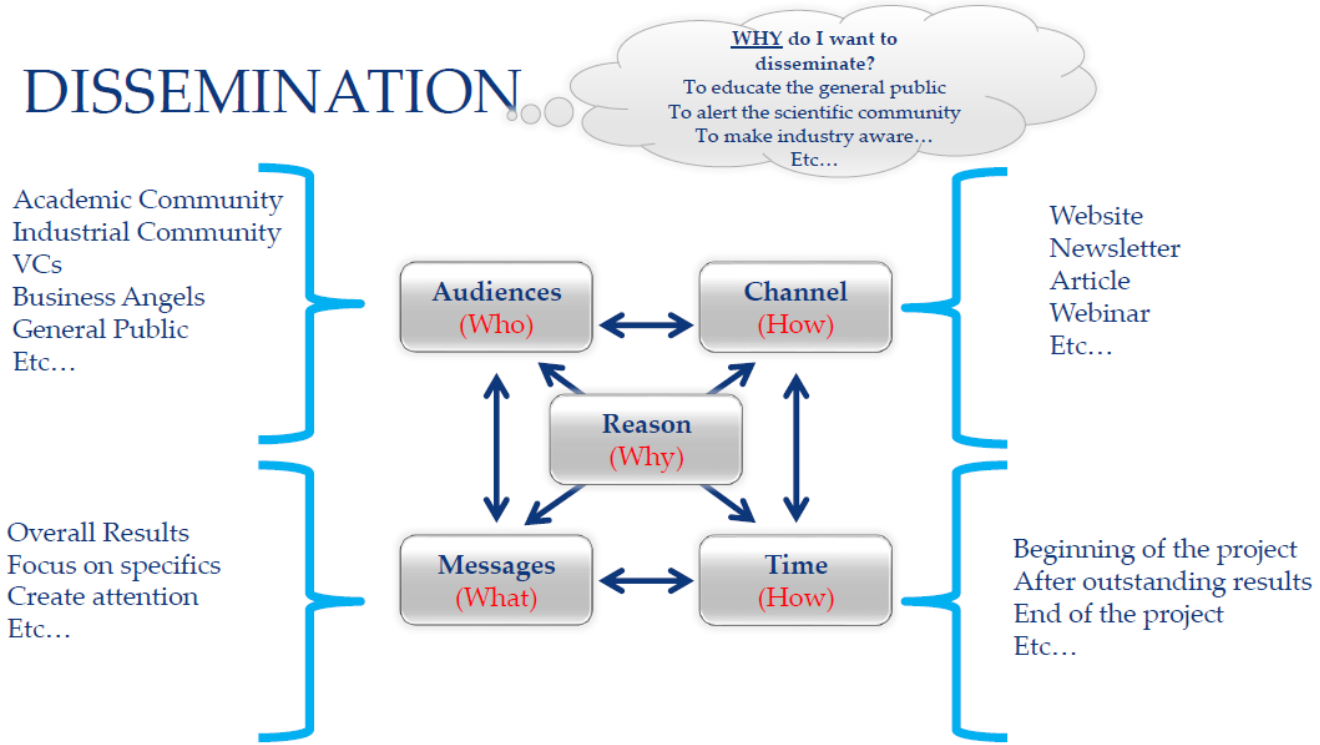
- Consider the full range of **potential users and uses**, including research, commercial, investment, social, environmental, policy-making, setting standards, skills and educational training, …
- Target **multiple audiences**, e.g. other researchers, policy makers (can link to European excellence), industry, government science advisors, "think tanks", legislative bodies…..
- Identify the **project's outcomes** (research findings (datasets, reports), guide for policy recommendations, etc
- **Channels for dissemination** (already available; create new ones; what EC channels will be used;etc). What concrete **journal and conferences** are targeted?
- **Dissemination formats** (newsletter, webinar, workshop, summer school, invited scientists, European Researchers' Night, etc.

Cuantificar!!!!!

Example:

Target groups (WHO)	Main type of information and outcomes (WHAT)	Dissemination channels (HOW)

DN 2021: Impact - What goes under 2.3

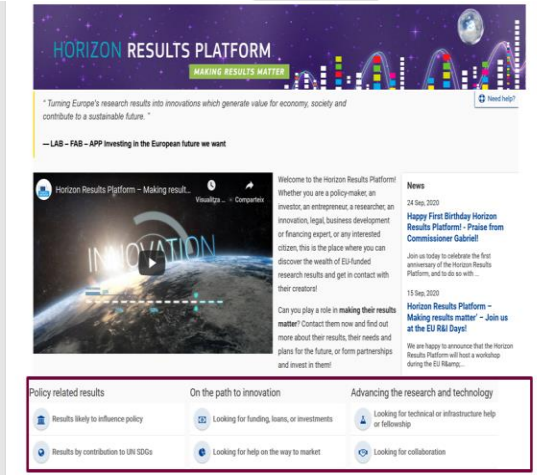


Source: Writing an ITN proposal- Pablo Garcia Tello; http://cerneu.web.cern.ch/writing-itn-proposal

DN 2021: Impact - What goes under 2.3

Exploitation of results

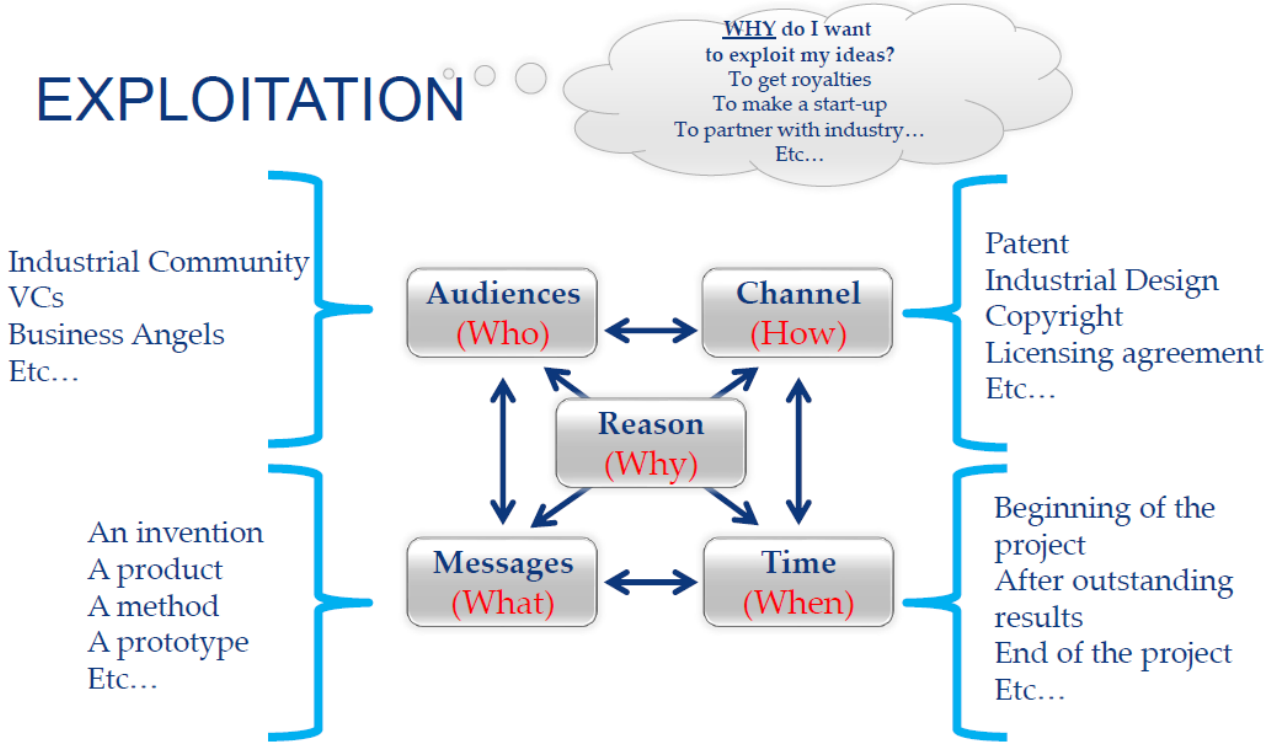
- How the academic consortium members will exploit the project results?
- How the industrial consortium members will exploit the project results? Be concrete if possible with projected business figures.
- Include a **business plan** where relevant.
- Ensuring the **sustainability and continuity** of the project: financing, synergies with other European, national or regional funds, etc.



Intellectual property management

- How the IP background will be identified?
- How the ownership of the IP foreground (results) will be managed?
- What will happen in case of conflict? How it will be managed?

DN 2021: Impact - What goes under 2.3



The why gives you the who gives you the what gives you the how gives you the when….

Source: Writing an ITN proposal- Pablo Garcia Tello; http://cerneu.web.cern.ch/writing-itn-proposal

DN 2021: Impact - What goes under 2.3

Public Engagement / Communication

- P.E engage a large audience, bring knowledge to the general public and imply interaction between sender /receiver
- Communication requires a clear and accessible language
- Include specifics (**what – who – when**) in a readable format
- Possible Activities: Marie Sklodowska Curie Ambassadors, Workshop Days, Open Doors, Public Talks, articles, E-newsletters, multimedia releases, Videos, European Researchers´ Night, EC Events, conferences, Marie Curie Alumni Association (MCAA), MSCA "Fellow of the Week" on Facebook

- Mention the **support of the host institution's** Education and Outreach support staff.
- Specifically mention **training in communication, public engagement and edu**cation as part of the fellows training programme and direct the evaluator back to section 1.3.2.
- Mention **specific types of activities** fellows will take part in to communicate their results / interact / educate the general public – link to existing outreach and education programmes at the host organisations.

Communicating Eu Research and innovation guidance for project participants:
http://ec.europa.eu/research/mariecurieactions/documents/documentation/publications/guidelines_en.pdf

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DN 2021: Scientific, societal and economic impacts (2.4)

KEY IMPACT PATHWAY: Logical steps towards the achievement of the expected impacts of the project over time, in particular beyond the duration of a project. A pathway begins with the projects' results, to their dissemination, exploitation and communication, contributing to the expected outcomes in the work programme, and ultimately to the wider scientific, economic and societal impacts of the work programme destination

Scientific impact
Promote scientific excellence, support the **creation and diffusion of high-quality new fundamental** and **applied knowledge**, skills, training and mobility of researchers, attract talent at all levels, and contribute to full engagement of Union's talent pool in actions supported under the Programme.

Societal impact
Generate knowledge, strengthen the impact of R&I in developing, supporting and **implementing Union policies**, and support the **uptake of innovative solutions in industry**, notably in SMEs, and society to address global challenges, inter alia the SDGs

Economic impact
Foster all forms of innovation, facilitate technological development, demonstration and **knowledge transfer**, and strengthen deployment of innovative solutions

- Provide a **narrative** explaining how the project's results are expected to make a difference in terms of impact, beyond the immediate scope and duration of the project.

+ environmental, Sustainable development Goals, etc

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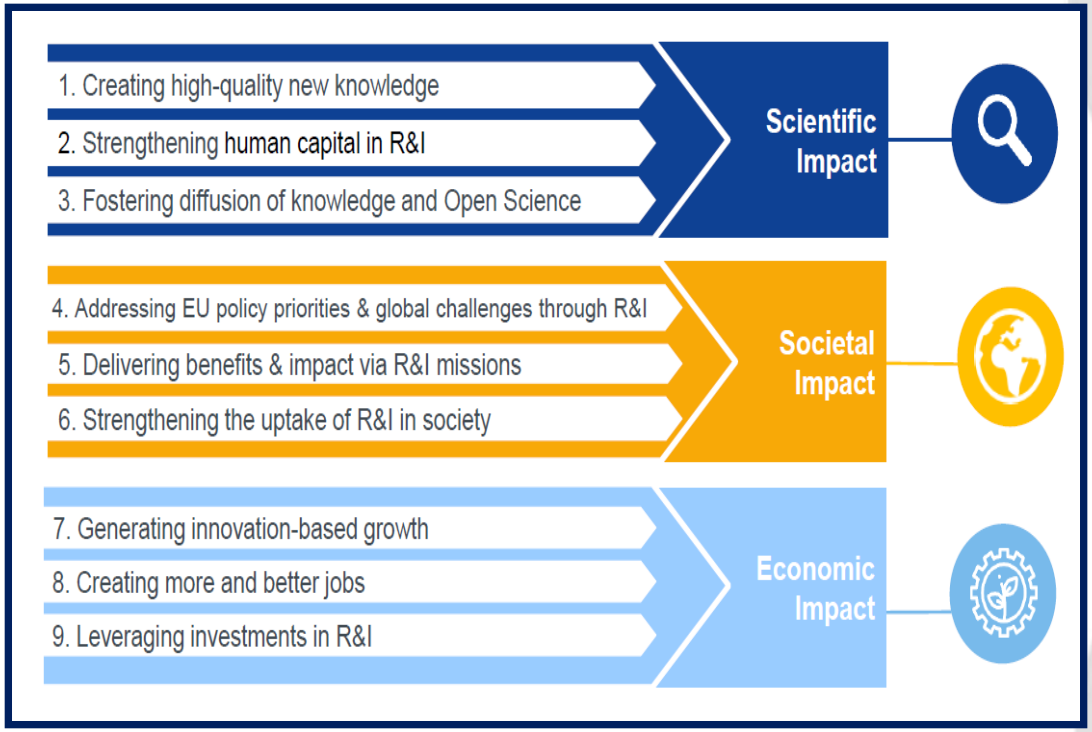
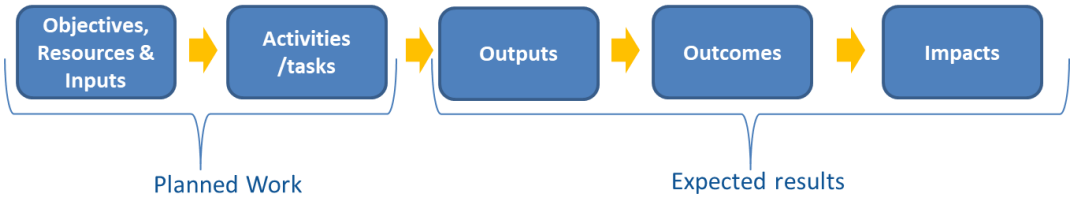
DN 2021: Scientific, societal and economic impacts

HORIZON EUROPE LEGISLATION defines three types of impact, tracked with Key Impact Pathways

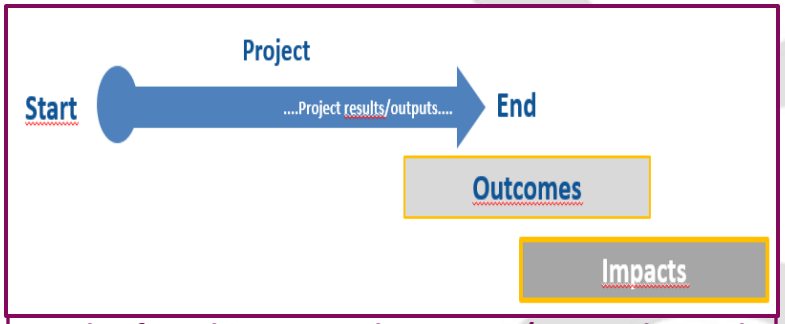


Article 50 & Annex V 'Time-bound indicators to report on an annual basis on progress of the Programme towards the achievement of the objectives referred to in Article 3 and set in Annex V along impact pathways'

DN 2021: Scientific, societal and economic impacts (2.4)



- **Ouputs (Results):** What is generated during the project implementation. This may include, for example, know-how, innovative solutions, algorithms, proof of feasibility, new business models, policy recommendations, guidelines, prototypes, demonstrators, databases and datasets, trained researchers, new infrastructures, networks, etc.
- **Outcomes:** are results that occur from creating your product or service. They are the changes in policies, people and communities that you aim to achieve with your work. Occur during or shortly after the end of the project. These statements are specific and measurable, letting you know when you accomplished your goal. Focused goal. During or Shortly after.
- **Impact:** are also results that occur from creating your product or service but occur some time after the end of the project. results that occur some time after the end of the project. Wider goal. Some time after.



A plan for achievement the outputs/impacts beyond the immediate scope and duration of the project

- **Magnitude**: How widespread the outcines and imoacts are likely to be. Example: How many people are benefitting (ie. The size of the target group).
- **Importance:** how large the benefits for the target groups are likely to be (ie. Tones of CO2 saved per househols).

- **Target group**: who would benefit.
- Related to EU policies, Horizon Europe programme

(ie. Missions), SDG

- **SMART:**Specific, Measurable, Achievable, Realistic and
- anchored within a Time Frame

DN 2021: Scientific, societal and economic impacts

Ejemplo Pilar 2. Cluster (Top-down calls)

IMPACT IMPLEMENTATION

Example

	Result	Outcome	Impact
STRATEGIC PLAN Policy priorities & R&I strategic orientation	-	-	Seamless, smart, inclusive and sustainable mobility services through new digital technologies
WORK PROGRAMME Destinations & Topics	-	Innovative logistics solutions applied by the European air transport sector	Seamless, smart, inclusive and sustainable air services
PROJECT Project results & objectives	Successful large-scale demonstration trial with 3 airports of an advanced forecasting system for proactive airport passenger flow management	At least 9 European airports adopt the advanced forecasting system that was demonstrated during the project	15% increase of maximum passenger capacity in European airports

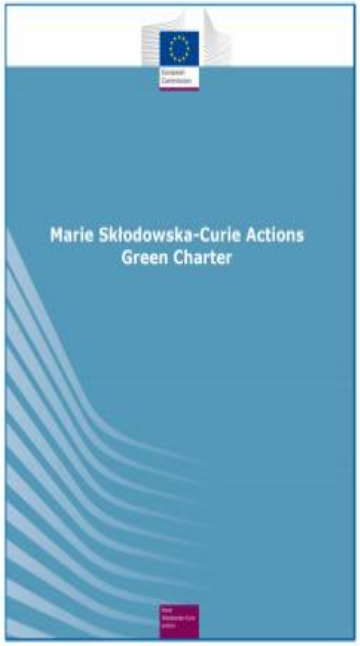
DN 2021: Implementation: Work Plan (3.1)

Required Sub-headings

- Work Packages description (please include table 3.1a);
- List of major deliverables *(*please include table 3.1b*,* including the awarding of doctoral degrees;
- List of major milestones (please include table 3.1c);
- Fellow's individual projects, including secondment plan (please include table 3.1d)*;*

- Network organisation
- Joint governing structure (mandatory for DN-ID and DN-JD actions)
- For DN-JD, joint admission, selection, supervision, monitoring and assessment procedures
- Supervisory board
- Recruitment strategy
- Progress monitoring and evaluation of individual projects
- Risk management at consortium level (including table 3.2a)
- Gender aspects
- Environmental aspects in light of the MSCA Green Charter

DN 2021: MSCA Green Charter



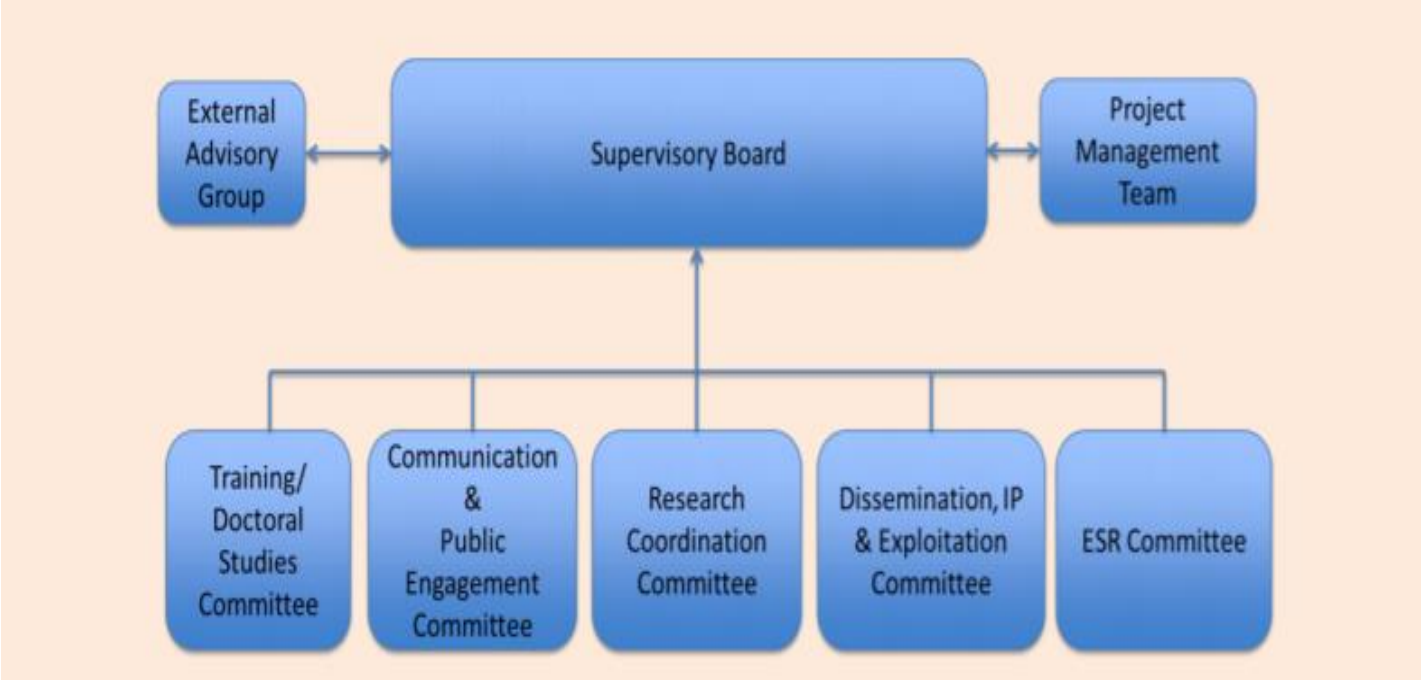
- Code of good practice for MSCA recipients
- Promotes the mainstreaming of environmental considerations in all aspects of project implementation
- Aims to:
  - Reduce the carbon footprint of MSCA projects
  - Raise awareness of environmental issues
  - Promote sustainable research management best practices
- Not an evaluation criteria as such

- 4 levels:
  - 1. Researcher-related measures
  - 2. Institutional-related measures
  - 3. Consortium-related measures (for multi-beneficiary projects)
  - 4. Outreach (applicable to MSCA researchers and participating institutions)

Marie Skłodowska-Curie Actions Green Charter - Publications Office of the EU (europa.eu)

DN 2021: Implementation: Work Plan

3.1 Quality and effectiveness of the work plan, assessment of risks and appropriateness of the effort assigned to work packages



Different Supervisory Board / Steering Committee

DN 2021: Implementation: Capacity of institutions, hosting arrangements (3.2)

- Operational capacity fully assessed under criterion 3.2
- Description of the **necessary infrastructure** and how the consortia provides them.
- **Hosting arrangements** – excellent environment for host the doctoral candidates.
- Euraxess Services – Office
- **HR Excellence in Research**
- Explain the consortium and its **complementarities, synergies**, previous collaborations, etc.
- Commitment of the beneficiaries

DN 2021: Herramientas
Proyectos financiados en SWAFS 2014-2020 (Disponible listado)

- Gènero
- Ètica
- Investigación e Innovación Responsable
- Ciencia Ciudadana
- Educación Científica
- Comunicación Científica
- PhD Training (Ciencia abierta, etc)

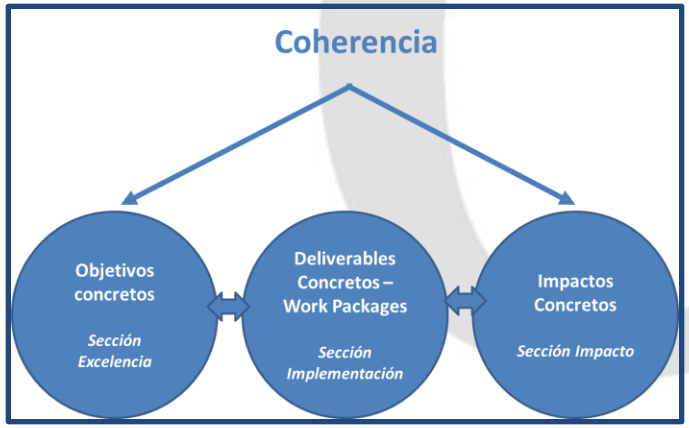
Proyectos Ciencia Ciudadana

Proyecto	Título	Presupuesto (€)	Fechas	Coordinador	País Coordinador	Socios	Nº de entidades participantes	Web CE	Web Proyecto
ISSI-1-2014 Pan-European public outreach: exhibitions and science cafés engaging citizens in science									
SPARKS	SPARKS	3,5M	01-07-2015 20-06-2018 Ended	ASSOCIATION EUROPEENNE DES EXPOSITIONS SCIENTIFIQUES TECHNIQUES ET INDUSTRIELLES	BE	**EU:**NL,UK,PL,DE,BE(2),AT,CY,HU,LT,RO,SK,LU **AC:**CH	14	https://cordis.europa.eu/project/id/665825	http://www.sparksproject.eu/
ISSI-2-2014 Citizens and multi-actor engagement for scenario building									
CIMULACT	CITIZEN AND MULTI-ACTOR CONSULTATION ON HORIZON2020	3,3M	01-06-2015 31-03-2018 Ended	FONDEN TEKNOLOGIRADET	DK	**EU:**DE,AT,FR,BE(2),RO,CZ,BU,HU,IT,UK,ES,FI,PL,LI,LV,IE,NL,PT,MT,SK,CY,LU,HR,SE,GR **AC:**CH,NO	29	https://cordis.europa.eu/project/id/665948	http://www.cimulact.eu/
SwafS-23-2017. Responsible Research and Innovation (RRI) in support of sustainability and governance, taking account of the international context									
D-NOSES	Distributed Network for Odour Sensing, Empowerment and Sustainability	3,16M	01-04-2018 31-03-2021 Running	FUNDACION IBERCIVIS	ES	**EU:**ES(2),UK,DE(2),EL(2),AT,IT,PT(3),BG **TC:**CL	15	https://cordis.europa.eu/project/id/789315	https://dnoses.eu/
SwafS-15-2018-2019 Exploring and supporting citizen science									

DN 2021: General tips

About the project :

- How your Project goes beyond the state-of-the art.
- Innovative Aspects of the current state of the art, existing programmes, networks.
- Employability - Career Development of the Doctoral Candidates
- Supervision
- IMPACTS of the Project
  - Doctoral Training / Career development
  - Scientific/ Social /Economic
- Novelties of the call
  - Gender Dimension and diversity Aspects
  - Open Science
- Related to EU policies, SDG
- Synergies with other projects or programmes



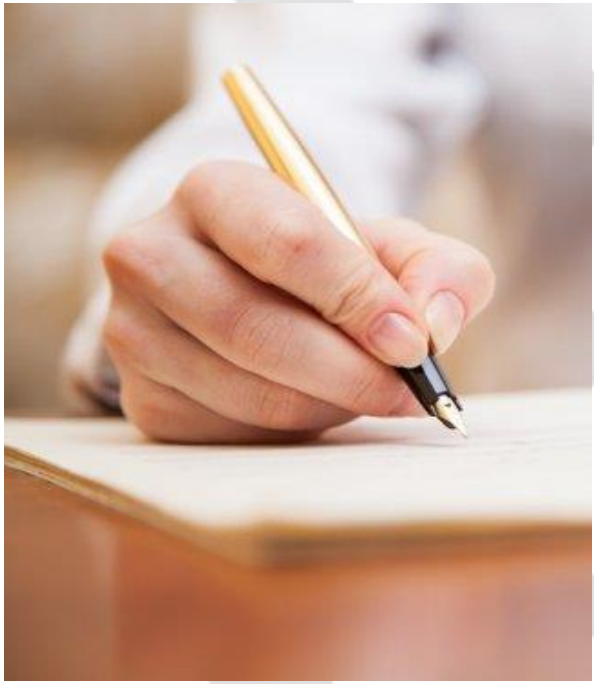
DN 2021: General tips

General Approach:

- It is a DOCTORAL NETWORK based on individual projects and its relationships
- Doctoral candidates the centre of the project.
- Concrete, Concrete and concrete

About the evaluation:

- The **weighting of criteria** is 50% -30% -20%. You need to perform at close to 100% on each
- **Follow the template** –the evaluators need to find all key points
- The reviewers may not be specialists in the field
- **"Una imagen vale más que mil palabras":** use visuals to provide global information at a glance



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