Project:

SUSNANO

(Grant Agreement number 101059266)

"Twinning to boost the scientific and innovation capacity of the Universiteti i Tiranes to develop sustainable nanosensors for water pollution detection"

Funding Scheme: Coordination and Support Action
Call: HORIZON-WIDERA-2021-ACCESS-02
Date of the latest version of ANNEX I: 28/04/2022

D4.2 Sets of training materials on proposal preparation and project management

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Document History *(Revisions – Amendments)*	
Version and date	**Changes**
1.0 – 08/08/2023	First version

Dissemination Level		
PU	Public	X
PP	Restricted to other program participants (including the EC Services)	
RE	Restricted to a group specified by the consortium (including the EC Services)	
CO	Confidential, only for members of the consortium (including the EC)	

SUSNANO's overall aim is to boost the scientific excellence and innovation capacity in sustainable nanosensors for water pollution detection of Universiteti i Tiranes (UT) and its high-quality Twinning partners: Fundació Institut Català de Nanociència i Nanotecnologia, Univerzita Palackého v Olomouci and Intelligentsia Consultants Sàrl. To achieve this aim, SUSNANO will implement a research and innovation strategy over 3 years based upon 5 objectives implemented via 5 corresponding WPs:

Objective 1: Conduct exploratory research on sustainable nanosensors to detect water pollution in Albania
The goal is to develop innovative sustainable nanosensors to detect heavy metals, pesticides and antiobiotics. The validated sensors will be used in field tests to provide an environmental assessment of rivers and lakes in Albania.

Objective 2: Transfer knowledge between experienced researchers (ERs) of UT and the Twinning partners
The goal is to organise short term staff exchanges, trainings and seminars for UT's ER's and the Twinning partners' ERs to complement the preparatory research undertaken in Objective 1.

Objective 3: Enhance career prospects of early-stage researchers (ESRs) of UT and the Twinning partners
The goal is to enhance the career prospects of UT's ESRs and the Twinning partners' ESRs by organising short- and medium-term exchanges, training workshops/seminars, summer schools & joint PhD programme.

Objective 4: Improve UT's management and administrative capacity for European R&D programmes
The goal is to improve the skills of UT's Directorate of Scientific Research, Projects and Foreign Relations in proposal preparation, project management and innovation management for European R&D funding programmes.

Objective 5: Raise the research profile of UT and the Twinning partners
The goal is to raise the research profile and scientific reputation of UT and the Twinning partners through a comprehensive range of dissemination, exploitation, communication & outreach activities.

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1. Introduction

This deliverable contains the training materials presented on:

- *Proposal preparation* during training workshops held in Tirana during 6 October 2022 and 20-21 June 2023.
- *Project management* during training workshops held in Tirana during 19-20 June 2023.

The training materials presented on 6 October 2022 coincided with the official launch of the SUSNANO project as well as the hosting of the 22nd edition of the Trends in Nanotechnology International Conference (TNT2022) in Tirana, Albania. This enabled the training materials to be shown to an audience of thirty-two (32) participants from the University of Tirana, Agricultural University of Tirana, University of Prishtina and Academy of Sciences of Albania.

The selection of training materials presented in June 2023 took account of the plan for training requirements defined in SUSNANO deliverable D4.1 *Strategic plan for proposal preparation & project management*. The participants in the training were exclusively from the University of Tirana.

2. Proposal preparation training

2.1 Training workshops on 6 October 2022

Held within the frame of the 22nd edition of the Trends in Nanotechnology International Conference (TNT2022), Tirana, Albania, the training workshops attracted thirty-two (32) participants from the University of Tirana, Agricultural University of Tirana, University of Prishtina and Academy of Sciences of Albania

Giles Brandon (INT) held two workshops on how to write Horizon Europe proposals.

The morning workshop was focused on several coordination and support actions (CSA) funded under the Horizon Europe Widening programme (Twinning, ERA-Chair and Hop-On Facility)

- *Tips on how to structure and write a Twinning proposal*
- *Tips on how to structure and write an ERA-Chair proposal*

The afternoon workshop was focused on research and innovation actions (RIA) and innovation actions (IA) funded under Horizon Europe Pillar 2 (Clusters 4 and 5).

- *How to get started & how to structure the overall proposal*
- *How to write Section 1 “Excellence”*
- *How to write Section 2 “Impact”*
- *How to write Section 3 “Implementation”*

During the practical workshops, Mr Brandon provided concrete examples of proposal structure, text and figures to support researchers based on his own experience of writing successful Twinning, ERA-Chair and RIA proposals.

Copies of the training materials can be found in Annex A.1: Training workshops on 6 October 2022.

2.2 Training workshops during 20-21 June 2023

Giles Brandon (INT) held three workshops on how to write Horizon Europe proposals at the University of Tirana.

The first workshop was dedicated to *Twinning Proposal Training* and held on Tuesday 20th June with the University of Tirana's Nanotoxicology Research Group of NanoAlb Unit.

- Prof. Valbona Aliko (biologist)
- Prof. Assoc. Ani Bajrami (biologists/anthropologists)
- Dr. Ledia Vasjari (molecular biologists)
- Dr. Fundime Miri (zoologists)
- Dr. Eliana Ibrahimi (biologists/ biostatisticians)

The training also involved brainstorming and discussing in detail ways to prepare a Twinning proposal focused on evaluating the toxicological effects of micro- and nano-plastics on freshwater ecosystems under global warming (NEPTUNE).

The second workshop was also dedicated to *Twinning Proposal Training* and held on Tuesday 20th June, but with Loredana Sulejmana from the Faculty of Economics about a possible Twinning proposal focused on gender economics. Ultimately, it was decided not to pursue this proposal idea further on this occasion.

The third workshop was dedicated to *Project Proposal Development Training* and held on Wednesday 21st June. This workshop was attended by 19 people from across the University of Tirana.

- Martin Serreqi
- Valbona Ndrepepaj
- Mimoza Kasimati
- Vasilika Mulle
- Elona Dervishi
- Ledjon Shahini
- Drita Rira
- Dbrigda Gjidij
- Ornela Hasrama
- Amalia Tola

- Eriola Sila
- Loreta Loli
- Erinda Ndrecka
- Fatmir Memaj
- Etleva Bajrami
- Elida Qershori
- Etlon Peppo
- Xhei Celiku
- Jonad Bara

Copies of the training materials can be found in Annex A.2: Training workshops during 20-21 June 2023.

3. Project management training

3.1 Training workshops during 19-20 June 2023

Giles Brandon (INT) held three training workshops on project management at the University of Tirana.

The first workshop was dedicated to *Overview of EU Project Management* and held on Monday 19th June 2023 with the following members of the Directorate of Scientific Research, Projects and Foreign Relations.

- Erida Elmazi
- Ledjon Shahini
- Elis Angiellari
- Zhaneta Muça

The second workshop was dedicated to *Project Financial Management (for Horizon Europe projects)* and held on Tuesday 20th June 2023 with the following members of the Directorate of Scientific Research, Projects and Foreign Relations.

- Erida Elmazi
- Ledjon Shahini
- Elis Angiellari
- Alma Bezhani

The third workshop was dedicated to *Project planning and monitoring (for Horizon Europe projects)* and held on Tuesday 20th June 2023 with the following members of the Directorate of Scientific Research, Projects and Foreign Relations.

- Erida Elmazi
- Ledjon Shahini
- Elis Angiellari
- Alma Bezhani

Copies of the training materials can be found in Annex B.1: Training workshops during 19-20 June 2023.

Annex A: Proposal preparation training materials

A.1 Training workshops on 6 October 2022

Tips on how to structure and write a Twinning proposal

Giles Brandon, Intelligentsia Consultants,
6th October 2022

Funded by the European Union

Agenda

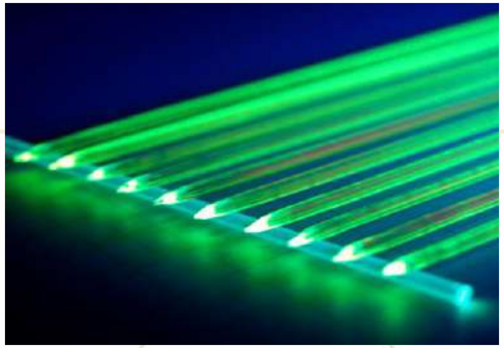
- What is the Twinning call?
- How to register for the Twinning call
- Essential documents
- How to structure a Twinning Network
- How to structure a Twinning Proposal
- Ideas to consider for Section 1
- Ideas to consider for Section 2
- Ideas to consider for Section 3
- Other sources of information

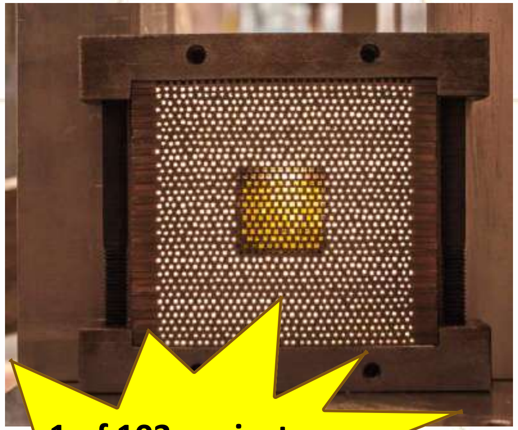
What is the Twinning call? (1 of 3) - Two example successful Twinning proposals

- **SUSNANO**: Twinning to boost the scientific and innovation capacity of the Universiteti i Tiranes to develop sustainable nanosensors for water pollution detection.
- Widening country coordinator: Universiteti i Tiranes (AL).
- Consortium partners: Univerzita Palackého v Olomouci (CZ) and Institut Català de Nanociència i Nanotecnologia (ES)

1 of 15 projects funded from Oct 2021 WBC Twinning call

- **TWISMA**: Twinning with ISMA to develop innovative calorimeters for high energy physics based upon advanced scintillation materials.
- Widening country coordinator: Institute for Scintillation Materials (Kharkiv, UA).
- Consortium partners: CERN and CNRS Lyon.





1 of 103 projects funded from Jan 2022 Twinning call

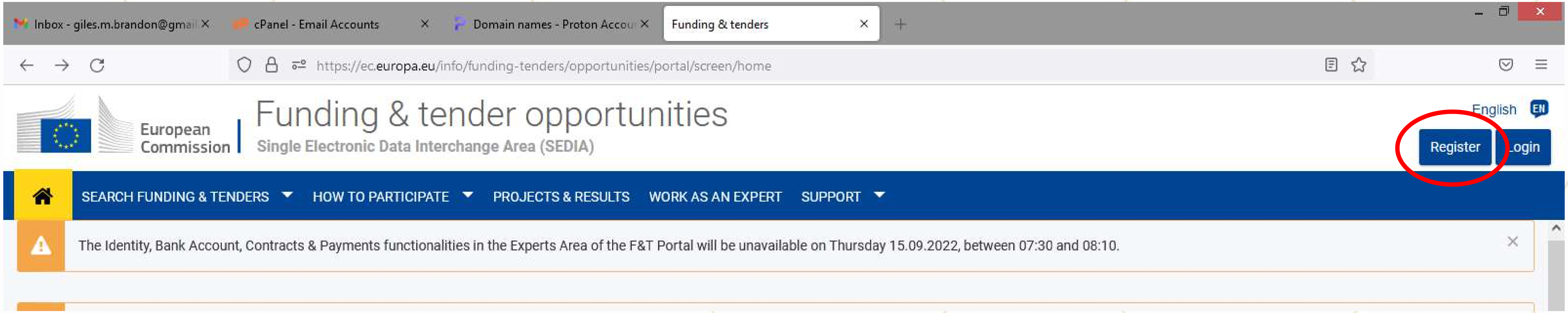
What is the Twinning call? (2 of 3)

1. **Twinning** aims to **enhance networking** activities between the **research institutions of the Widening countries (e.g. Armenia) acting as co-ordinators** and **top-class leading counterparts at EU level** by linking it with at least two research institutions from two different Member States or Associated Countries.
2. **Twinning proposals (Budget: 0.5-1.5 million euro, 3 year duration)** should have to clearly outline the **scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research** as well as the scientific quality of the partners involved in the twinning exercise
3. **The scientific strategy should include arrangements for formulating new (or ongoing) joint research project(s) in the scientific area of choice** and describe how Twinning will take this research to a new stage, by enlarging its scope and/or the research partnership. If relevant, any links with sustainable development objectives are to be outlined.

What is the Twinning call? (3 of 3)

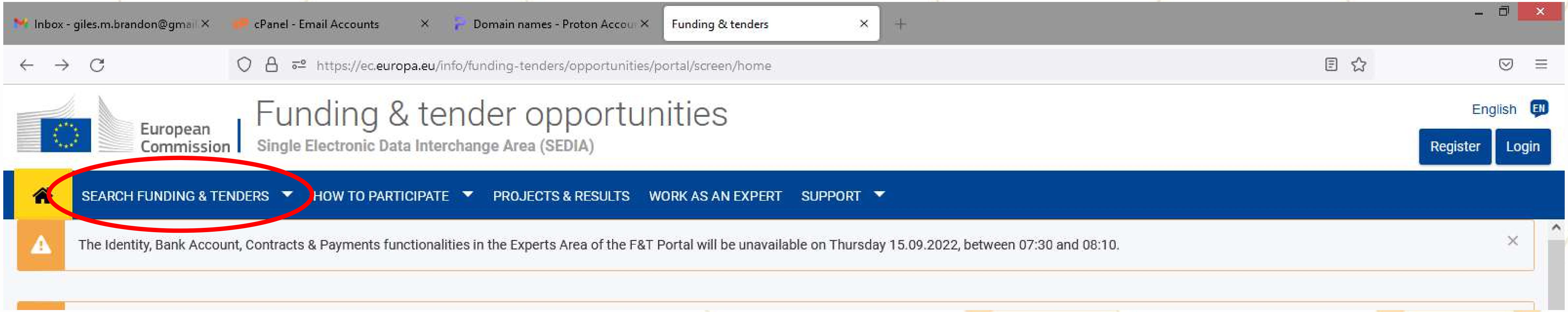
4. The scientific strategy should include a comprehensive set of activities to be supported. These should include at least a number of the following:
   – **Short-term staff exchanges; expert visits and short term on-site or virtual training; workshops; conference attendance; organisation of joint summer school type activities; dissemination and outreach activities**.
5. Proposals should also focus on **strengthening the research management and administration skills of the coordinating institution from the Widening country**. This should take the form of a dedicated work package or task, placing emphasis to specific activities.
6. A **research component not exceeding 30% of the total Horizon Europe grant may include an exploratory research project.** This will open opportunities for integrating smaller research activities and by this strengthening the commitment and the engagement of the twinning partners.

How to register for the Twinning call (1 of 2)



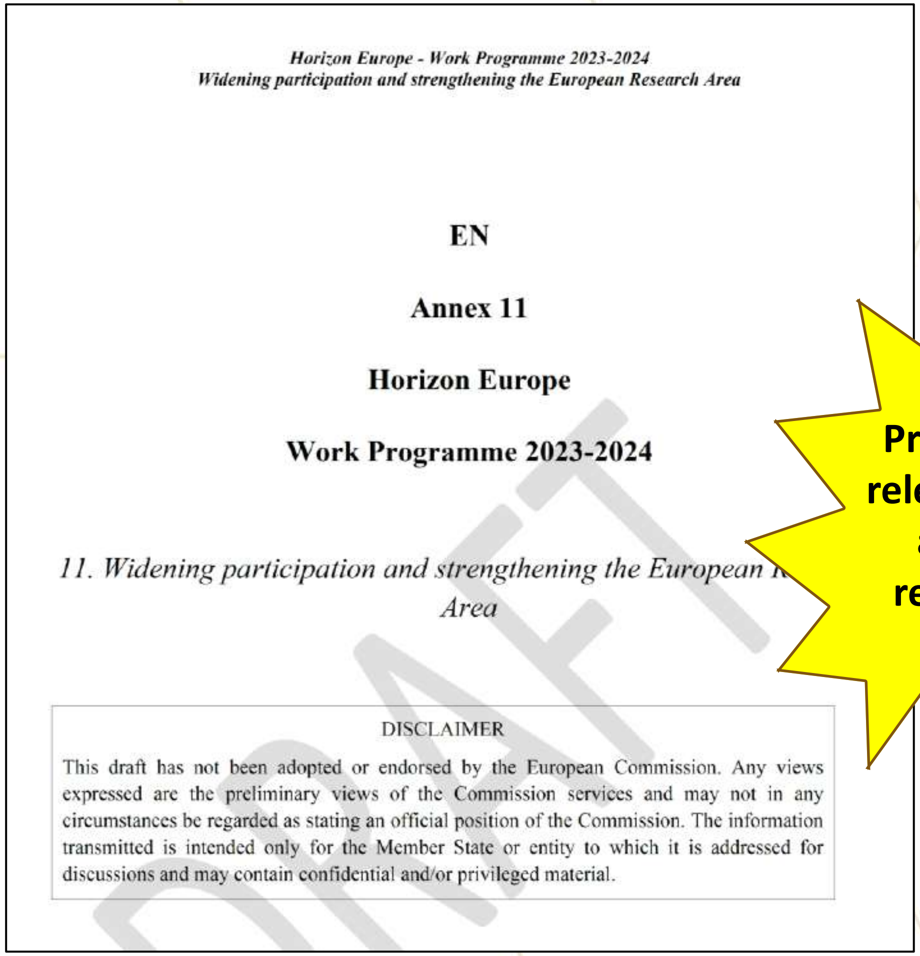
1. If not already done, you need to register a) yourself (email address and password) and b) your institute (PIC number – but check first to see if one already exists!) on the EC's Funding and Tender portal:
   – https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

How to register for the Twinning call (2 of 2)



1. Search and register to the Twinning call in the EC's Funding and Tender portal.
   - Select "Search funding and tenders"
   - Set "Submission status" = Open for submission
   - Set "Programming period" = 2021-2027
   - Set "Filter by programme" = Horizon Europe
   - Set "Programme part" = Widening Participation and Spreading Excellence
   - Click on the hypertext link for the Twinning call

Two Essential Documents



Horizon Europe - Work Programme 2023-2024
Widening participation and strengthening the European Research Area

EN

Annex 11

Horizon Europe

Work Programme 2023-2024

11. Widening participation and strengthening the European R[...] Area

DISCLAIMER

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission. The information transmitted is intended only for the Member State or entity to which it is addressed for discussions and may contain confidential and/or privileged material.

Print out the relevant pages and read repeatedly!

Horizon Europe Programme

Standard Application Form (CSA)

Application form (Part A)
Project proposal – Technical description (Part B)

Version 2.0
22 April 2021

Widening work programme 2023-2024

Standard application form for CSA (Coordination and Support Action)

CSA proposal – Technical Description (Part B)

Total length: only 30 pages!

1. Excellence

   1.1 Objectives [EC recommended length: 2 pages]

   1.2 Coordination and/or support measures and methodology [EC recommended length: 6 pages]

2. Impact

   2.1 Project's pathways towards impact [EC recommended length: 4 pages]

   2.2 Measures to maximise impact - Dissemination, exploitation and communication

   2.3 Summary [EC recommended length: 5 pages for Sections 2.2 and 2.3]

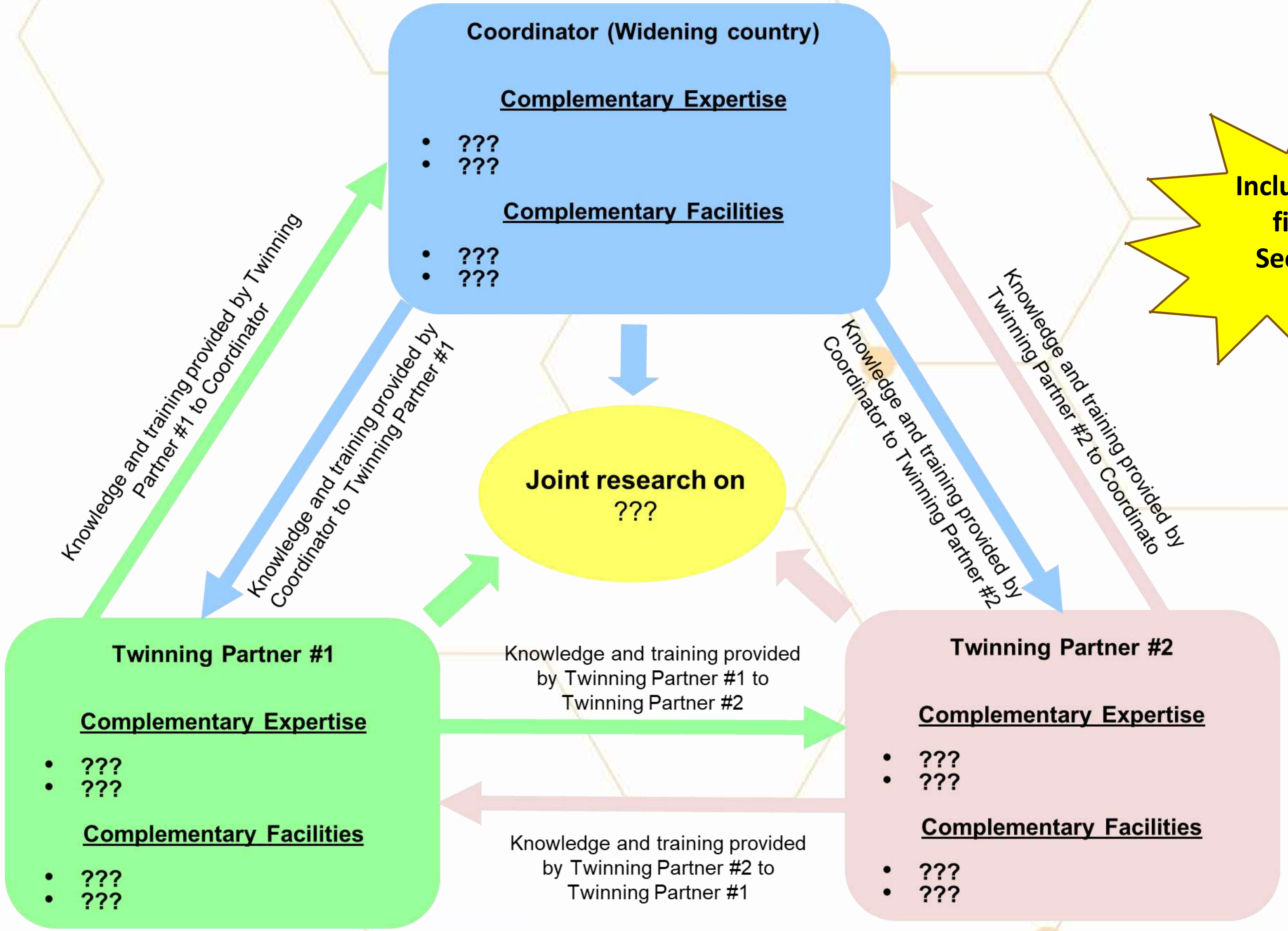
3. Quality and efficiency of the implementation

   3.1 Work plan and resources [EC recommended length: 10 pages – including tables]

   3.2 Capacity of participants and consortium as a whole [EC recommended length: 3 pages]

- **Don't deviate more than ½-1 page from the recommended limits!**
- **Start Section 1.1 on the proposal cover page!**

How to structure a Twinning network



Include such a figure in Section 3.2

How to structure a Twinning proposal

1. Excellence

1.1 Objectives

Describe objectives **briefly** in Section 1.1 (2 page limit)

3. Implementation

3.1 Work Plan

Include indicators in Section 1.1!

Indicators

1.1 Objectives	3.1 Work Plan	Indicators
Objective 1: Conduct preparatory research on …	WP1: Preparatory research project	Research papers, patents, collaboration agreements, ...
Objective 2: Transfer knowledge between senior researchers	WP2: Exchanges involving senior researchers	Months of exchanges, workshops, seminars, ...
Objective 3: Provide training to young researchers	WP3: Exchanges involving young researchers	Months of exchanges, summer schools, seminars, ...
Objective 4: Strengthen coordinator's research management capacities and administrative skills	WP4: Capacity building of research mgt and admin.	Training workshops, research proposals prepared, ...
Objective 5: Raise the coordinator's research profile	WP5: Dissemination and communication	International conference, industry events, open days, ...
	WP6: Project Management	

Elaborate on objectives in Section 1.2 (6 page limit)

Prepare Sections 1.1, 1.2 and 3.1 concurrently

Section 1: Excellence

- Section 1.1
  - Demonstrate proposal's pertinence to the work programme
- Section 1.2
  - Why the research is important from a national and EU perspective
  - SWOT analysis
  - Specify scientific targets for the exploratory research project

Demonstrate proposal's relevance to the work programme (Section 1.1)

Scope of the Twinning call	How/where this proposal addresses the scope of the call
Twinning aims to enhance networking activities between the research institutions (RIs) of the Widening countries and top-class leading counterparts at EU level by linking it with at least two research institutions from two different MS or AC.	Coordinator: ?? (Widening country) Two leading RIs: ?? (Country), ?? (Country)
Twinning proposals should clearly outline the scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research as well as the scientific quality of the partners involved.	The proposal's scientific strategy is focused on ?? where the Twinning partners have world class researchers in the domain.
Extract other important requirements from the call text	*Indicate where the proposal addresses the requirement e.g see Section 1.2*
Etc	*Etc*

Include such a table in Section 1.1

Why the research is important from a national and EU perspective (Section 1.2)

- Concisely describe why the research topic is important (1/2 – 1 page)
- National level
  - Reference SMART specialization strategy (S3) and/or
  - Reference national research and innovation strategy/policies
- EU level
  - Reference research and innovation priorities in Horizon Europe and/or
  - Reference European Partnership's research and innovation priorities e.g. Processes4Planet

SWOT Analysis (Section 1.2)

Be specific = More convincing!

Explain how your scientific strategy (objectives) addresses the SWOT

Strengths (S) and Weaknesses (W) of Coordinator	Opportunities (O) and Threats (T) faced by Coordinator
<u>Strengths</u> 1. Strong expertise in a wide range of logistics and logistics technology related research topics. 2. Good cooperation of the Institute of Logistics with various industrial partners (e.g. automotive, electronics, manufacturing, logistics). 3. Free access to the university's facilities and equipment (e.g. manufacturing engineering, ICT, logistics, simulation computing, etc.) 4. Good contact with national and European industrial actors with interest in the Institute research and development activities	**<u>Opportunities</u>** 1. Potential to participate in logistics and ICT technologies projects funded by national authority 2. Potential to participate in Horizon Europe research and innovation actions 3. Potential for further research capacity building via European Structural Funds 4. Potential to develop RTD projects with international research organisations as well as private clients 5. Potential to become a top European actor in logistics research and innovation
<u>Weaknesses</u> 1. Low financial resources received directly from national government and significant reduction of national funding for research and innovation 2. Lack of job opportunities for young researchers leads to decrease in capability to fully exploit recent developments in logistics 3. Lack of communication with the Innovation Technology Transfer Centre at the Coordinator. 4. Lack of knowledge and experience of innovation and project management amongst researchers 5. Lack of R&D proposal writing skills and low participation to international projects	**<u>Threats</u>** 1. Fluctuation in national R&D funding due to changing priorities of government budget formation 2. High competition to access European research projects and lack of trained researchers and managers to fully exploit opportunities with Horizon Europe projects 3. Lack of trained researchers and managers to fully exploit opportunities with Horizon Europe projects 4. Low start-up and spin-off activity 5. Lack of public-private partnerships with national and European companies resulting in a reduced transfer of knowledge and technologies to the industry

Specify scientific targets for the exploratory research project (Section 1.2)

Example from an organic electronics related project

TADF material as OLED emitters	PL Max. in toluene, nm	PLQY in hosted film, %	Max. OLED EQE, %	Max. OLED PE, lm/W	OLED Lifetime LT50@3000cd/m², hrs
Blue	460-490	>60	>15	>20	>500
Green	510-540	>70	>20	>80	>1000
Red	610-650	>60	>15	>20	>1000

Demonstrate how your exploratory research will be at the state-of-the-art or beyond …

Section 2: Impact

- Section 2.1
  - Contribution to expected outcomes (qualitative and quantitative)
  - Potential barriers arising from factors beyond the scope and duration of the project
- Section 2.2
  - Dissemination and Communication Plan
  - Strategy for the management of intellectual property

Qualitative contribution to expected outcomes (Section 2.1)

Write about 2 pages in a narrative style

- Outcome 1: Improved excellence capacity and resources in Widening countries enabling to close the still apparent research and innovation gap within Europe.
- Outcome 2: Enhanced strategic networking activities between the research institutions of the Widening countries and at least two internationally-leading counterparts at EU level.
- Outcome 3: Raised reputation, research profile and attractiveness of the coordinating institution from the Widening country and the research profile of its staff.
- Outcome 4: Strengthened research management capacities and administrative skills of the staff working in institutions from the Widening country.
- Outcome 5: Improved creativity supported by development of new approaches in R&I collaboration, increased mobility (inwards and outwards) of qualified scientists.

Quantitative contribution to expected outcomes (Section 2.1)

Use the KPIs from Section 1.1

Expected Outcomes	WP	Performance Indicators	Target
Outcome 1: Improved excellence capacity and resources in Widening countries enabling to close the still apparent research and innovation gap within Europe.	1, 2, 3 and 5	• Coordinator's senior researchers trained in Research Topic ??? • Coordinator's junior researchers trained in Research Topic ??? • Summer schools hosted by partners • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences • Patents submitted by Coordinator • Collaboration agreements between Coordinator and private companies	?? ?? ?? ?? ?? ??
Outcome 2: Enhanced strategic networking activities between the research institutions of the Widening countries and at least two internationally-leading counterparts at EU level.	1, 2, 3, 4 and 5	• Total person-months (PMs) of exchanges of senior researchers between partners • Total PMs of exchanges of junior researchers between partners • Total PMs of exchanges of mgt. and admin. staff between partners • Summer schools hosted by partners • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences	?? ?? ?? ?? ??
Outcome 3	etc	• etc	etc

Potential barriers arising from factors beyond the scope and duration of the project (Section 2.1)

- Scientific related barriers
  - Describe 3-4 challenges/barriers specific to the research topic and/or
  - Describe 3-4 challenges/barriers identified by relevant European Partnerships e.g. Made in Europe
- Country related
  - Describe 3-4 challenges/barriers faced by your country's research and innovation system

For each challenge/barrier, describe a mitigation measure the project will take!

Dissemination and Communication Plan (Section 2.2)

Dissemination and Communication Plan				
Project result	**Partners Concerned**	**Dissemination Activity**	**Target audience**	**Indicator & Target**
Project leaflet and poster	Coordinator and Twinning Partners	Distribute during international conferences (e.g. X, Y, Z, etc.), training workshops and outreach events	Scientists, engineers and general public	250+ leaflets distributed, 25+ posters displayed
Press conferences	Coordinator	Press conferences at the start and end of the project	Regional and national news media (radio, TV and print newspapers)	2 conferences, 5+ journalists
Project news	Coordinator and Twinning Partners	Publish project news releases and distribute through broader scientific news channels	Scientists, engineers and general public	2+ press releases
Project website	Coordinator and Twinning Partners	Publish project summary, regular news and event updates on website	Scientists, engineers and general public	2500+ visitors
etc	etc	etc	etc	etc

Strategy for the management of intellectual property (Section 2.2)

Include tables that capture ownership of background and foreground knowledge!

Background Knowledge	Partners Concerned
Device architecture for state-of-the-art OLEDs, especially using phosphorescent emitters	Coordinator
Performance impact of parameter variations on OLED device performance for typical stack architectures (trade-offs etc.)	Partner #1
Physico-chemical properties required from OLED materials for good device performance (e.g. purity, energy levels, glass transition temperature etc.)	Partner #2
etc	etc

Possible Foreground Knowledge	Partners Concerned	Other Partners claiming Ownership Rights
Synthesis routes, scale up and purification processes for sterical shielding of compounds	Coordinator	Partner #2
Stack architectures optimised for TADF plus shielded emitter concept	Coordinator	-
Fluorescent core structures and shielded emitters based on these for different emission colours	Partner #1	Partner #2
etc	etc	etc

Section 3: Implementation

- Section 3.1
  - Work package (WP) descriptions
  - WP2 and WP3 (Exchanges involving senior/young researchers)
  - Budget

Work package (WP) descriptions (Section 3.1)

See MS Word file!

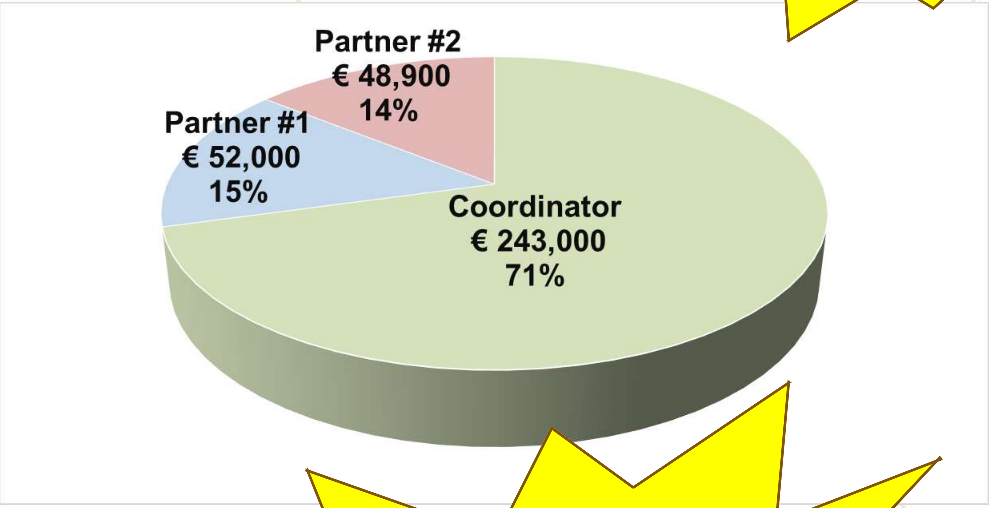
WP2 and WP3 (Exchanges involving senior/junior researchers) (Section 3.1)

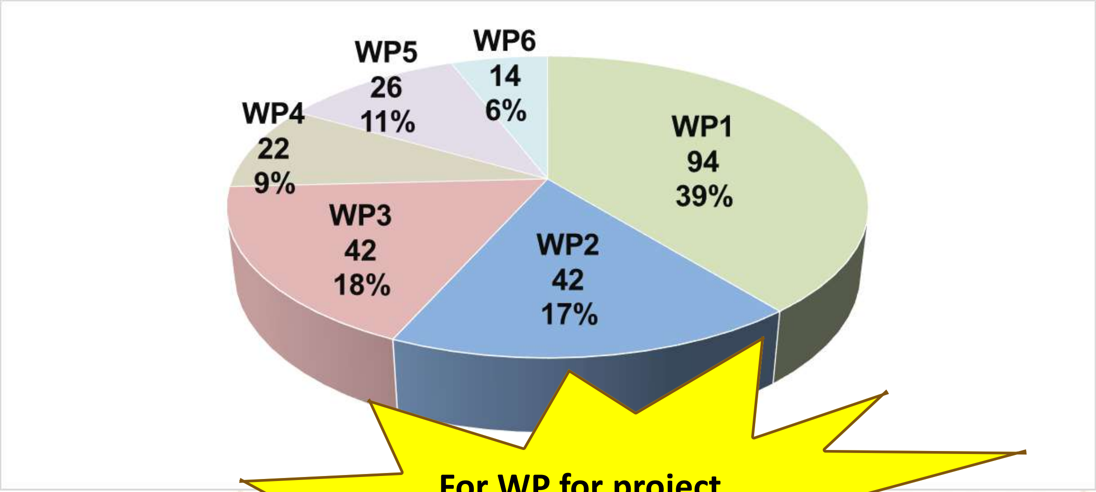
Show you have a concrete plan - include secondment tables!

Year	Coordinator		Partner #1	
	Researcher	**PMs**	**Researcher**	**PMs**
1	Danny Wilson	2	Helene Arnaud	1
	Graham Mills	0.5	Francoise Hoss	1.25
	Rebecca Moore	1.25	Claude Hollande	0.5
	Sharon Raymond	0.25	Benoit Leroy	2
2	Danny Wilson	0.5	Helene Arnaud	0.5
	Graham Mills	0.75	Francoise Hoss	1
	Rebecca Moore	1	Claude Hollande	2
	Sharon Raymond	2	Benoit Leroy	1.5
3	Danny Wilson	0.5	Helene Arnaud	0.25
	Graham Mills	0.5	Francoise Hoss	0.75
	Rebecca Moore	2	Claude Hollande	1.5
	Sharon Raymond	1.25	Benoit Leroy	0.75

Budget (Section 3.1)

Include some pie charts to illustrate how your budget and efforts (PMs) are allocated!



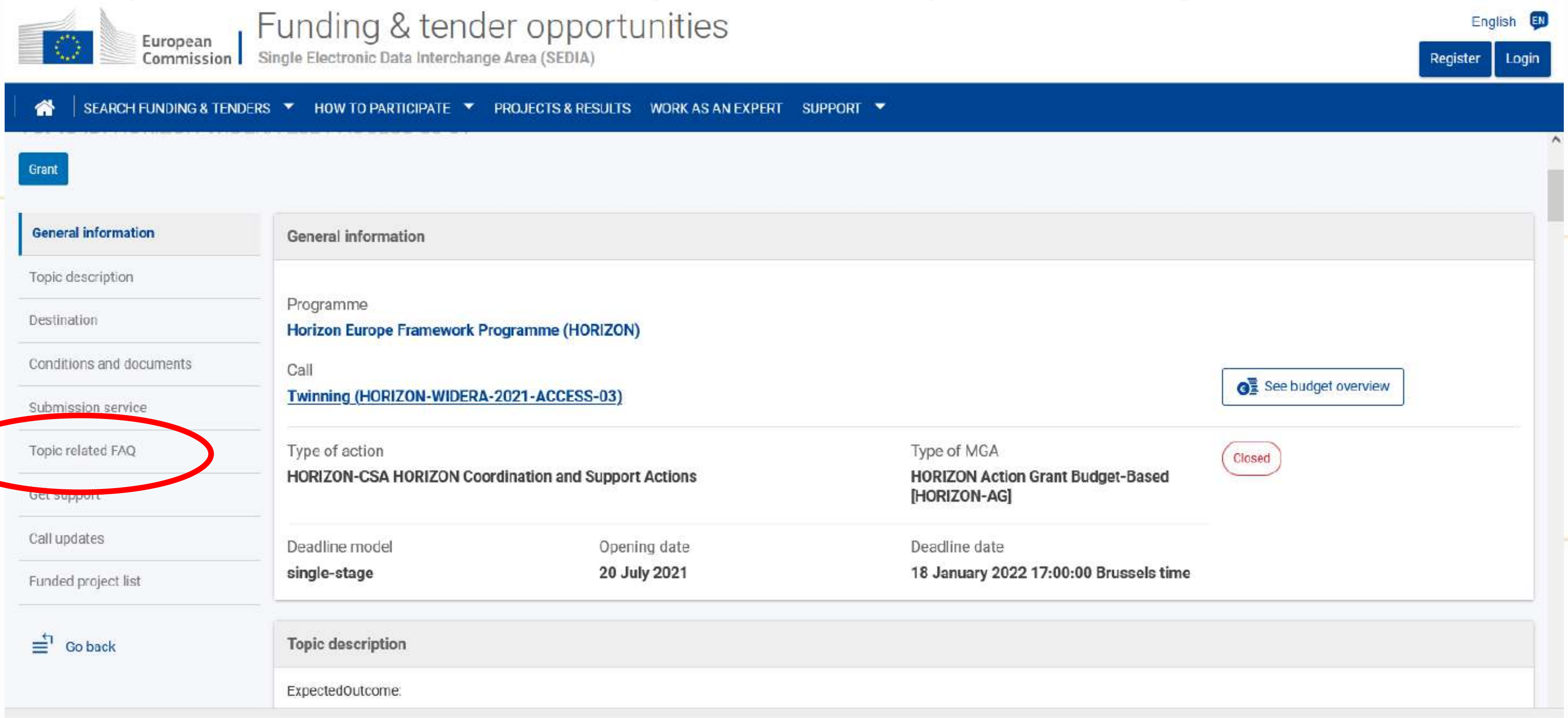


For WP with the preparatory research project (i.e. WP1) show that it consumes below 30% total budget and that the coordinator has over 70%!

For WP for project management (i.e. WP6), keep it within 5-7% range.

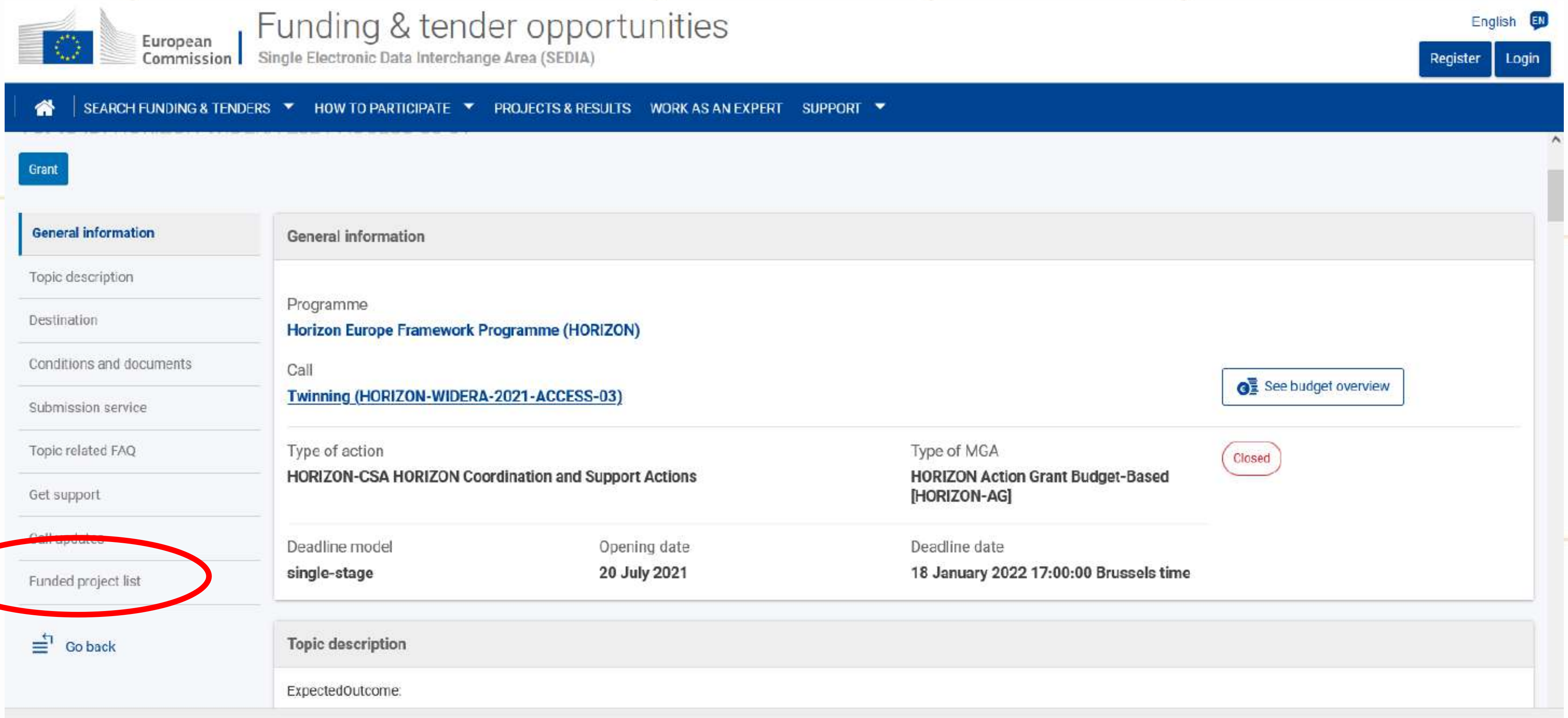
Other Sources of Information (1 of 4)

- Frequently asked questions (FAQs)



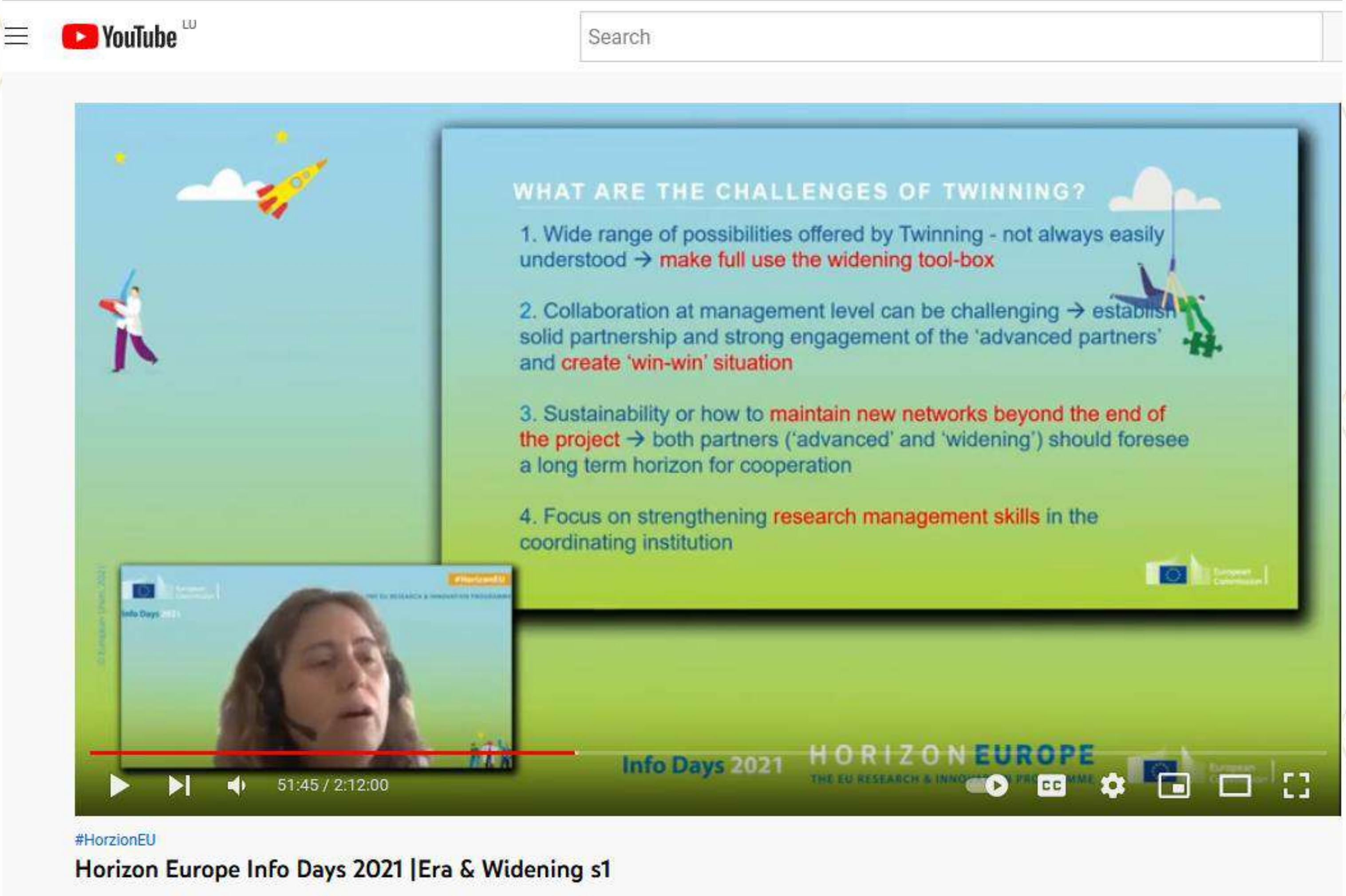
Other Sources of Information (2 of 4)

- Investigate proposals funded under previous calls



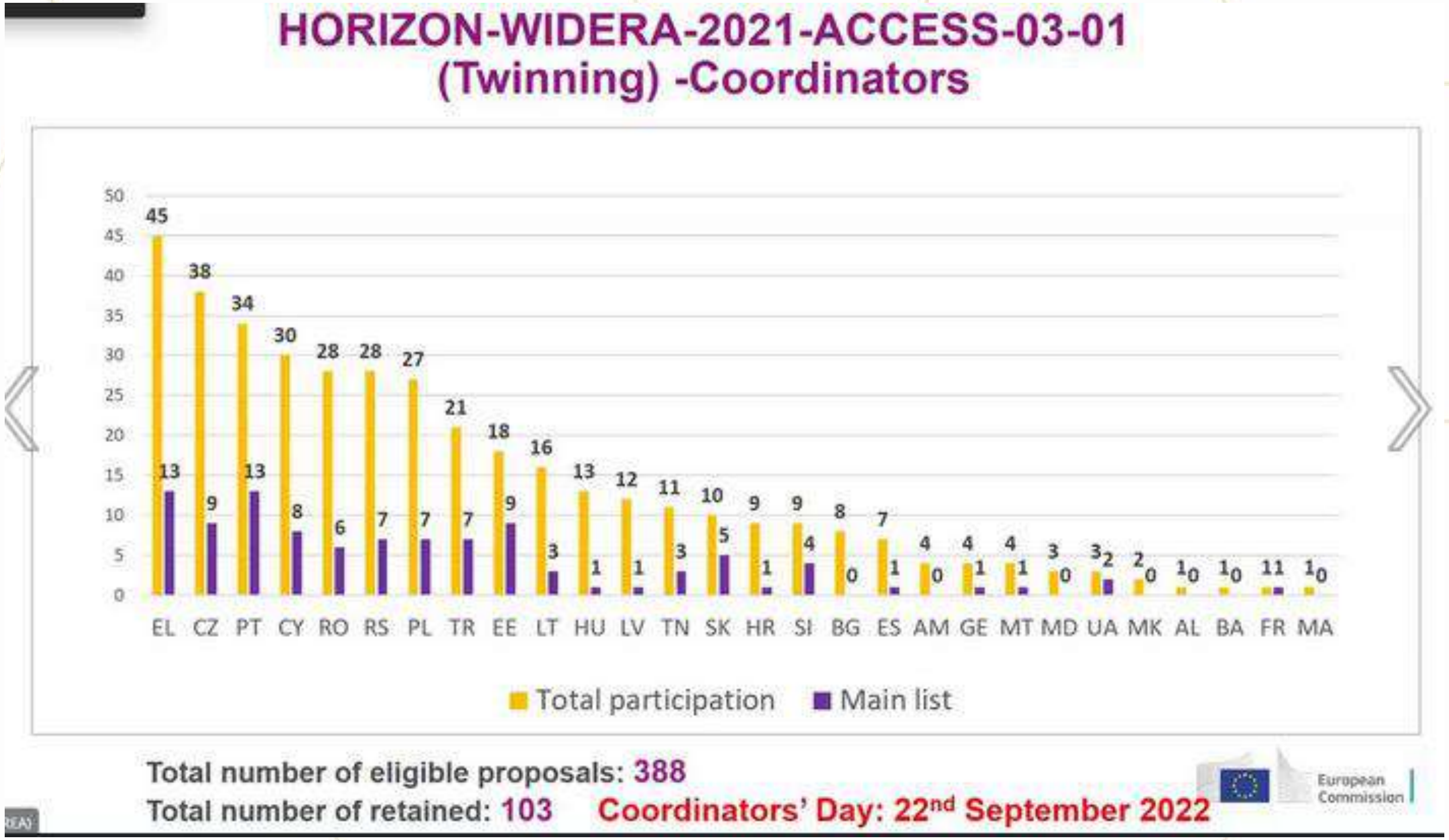
Other Sources of Information (3 of 4)

- Check to see if the EC published a Youtube video about the call



Other Sources of Information (4 of 4)

- Register for e-newsletters from NCP WIDE.NET (www.ncpwide.net)



Questions and Answers about Twinning call (5-10 minutes)

Good luck with your Twinning proposals!

Tips on how to structure and write an ERA-Chair proposal

Giles Brandon, Intelligentsia Consultants,
6th October 2022

Funded by the European Union

Agenda

- What is the ERA-Chair call?
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- Other sources of information

What is the ERA-Chair call? (1 of 3):
- Two example successful ERA-Chair proposals

- **MariCybERA**: ERA Chair in Maritime Cyber Security at Tallinn University of Technology.
- Widening country coordinator: TalTech (EE).

1 of about 15 projects funded from Nov 2019 ERA-Chair call

- **SanDAL**: ERA Chair in Mathematical Statistics and Data Science for the University of Luxembourg.
- Widening country coordinator: University of Luxembourg (LU).

1 of about 15 projects funded from Nov 2017 ERA-Chair call

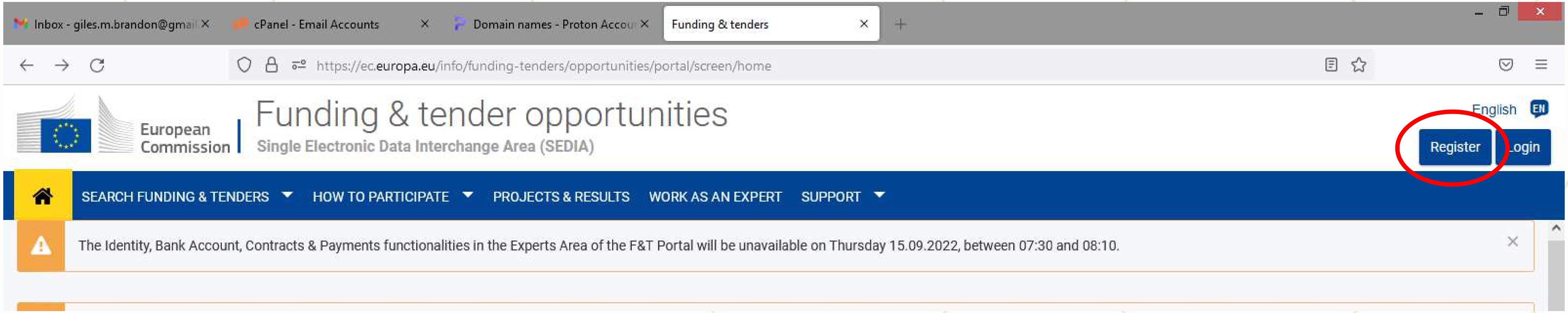
What is the ERA-Chair call? (2 of 3)

1. **Research organisations located in widening countries interested in establishing an ERA Chair shall** (*Professorial position + Research Group*) submit a proposal **(Budget: 1.5-2.5 million euro, 5 year duration)** with the **prospective ERA Chair holder who should be an outstanding researcher and/or innovator in the chosen scientific domain**. The scientific field can be any domain of research and innovation addressed under the Treaty on the Functioning of the European Union.
2. The **institution in the Widening country shall be the coordinator** and can opt between a **joint application** with the legal entity currently employing the future ERA Chair or submitting a proposal as a **single applicant**. For the former, partner institutions can be located in any country (including countries outside the EU) except the country of the coordinator and ERA Chair holders can be citizens of any country in the world.

What is the ERA-Chair call? (3 of 3)

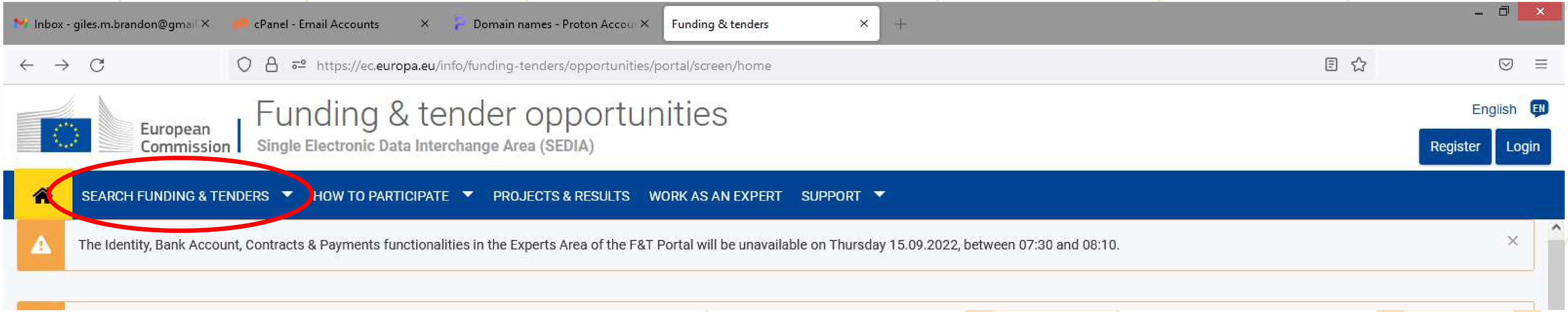
3. Proposals should include a **CV in Europass form of the future ERA Chair holder** and detail the scientific and technical support he/she will provide to the coordinator and how the proposed activities will upgrade from the current situation. If there is a **partner institution** proposals should **outline any additional support** to be provided by it to the coordinator.
4. Proposals should also **describe any relevant investments of the coordinator in research projects, facilities and infrastructures** and how those will be achieved and/or a better use of the installed research capacity (in particular of EU co-funded research infrastructures & facilities)
5. **ERA Chair holders** should be **excellent researchers and/or innovators** in the chosen field of research. They should **establish a research team fully integrated in the coordinator's institution** to significantly improve its research performance in the scientific domain of choice and to be more successful in obtaining competitive funding.

How to register for ERA-Chair call (1 of 2)



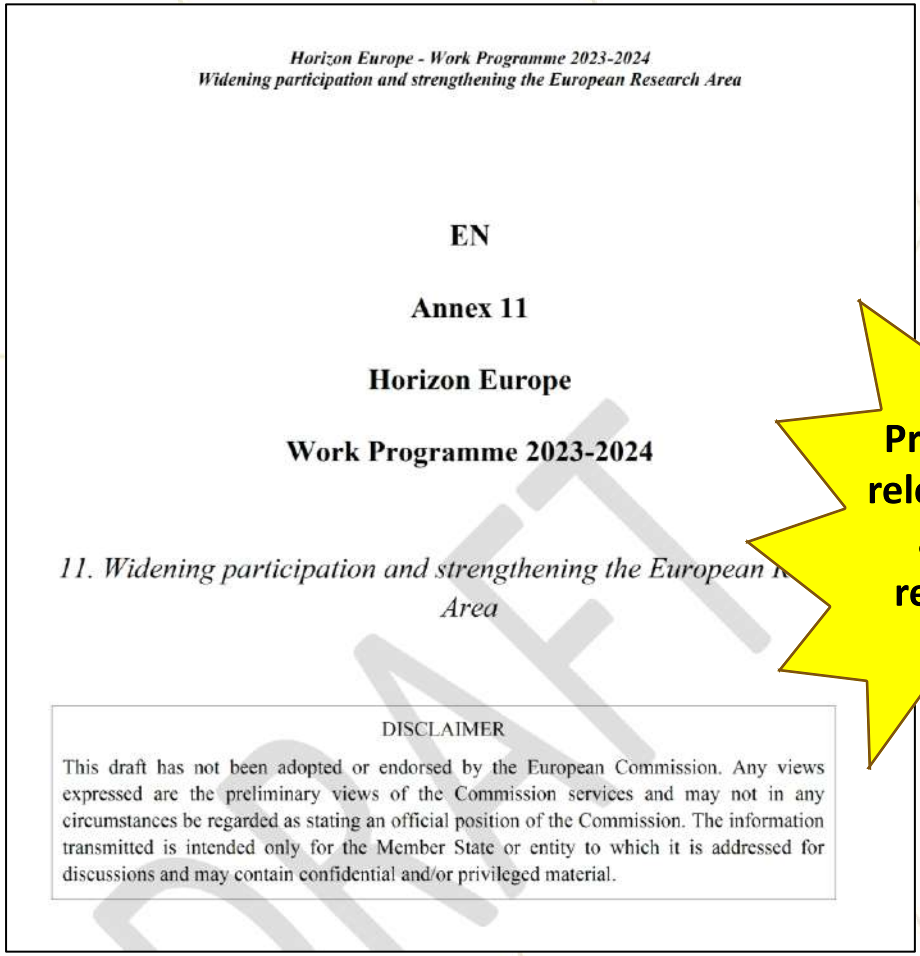
1. If not already done, you need to register a) yourself (email address and password) and b) your institute (PIC number – but check first to see if one already exists!) on the EC's Funding and Tender portal:
   – https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

How to register for ERA-Chair call (2 of 2)



1. Search and register to the Twinning call in the EC's Funding and Tender portal.
    - Select "Search funding and tenders"
    - Set "Submission status" = Open for submission
    - Set "Programming period" = 2021-2027
    - Set "Filter by programme" = Horizon Europe
    - Set "Programme part" = Widening Participation and Spreading Excellence
    - Click on the hypertext link for the ERA-Chair call

Two Essential Documents



Horizon Europe - Work Programme 2023-2024
Widening participation and strengthening the European Research Area

EN

Annex 11

Horizon Europe

Work Programme 2023-2024

11. Widening participation and strengthening the European
Area

DISCLAIMER

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission. The information transmitted is intended only for the Member State or entity to which it is addressed for discussions and may contain confidential and/or privileged material.

Print out the relevant pages and read repeatedly!

Horizon Europe Programme

Standard Application Form (CSA)

Application form (Part A)
Project proposal – Technical description (Part B)

Version 2.0
22 April 2021

Widening work programme 2023-2024

Standard application form for CSA (Coordination and Support Action)

CSA proposal – Technical Description (Part B)

Total length: only 30 pages!

1. Excellence

   1.1 Objectives [EC recommended length: 2 pages]

   1.2 Coordination and/or support measures and methodology [EC recommended length: 6 pages]

2. Impact

   2.1 Project's pathways towards impact [EC recommended length: 4 pages]

   2.2 Measures to maximise impact - Dissemination, exploitation and communication

   2.3 Summary [EC recommended length: 5 pages for Sections 2.2 and 2.3]

3. Quality and efficiency of the implementation

   3.1 Work plan and resources [EC recommended length: 10 pages – including tables]

   3.2 Capacity of participants and consortium as a whole [EC recommended length: 3 pages]

- **Don't deviate more than ½-1 page from the recommended limits!**
- **Start Section 1.1 on the proposal cover page!**

How to structure an ERA-Chair proposal

Describe objectives briefly in Section 1.1 (2 page limit)

Include indicators in Section 1.1!

1. Excellence	3. Implementation	
1.1 Objectives	3.1 Work Plan	Indicators
Objective 1: Recruit Experienced Researchers and Research Administration Manager	WP1: ERA Chair Team Recruitment	No. new recruited research staff, staff assessments...
Objective 2: Establish ERA Chair Strategic Research Programme and Postgraduate Training	WP2: Strategic Research Programme and Postgraduate Training	Strategic research programme, new MSc/PhD programmes ...
Objective 3: Improve Performance in National and EU R&D Funding Programmes	WP3: Research Administration Performance	Training workshops attended, Proposals prepared, ...
Objective 4: Raise the research profile of the ERA Chair	WP4: Summer/Winter Schools and International Conferences	Summer/Winter schools, Training workshops ...
Objective 5: Disseminate the results of the ERA Chair	WP5: Dissemination and Promotion	International conferences, industry events, open days, ...
	WP6: Project Management	

Elaborate on objectives in Section 1.2 (6 page limit)

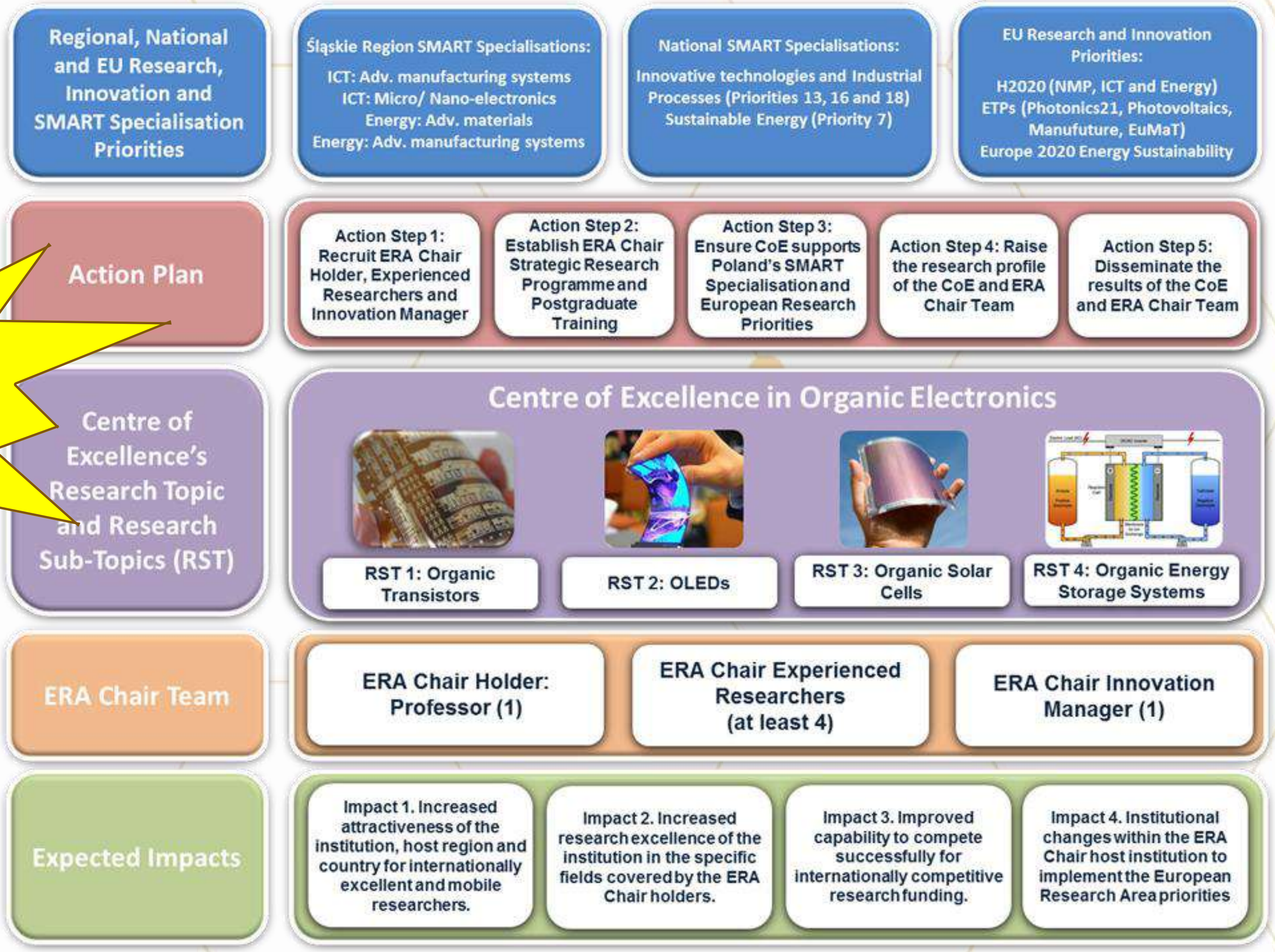
Prepare Sections 1.1, 1.2 and 3.1 concurrently

Section 1: Excellence

- Section 1.1
  - Demonstrate proposal's pertinence to the work programme
- Section 1.2
  - Why the research is important from a national and EU perspective
  - SWOT analysis

Section 1: Excellence

If you have space, then it's nice to have an overview figure in Section 1 ... This one is from a H2020 ERA Chair proposal



Demonstrate proposal's relevance to the work programme (Section 1.1)

Scope of the ERA-Chair call	How/where this proposal addresses the scope of the call
Research organisations located in widening countries interested in establishing an ERA Chair shall submit a proposal with the prospective ERA Chair holder who should be an outstanding researcher and/or innovator in the chosen scientific domain. The scientific field can be any domain of research and innovation addressed under the Treaty on the Functioning of the European Union.	Coordinator: ?? (Widening country) ERA-Chair holder: Prof. ?? who is an outstanding researcher in the field of ?? (H-Index = ??, Other prestigious awards)
Proposals should include a CV in Europass form of the future ERA Chair holder and detail the scientific and technical support he/she will provide to the coordinator and how the proposed activities will upgrade from the current situation.	Europass CV can be found in Section ??
Extract other important requirements from the call text	*Indicate where the proposal addre[sses the] requirement e.g see Section 1.2*
Etc	*Etc*

Include such a table in Section 1.1

Why the research is important from a national and EU perspective (Section 1.2)

- Concisely describe why the research topic is important (1/2 – 1 page)
- National level
  - Reference SMART specialization strategy (S3) and/or
  - Reference national research and innovation strategy/policies
- EU level
  - Reference research and innovation priorities in Horizon Europe and/or
  - Reference European Partnership's research and innovation priorities e.g. Processes4Planet

SWOT Analysis (Section 1.2)

Be specific = More convincing!

Explain how your scientific strategy (objectives) addresses the SWOT

Strengths (S) and Weaknesses (W) of SUT	Opportunities (O) and Threats (T) faced by SUT from External Environment
Strengths S1. Expertise in development of new molecules for optoelectronics S2. Expertise in organic synthesis S3. Expertise in electrochemistry and spectro-electrochemistry. S4. Expertise in polymer chemistry S5. Expertise in the study of conjugated compounds S6. Expertise in investigation of charge carriers in organic compounds S7. The laboratory has access to unique self-built UV-Vis-NIR-EPR spectro-electrochemical to evaluate the formation of charge carriers. S8. Culture of communication, networking and forming research partnerships (national and international) S9. Strong communication infrastructure to disseminate information	**Opportunities** O1. Potential to win materials science, optoelectronics, nano- and light technologies projects funded by National Authority for Scientific Research O2. Potential to participate in H2020 programme (NMP, ICT, FET, MSCA, FET) O3. Potential to participate in EU cross-border cooperation programmes O4. Potential to improve in area of organic optoelectronics through collaborative research and technology transfer involving Twinning partners O5. Existence of a significant Organic Electronic scientific diaspora and potential of involving it in the national R&D and innovation activities O6. An existing network R&D and innovation organizations and qualified human resources O7. Growing market (regulations relating to data protection).
Weaknesses W1. Out-of-date facilities to investigate surface morphology. W2. Lack of direct access to equipment for device formation and characterization. W3. Lack of job opportunities for young researchers leads to decrease in capability to exploit recent developments in new materials for OLED and OSC. W4. Insufficient national investment in R&D equipment and training of researchers. W5. Insufficient international visibility. W6. Lack of R&D proposal writing skills. W7. Weak regulation environment and innovation infrastructure W8. Weak science-industry collaboration	**Threats** T1. Continued brain-drain of well qualified Polish researchers to multinational companies T2. Fluctuation in national R&D funding due to changing priorities of government budget formation T3. Lack of trained researchers and managers to fully exploit opportunities with H2020 projects T4. Continued domination of inorganic semiconductor devices producers in the field of electronics T5. Reduced private investment in organic electronics sector due to recent global economic crisis T6. Reduced employment opportunities in the sector of organic semiconductors due to global economic crisis

Section 2: Impact

- Section 2.1
  - Contribution to expected outcomes (qualitative and quantitative)
  - Potential barriers arising from factors beyond the scope and duration of the project
- Section 2.2
  - Dissemination and Communication Plan
  - Strategy for the management of intellectual property

Write about 2-3 pages in a **narrative style**

Qualitative contribution to expected outcomes (Section 2.1) (1 of 2)

At system level

- Outcome 1: Increase in number of R&I talents moving to host organisations in Widening countries.
- Outcome 2: Increase in international, interdisciplinary and intersectoral mobility of researchers and innovators.
- Outcome 3: Encouraging institutional reforms in research institutions and in the national R&I system in widening countries.
- Outcome 4: Strengthening of Widening countries' human capital base in R&I with more entrepreneurial and better trained researchers and innovators.
- Outcome 5: Better communication of R&I results to society.
- Outcome 6: Better quality and capacity of research and innovation contributing to Europe's competitiveness and growth.
- Outcome 7: Improved excellence capacity and resources in Widening countries and close the still apparent research and innovation gap within Europe

Qualitative contribution to expected outcomes (Section 2.1) (2 of 2)

At organisation level

- Outcome 1: Research excellence of the institution in the specific fields covered by the ERA Chair holder.
- Outcome 2: Increased attractiveness of the institution for internationally excellent and mobile researchers.
- Outcome 3: Creation of a permanent and excellent research group in the chosen scientific field with a spill-over effect on the institution.
- Outcome 4: Improved capability to succeed in competitive research funding in the EU and globally, at least, in the fields of choice.
- Outcome 5: Greater contribution to the knowledge-based economy and society.

Quantitative contribution to expected outcomes (Section 2.1)

Use the KPIs from Section 1.1

Expected Outcomes	WP	Performance Indicators	Target
Outcome 1: Research excellence of the institution in the specific fields covered by the ERA Chair holder.	1, 2, 3, 4 and 5	• Recruit Professor • Recruit Experienced Researchers • Average h-index of institution's project members involved in ERA-Chair • PhD Training Course in ??? • MSc Training Course in ??? • Papers published in international journals • Papers presented at international conferences	?? ?? ?? ?? ?? ??
Outcome 2: Increased attractiveness of the institution for internationally excellent and mobile researchers.	??, ??, ??	• Etc. • Etc. • Etc.	?? ?? ??
Etc.	etc	• Etc	etc

Potential barriers arising from factors beyond the scope and duration of the project (Section 2.1)

- Scientific related barriers
  - Describe 3-4 challenges/barriers specific to the research topic and/or
  - Describe 3-4 challenges/barriers identified by relevant European Partnerships e.g. Made in Europe
- Country related
  - Describe 3-4 challenges/barriers faced by your country's research and innovation system

For each challenge/barrier, describe a mitigation measure the project will take!

Dissemination and Communication Plan (Section 2.2)

Dissemination and Communication Plan				
Project result	**Partners Concerned**	**Dissemination Activity**	**Target audience**	**Indicator & Target**
Project leaflet and poster	Coordinator and Twinning Partners	Distribute during international conferences (e.g. X, Y, Z, etc.), training workshops and outreach events	Scientists, engineers and general public	250+ leaflets distributed, 25+ posters displayed
Press conferences	Coordinator	Press conferences at the start and end of the project	Regional and national news media (radio, TV and print newspapers)	2 conferences, 5+ journalists
Project news	Coordinator and Twinning Partners	Publish project news releases and distribute through broader scientific news channels	Scientists, engineers and general public	2+ press releases
Project website	Coordinator and Twinning Partners	Publish project summary, regular news and event updates on website	Scientists, engineers and general public	2500+ visitors
etc	etc	etc	etc	etc

Strategy for the management of intellectual property (Section 2.2)

Include tables that capture ownership of background and foreground knowledge!

Research Sub-Topic	Existing Background Knowledge
Research Sub-Topic #1: Organic Transistors	Issues concerning high operational voltage for application and mobility overestimation for material analysis purposes.
Research Sub-Topic #2: Organic Light Emitting Diodes	Stability, efficiency and costs of OLEDs.
Research Sub-Topic #3: Organic Solar Cells	Stability, efficiency and costs of OPVs.
Research Sub-Topic #4: Organic energy storage systems	Issues concerning costs (per kWh), stability of storage energy, and stability during charging-discharging cycles. Poor stability of flexible batteries.

Research Sub-Topic	Possible Foreground Knowledge
Research Sub-Topic #1: Organic Transistors	New high electron mobility materials. Gradient source-drain electrode materials to reduce operational voltage. New impedance technique to analyse charge mobility properties.
Research Sub-Topic #2: Organic Light Emitting Diodes	Methods to reduce degradation pathways. New highly efficient TADF-RTP materials for white OLED lighting.
Research Sub-Topic #3: Organic Solar Cells	New non-fullerene acceptors. New structures and new transporting materials to increase charge extraction from the active part of OPVs.
Research Sub-Topic #4: Organic energy storage systems	New materials for flexible batteries for use in flexible devices. Use of carbon nanotubes and graphene in printed batteries. Environmental friendly high capacity flow batteries.

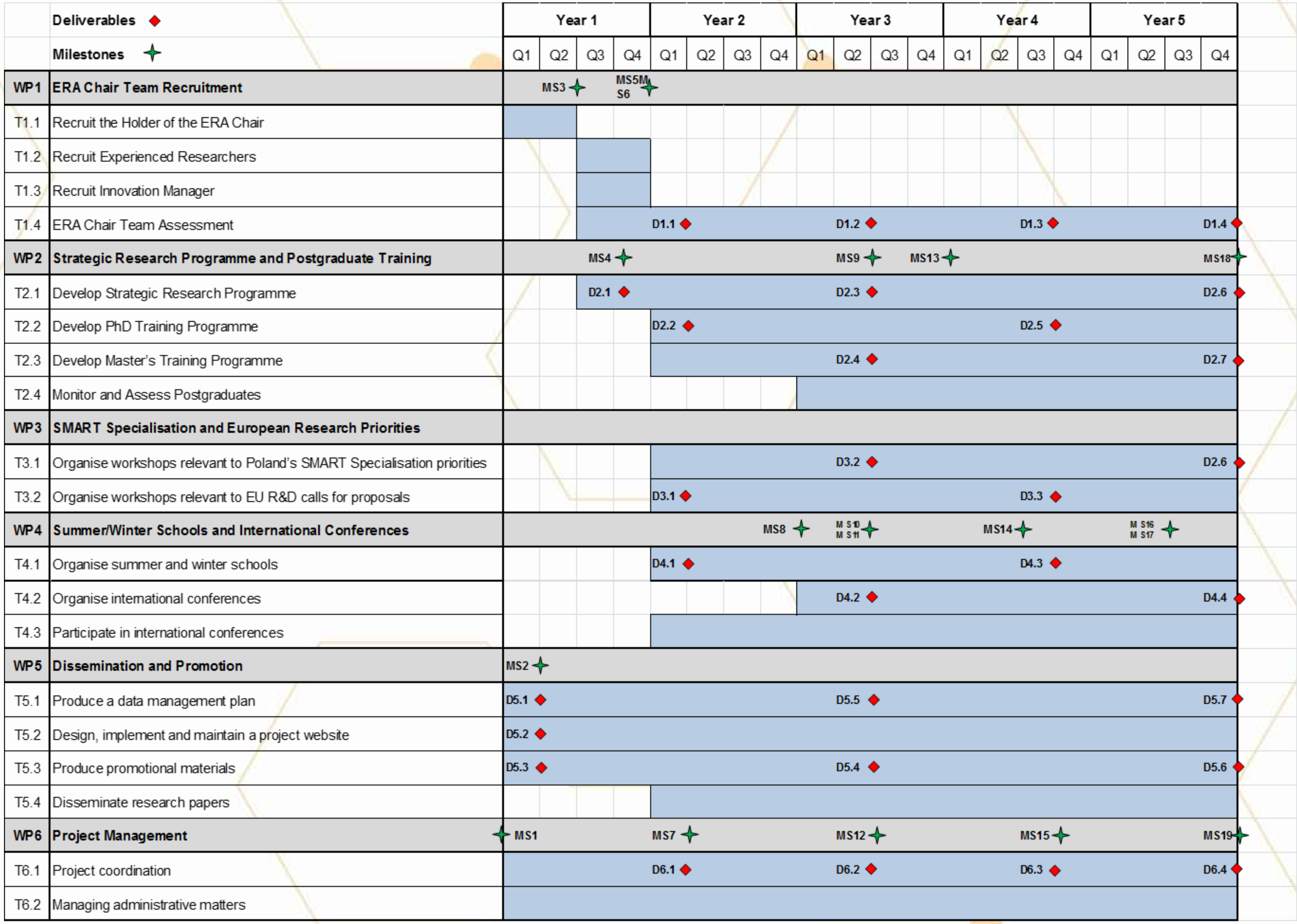
Section 3: Implementation

- Section 3.1
  - Work package (WP) descriptions
  - Gantt chart
  - Budget

Work package (WP) descriptions (Section 3.1)

See MS Word file!

Gantt Chart (Section 3.1)



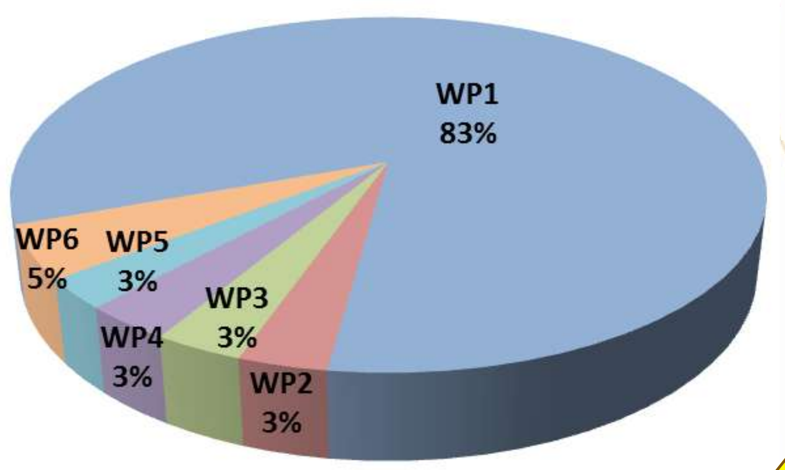
Careful!
This is a Gantt chart from a H2020 ERA-Chair proposal. Now, in Horizon Europe, no need for task T1.1!

Budget (Section 3.1)

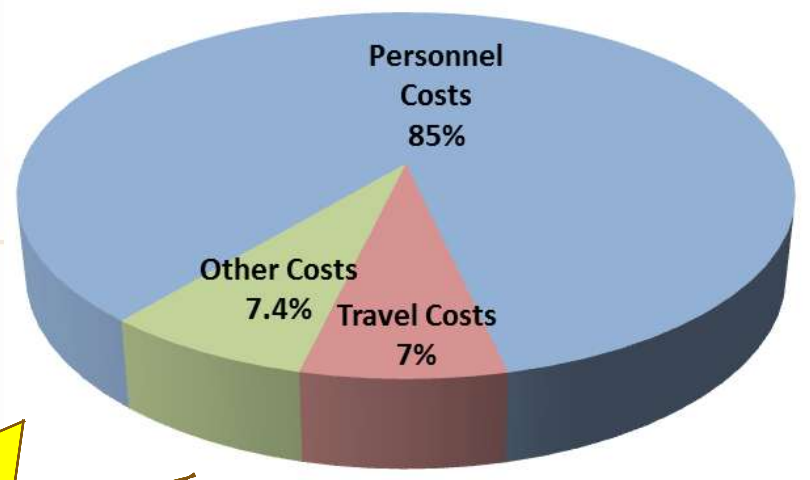
Include some pie charts to illustrate how your budget and efforts (PMs) are allocated!

For WP for project management (i.e. WP6), keep it within 5-7% range.

Person-Month Efforts Distribution (%)



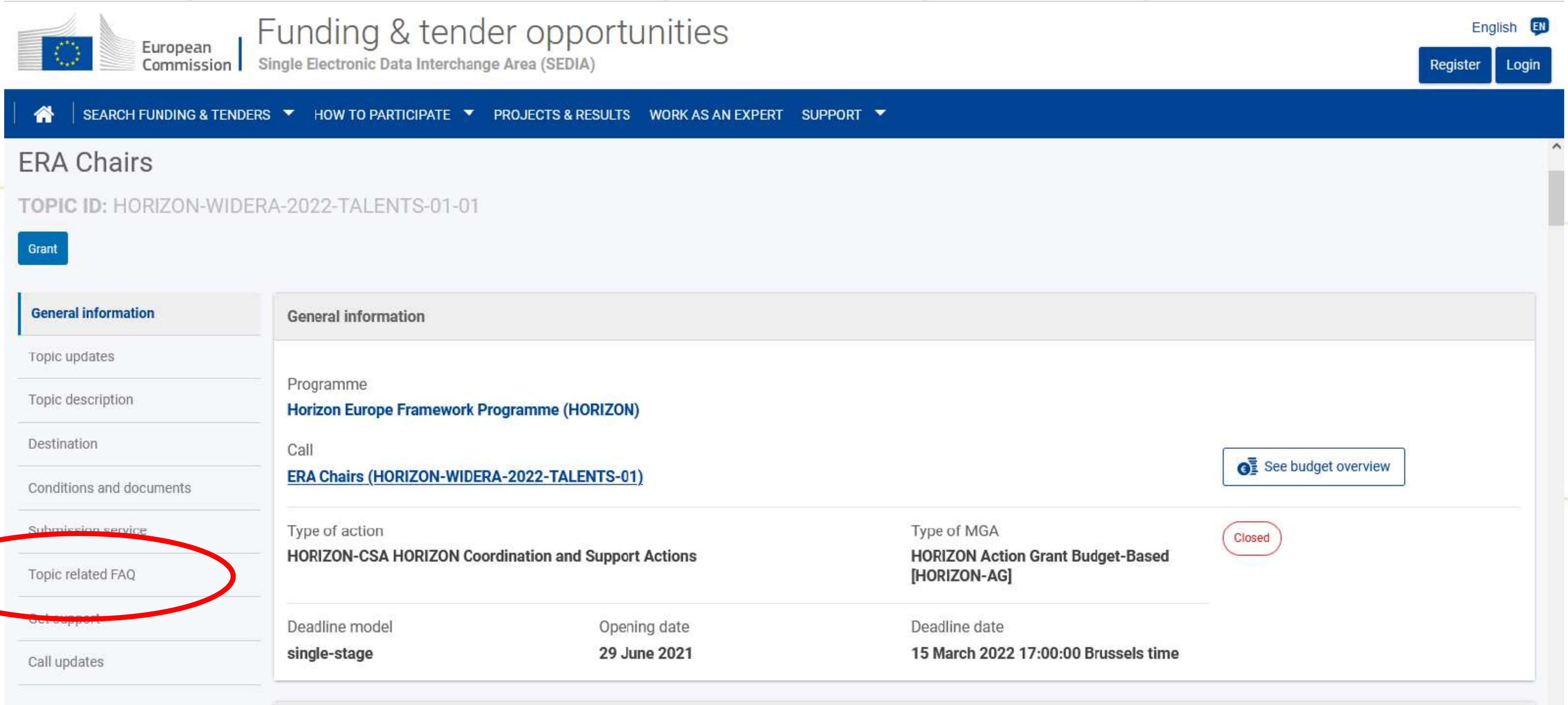
Budget Distribution (%)



Write a few bullet points of "blah-blah" in the proposal justifying the allocation of efforts and budget

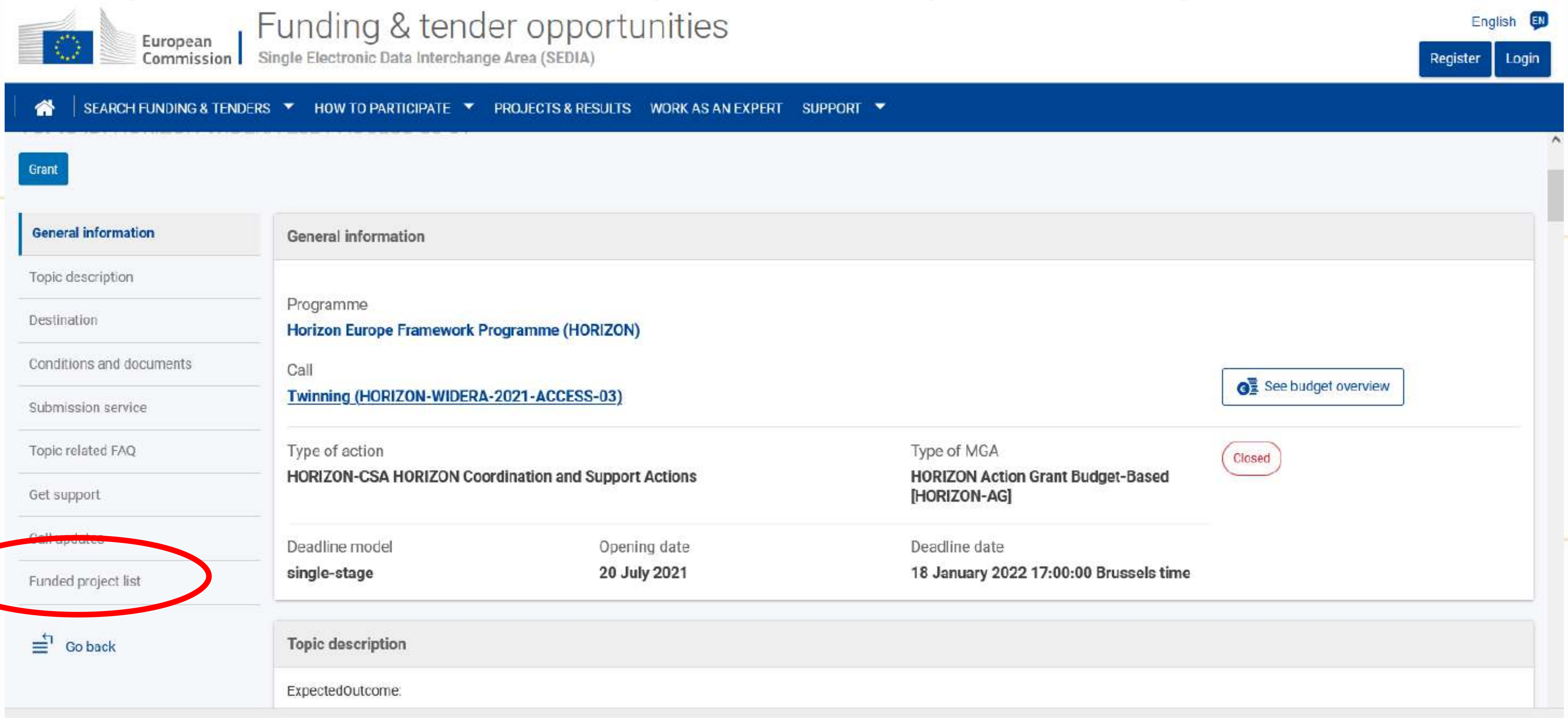
Other Sources of Information (1 of 4)

- Frequently asked questions (FAQs)



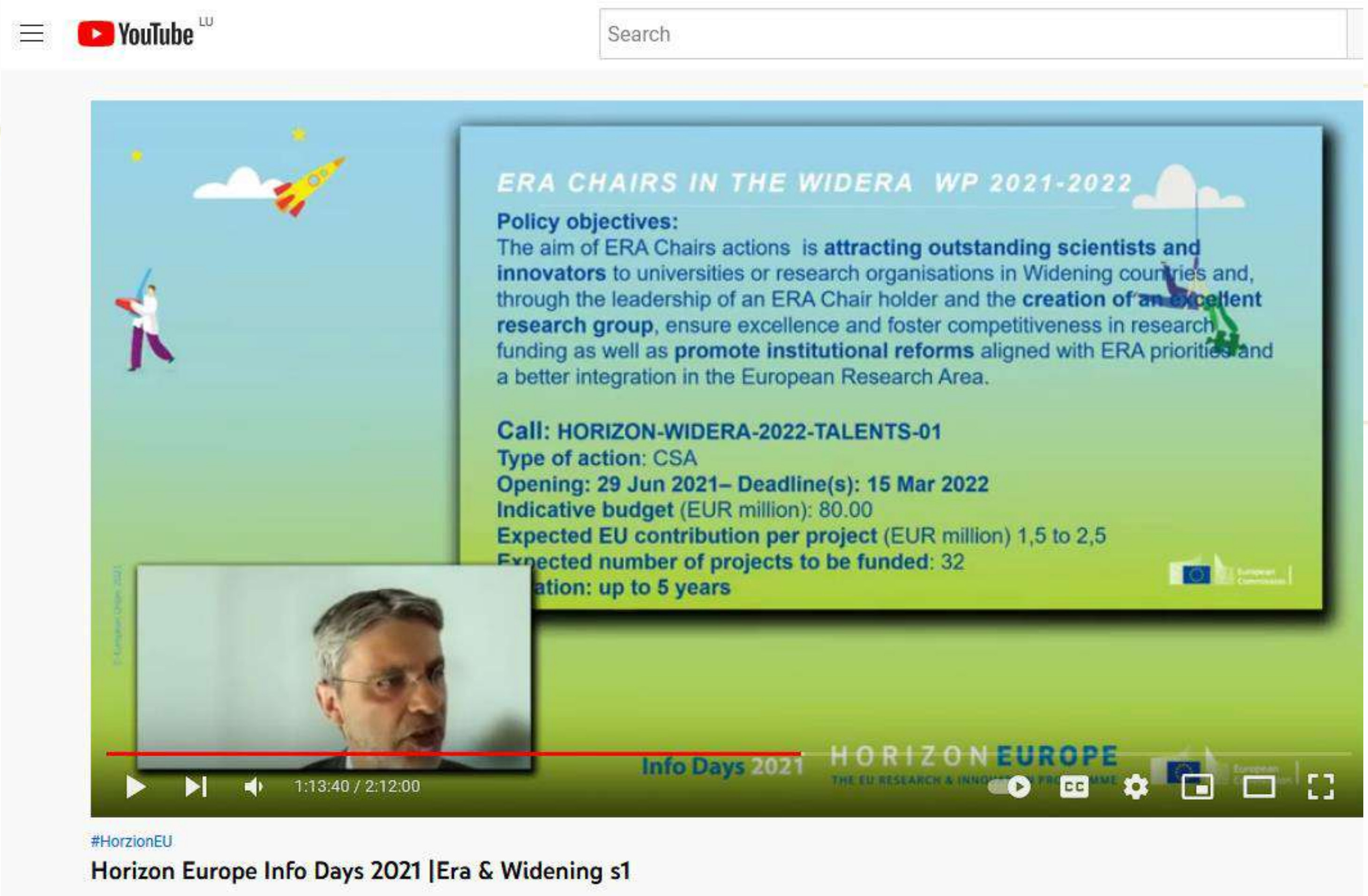
Other Sources of Information (2 of 4)

- Investigate proposals funded under previous calls



Other Sources of Information (3 of 4)

- Check to see if the EC published a Youtube video about the call



Other Sources of Information (4 of 4)

- Register for e-newsletters from NCP WIDE.NET (www.ncpwide.net)

Questions and Answers about ERA-Chair call (5-10 minutes)

Good luck with your ERA-Chair proposals!

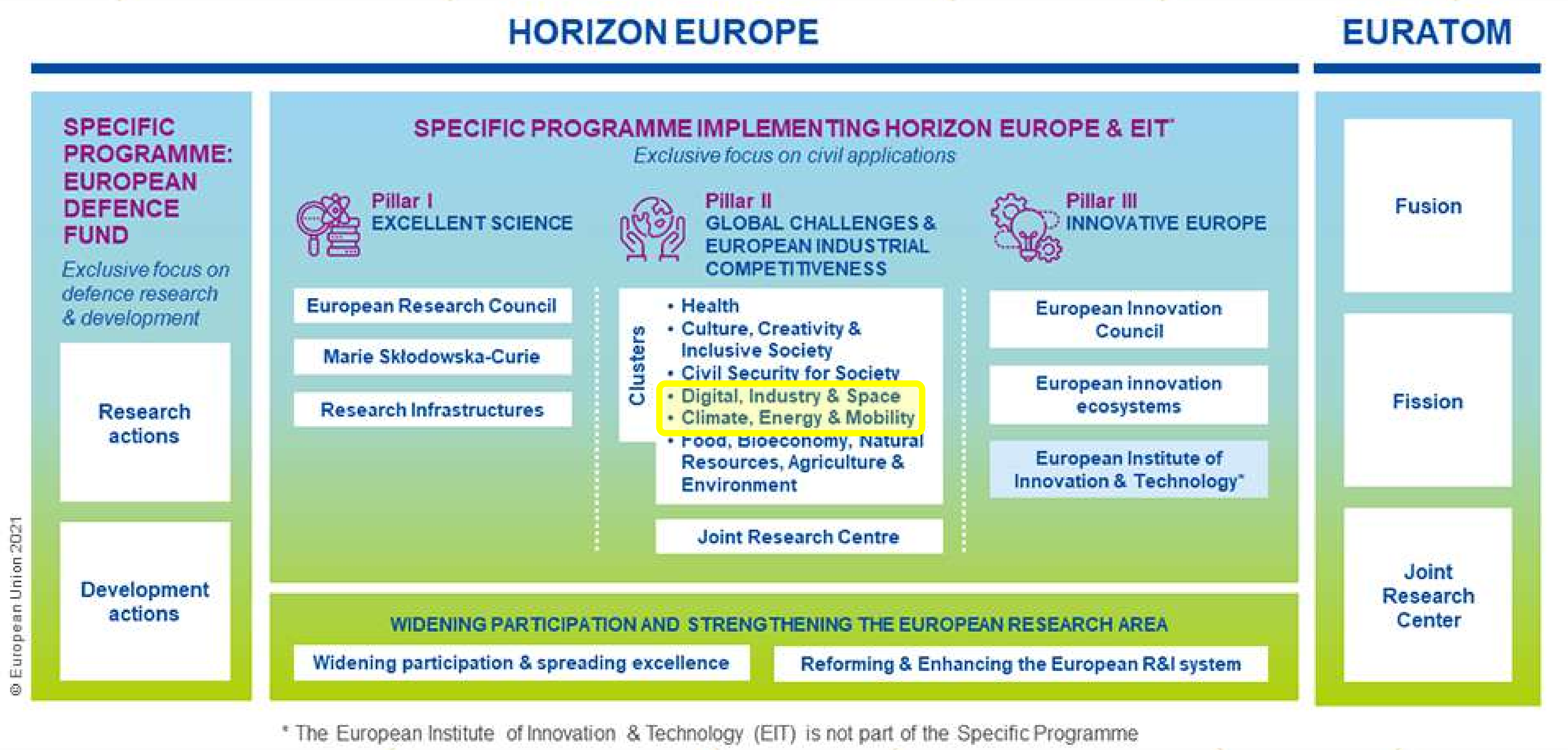
How to get started & how to structure the overall proposal

Giles Brandon, Intelligentsia Consultants

6th October 2022

Funded by the European Union

Horizon Europe Programme



Training focused on proposals for **Research and Innovation Actions (RIA)** and **Innovation Actions (IA)** under **Pillar II Cluster 4 (Digital, Industry and Space)** and **Cluster 5 (Climate, Energy and Mobility)**

Essential Documents

EN

Horizon Europe

Work Programme 2021-2022

7. Digital, Industry and Space

(European Commission Decision C(2022)2975 of 10 May 2022)

Work programme 2021-2022
(in this case Pillar II Cluster 4)

Print out the relevant pages and read repeatedly!

Check online to see if EC has run an info-day webinar about the call!

Horizon Europe Programme

Standard Application Form (HE RIA, IA)

Application form (Part A)
Project proposal – Technical description (Part B)

Version 4.0
21 January 2022

Standard application form for
RIA (Research and Innovation Actions)
and IA (Innovations Actions)

Example Call Text

HORIZON-CL4-2022-DIGITAL-EMERGING-02-05: AI, Data & Robotics for Industry optimisation (including production & services) (AI, Data & Robotics)

1. Specific Conditions
   - Expected EU contribution per project, Indicative budget, Type of action (RIA or IA), Technology readiness level (TRL), Procedure, legal and financial set-up of the grant agreements
2. Expected Outcome
   - Typically, several bullet points identifying the expected outcomes the proposal is expected to contribute to.
3. Scope
   - Typically, extensive text describing the scope of the call.

Part B for an RIA/IA proposal

Total length: 45 pages (including cover page)

1. Excellence

   1.1 Objectives and ambition [EC recommended length: 4 pages]

   1.2 Methodology [EC recommended length: 14 pages]

2. Impact

   2.1 Project's pathways towards impact [EC recommended length: 4 pages]

   2.2 Measures to maximise impact - Dissemination, exploitation and communication

   2.3 Summary [EC recommended length: 5 pages for Sections 2.2 and 2.3]

3. Quality and efficiency of the implementation

   3.1 Work plan and resources [EC recommended length: 14 pages – including tables]

   3.2 Capacity of participants and consortium as a whole [EC recommended length: 3 pages]

- **Don't deviate more than 1 page from the recommended limits!**
- **Consider starting Section 1.1 on the proposal cover page!**

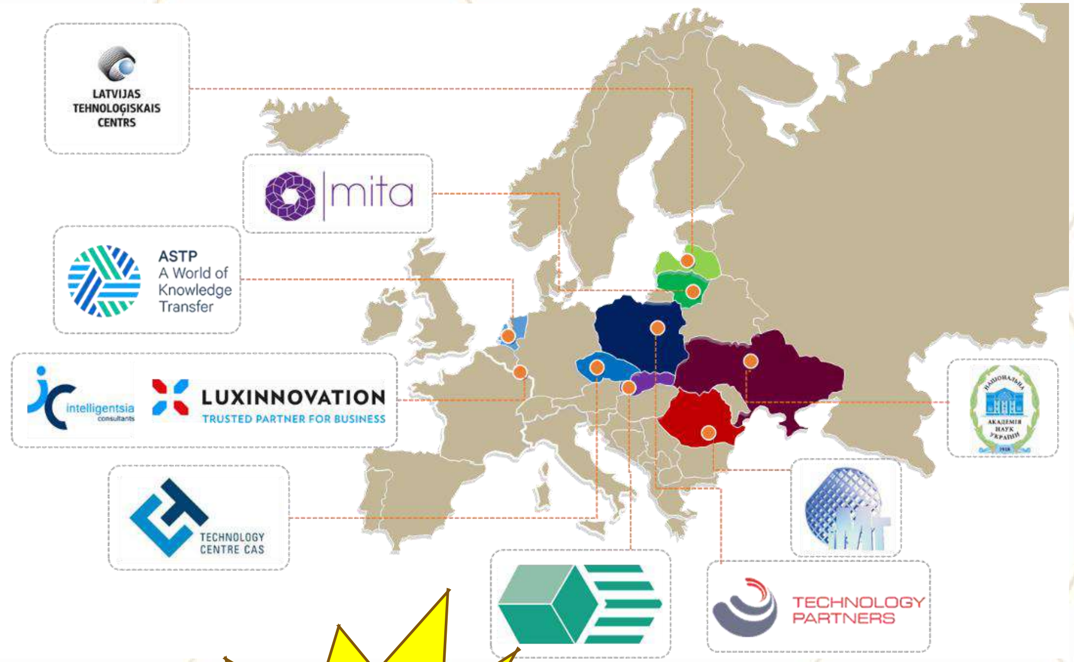
Consortium Building (1 of 3)

- Check carefully the call text to identify the minimum consortium requirements (e.g. at least three independent legal entities from three different Member States or Associated Countries).
- Typically, 5-10 partners in an RIA and IA with a €3-6m budget.
- Identify an initial "critical mass" of partners e.g. 5+ partners.
- Identify who will be the proposal coordinator and who will be the lead proposal writer (not necessarily the same person!)
- Organise meeting(s) with the "critical mass" to structure the proposal
  - Ideally, face-to-face with a white board
  - Alternatively, online with one person good at editing MS Powerpoint

Consortium Building: Examples (2 of 3)

OLED Materials	OLED Stacks	OLED Micro-displays
• Shielded Emitter (Merck) • TADF Host (UDUR) • Photo-physical Characterisation (UDUR)	• Hyper-fluorescence OLEDs (Merck) • Optical Anisotropy (IOF)	• Hyper-fluorescence Microdisplays (MOD)
EU Project Management and Dissemination Support (Intelligentsia)		

Important to include companies across value chain!



Important to have a "nice" geographical spread!

Consortium Building: Examples (3 of 3)

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Merck KGaA	Merck	Germany
2	MICROOLED S.A.S	MOD	France
3	Fraunhofer Institute for Applied Optics and Precision Engineering	IOF	Germany
4	Durham University	UDUR	UK
5	Intelligentsia Consultants Sarl	Intelligentsia	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	MZ Denmark GmbH	MOZ	Germany
2	Ericsson AB	ERI	Sweden
3	F-Secure Oyj	FSEC	Finland
4	Intel Deutschland GmbH	INT	Germany
5	Intelligentsia Consultants Sarl	IC	Luxembourg
6	Luminem SRLs	LUM	Italy
7	Mind SRL	MIND	Italy
8	Riots Global Oy	RIO	Finland
9	Sensative AB	SEN	Sweden
10	Consiglio Nazionale delle Ricerche	CNR	Italy
11	RISE Research Institutes of Sweden AB	RISE	Sweden
12	Centria Ammattikorkeakoulu Oy	CEN	Finland
13	Politecnico di Torino	POL	Italy

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Technische Universiteit Delft	TUD	Netherlands
2	Technische Universiteit Eindhoven	TUE	Netherlands
3	Rheinisch-Westfälische Technische Hochschule Aachen	RWTH	Germany
4	Institut National de Recherche en Informatique et en Automatique	INRIA	France
5	Eidgenössische Technische Hochschule Zürich	ETHZ	Switzerland
6	Stichting IMEC Nederland	IMEC	Netherlands
7	ARM Limited	ARM	UK
8	IBM Research GmbH	IBM	Switzerland
9	Intelligentsia Consultants Sarl	INT	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Intelligentsia Consultants *Sàrl*	Intelligentsia	Luxembourg
2	Novaled GmbH	Novaled	Germany
3	Astron Fiamm Safety *Sàrl*	Astron-FIAMM	France
4	University of Durham	UDUR	UK
5	Technische Universität Dresden	TUD	Germany
6	Kauno Technologijos Universitetas	KTU	Lithuania

How to structure Sections 1 and 3

Breakdown overall project goal into “chronological” scientific and technological objectives

1. Excellence

1.1 Objectives

Map each S&T objective to its own WP

3. Implementation

3.1 Work Plan

During discussions with consortium partners, start by sketching out the WPs and who will lead each WP.

Scientific and Technological (S&T) Objective 1 → WP1: Tasks to achieve S&T Objective 1

S&T Objective 2 → WP2: Tasks to achieve S&T Objective 2

S&T Objective 3 → WP3: Tasks to achieve S&T Objective 3

S&T Objective 4 → WP4: Tasks to achieve S&T Objective 4

Describe S&T objectives concisely in Section 1.1

WP5: Dissem., Exploit. & Communication

WP6: Project Management

Prepare Sections 1.1 and 3.1 concurrently

Put Dissemin. and Project Mgt WPs at the end!

Structuring Sections 1 & 3: Example

1. Excellence	3. Implementation
1.1 Objectives	3.1 Work Plan
S&T Objective 1: Screen potential ICT-TADF and Exciplex-TADF compounds with theoretical models →	WP1: Modelling
S&T Objective 2: Synthesise the most promising ICT-TADF and Exciplex-TADF model compounds →	WP2: Synthesis
S&T Objective 3:Characterise and select the best ICT-TADF and Exciplex-TADF synthesised compounds →	WP3: Characterisation
S&T Objective 4: Design white stack units employing the selected TADF based emitter and block materials →	WP4: Emitter Layer Design and Stack Integration
S&T Objective 5: Design close-to-production OLED lighting panel demonstrators →	WP5: OLED Lighting Panel Demonstrators
	WP6: Dissem., Exploit. & Communication
	WP7: Project Management

How to write Section 1 "Excellence"

Giles Brandon, Intelligentsia Consultants

6th October 2022

Funded by the European Union

Section 1: Excellence

- Section 1.1: Objectives and ambition
  - EC recommended length: 4 pages
- Section 1.2: Methodology
  - EC recommended length: 14 pages

Section 1.1: Objectives and ambition

1. Briefly describe the objectives of your proposed work. Why are they pertinent to the work programme topic? Are they measurable and verifiable? Are they realistically achievable?
2. Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious. Indicate any exceptional ground-breaking R&I, novel concepts and approaches, new products, services or business and organisational models. Where relevant, illustrate the advance by referring to products and services already available on the market. Refer to any patent or publication search carried out.
3. Describe where the proposed work is positioned in terms of R&I maturity (i.e. where it is situated in the spectrum from 'idea to application', or from 'lab to market'). Where applicable, provide an indication of the Technology Readiness Level, if possible distinguishing the start and by the end of the project.

Section 1.1: Objectives and ambition

"*Briefly describe the objectives of your proposed work. Why are they pertinent to the work programme topic?*" (1 of 2)

Each WP leader should describe/elaborate the S&T objective for their WP (½ page or less)

1. Excellence		3. Implementation
1.1 Objectives		3.1 Work Plan
Scientific and Technological (S&T) Objective 1	→	WP1: Tasks to achieve S&T Objective 1
S&T Objective 2	→	WP2: Tasks to achieve S&T Objective 2
S&T Objective 3	→	WP3: Tasks to achieve S&T Objective 3
S&T Objective 4	→	WP4: Tasks to achieve S&T Objective 4
		WP5: Dissem., Exploit. & Communication
		WP6: Project Management

Section 1.1: Objectives and ambition
"Briefly describe the objectives of your proposed work. Why are they pertinent to the work programme topic?" (2 of 2)

Topic addressed by the Call	SIFIS-Home relevance
SU-ICT-02-2018-2020: Building Blocks for Resilience in Evolving ICT Systems	**This is the centre of gravity of the SIFIS-Home project, which especially focuses on solutions for security, privacy and accountability for Smart-Home networked systems.**
Algorithms, software and hardware systems must be designed having security, privacy, data protection and accountability in mind from their design phase in a measurable manner.	The planned work in the project is structured in order to successfully fulfil this requirement from the start. In fact, from a logical and chronological point of view: 1. The work starts with defining an architecture and related security & privacy goals (WP1). This will keep in mind a "measurable approach" from the start. 2. Building on previous results, guidelines/methods/tools for assessing quality and legal aspects will be developed in WP2 throughout the project. 3. Building on previous results, technical solutions such as algorithms and methods, as well as software and hardware systems will be designed and developed in WP3 and WP4. Measures will be produced on testbed level (WP5) and use case level (WP6), as to performance, requirement fulfilment, usability and user experience, as well as perceived and achieved security & privacy level.
Relevant challenges include: (a) to develop mechanisms that measure the performance of ICT systems with regards to cybersecurity and privacy and	Challenge (a) will be especially tackled through the work in WP2, by developing and providing methods, techniques, metrics and tools for performing an evaluation at IoT software level and at IoT infrastructure level. Performance indicators of interest include, but are not limited to: level of security and privacy provided to end users, as to the effectiveness in fulfilling the intended security requirements; impact on infrastructure, system and network functioning; risk of vulnerability exploitation.

Create a table with each key requirement from the call text. Then, concisely explain how your proposal addresses each of them

Section 1.1: Objectives and ambition
"Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious" (1 of 2)

Example from an organic electronics related project

	Current State-of-the-Art	HyperOLED Target
TADF host and shielded fluorescence emitter materials		
TADF host	Emission peak maximum 465nm	430nm to excite deep blue fluorescence emitters
Shielded fluorescence emitters synthesis	Phosphorescent emitters: Complex metal-organic synthesis and purification	Purely organic material: Easier synthesis and purification
Shielded fluorescence emitters analytics, quality control	Phosphorescent emitters: Difficult chemical analytics (purity, trace impurities etc.)	Well-developed analytical techniques for purely organic materials can be used
White OLED stack		
Simplified white stack	Hybrid tandem (fluorescent blue + phosphorescent red/green), approx. 10-15 organic layers	One-unit stack, approx. 6-8 organic layers
Efficiency	Hybrid tandem 30lm/W @ 1000cd/m², CIE x/y 0.39/0.39 (no outcoupling)	40lm/W with same CIE
Voltage	Hybrid tandem as above, 8.5V @ 10mA/cm²	5.5V @ 10mA/cm²
Lifetime	Full phosphorescent 50lm/W @ 1000cd/m², 1500h LT70 @ 1000cd/m², CIE x/y 0.49/0.42 (no outcoupling)	5000h LT70 (same efficiency etc.)
Blue TADF+shielded fluorescence emitter OLED		
Efficiency	Fluorescent, 11.5% EQE, CIE x/y 0.14/0.09 (EQE is the same for lighter blue)	20% EQE, CIE x/y 0.14/0.20
Lifetime	Phosphorescent 20% EQE, 90h LT70 @ 5mA/cm², CIE x/y 0.14/0.31	300h LT70 @ 5mA/cm² CIE x/y 0.14/0.20
High temperature lifetime	Phosphorescent: Lifetime decrease of factor 3 per 20°C	Factor of 2 per 20°C
OLED Microdisplay		
Brightness, operating voltage and backplane technology	Products: Full colour at 500cd/m² (MOD, eMagin, Sony), two-colour red green at 3000cd/m² (MOD) Prototype under development: full colour with high voltage (5V) CMOS process, proof of concept for 3000-5000cd/m² (MOD)	2000cd/m² using low voltage (2.5V CMOS process) backplane.

Section 1.1: Objectives and ambition
“Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious” (2 of 2)

Example from a computation-in-memory related project

Table 1a: MNEMOSENE anticipated performance improvements relative to state-of-the-art
Improve the energy-delay product by factor of 100X to 1000X
Improve the computational efficiency (#operations / total-energy) by factor of 10X to 100X
Improve the performance density (# operations per area) by factor of 10X to 100X

Section 1.1: Objectives and ambition *“Describe where the proposed work is positioned in terms of R&I maturity”* (1 of 2)

Level of Development	TRL No.	TRL Definition	Means of Verification	Timing
Basic Technology Research	TRL 1	Basic principles observed	Research papers and patents.	Completed
Research to Prove Feasibility	TRL 2	Technology concept formulated	• The concept of CIM will be developed and demonstrated using real crossbar and memristive devices and by performing experiments and measurements. • Different memristive device technologies (e.g., PCM, RRAM) will be explored for CIM concept.	To be done during project
	TRL 3	Experimental proof of concept	• The potential of the CIM die combined with a conventional CPU will be demonstrated using full simulation and emulation. • Results of tests performed will be used to measure parameters of interest and compare to analytical predictions. • Potential practical applications will be defined and evaluated that will significantly benefit from such architecture. • Calibrated models (micro and macro level) will be provided that can be used to build different optimised versions of the architecture and experimented with it for specific applications.	To be done during project
Technology Development	TRL 4	Technology validated in laboratory environment	• The CIM dies will be integrated with a conventional CPU on a single chip to establish and validate the fact that when combined together on a single die they can deliver the expected system functionality and performance for a range of applications. • The key parameters of the intended approach will be measured and identified (e.g. power/energy, frequency/performance and chip size). • Insights (based on measurements) will be provided on how the architecture can be further refined and optimised for different applications. • Partners will consider potential bi-lateral spin-outs to ensure optimal knowledge transfer and valorisation.	Within 3 years of project completion. Partners envision a follow-up RIA project (TRL 4-7) involving additional industry partners.
	TRL 5	Technology validated in industrially relevant environment	• The basic technological components (CIM die integrated with a CPU, compiler, etc.) will be combined with supporting elements (DRAM, I/O, etc.) so that the whole architecture and its software components can be tested and simulated in an industrial environment. This w ill mimic a new computer based on the new architecture operating in a real application/ in field. • Insights will be obtained based on the experiments on problems - if any - and how to address them to further improve and refine the new CIM based computing sy stem and realize the overall system goals.	Within 3 years of project completion. Partners envision a follow-up RIA project (TRL4-7) involving additional industry partners.

Example from a low TRL project

Section 1.1: Objectives and ambition *“Describe where the proposed work is positioned in terms of R&I maturity”* (2 of 2)

Level of Development	TRL No.	TRL Definition	Means of Verification	Timing
Technology Demonstration	TRL 6	Technology demonstrated in industrially relevant environment	• The implementation of both the hardware and associated software stack of CIM based computer will be prototyped near or at planned operational functionalities. Metrics of interest will be measured and analysed as well as the scalability of the approach. This will be in order to demonstrate the functionality and expected improvements even under different environmental conditions and for variety of realistic applications. • The engineering feasibility of the new computation paradigm will be fully demonstrated. • Insights will be obtained based on a full demonstrator to further refine both the hardware and software components and provide a more “reliable” and “robust” demonstra tor at TRL7.	4 to 7 years after project completion
System Commissionin g	TRL 7	System prototype demonstration in operational environment	• A mature CIM based computer prototype (hardware software integration) will be built to demonstrate the targeted performance for realistic applications in the actual operational environments and platforms. The prototype will have all the all key features needed for demonstration and test.	6 to 9 years after project completion
	TRL 8	System complete and qualified	• The final CIM based computer and final configuration will be demonstrated through test and analysis for its intended realistic applications in operational environments and platforms. The software of the CIM computer will have to be thoroughly debugged and fully integrated with operations CIM computer hardware. • The CIM computer will be characterised, verified and validated. • All user documentation, training documentation, and maintenance documentation will be provided.	8 to 10 years after project completion
System Operations	TRL 9	Actual system proven in operational environment	• The final CIM based computer will be built and its operation successfully demonstrated for the targeted applications in their associated environment. Debug software will be developed and fully integrated with hardware. Full documentation will be provided.	9 to 12 years after project completion

Section 1.2: Methodology (1 of 2)

1. 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. [e.g. 10 pages]
2. Describe any national or international research and innovation activities whose results will feed into the project, and how that link will be established. [e.g. 1 pages]
3. 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. [e.g. 1/2 page]
4. For topics where the work programme indicates the need for the integration of social sciences and humanities, show the role of these disciplines in the project or provide a justification if you consider that these disciplines are not relevant to your proposed project. [e.g. 1/2 page]

Section 1.2: Methodology (2 of 2)

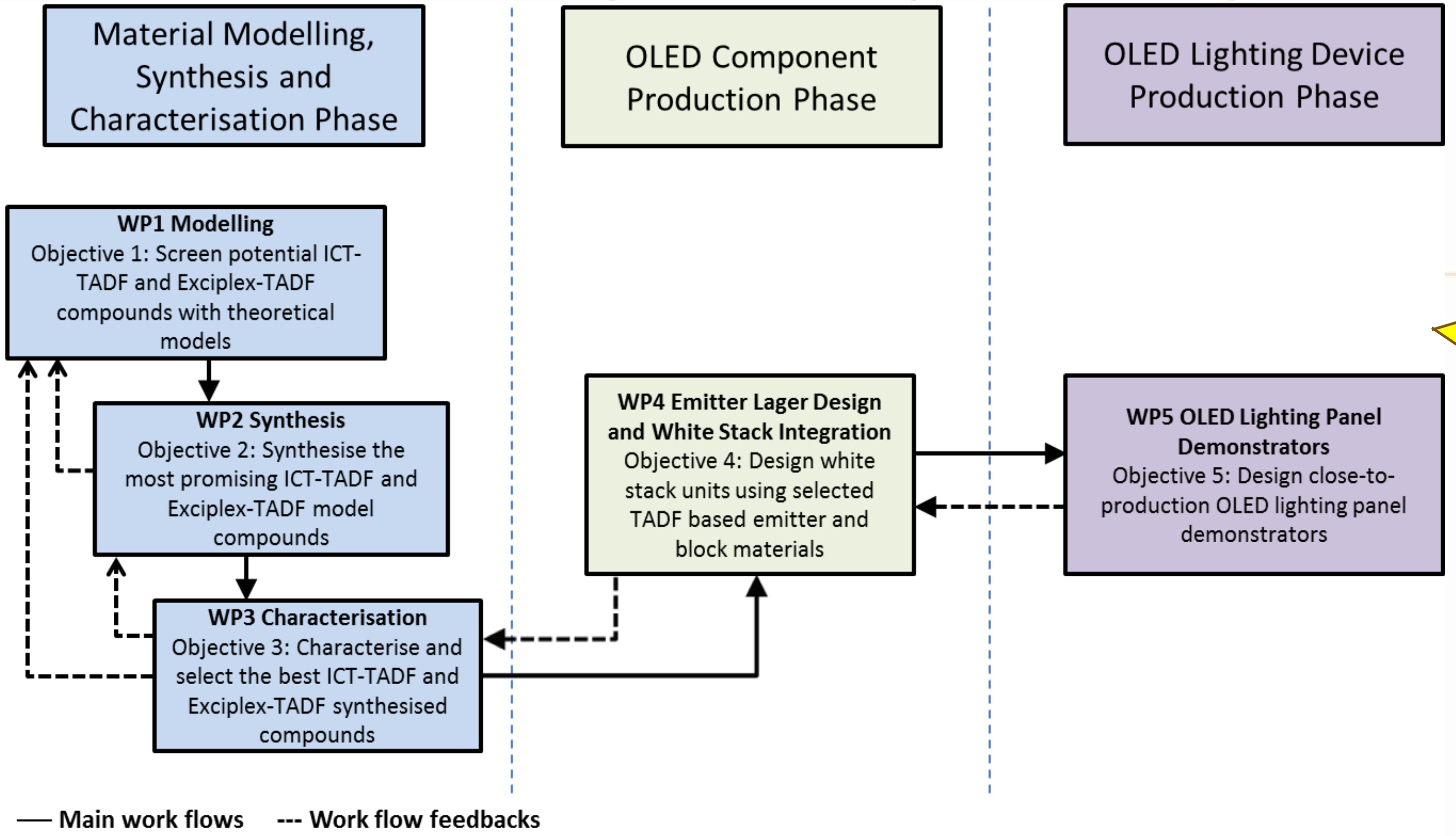
5. Describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's research and innovation content [e.g. 1 page]. If you do not consider such a gender dimension to be relevant in your project, please provide a justification.
6. Describe how appropriate open 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 [e.g. 1 page]. If you believe that none of these practices are appropriate for your project, please provide a justification here.
7. 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/ research outputs will be managed in line with the FAIR principles (Findable, Accessible, Interoperable, Reusable), addressing the following (the description should be specific to your project): [1 page]

Section 1.2: Methodology

"Describe & explain the overall methodology, including the concepts, models & assumptions that underpin your work" (1 of 2)

Example: The **methodology underpinning the PHEBE project is based on a** **new technology development process that is broken down into phases**, each with its own set of work packages and objectives. Indeed, the work packages dealing with scientific and technical activities have been defined so that they correlate very closely with the objectives described in Section 1.1. Graphically the technology development process with its phases looks as follows:

WP1-WP3 are iterative



Describe / elaborate the concepts and models for each WP

Section 1.2: Methodology
"Describe & explain the overall methodology, including the concepts, models & assumptions that underpin your work" (2 of 2)

Example: To achieve the project targets, a solid strategy has been set up that divides the needed work into four main interrelated components, as shown in Figure 1e:

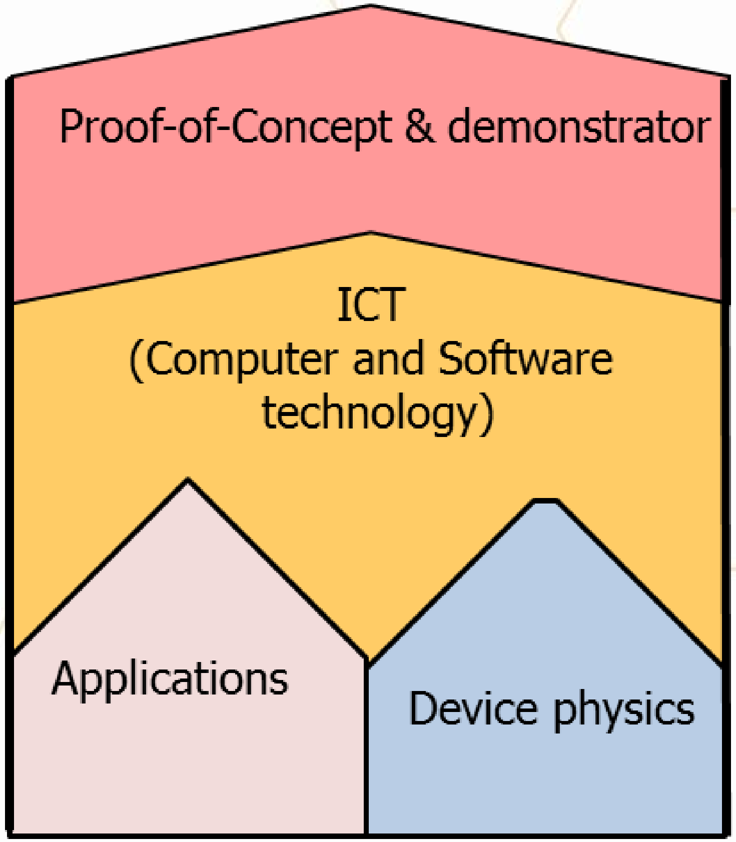


Figure 1e: Main components of the research method

Describe / elaborate the concepts and models for each component

Section 1.2: Methodology

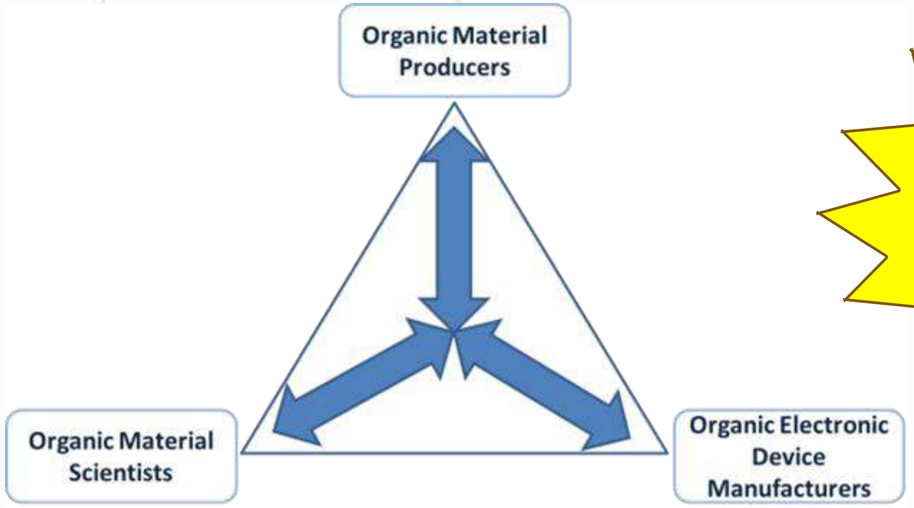
"Describe any national or international research and innovation activities whose results will feed into the project, and how that link will be established."

Example from a maritime cybersecurity proposal!

Initiative / Project	Duration	Reason for link with the ERA Chair
ECHO	2019-2022	TalTech is a partner in this European network of Cybersecurity centres and competence Hub for innovation and Operations. The ERA Chair will utilise this network as a source of partners and project ideas for EU proposals.
TOOP	2017-2020	TalTech is coordinating this H2020 project involving 20 EU Member States and two Associated Countries. One pilot addresses the introduction of ship and crew e-certificates.
Cyber-MAR	2019-2022	Cyber-MAR is a H2020 innovation action developing an innovative "cyber range" to support the maritime logistics value chain. The ERA Chair will use their expertise for Research Sub-Topic 2: Human Aspects of Cyber Security.
ENISA	2019-	The European Union Agency for Cybersecurity (ENISA) organises cyber exercises and cybersecurity education relevant for the ERA Chair.
EMSA	2018-	The European Maritime Safety Agency (EMSA) offers a course on Awareness in Maritime Cybersecurity relevant for the ERA Chair's Cyber Hygiene training.

Section 1.2: Methodology

"Explain how expertise and methods from different disciplines will be brought together and integrated in pursuit of your objectives."



Figures are always nice to help clarify

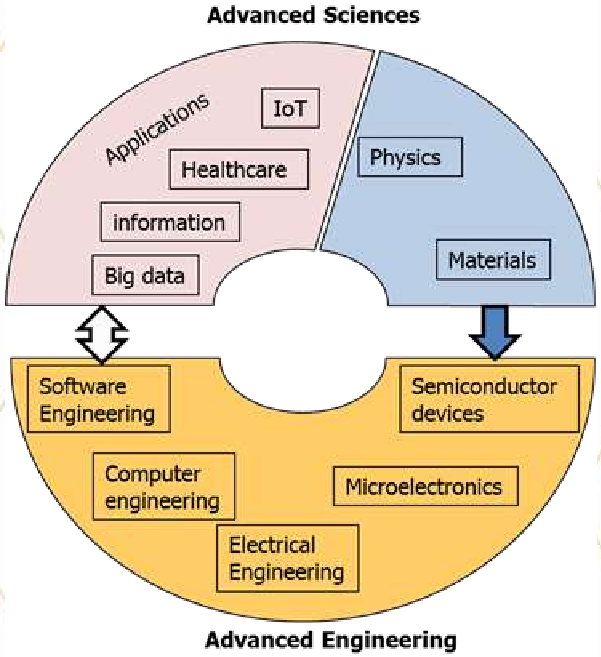


Figure 1d: MNEMOSENE' Interdisciplinarity

__Example:__ Based on the interdisciplinary character of the proposed programme, there will be knowledge integrated from **three main expert groups: organic material scientists, organic material producers and organic electronic device manufacturers.**

__Example:__ MNEMOSENE is a highly interdisciplinary R&D project and collaboration; a cross and deep synergy is needed between different advanced sciences and cutting edge engineering disciplines in order to turn the ideas presented in this project to viable basis for a radically new computation paradigm for data-intensive applications. Figure 1d illustrates the different disciplines involved in this project.

Section 1.2: Methodology
"Describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's research and innovation content." (1 of 2)

- See "Gender Analysis" Checklists and Case-Studies on http://genderedinnovations.stanford.edu/index.html
  - Engineering
  - Health and Medicine
  - Tissues and Cells
  - Urban Planning and Design

Section 1.2: Methodology
"Describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's research and innovation content." (2 of 2)

- **The project is gender-agnostic, i.e., sex or gender separation and privileging do not play any role in the project.** In particular, human beings taking part in the project activities will be fairly considered based on their roles, motivations and abilities. All the project partners are aligned and fully agree with the EC objectives to promote gender equality and encourage the involvement of researchers of both sexes, whose recruitment is based uniquely on their qualifications and technical merit. In particular, the consortium will respect the European policy of non-discrimination and equality between women and men in the Treaty of the European Union (Articles 2 and 3). The project members also agree to encourage the practices for a better work/life balance achievement (e.g. maternity and paternity leave) and flexible work planning (e.g. teleworking), with no sex or gender distinction. Furthermore, our project consortium strives to achieve a balanced distribution of responsibilities and tasks with respect to gender. **This is challenging in IT-Security, due to the low numbers of female specialists in the field.**

- We have also analysed our technical work for possible gender-related aspects and have, at this point, not found relevant gender-specific aspects related to it. The reason for this is that many parts of the solutions we will work on apply to machine-to-machine interactions, which will not involve a human, and that are therefore unlikely to have a gender-related impact. We expect that the human interaction aspects of our work will mostly apply to interactions with back-end services, running on regular desktop PCs and handheld, mobile devices. At this point we cannot find any gender specific aspects to this part of the work either. Nevertheless, in order to ensure a continuity in this line of considerations, we will continuously analyse our results for gender-related aspects and include the corresponding findings in our reports.

Section 1.2: Methodology
“Describe how appropriate open science practices are implemented as an integral part of the proposed methodology.”

Open Science Practices	
Open Access to Publications	The SUSNANO consortium will provide access to peer-reviewed scientific publications via self-archiving (“green” open access) and therefore only journals which are compatible with such policy will be considered for dissemination. Publications and data will be made available via the Zenodo repository, which is hosted by CERN and supported by the EU’s OpenAIRE initiative. This guarantees that data will be curated and preserved according to the highest standards available. Additionally, project results may be made available via social media used by the academic community (e.g. ResearchGate) according to the rules defined by the publisher.
Open Research Data	A detailed FAIR (findable, accessible, interoperable and re-usable) data management plan will be produced near the start of SUSNANO in compliance with the Horizon Europe data management plan template (see WP5/Task 5.1). The data generated in the context of SUSNANO will mainly consist of text documents, spreadsheet tables, tab-delimited files, image files, etc. These will be saved in standard formats (txt, jpg, pdf, tiff, png, etc.) and made as FAIR as possible. Researchers aiming to publish the results of research performed in the framework of the project will first submit their paper and data to the Steering Committee, which will check for IP or ethical issues. Legal officers will be consulted on a case-by-case basis to address any concerns, if necessary. Once the researchers receive the authorisation to publish, they will submit their papers to be published in peer-reviewed journals and/or conference proceedings.
Open Societal Actor Engagement	The SUSNANO consortium will invite and train Albanian high school students and bachelor students to support the lab validation testing and field testing of the sustainable nanosensors in Albania.
Open Evaluation	The SUSNANO consortium will follow an open peer review approach - with respect to their peer reviewed scientific publications - to provide transparency about the reviewer and author identities, publication of review reports, and enable the wider research community to contribute to the peer review process. Also, the consortium will provide open metrics – open access to data, methods, and results of bibliometric analyses – to enable traceability and reusability of their evaluation procedures.
Open Methodology	SUSNANO’s experienced researchers will document the scientific procedures used in the preparatory research project (WP1) in sufficient detail to enable the early-stage researchers to repeat the work and apply them elsewhere. These procedures will be made available via the project website and Zenodo repository.

How to write Section 2 “Impact”

Giles Brandon, Intelligentsia Consultants,
6th October 2022

Funded by the European Union

Section 2: Impact

- Section 2.1: Project's pathways towards impact
  - EC recommended length: 4 pages
- Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication
  - EC recommended length: 5 pages, including Section 2.3
- Section 2.3: Summary

Section 2.1: Project’s pathways towards impact

1. 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. The narrative should include the components below, tailored to your project.

   a) Describe the unique contribution your project results would make towards (1) the outcomes specified in this topic, and (2) the wider impacts, in the longer term, specified in the respective destinations in the work programme.

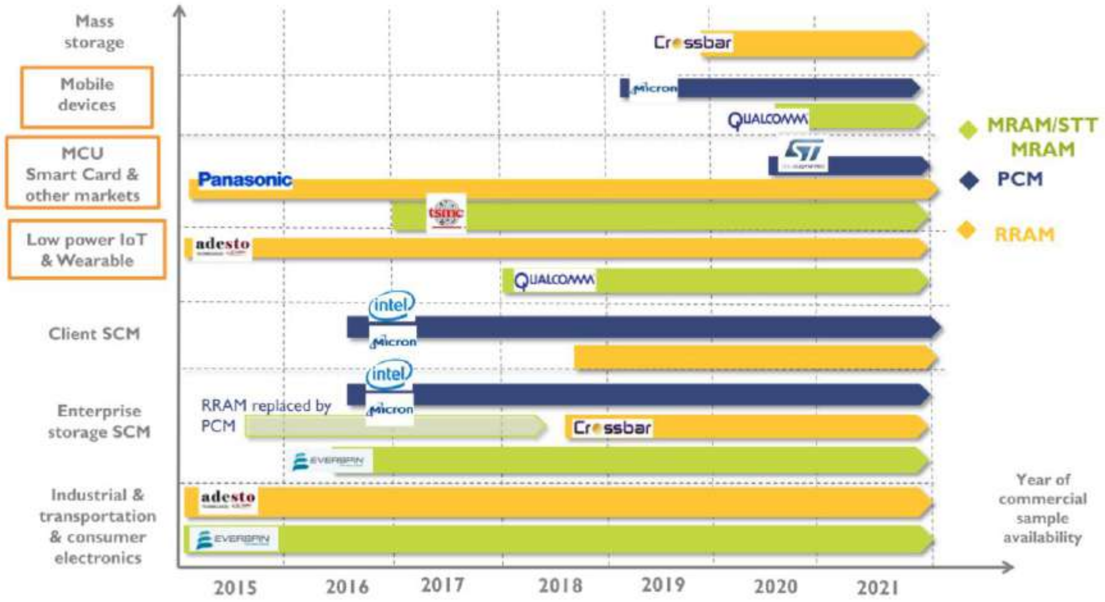
   b) Give an indication of the scale and significance of the project’s contribution to the expected outcomes and impacts, should the project be successful. Provide quantified estimates where possible and meaningful.

   c) Describe any requirements and potential barriers - arising from factors beyond the scope and duration of the project - that may determine whether the desired outcomes and impacts are achieved. These may include, for example, other R&I work within and beyond Horizon Europe; regulatory environment; targeted markets; user behaviour. Indicate if these factors might evolve over time. Describe any mitigating measures you propose, within or beyond your project, that could be needed should your assumptions prove to be wrong, or to address identified barriers.

Section 2.1: Project's pathways towards impact
"Describe unique contribution of project results towards (1) <u>topic outcomes</u> and (2) wider impacts" (1 of 2)

Write in a narrative and engaging style (e.g. Marketing)

2.1.2 <u>Helping to double economic value of semiconductor component production in Europe within 10 years</u>
MNEMOSENE is focused on CIM and memristors which are disruptive technologies that are expected to create vast economic returns over the coming years. MNEMOSENE will assist European organisations to enter and maintain a position in this rapidly evolving technology market place and thereby support the Electronics Leaders Group's target of doubling the economic value of semiconductor component production in Europe within the next 10 years. The anticipated explosive growth for CIM and memristors is reflected in recent market reports. Yole Development forecasts the emerging market for memristor-based non-volatile memory (NVM) will surge from $56 million in 2015 to $4.6 billion by 2021. Similarly, Allied Market Research valued the global memristor market at $3.2 Million in 2015 and expected it to reach $79.0 million by 2022.



Section 2.1: Project's pathways towards impact
"Indicate the scale and significance of the project's contribution to <u>expected outcomes</u> and impacts" (1 of 2)

Expected Outcomes	WP	Performance Indicators	Target
Outcome 1: Support the "Economic & Investment Plan" and "Innovation Agenda" for WBC by spurring economic recovery, supporting green and digital transition, fostering regional integration & EU convergence.	1, 2, 3, 4 and 5	• Preparatory research project on sustainable nanosensor on water pollution • Sustainable nanosensors developed to detect different water pollutants • Rivers and lakes in Albania where sustainable nanosensors are demonstrated • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences • SUSNANO workshops for private and public organisations in Albania • Info-days and networking sessions attended about EU calls for proposals • Joint research proposals submitted for EU funding (e.g. Horizon Europe) • Patents submitted by UT researchers involved in SUSNANO • Collaboration agreements between UT and Albanian private companies	1 3 8 9+ 9+ 3+ 5+ 3+ 2+ 3+
Outcome 2: Improved excellence capacity and resources in WBC enabling to close the still apparent research and innovation gap within Europe.	1, 2, 3 and 5	• UT experienced researchers trained in Research Sub-Topics A, B and C • UT early-stage researchers trained in Research Sub-Topics A, B and C • Summer schools hosted by UT, ICN2 and UPO • Joint PhD programme • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences • Increase in average H-Index of UT researchers involved in SUSNANO • Patents submitted by UT researchers involved in SUSNANO • Collaboration agreements between UT and Albanian private companies	5 10 3 1 9+ 9+ >15% 2+ 3+

Expected outcomes – see text of call topic

Section 2.1: Project’s pathways towards impact
“Indicate the scale and significance of the project’s contribution to expected outcomes and <u>impacts</u>” (2 of 2)

Expected impacts – see introductory text in work progamme

Expected Impacts for Destination 1 “Improved access to excellence”	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6
Impact 1: Increased science and innovation capacities for all actors in the R&I system in widening countries.	X	X	X			X
Impact 2: Structural changes leading to a modernised and more competitive R&I systems in eligible countries		X	X			
Impact 3: Reformed R&I systems & institutions leading to increased attractiveness & retention of researchers		X	X			X
Impact 4: Higher participation success in Horizon Europe and more consortium leadership roles		X	X	X	X	X
Impact 5: Stronger linkages between academia and business and improved career permeability	X				X	
Impact 6: Strengthened role of the Higher Education sector in research and innovation		X		X	X	
Impact 7: Greater involvement of regional actors in R&I process	X		X			

Section 2.1: Project's pathways towards impact
"Describe any requirements and <u>potential barriers</u>" (1 of 2)

Identify challenges / barriers in EU Strategic Research Agendas

Section 2.1: Project's pathways towards impact
"Describe any requirements and potential barriers" (2 of 2)

Describe project mitigation measures for each barrier / challenge

Potential barriers and requirements specific to sustainable nanosensors based on graphene

Challenge 1: Stability of graphene-based materials. The main challenge is maintaining the stability of graphene-based materials since they are prone to aggregation which results in decreased electrochemical properties.

⇒ SUSNANO's mitigation measure: we will provide graphene-related materials equipped with different functional groups overcoming such drawbacks.

Challenge 2: Limit of detection (LOD) of sustainable nanosensors. Development of novel sustainable nanosensors with a low LOD is essential since target analytes often exist only at trace concentrations in real samples.

⇒ SUSNANO's mitigation measure: we will develop graphene materials exhibiting significantly improved electrical conductivity compared to conventional graphene-based materials, which enable to build ultrasensitive nanosensors with enhanced values of LOD.

Challenge 3: Suppressing the non-specific adsorption of interfering species. The main drawback related to conventional graphene-based nanosensors is connected with non-specific adsorption of interfering species which results in lower selectivity and sensitivity of developed nanosensors.

⇒ SUSNANO's mitigation measure: we will prepare graphene-based materials modified with different functional groups which can selectively capture the target analytes.

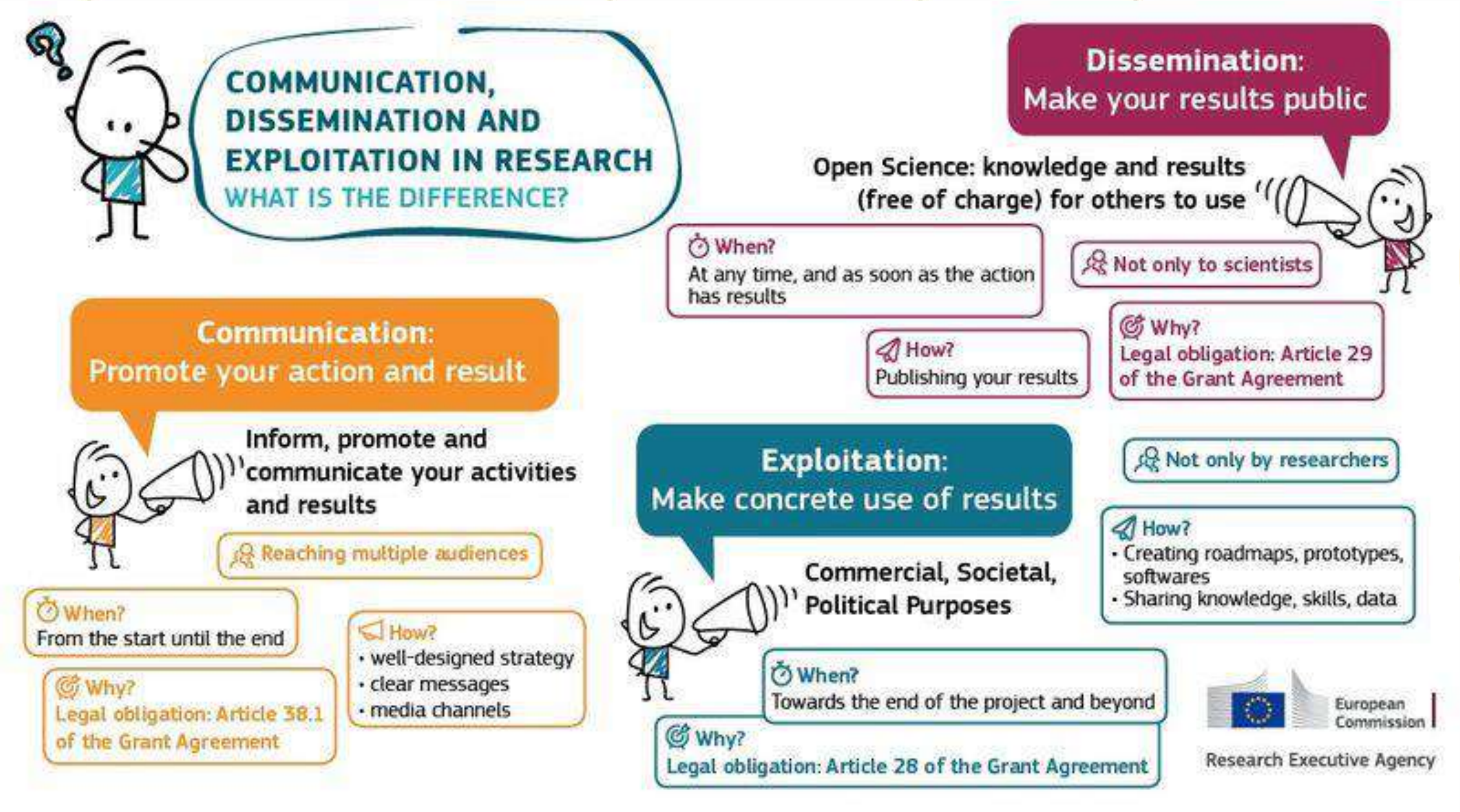
Challenge 4: Stability of sustainable nanosensors. The stability of nanosensors is the main challenge limiting their testing in real applications. Nanosensors are often evaluated by their shelf-life. Hence, it is important to develop sensing platforms capable to operate for long time. When using commonly available graphene-based materials, long-term stability becomes a major concern due to the issue related to aggregation of individual graphene flakes.

⇒ SUSNANO's mitigation measure: we will provide graphene-related materials equipped with different functional groups which can overcome such handicap.

Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication (1 of 2)

1. Describe the planned measures to maximise the impact of your project by providing a first version of your ‘plan for the dissemination and exploitation including communication activities’. Describe the dissemination, exploitation and communication measures that are planned, and the target group(s) addressed (e.g. scientific community, end users, financial actors, public at large).
2. Outline your strategy for the management of intellectual property, foreseen protection measures, such as patents, design rights, copyright, trade secrets, etc., and how these would be used to support exploitation.

Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication (2 of 2)

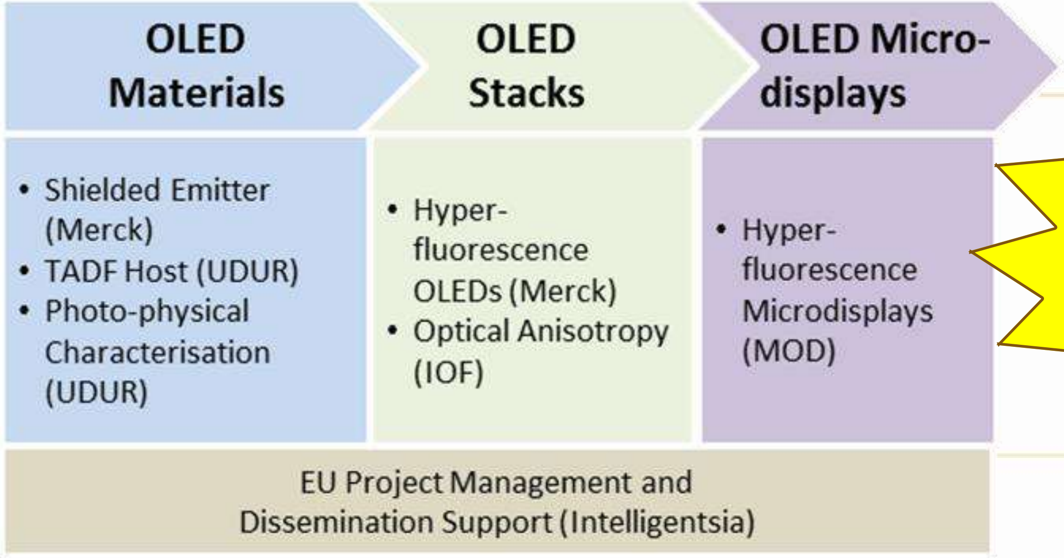


Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication *“Provide 1st version of plan for <u>dissemination, communication</u> & exploitation”* (1 of 4)

MNEMOSENE Dissemination and Communication Plan			
Project Result	**Dissemination Activity**	**Target Audience**	**Target Indicator**
Project leaflet and poster	Distribute during international conferences (e.g. ISSCC, ESSCIRC and DATE), public seminars and outreach events.	Scientists, engineers and general public	400+ leaflets distributed, 30+ events where poster displayed (including 9+ outreach events)
Project website	Publish project summary, regular news and event updates on website.	Scientists, engineers and general public	5000+ visitors
Project news	Publish project news releases and distribute through broader scientific news channels e.g. Cordis wire and Alpha Galileo.	Scientists, engineers and general public	3+ news releases, 10+ articles in broader scientific press
	Distribute project news releases via social media (e.g. LinkedIn, Facebook, Twitter, etc)	Scientists, engineers and general public	15+ announcements
Short project film	Publish film on Youtube and project website. Show during public outreach events.	Scientists, engineers and general public	1000+ hits, 9+ public outreach events
Open workshops	Present research results at open workshops: • MemTDAC workshops on memristor technology during the annual HiPEAC conference. • Workshops at DATE conferences (e.g. Workshop on Emerging Memory Solutions) • MemoCiS COST action workshops.	Scientific research community and industrial actors (SMEs and MNEs)	5+ open workshops
Scientific results from development of non-volatile memory domain technologies and methods.	Publish results in international peer reviewed journals (e.g. IEEE Journals). Gold open-access approach scheme will be adopted whenever possible.	Scientific research community	15+ journal papers
	Present results at international scientific conferences: materials and device technology (e.g. ESSCDRC, IEDM, SISPAD), circuit and hardware design (e.g. DATE, ISSCC, DAC, ISCAS), micro architecture and computing (e.g. MICRO, ISCA, HiPEAC, PACT), software technology and programming (e.g. CGO, PPoPP, CC, CSE), big-data applications (e.g., Int. Conf. on Big Data, IEEE BigDataSE), together with journals in the same fields (ISS, TC, Micro, TED, TOPLAS, TACO, etc.).	Scientific research community	15+ conferences
	Present results during seminars for university Master’s students.	Young postgraduate students	6+ seminars

Dissemination and Communication

Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication *"Provide 1st version of plan for dissemination, communication & <u>exploitation</u>"* (2 of 4)



Value chain for OLED proposal

Partners' individual exploitation plans

Partner	Individual Exploitation Plan
Merck (industrial partner)	Merck already supplies OLED materials for current state-of-the-art AMOLED display [illegible] es an established process of scaling-up material production from small R&D quantities to custome[illegible] n and finally into standard production size. As recently reported, Merck is constantly investing [illegible] uction capacity in Germany to answer to the increasing customer requests. OLED device manufa[illegible] are mostly located in Asia and Merck already intensively cooperates with all display manufacturers in this [illegible] e.g. LG Display, SDC, AUO, EDO, Visionox, BOE, Tianma and JDI). Similar to its successful history in Liquid Crystal material business, Merck is dedicated to develop the OLED technology focussing on the customers' technological and commercial needs. The core material production technology is developed in Europe and will be marketed to customers worldwide. **Based on HyperOLED's commercial potential, Merck has prepared the following post-project business plan …**
UDUR (academic partner)	UDUR have a very strong track record of publishing journal papers as well as collaborating with industry in the fields of OLED material synthesis and characterisation. Notably, Professor B. (h-index=57, >14,500 citations, 10 patents) and Professor M. (h-index=53, >10,500 citations, 7 patents) are world-renowned experts in their respective fields. Also, Lomox Ltd funds UDUR for the synthesis of OLED materials and Merck currently funds a PhD studentship at UDUR in photophysical studies of non-TADF OLED materials. Consequently, UDUR's plans to exploit the HyperOLED results include: • Publishing papers in international journals based on the project results (e.g. Nature Materials) • Attracting further public/private funding for R&D projects requiring their expertise in "OLED material synthesis" and "Photo-physical characterisation" (e.g. Novaled and EPSRC) • Licensing their IP created in the project (see earlier IP Ownership Tables)
etc.	

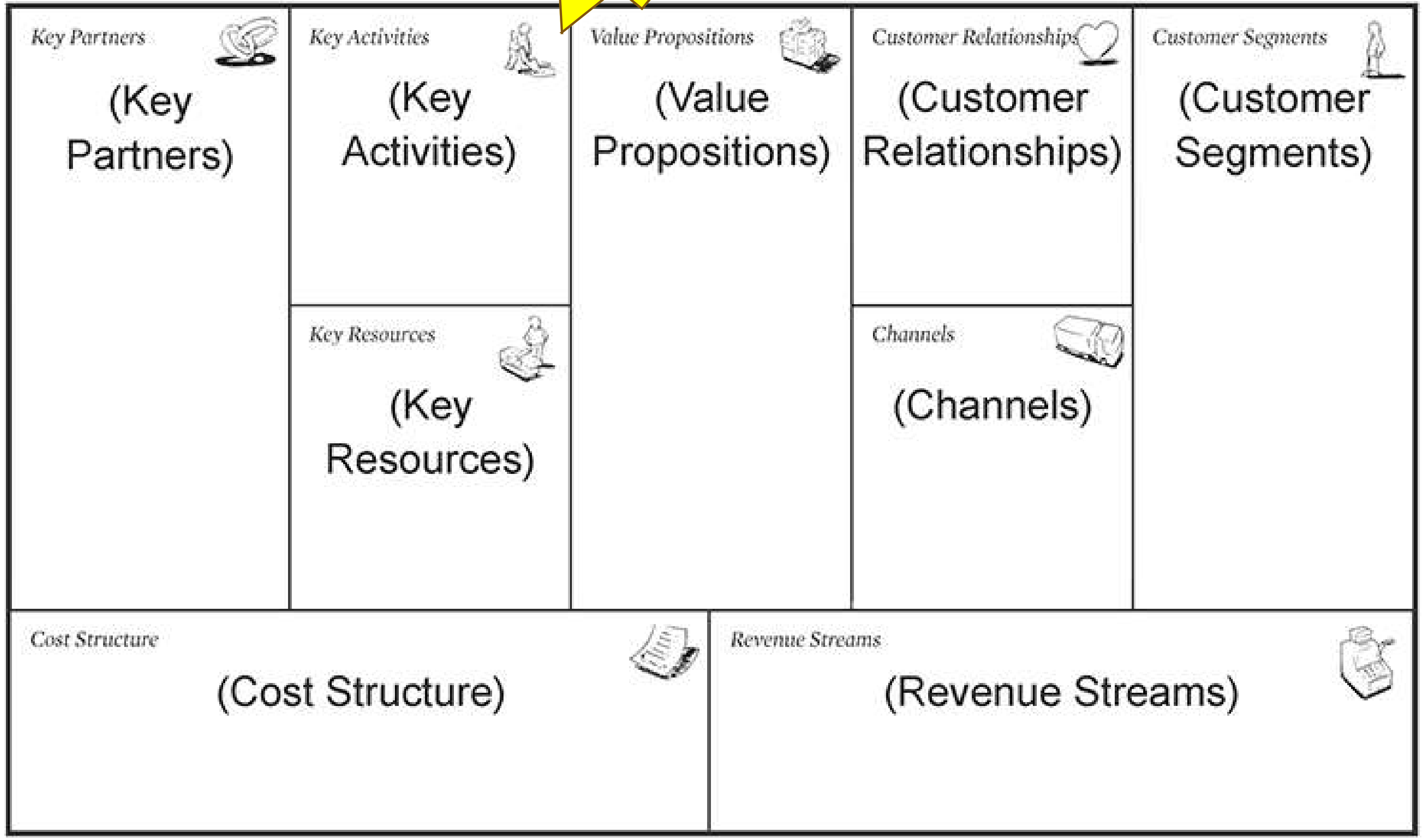
Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication *“Provide 1st version of plan for dissemination, communication & <u>exploitation</u>”* (3 of 4)

TRL9 Technology system proven in operational environment	**BRL9** Business model finalised. Business scaling with recurring revenues.
TRL8 Technology system completed & qualified through test and demonstration	**BRL8** Business model is fine-tuned. Sales & metrics show business model holds and can scale.
TRL7 Prototype demonstrated in an operational environment	**BRL7** Product/market fit demonstrated. Attractive revenue/cost projections
TRL6 Technology demonstrated in a relevant environment	**BRL6** Full business model including pricing verified on customers
TRL5 Technology validated in a relevant environment	**BRL5** Business model testing, first revenue model, competitive position verified in market
TRL4 Technology validated in the laboratory environment	**BRL4** First version of business model, first projections of economic viability & market potential
TRL3 Analytical & experimental PoC of critical function and characteristics	**BRL3** Draft of business model Described market potential & competitive overview
TRL2 Technology concept and/or application formulated	**BRL2** First business concept described. Identified overall market & some competitors
TRL1 Basic principles observed	**BRL1** Hypothesizing on possible business concept

Technology Readiness Levels (TRL) + Business Readiness Levels (BRL)

Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication *"Provide 1st version of plan for dissemination, communication & <u>exploitation</u>"* (4 of 4)

Business Model Canvas



Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication
"Outline strategy to manage intellectual property" (1 of 2)

IP Ownership Tables		
Expected Foreground Knowledge	**Lead Partner Concerned**	**Other Partners claiming Ownership Rights**
Related to WP1		
New algorithms to tackle problems related to data analytics that are optimized for implementation in a CIM-based architecture	IBM, TUD, ARM	TUE
New algorithms to tackle problems related to healthcare and database applications that are optimized for implementation in a CIM-based architecture	TUD	TUE
Related to WP2		
2-D SIMD programming element	TUE, INRIA	ETHZ
Macro-programming interface for CIM tiles	TUE, INRIA	ETHZ
Portable programming model for CIM-accelerated kernels	TUE, INRIA	ETHZ
Related to WP3		
CIM macro architecture	TUE	TUD, ETHZ and ARM
Embedded circuits and energy-efficient digital/analogue interfacing between resistive compute units and external digital compute units	TUE, ARM	TUD, ETHZ
Related to WP4		
Models to enter into the micro-architecture simulator	IMEC, RWTH	-
CIM microarchitectures	IMEC	RWTH, ARM, IBM, TUD
PCM-based logical and arithmetic operations that can be implemented in a CIM module	IBM	-
Designs for parallel bit-wise and arithmetic operations within the crossbar	TUD	RWTH
Related to WP5		
Data collected based on measurements of crossbars (CIM)	TUD, RWTH	TUE, ETHZ, ARM, IBM,
Full CIM simulator	TUD	All

Capture initial strategy for Foreground Knowledge

Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication
"Outline strategy to manage intellectual property" (2 of 2)

Background Knowledge	Contributing Partner	Included	Excluded
Related to WP2			
PENCIL language for domain-specific compilation	INRIA	X	
Skeleton-based instantiation from Bones framework	TUE	X	
New loop-nest fusion and inter-tile reuse techniques	TUE	X	
Related to WP3			
Two patents filed on resistive computing and computation-in-memory architecture	TUD	X	
Related to WP4			
Low level detailed non-volatile memory compiler models (STT_MRAM, SOT-MRAM, OxRAM, VMCO, CBRAM, NAND Flash)	IMEC		X
Black box models for non-volatile memories (STT_MRAM, SOT-MRAM, OxRAM, VMCO, CBRAM, NAND Flash)	IMEC	X	
PCM-based physical models that are not confidential	IBM	X	
Confidential information concerning PCM device technology	IBM		X
Circuit design schemes within the crossbar	TUD	X	

Don't overlook initial strategy for Background Knowledge!

Section 2.3: Summary

1. Provide a summary of this section by presenting in the canvas below the key elements of your project impact pathway and of the measures to maximise its impact. (1 of 2)

KEY ELEMENT OF THE IMPACT SECTION

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
What are the specific needs that triggered this project? Example 1 Most airports use process flow-oriented models based on static mathematical values limiting the optimal management of passenger flow and hampering the accurate use of the available resources to the actual demand of passengers. Example 2 Electronic components need to get smaller and lighter to match the expectations of the end-users. At the same time there is a problem of sourcing of raw materials that has an environmental impact.	What do you expect to generate by the end of the project? Example 1 **Successful large-scale demonstrator:** Trial with 3 airports of an advanced forecasting system for proactive airport passenger flow management. **Algorithmic model:** Novel algorithmic model for proactive airport passenger flow management. Example 2 Publication of a **scientific discovery on transparent electronics.** **New product:** More sustainable electronic circuits. **Three PhD students trained.**	What dissemination, exploitation and communication measures will you apply to the results? Example 1 **Exploitation:** Patenting the algorithmic model. **Dissemination towards the scientific community and airports**: Scientific publication with the results of the large-scale demonstration. **Communication towards citizens:** An event in a shopping mall to show how the outcomes of the action are relevant to our everyday lives. Example 2 **Exploitation of the new product:** Patenting the new product; Licencing to major electronic companies. **Dissemination towards the scientific community and industry:** Participating at conferences; Developing a platform of material compositions for industry; Participation at EC project portfolios to disseminate the results as part of a group and maximise the visibility vis-à-vis companies.

Section 2.3: Summary

1. Provide a summary of this section by presenting in the canvas below the key elements of your project impact pathway and of the measures to maximise its impact. (2 of 2)

TARGET GROUPS

Who will use or further up-take the results of the project? Who will benefit from the results of the project?

Example 1
9 European airports:
Schiphol, Brussels airport, etc.

The European Union aviation safety agency.

Air passengers (indirect).

Example 2
End-users: consumers of electronic devices.

Major electronic companies: Samsung, Apple, etc.

Scientific community (field of transparent electronics).

OUTCOMES

What change do you expect to see after successful dissemination and exploitation of project results to the target group(s)?

Example 1
Up-take by airports: 9 European airports adopt the advanced forecasting system demonstrated during the project.

Example 2
High use of the scientific discovery published (measured with the relative rate of citation index of project publications).

A **major electronic company** (Samsung or Apple) **exploits/uses the new product** in their manufacturing.

IMPACTS

What are the expected wider scientific, economic and societal effects of the project contributing to the expected impacts outlined in the respective destination in the work programme?

Example 1
Scientific: New breakthrough scientific discovery on passenger forecast modelling.

Economic: Increased airport efficiency
Size: 15% increase of maximum passenger capacity in European airports, leading to a 28% reduction in infrastructure expansion costs.

Example 2
Scientific: New breakthrough scientific discovery on transparent electronics.

Economic/Technological: A new market for touch enabled electronic devices.

Societal: Lower climate impact of electronics manufacturing (including through material sourcing and waste management).

Section 2.3: Summary
"Canvas showing key elements of the project's impact pathways and measures to maximise its impact"

No.	SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
1	UT's SWOT analysis highlights weaknesses and threats which need to be addressed with respect to its R&I for sustainable nanosensors for water pollution detection (see Section 1.2.2).	See Performance Indicators for Outcomes 2, 3, 4, 5 and 6 in Section 2.1.2	Communication: News releases via Press conferences, Project website, and Social media accounts. Dissemination: Research papers presented at international conferences.
2	Albania's rivers and lakes are polluted with heavy metals, pesticides and antibiotics (see Section 1.2.1).	Development of novel sustainable nanosensors. Extensive environmental assessment of Albania's rivers and lakes (WP1).	Communication: as above. Dissemination: Present env. assessment report to National Environmental Agency and Ministry of Tourism and Environment Exploitation: Industry workshops at UT and NanoAlb.

No.	TARGET GROUPS	OUTCOMES	IMPACTS
1	UT's Dept of Chemistry and UT's Directorate of Scientific Research, Projects and Foreign Relations.	Increased UT research papers in journals / conferences; Increased UT EU grant proposals.	Scientific/Economic: Albania's increased participation in EU R&D funding programmes.
2	Public organisations: e.g. National Environmental Agency, Ministry of Tourism and Environment Academic Associations: e.g. NanoAlb Private companies: e.g. EHW, LUFRA	Evidence-based policy development by Albanian government. Collaboration agreements between UT & Albanian private companies.	Societal: Albania's supported green transition and increased integration with EU. Technological/Economic: Albania's spurred digital transition and economic recovery.

How to write Section 3 "Implementation"

Giles Brandon, Intelligentsia Consultants,
6th October 2022

Funded by the European Union

Section 3: Implementation

- Section 3.1: Work plan and resources
  - EC recommended length: 14 pages – including tables

- Section 3.2: Capacity of participants and consortium as a whole
  - EC recommended length: 3 pages

Section 3.1: Work plan and resources (14 pages)

1. Provide brief presentation of the overall structure of the work plan;
2. Provide timing of the different work packages and their components (Gantt chart or similar);
3. Provide graphical presentation of the components showing how they inter-relate (Pert chart or similar).
4. Provide detailed work description, i.e.:
    - a list of work packages (table 3.1a);
    - a description of each work package (table 3.1b);
    - a list of deliverables (table 3.1c); Distribute evenly over the project
5. Provide a list of milestones (table 3.1d); Distribute evenly over the project
6. Provide a list of critical risks, relating to project implementation, that the stated project's objectives may not be achieved. Detail any risk mitigation measures. You will be able to update the list of critical risks and mitigation measures as the project progresses (table 3.1e); Rule of thumb: describe at least two critical risks per work package
7. Provide a table showing number of person months required (table 3.1f);
8. Provide a table showing description and justification of subcontracting costs for each participant (table 3.1g);
9. Provide a table showing justifications for ‘purchase costs’ (table 3.1h) for participants where those costs exceed 15% of the personnel costs (according to the budget table in proposal part A);
10. Provide, if applicable, a table showing justifications for ‘other costs categories’ (table 3.1i);
11. Provide, if applicable, a table showing in-kind contributions from third parties (table 3.1j)

3.1: Work plan and resources

Each WP leader should describe/elaborate the S&T objective for their WP (½ page or less)

1. Excellence	3. Implementation
1.1 Objectives	3.1 Work Plan
Scientific and Technological (S&T) Objective 1 →	WP1: Tasks to achieve S&T Objective 1
S&T Objective 2 →	WP2: Tasks to achieve S&T Objective 2
S&T Objective 3 →	WP3: Tasks to achieve S&T Objective 3
S&T Objective 4 →	WP4: Tasks to achieve S&T Objective 4
	WP5: Dissem., Exploit. & Communication
	WP6: Project Management

Section 3.1: Work plan and resources
Work Package Description

See
MS Word file!

Section 3.1: Work plan and resources

Work Plan Timing

		WP/Task Leader	Task Support	Month (1–36)
WP1	**Shielded Emitter**	**Merck**		MS1.1, MS1.2
T1.1	Shielding substituents	Merck	-	D1.2, D1.4
T1.2	Emissive core structure	Merck	UDUR	D1.3
T1.3	Shielded deep blue emitter	Merck	UDUR	D1.5
T1.4	Estimate shielding efficiency	Merck	UDUR	D1.1
WP2	**TADF Host**	**UDUR**		MS2.1, MS2.2, MS2.3
T2.1	Synthesise ICT molecules with high triplet levels	UDUR	Merck	D2.1, D2.2, D2.3
T2.2	Batch scale synthesis and purification routes for new materials	UDUR	Merck	D2.4, D2.5
T2.3	Changing molecular shape to induce higher degrees of self-ordering	UDUR	IOF	
WP3	**Photo-physical Characterisation**	**UDUR**		MS3.1, MS3.2, MS3.3, MS3.4
T3.1	Elucidate photo-physics of shielded emitters	UDUR	Merck and IOF	D3.1
T3.2	Determine photo-physical and energetic characteristics of TADF hosts	UDUR	Merck and IOF	D3.2, D3.3
T3.	Elucidate energy and electron transfer mechanisms	UDUR	Merck and IOF	D3.4
	Determine microcavity and orientation effects on energy transfer	UDUR	Merck and IOF	D3.5
4	**Optical Anisotropy**	**IOF**		MS4.1, MS4.2
1	Anisotropic dispersion of organic thin films in encapsulated samples	IOF	Merck and UDUR	D4.1
	…rientation and internal emission spectra	IOF	Merck and UDUR	D4.2
	…ntation ensemble average for different emitter systems	IOF	Merck and UDUR	D4.3
	Simulation model of energy transfer inside an OLED	IOF	Merck and UDUR	D4.4
	Experimental verification of energy and anisotropy effects	IOF	Merck and UDUR	D4.5, D4.6
	Hyperfluorescence OLEDs	**Merck**		MS5.1, MS5.2, MS5.3, MS5.4, MS5.5, MS5.6, MS5.7
	Establish reference material system	Merck	UDUR and MOD	D5.1
	Evaluate consortium materials and optimise stack	Merck	UDUR	D5.2, D5.8
3	"High throughput" characterisation	Merck	UDUR and IOF	D5.3
	Model emission layer	Merck	UDUR and IOF	D5.5
	Develop white OLED stack	Merck	MOD and IOF	D5.4, D5.6, D5.7
T5.	Conduct life cycle assessment for OLED stacks	Intelligentsia	Merck and MOD	D5.9
WP6	**Hyperfluorescence Microdisplays**	**MOD**		MS6.1, MS6.2, MS6.3
T6.1	Specifications	MOD	Merck	D6.1, D6.2
T6.2	Microdisplay demonstration	MOD	Merck	D6.3
WP7	**Dissemination and Exploitation**	**Intelligentsia**		MS7.1
T7.1	Produce a data management plan	Intelligentsia	-	D7.1, D7.4, D7.7
T7.2	Create and maintain a project website	Intelligentsia	-	D7.2
T7.3	Create project promotional material	Intelligentsia	-	D7.3
T7.4	Protect intellectual property	MOD	All	D7.5, D7.8
T7.5	Disseminate achieved scientific and technological results	MOD	All	
T7.6	Produce exploitation plan	MOD	All	D7.6, D7.9
T7.7	Cooperate with related European research actions	Intelligentsia	All	
WP8	**Project Management**	**Merck**		MS8.1, MS8.2, MS8.3, MS8.4
T8.1	Collate deliverables, milestones and reports	Merck	Intelligentsia	D8.2, D8.3
T8.2	Manage legal, contractual, financial, ethical and administrative matters	Merck	Intelligentsia	D8.1
T8.3	Ensure communication between partners	Intelligentsia	All	
T8.4	Manage scientific and technical activities	Merck	All	
T8.5	Organise project steering committee meetings	Merck	Intelligentsia	

Deliverables ◆
Milestones ✦

Deliverables and milestones distributed "evenly" across the project

Section 3.1: Work plan and resources

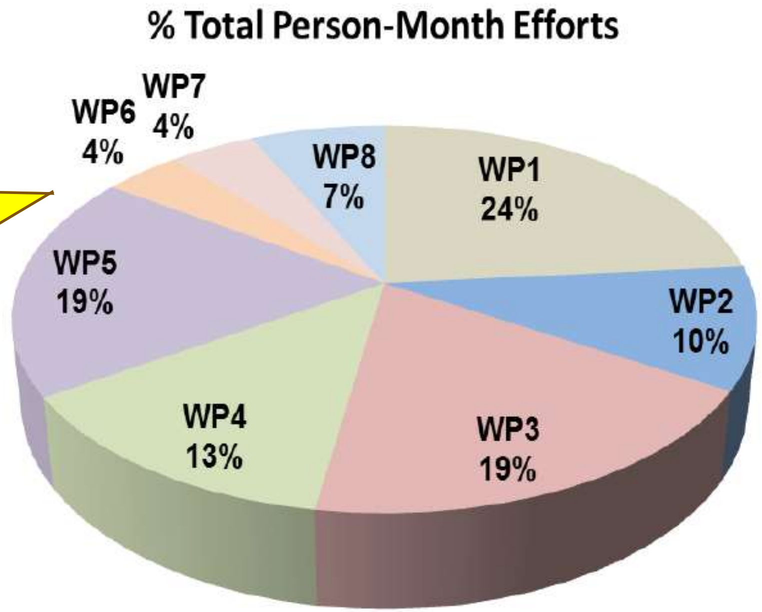
Critical Risks

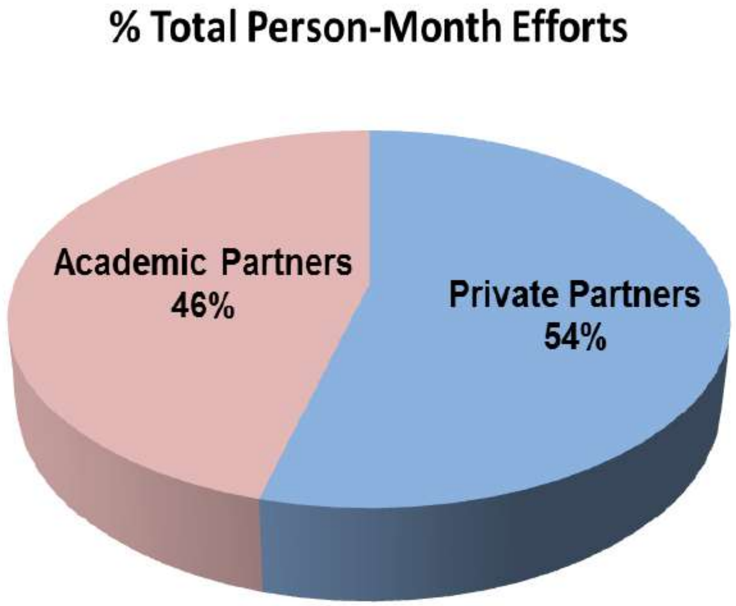
Risk No.	Description of Risk	WP(s)	Risk Rating	Proposed Risk Mitigation Measures
1	Molecular weight of shielded components could be too high for processing by thermal evaporation.	1	Low	Use compounds in OLEDs processed from solution.
2	If Dexter transfer is efficiently prevented by shielding, Forster coupling could be reduced to a level where efficient energy transfer from the TADF to the shielded emitter is not sufficient.	1	Low	The relative orientation of TADF to fluorescent core has to be optimised very carefully => shift resources to investigation of orientation and anisotropy effects.
3	New material designs cannot be synthesised.	2	Low	UDUR has developed many of the synthetic routes to D-A-D systems, especially the acceptor units, so varied approaches to the target molecules are in place to mitigate failure of one strategy.
4	Sufficiently high purity of materials cannot be achieved.	2	Low	UDUR has state-of-the-art facilities to analyse materials to determine impurities and a sublimation facilities in Physics for high quality purification. Multiple routes to materials exist to provide work-arounds to eliminate impurities that are impossible to separate.
5	Efficient fluorescence emitters will have weak or no phosphorescence making measurement of their triplet states difficult.	3	Med	UDUR has shown that steady state photo-induced absorption can be used to measure dark [illegible]ates in D-A-D molecules and will introduce time resol[illegible] measurements in this project to enable the dyna[illegible]e measured.
6	Host and / or guest molecules do not show FRET.	3	Low	Change shie[illegible]uce their separation.
7	Host and / or guest molecules do not orient.	3	Low	Induce enhance[illegible]sing inert substituents.
8	Etc.	4	Etc.	Etc.

Rule of thumb: at least two risks per WP!

Section 3.1: Work plan and resources
Budget

Distribution of efforts (%)





- Concentration of efforts in WPs 1, 2, 3 and 4 reflects the project's strong focus on development of advanced materials, design and modelling tools and is in line with the call's scope.
- Several tasks/efforts (e.g. Task 5.5) in WP5 also directly contribute to WP6.
- Project management efforts (WP8) consistent with typical EU collaborative R&D projects.
- Good balance between efforts for academic partners (IOF and UDUR) and private partners (Merck, MOD and INT) also reflects the general balance between research and innovation tasks.

Section 3.2: Capacity of participants and consortium as a whole (3 pages)

1. Describe the consortium. How does it match the project's objectives, and bring together the necessary disciplinary and inter-disciplinary knowledge. Show how this includes expertise in social sciences and humanities, open science practices, and gender aspects of R&I, as appropriate. Include in the description affiliated entities and associated partners, if any.
2. Show how the partners will have access to critical infrastructure needed to carry out the project activities.
3. Describe how the members complement one another (and cover the value chain, where appropriate)
4. In what way does each of them contribute to the project? Show that each has a valid role, and adequate resources in the project to fulfil that role.
5. If applicable, describe the industrial/commercial involvement in the project to ensure exploitation of the results and explain why this is consistent with and will help to achieve the specific measures which are proposed for exploitation of the results of the project (see section 2.2).
6. Other countries and international organisations (based in a country or is an international organisation that is not automatically eligible for such funding).

Section 3.2: Capacity of participants and consortium as a whole (1 of 4)

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Merck KGaA	Merck	Germany
2	MICROOLED S.A.S	MOD	France
3	Fraunhofer Institute for Applied Optics and Precision Engineering	IOF	Germany
4	Durham University	UDUR	UK
5	Intelligentsia Consultants Sarl	Intelligentsia	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	MZ Denmark GmbH	MOZ	Germany
2	Ericsson AB	ERI	Sweden
3	F-Secure Oyj	FSEC	Finland
4	Intel Deutschland GmbH	INT	Germany
5	Intelligentsia Consultants Sarl	IC	Luxembourg
6	Luminem SRLs	LUM	Italy
7	Mind SRL	MIND	Italy
8	Riots Global Oy	RIO	Finlan
9	Sensative AB	SEN	Swede
10	Consiglio Nazionale delle Ricerche	CNR	
11	RISE Research Institutes of Sweden AB	RISE	Sw
12	Centria Ammattikorkeakoulu Oy	CEN	
13	Politecnico di Torino	POL	

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Technische Universiteit Delft	TUD	Netherlands
2	Technische Universiteit Eindhoven	TUE	Netherlands
3	Rheinisch-Westfälische Technische Hochschule Aachen	RWTH	Germany
4	Institut National de Recherche en Informatique et en Automatique	INRIA	France
5	Eidgenössische Technische Hochschule Zürich	ETHZ	Switzerland
6	Stichting IMEC Nederland	IMEC	Netherlands
7	ARM Limited	ARM	UK
8	IBM Research GmbH	IBM	Switzerland
9	Intelligentsia Consultants Sarl	INT	Luxembourg

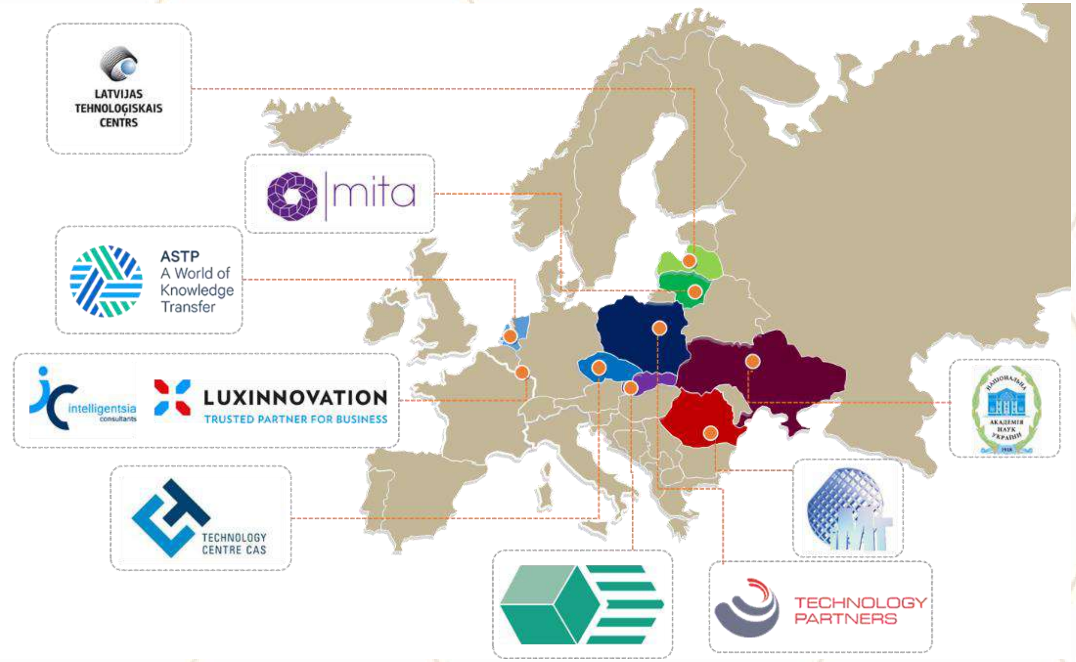
Participant no.	Participant organisation name	Part. short name	Country
1 (co-ord[illegible]ator)	Intelligentsia Consultants *Sàrl*	Intelligentsia	Luxembourg
[illegible]	Novaled GmbH	Novaled	Germany
3	Astron Fiamm Safety *Sàrl*	Astron-FIAMM	France
4	University of Durham	UDUR	UK
5	Technische Universität Dresden	TUD	Germany
6	Kauno Technologijos Universitetas	KTU	Lithuania

Important to include companies across value chain

Section 3.2: Capacity of participants and consortium as a whole (2 of 4)

OLED Materials	OLED Stacks	OLED Micro-displays
• Shielded Emitter (Merck) • TADF Host (UDUR) • Photo-physical Characterisation (UDUR)	• Hyper-fluorescence OLEDs (Merck) • Optical Anisotropy (IOF)	• Hyper-fluorescence Microdisplays (MOD)

EU Project Management and Dissemination Support (Intelligentsia)



Section 3.2: Capacity of participants and consortium as a whole (3 of 4)

Example: The project's scientific and technical objectives are perfectly aligned with the consortium partners' capabilities, contributions and complementarities:

No.	Scientific and Technical Objectives	Partner's Capabilities, Contributions and Complementarities
1	Develop new algorithmic solutions for targeted applications for CIM architecture	**IBM (WP leader)** is a pioneer of cognitive computing. The company has formed a new business unit called IBM Watson in 2014 offering services for data analytics and IoT. **TUD (Task leader)** has a strong record in developing and optimising healthcare (genomics and DNA sequencing) and data science algorithms for accelerated multi-core platforms.
2	Develop and design new mapping methods integrated in a framework for efficient compilation of the new algorithms into CIM macro-level operations	**INRIA (WP leader)** has extensive experience with the design and implementation of aggressive optimizations and analyses, including production compilers like Clang/LLVM and domain-specific code generators. **TUE (Task leader)** is specialised in research on low power single and multi-processor architectures, their programmability, and the predictable design of soft- and hard real-time systems.
3	Develop a macro-architecture based on the integration of group of CIM tiles	**TUE (WP leader)** is specialised in research on low power single and multi-processor architectures, their programmability, and the predictable design of soft- and hard real-time systems. **ETHZ (Task leader)** has a proven track record of working on novel processor and memory architectures.
4	Develop and demonstrate the micro-architecture level of CIM tiles and their models	**RWTH (WP leader)** has one of the World's leading groups on the process technology and basic physical-chemical understanding of functional oxide thin films w.r.t future integrated nanoelectronic devices, especially redox-based resistive switching memories (70+ papers, 3000+ citations). **IMEC (Task leader)** has past experience to lead the development of memristor crossbar based logic/ arithmetic and memory circuit design and simulation.
5	Design a simulator and FPGA emulator for the new architecture in order demonstrate its superiority	**ARM (WP leader)** is a world-renowned semiconductor IP company with around 3000 employees. ARM partners have shipped over 50 billion ARM microprocessors. The company has a strong track record on embedded processors, IoT devices, power-efficient server and HPC chips. **TUD (Task leader)** has a research focus on In-Memory Computing and targets the development, design and demonstration of new architecture paradigms to enable low energy and/or high throughput computing. TUD has a proven track record of implementing demonstrators.

Section 3.2: Capacity of participants and consortium as a whole (4 of 4)

The consortium partners will be able to effectively implement the MNEMOSENE project, because they have extensive past experience of working together on international research projects including:

- FP7 ENCORE involving TUD and ARM (2010-2013)
- H2020 ExaNode involving ARM and ETHZ (2015-2018)
- H2020 Antarex involving ETHZ and INRIA (2015-2018)
- H2020 neuRAM3 involving IMEC and IBM (2016-2018)

Their collaborative research work will also be facilitated by:

- Many researchers and engineers knowing each other on a personal level
- Management and technical issues being discussed during quarterly steering committee meetings
- Face-to-face consortium meetings occurring every six months
- Regularly using email, phone and Skype to communicate over the duration of the project

A.2 Training workshops during 20-21 June 2023

Funded by the European Union

Universiteti i Tiranës

ICN2 Institut Català de Nanociència i Nanotecnologia

Palacký University Olomouc

intelligentsia consultants

SUSNANO

Twinning Proposal Training

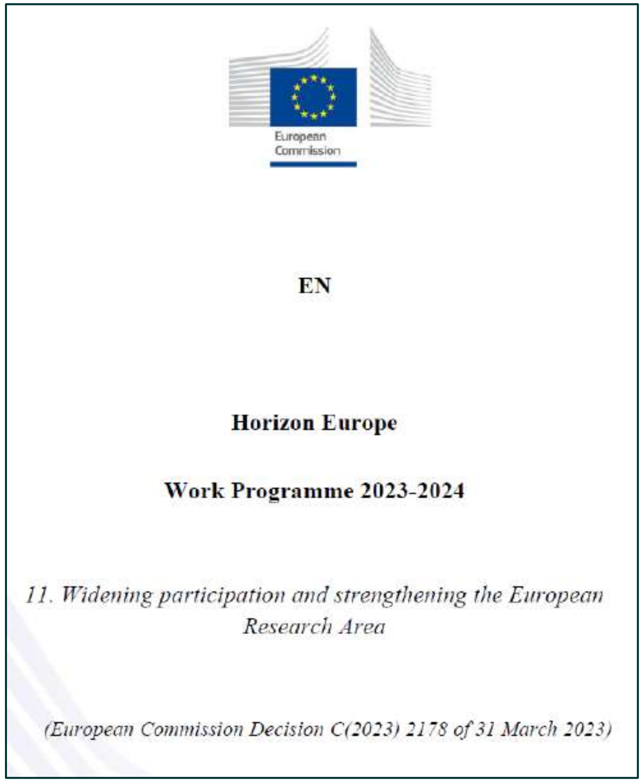
Giles Brandon (Intelligentsia Consultants), Tuesday 20th June 2023

Agenda

1. **Essential documents.**
2. **How to structure a Twinning Network.**
3. **How to structure a Twinning Proposal.**
4. **Ideas to consider for Section 1. Excellence**
5. **Ideas to consider for Section 2. Impact**
6. **Ideas to consider for Section 3. Implementation**
7. **How to prepare the Administrative Forms (including budget)**

1. Essential Documents

Essential Documents


European Commission

EN

Horizon Europe

Work Programme 2023-2024

11. Widening participation and strengthening the European Research Area

(European Commission Decision C(2023) 2178 of 31 March 2023)


Horizon Europe Programme

Standard Application Form (HE CSA)

Application form (Part A)
Project proposal – Technical description (Part B)

Version 7.0
12 April 2023

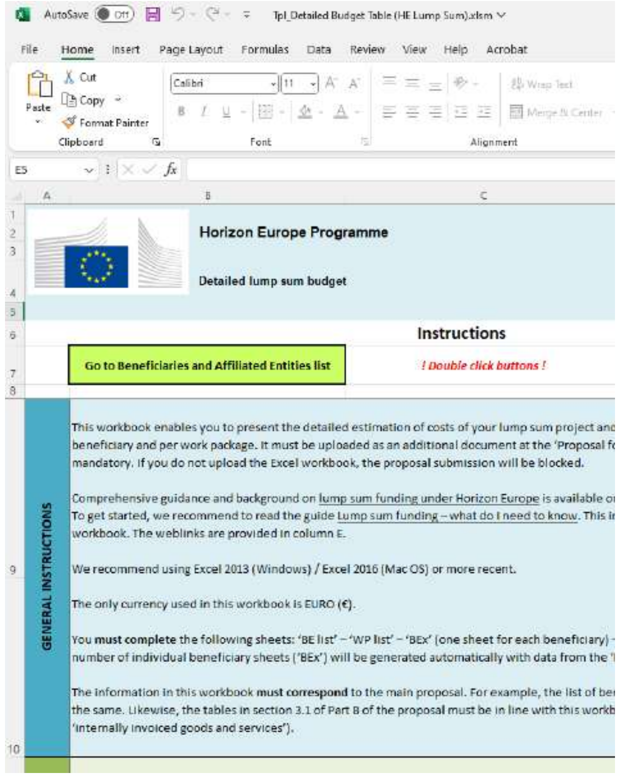

Instructions, please remove

Horizon Europe Programme

Specific Application Form (HE CSA)
HORIZON-WIDERA-2023-ACCESS-02

Project proposal – Technical description (Part B)

Version 1.0
14 February 2023



Twinning Bottom-Up

Twinning Green Deal

CSA form (Part B) for a Twinning proposal

Total length: only 33 pages!

1. Excellence
   1.1 Objectives [EC recommended length: 2 pages]
   1.2 Coordination and/or support measures and methodology [EC recommended length: 6 pages]
2. Impact
   2.1 Project's pathways towards impact [EC recommended length: 4 pages]
   2.2 Measures to maximise impact - Dissemination, exploitation and communication
   2.3 Summary [EC recommended length: 5 pages for Sections 2.2 and 2.3]
3. Quality and efficiency of the implementation
   3.1 Work plan and resources [EC recommended length: 13 pages – including tables]
   3.2 Capacity of participants and consortium as a whole [EC recommended length: 3 pages]

- **Don't deviate more than ½-1 page from the recommended limits!**
- **Start Section 1.1 on the proposal cover page!**

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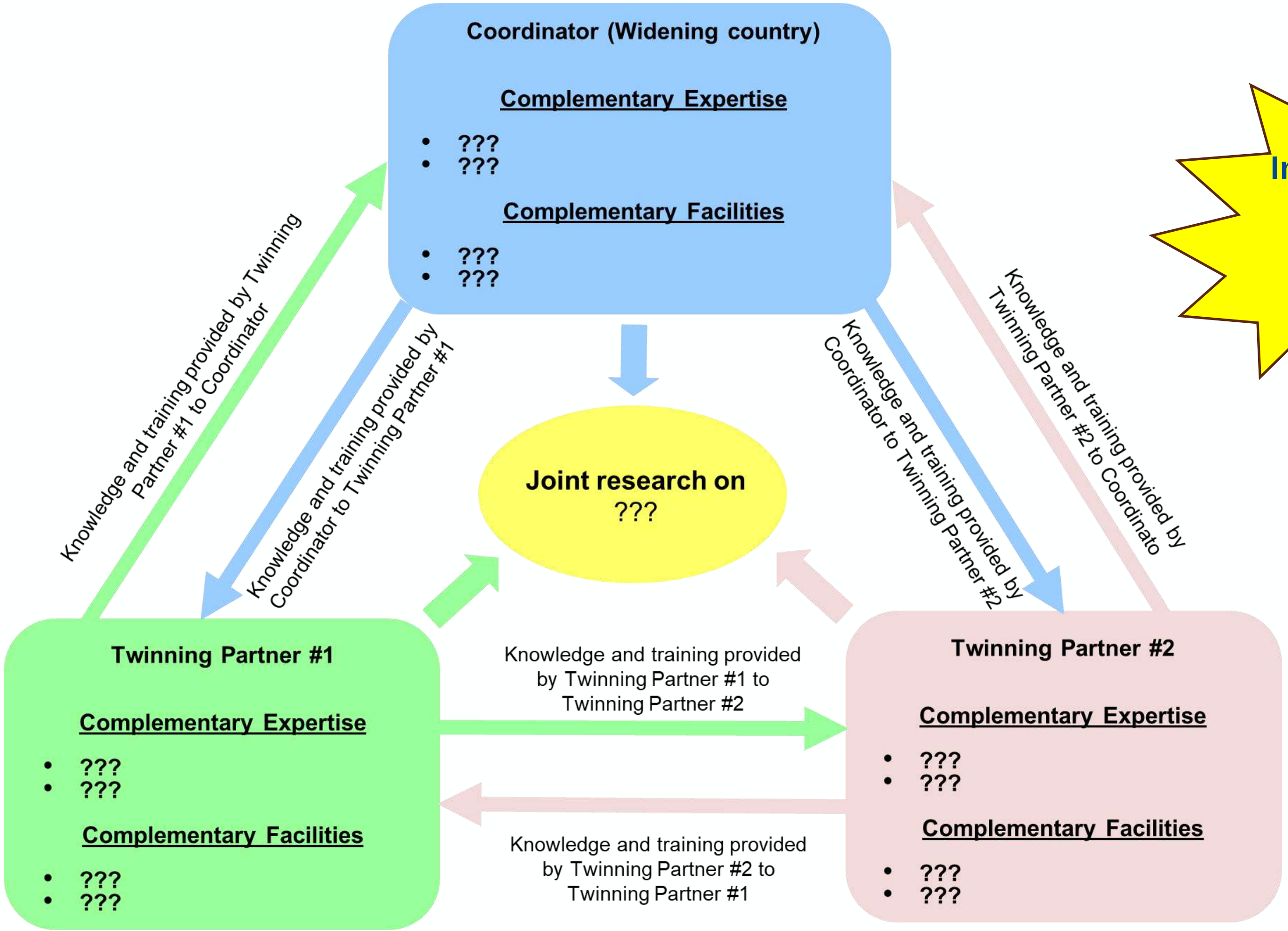
2. How to structure a Twinning Network

Twinning Network



Include such a figure in Section 3.2

3. How to structure a Twinning Proposal

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Twinning Proposal Structure

Describe objectives briefly in Section 1.1 (2 page limit)

Include indicators in Section 1.1!

1. Excellence	3. Implementation	
1.1 Objectives	3.1 Work Plan	Indicators
Objective 1: Conduct preparatory research on …	WP1: Preparatory research project	Research papers, patents, collaboration agreements, …
Objective 2: Transfer knowledge between senior researchers	WP2: Exchanges involving senior researchers	Months of exchanges, workshops, seminars, …
Objective 3: Provide training to young researchers	WP3: Exchanges involving young researchers	Months of exchanges, summer schools, seminars, …
Objective 4: Strengthen coordinator's research management capacities and administrative skills	WP4: Capacity building of research mgt and admin.	Training workshops, research proposals prepared, …
Objective 5: Raise the coordinator's research profile	WP5: Dissemination and communication	International conference, industry events, open days, …
	WP6: Project Management	

Elaborate on objectives in Section 1.2 (6 page limit)

Prepare Sections 1.1, 1.2 and 3.1 concurrently

4. Ideas to consider for Section 1. Excellence

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- Section 1.1
  - Demonstrate proposal’s pertinence to the work programme
- Section 1.2
  - Why the research is important from a national and EU perspective
  - SWOT analysis
  - Specify scientific targets for the exploratory research project

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Demonstrate proposal's relevance to the work programme (Section 1.1)

Scope of the call HORIZON-WIDERA-2021-ACCESS-03-01: Twinning	How/where this proposal addresses the scope of the call
Twinning aims to enhance networking activities between the research institutions (RIs) of the Widening countries and top-class leading counterparts at EU level by linking it with at least two research institutions from two different MS or AC.	Coordinator: ?? (Widening country) Two leading RIs: ?? (Country), ?? (Country)
Twinning proposals should clearly outline the scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research as well as the scientific quality of the partners involved.	The proposal's scientific strategy is focused on ?? where the Twinning partners have world class researchers in the domain.
Extract other important requirements from the call text	*Indicate where the proposal addresses the requirement e.g see Section 1.2*
Etc	*Etc*

Include such a table in Section 1.1

Why the research is important from a national and EU perspective (Section 1.2)

- Concisely describe why the research topic is important (1/2 – 1 page)
- National level
  - Reference SMART specialization strategy (S3) and/or
  - Reference national research and innovation strategy/policies
- EU level
  - Reference research and innovation priorities in Horizon Europe and/or
  - Reference European Partnership’s research and innovation priorities e.g. Processes4Planet

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SWOT Analysis (Section 1.2)

Be specific = More convincing!

Explain how your scientific strategy (objectives) addresses the SWOT

Strengths (S) and Weaknesses (W) of Coordinator	Opportunities (O) and Threats (T) faced by Coordinator
Strengths	**Opportunities**
1. Strong expertise in a wide range of logistics and logistics technology related research topics. 2. Good cooperation of the Institute of Logistics with various industrial partners (e.g. automotive, electronics, manufacturing, logistics). 3. Free access to the university's facilities and equipment (e.g. manufacturing engineering, ICT, logistics, simulation computing, etc.) 4. Good contact with national and European industrial actors with interest in the Institute research and development activities	1. Potential to participate in logistics and ICT technologies projects funded by national authority 2. Potential to participate in Horizon Europe research and innovation actions 3. Potential for further research capacity building via European Structural Funds 4. Potential to develop RTD projects with international research organisations as well as private clients 5. Potential to become a top European actor in logistics research and innovation
Weaknesses	**Threats**
1. Low financial resources received directly from national government and significant reduction of national funding for research and innovation 2. Lack of job opportunities for young researchers leads to decrease in capability to fully exploit recent developments in logistics 3. Lack of communication with the Innovation Technology Transfer Centre at the Coordinator. 4. Lack of knowledge and experience of innovation and project management amongst researchers 5. Lack of R&D proposal writing skills and low participation to international projects	1. Fluctuation in national R&D funding due to changing priorities of government budget formation 2. High competition to access European research projects and lack of trained researchers and managers to fully exploit opportunities with Horizon Europe projects 3. Lack of trained researchers and managers to fully exploit opportunities with Horizon Europe projects 4. Low start-up and spin-off activity 5. Lack of public-private partnerships with national and European companies resulting in a reduced transfer of knowledge and technologies to the industry

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Specify scientific targets for the exploratory research project (Section 1.2)

Example from an organic electronics related project

TADF material as OLED emitters	PL Max. in toluene, nm	PLQY in hosted film, %	Max. OLED EQE, %	Max. OLED PE, lm/W	OLED Lifetime LT50@3000cd/m², hrs
Blue	460-490	>60	>15	>20	>500
Green	510-540	>70	>20	>80	>1000
Red	610-650	>60	>15	>20	>1000

Demonstrate how your exploratory research will be at the state-of-the-art or beyond ...

5. Ideas to consider for Section 2. Impact

Section 2. Impact

- Section 2.1
  - Contribution to expected outcomes (qualitative and quantitative)
  - Potential barriers arising from factors beyond the scope and duration of the project
- Section 2.2
  - Dissemination and Communication Plan
  - Strategy for the management of intellectual property

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Qualitative contribution to expected outcomes (Section 2.1)

Write about 2 pages in a narrative style

- Outcome 1: Improved excellence capacity and resources in Widening countries enabling to close the still apparent research and innovation gap within the European Union.
- Outcome 2: Enhanced strategic networking activities between the research institutions of the Widening countries and at least two internationally-leading counterparts at EU level.
- Outcome 3: Raised reputation, research profile and attractiveness of the coordinating institution from the Widening country and the research profile of its staff.
- Outcome 4: Strengthened research management capacities and administrative skills of the staff working in institutions from the Widening country.
- Outcome 5: Improved creativity supported by development of new approaches in R&I collaboration, increased mobility (inwards and outwards) of qualified scientists.

Quantitative contribution to expected outcomes (Section 2.1)

Use the KPIs from Section 1.1

Expected Outcomes	WP	Performance Indicators	Target
Outcome 1: Improved excellence capacity and resources in Widening countries enabling to close the still apparent research and innovation gap within Europe.	1, 2, 3 and 5	• Coordinator's senior researchers trained in Research Topic ??? • Coordinator's junior researchers trained in Research Topic ??? • Summer schools hosted by partners • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences • Patents submitted by Coordinator • Collaboration agreements between Coordinator and private companies	?? ?? ?? ?? ?? ??
Outcome 2: Enhanced strategic networking activities between the research institutions of the Widening countries and at least two internationally-leading counterparts at EU level.	1, 2, 3, 4 and 5	• Total person-months (PMs) of exchanges of senior researchers between partners • Total PMs of exchanges of junior researchers between partners • Total PMs of exchanges of mgt. and admin. staff between partners • Summer schools hosted by partners • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences	?? ?? ?? ?? ??
Outcome 3	etc	• etc	etc

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Potential barriers arising from factors beyond the scope and duration of the project (Section 2.1)

- Scientific related barriers
  - Describe 3-4 challenges/barriers specific to the research topic and/or
  - Describe 3-4 challenges/barriers identified by relevant European Partnerships e.g. Made in Europe
- Country related
  - Describe 3-4 challenges/barriers faced by your country's research and innovation system

For each challenge/barrier, describe a mitigation measure the project will take!

Dissemination and Communication Plan (Section 2.2)

Dissemination and Communication Plan				
Project result	**Partners Concerned**	**Dissemination Activity**	**Target audience**	**Indicator & Target**
Project leaflet and poster	Coordinator and Twinning Partners	Distribute during international conferences (e.g. X, Y, Z, etc.), training workshops and outreach events	Scientists, engineers and general public	250+ leaflets distributed, 25+ posters displayed
Press conferences	Coordinator	Press conferences at the start and end of the project	Regional and national news media (radio, TV and print newspapers)	2 conferences, 5+ journalists
Project news	Coordinator and Twinning Partners	Publish project news releases and distribute through broader scientific news channels	Scientists, engineers and general public	2+ press releases
Project website	Coordinator and Twinning Partners	Publish project summary, regular news and event updates on website	Scientists, engineers and general public	2500+ visitors
etc	etc	etc	etc	etc

Strategy for the management of intellectual property (Section 2.2)

Include tables that capture ownership of background and foreground knowledge!

Background Knowledge	Partners Concerned
Device architecture for state-of-the-art OLEDs, especially using phosphorescent emitters	Coordinator
Performance impact of parameter variations on OLED device performance for typical stack architectures (trade-offs etc.)	Partner #1
Physico-chemical properties required from OLED materials for good device performance (e.g. purity, energy levels, glass transition temperature etc.)	Partner #2
etc	etc

Possible Foreground Knowledge	Partners Concerned	Other Partners claiming Ownership Rights
Synthesis routes, scale up and purification processes for sterical shielding of compounds	Coordinator	Partner #2
Stack architectures optimised for TADF plus shielded emitter concept	Coordinator	-
Fluorescent core structures and shielded emitters based on these for different emission colours	Partner #1	Partner #2
etc	etc	etc

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6. Ideas to consider for Section 3. Implementation

- Section 3.1
  - WP2 and WP3 (Exchanges involving senior/young researchers)
  - Budget

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WP2 and WP3 (Exchanges involving senior/junior researchers) (Section 3.1)

Show you have a concrete plan - include secondment tables!

Year	Coordinator		Partner #1	
	Researcher	**PMs**	**Researcher**	**PMs**
1	Danny Wilson	2	Helene Arnaud	1
	Graham Mills	0.5	Francoise Hoss	1.25
	Rebecca Moore	1.25	Claude Hollande	0.5
	Sharon Raymond	0.25	Benoit Leroy	2
2	Danny Wilson	0.5	Helene Arnaud	0.5
	Graham Mills	0.75	Francoise Hoss	1
	Rebecca Moore	1	Claude Hollande	2
	Sharon Raymond	2	Benoit Leroy	1.5
3	Danny Wilson	0.5	Helene Arnaud	0.25
	Graham Mills	0.5	Francoise Hoss	0.75
	Rebecca Moore	2	Claude Hollande	1.5
	Sharon Raymond	1.25	Benoit Leroy	0.75

7. How to prepare Administrative Forms (including Budget)

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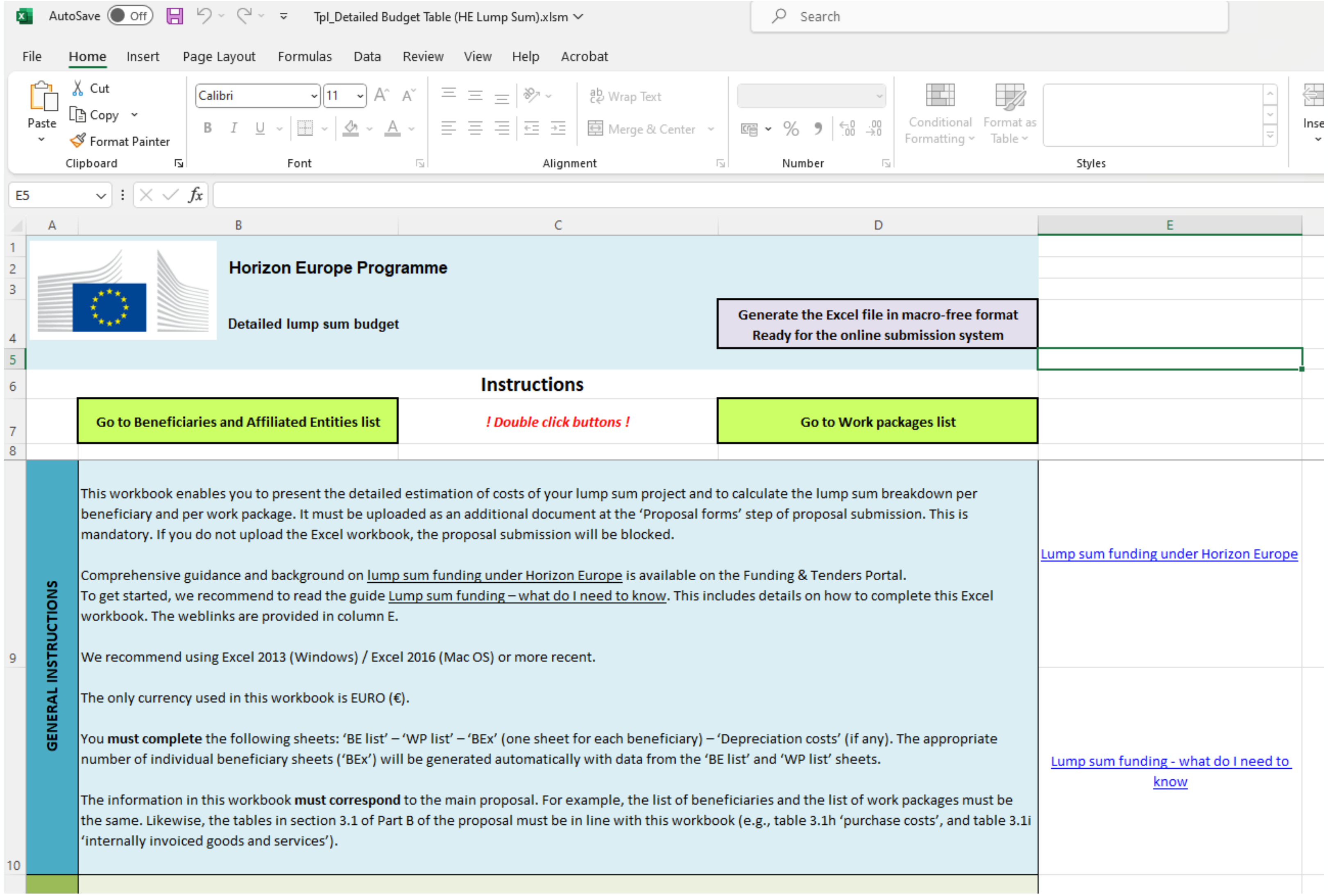
Twinning to boost the scientific and innovation capacity of the Universiteti i Tiranës to develop sustainable nanosensors for water pollution detection

Budget: Lump Sum Funding

- **European Commission's Lump Sum Funding Excel budget tool (see QR code)**
  - Warning: But make sure to download the Excel budget tool provided for the Horizon Europe call that you are applying to!
- **Completed Lump Sum Funding Excel budget tool must be uploaded with a proposal to the European Commission's portal.**



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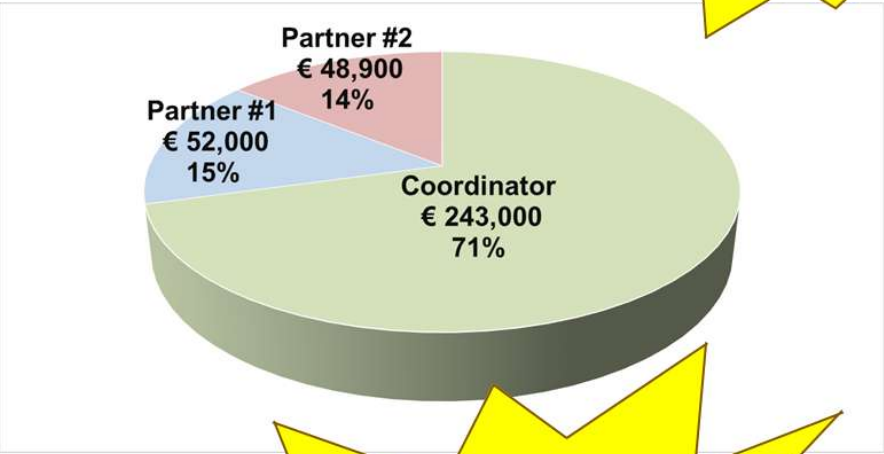
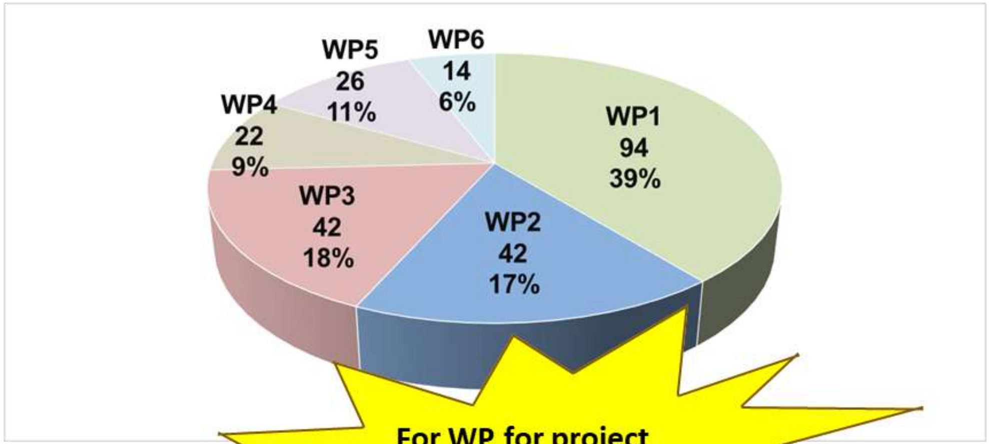
Budget: Pie Charts

Include some pie charts to illustrate how your budget and efforts (PMs) are allocated!





For WP with the preparatory research project (i.e. WP1) show that it consumes below 30% total budget and that the coordinator has over 70%!

For WP for project management (i.e. WP6), keep it within 5-7% range.

Thank You – Any Questions?

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Project Proposal Development (for Horizon Europe projects)

Giles Brandon (Intelligentsia Consultants), Project Management Training, Wednesday 21st June 2023

Agenda

1. How to get started.
2. How to structure the overall proposal.
3. How to write Section 1 “Excellence”.
4. How to write Section 3 “Implementation”.
5. How to write Section 2 “Impact”.

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Some *stepping stones* to help you to write Horizon Europe proposals

1. How to get started

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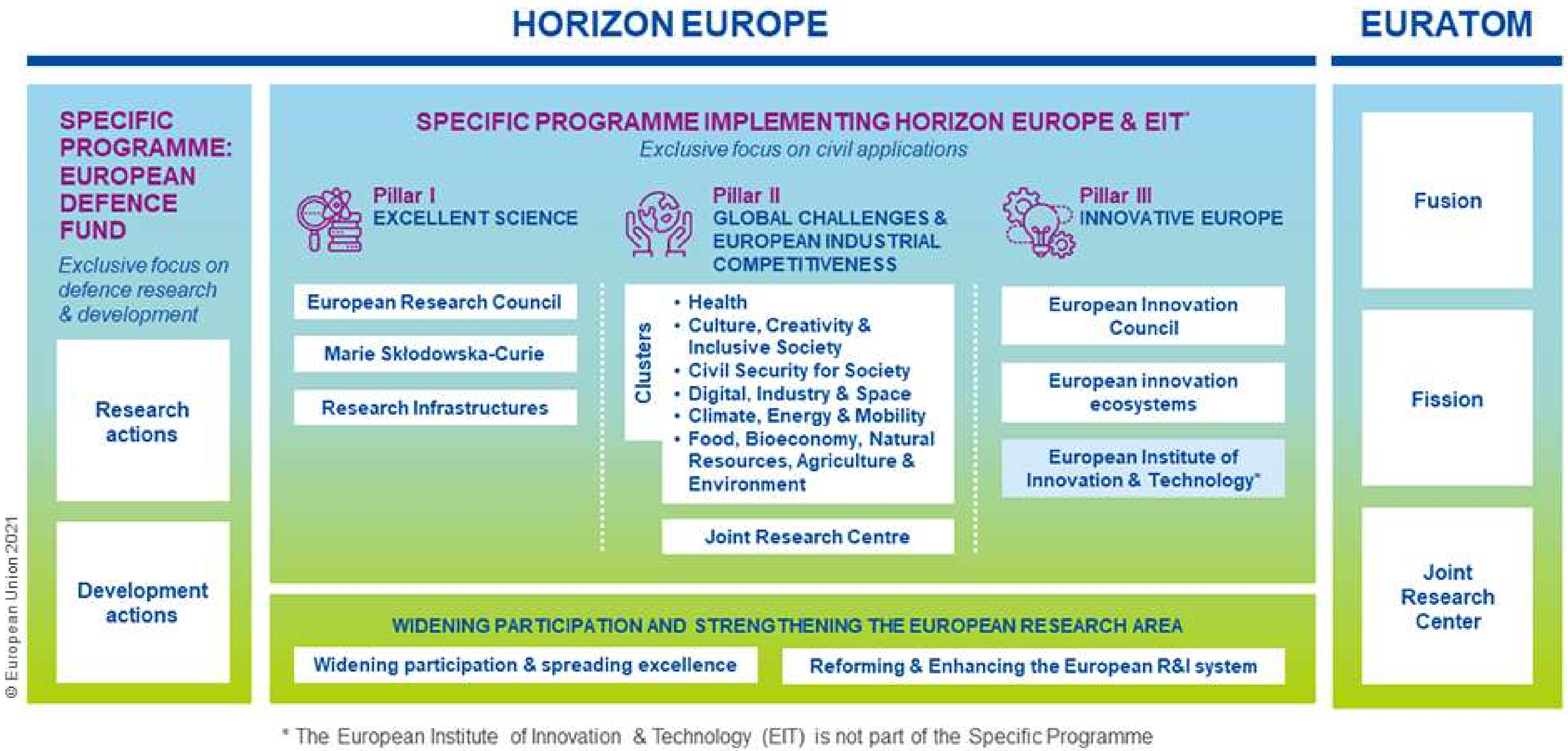
Twinning to boost the scientific and innovation capacity of the Universiteti i Tiranës to develop sustainable nanosensors for water pollution detection

Horizon Europe Programme



Training focused on proposals for **Research and Innovation Actions (RIA)**, **Innovation Actions (IA)** and **Coordination and Support Actions (CSA)**

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RIA, IA and CSA

Research and Innovation Actions (RIA)	Innovation Actions (IA)	Coordination and Support Actions (CSA)
Activities that aim primarily to establish new knowledge or to explore the feasibility of a new or improved technology, product, process, service or solution. This may include basic and applied research, technology development and integration, testing, demonstration and validation of a small-scale prototype in a laboratory or simulated environment.	Activities that aim directly to produce plans and arrangements or designs for new, altered or improved products, processes or services. These activities may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.	Activities aimed at coordinating or supporting research activities and policies (networking, exchanges, trans-national access to research infrastructures, studies, conferences, etc.). This excludes R&I activities, except those carried out under the 'Widening participation and spreading excellence' component of the programme.
100% Funding	70% Funding for Private Organisations, 100% Funding for Public Organisations	100% Funding

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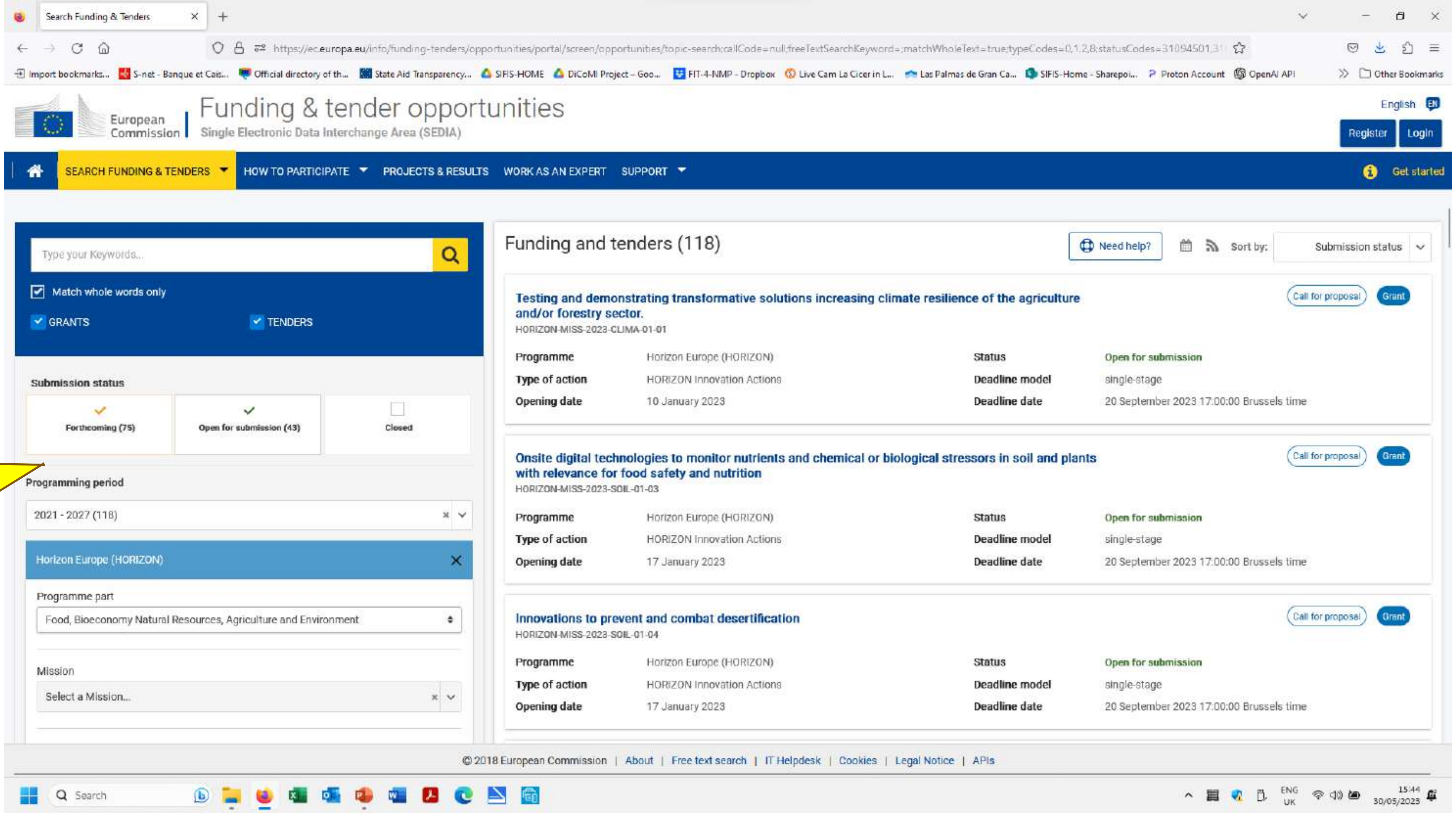
EC's Funding and Tender Portal



Check forthcoming and open calls under Horizon Europe

Download Essential Documents: Work Programme and Application Form

European Commission

EN

Horizon Europe

Work Programme 2023-2024

9. Food, Bioeconomy, Natural Resources, Agriculture and Environment

(European Commission Decision C(2022)7550 of 6 December 2022)

Print out the relevant pages and read repeatedly!

Check online to see if EC has run an info-day webinar about the call!

Horizon Europe Programme

Standard Application Form (HE RIA, IA)

Application form (Part A)
Project proposal – Technical description (Part B)

Version 6.0
15 November 2022

HORIZON-CL6-2023-BIODIV-01-4: Nature protection: Better methods and knowledge to improve the conservation status of EU-protected species and habitats

1. Specific Conditions
   – Expected EU contribution per project, Indicative budget, Type of action (RIA or IA), Procedure, legal and financial set-up of the grant agreements
2. Expected Outcome
   – Typically, several bullet points identifying the expected outcomes the proposal is expected to contribute to.
3. Scope
   – Typically, extensive text describing the scope of the call.

Application Form: Part B for an RIA/IA proposal

Total length: 45 pages (including cover page)

1. Excellence

1.1 Objectives and ambition [EC recommended length: 4 pages]

1.2 Methodology [EC recommended length: 14 pages]

2. Impact

2.1 Project's pathways towards impact [EC recommended length: 4 pages]

2.2 Measures to maximise impact - Dissemination, exploitation and communication

2.3 Summary [EC recommended length: 5 pages for Sections 2.2 and 2.3]

3. Quality and efficiency of the implementation

3.1 Work plan and resources [EC recommended length: 14 pages – including tables]

3.2 Capacity of participants and consortium as a whole [EC recommended length: 3 pages]

- **Don't deviate more than 1 page from the recommended limits!**
- **Consider starting Section 1.1 on the proposal cover page!**

Application Form: Part B for a CSA proposal

1. Excellence

1.1 Objectives [EC recommended length: 2 pages]

1.2 Coordination and/or support measures and methodology [EC recommended length: 6 pages]

2. Impact

2.1 Project's pathways towards impact [EC recommended length: 4 pages]

2.2 Measures to maximise impact - Dissemination, exploitation and communicati

2.3 Summary [EC recommended length: 5 pages for Sections 2.2 and 2.3]

Total length: 30 pages (including cover page)

3. Quality and efficiency of the implementation

3.1 Work plan and resources [EC recommended length: 10 pages – including tables]

3.2 Capacity of participants and consortium as a whole [EC recommended length: 3 pages]

- **Don't deviate more than 1 page from the recommended limits!**
- **Consider starting Section 1.1 on the proposal cover page!**

Consortium Building (1 of 3)

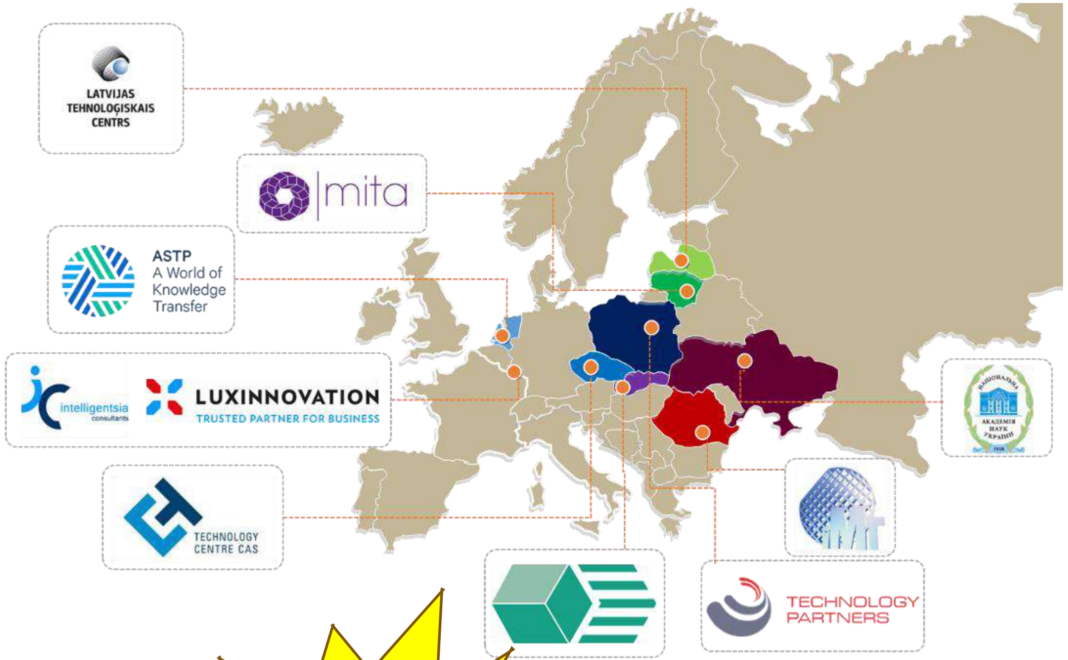
- Check carefully the call text to identify the minimum consortium requirements (e.g. at least three independent legal entities from three different Member States or Associated Countries).
- Typically, 5-10 partners in an RIA and IA with a €3-6m budget.
- Identify an initial “critical mass” of partners e.g. 5+ partners.
- Identify who will be the proposal coordinator and who will be the lead proposal writer (not necessarily the same person!)
- Organise meeting(s) with the “critical mass” to structure the proposal
  - Ideally, face-to-face with a white board
  - Alternatively, online with one person good at editing MS Powerpoint

Consortium Building: Examples (2 of 3)

OLED Materials	OLED Stacks	OLED Micro-displays
• Shielded Emitter (Merck) • TADF Host (UDUR) • Photo-physical Characterisation (UDUR)	• Hyper-fluorescence OLEDs (Merck) • Optical Anisotropy (IOF)	• Hyper-fluorescence Microdisplays (MOD)

EU Project Management and Dissemination Support (Intelligentsia)

Important to include companies across value chain!



Important to have a “nice” geographical spread!

Consortium Building: Examples (3 of 3)

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Merck KGaA	Merck	Germany
2	MICROOLED S.A.S	MOD	France
3	Fraunhofer Institute for Applied Optics and Precision Engineering	IOF	Germany
4	Durham University	UDUR	UK
5	Intelligentsia Consultants Sarl	Intelligentsia	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	MZ Denmark GmbH	MOZ	Germany
2	Ericsson AB	ERI	Sweden
3	F-Secure Oyj	FSEC	Finland
4	Intel Deutschland GmbH	INT	Germany
5	Intelligentsia Consultants Sarl	IC	Luxembourg
6	Luminem SRLs	LUM	Italy
7	Mind SRL	MIND	Italy
8	Riots Global Oy	RIO	Finland
9	Sensative AB	SEN	Sweden
10	Consiglio Nazionale delle Ricerche	CNR	Italy
11	RISE Research Institutes of Sweden AB	RISE	Sweden
12	Centria Ammattikorkeakoulu Oy	CEN	Finland
13	Politecnico di Torino	POL	Italy

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Technische Universiteit Delft	TUD	Netherlands
2	Technische Universiteit Eindhoven	TUE	Netherlands
3	Rheinisch-Westfälische Technische Hochschule Aachen	RWTH	Germany
4	Institut National de Recherche en Informatique et en Automatique	INRIA	France
5	Eidgenössische Technische Hochschule Zürich	ETHZ	Switzerland
6	Stichting IMEC Nederland	IMEC	Netherlands
7	ARM Limited	ARM	UK
8	IBM Research GmbH	IBM	Switzerland
9	Intelligentsia Consultants Sarl	INT	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Intelligentsia Consultants *Sàrl*	Intelligentsia	Luxembourg
2	Novaled GmbH	Novaled	Germany
3	Astron Fiamm Safety *Sàrl*	Astron-FIAMM	France
4	University of Durham	UDUR	UK
5	Technische Universität Dresden	TUD	Germany
6	Kauno Technologijos Universitetas	KTU	Lithuania

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2. How to structure the overall proposal

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How to structure Sections 1 and 3

Breakdown overall project goal into “chronological” scientific and technological objectives

1. Excellence

1.1 Objectives

Map each S&T objective to its own WP

3. Implementation

3.1 Work Plan

During discussions with consortium partners, start by sketching out the WPs and who will lead each WP.

Scientific and Technological (S&T) Objective 1 → WP1: Tasks to achieve S&T Objective 1

S&T Objective 2 → WP2: Tasks to achieve S&T Objective 2

S&T Objective 3 → WP3: Tasks to achieve S&T Objective 3

S&T Objective 4 → WP4: Tasks to achieve S&T Objective 4

Describe S&T objectives concisely in Section 1.1

WP5: Dissem., Exploit. & Communication

WP6: Project Management

Prepare Sections 1.1 and 3.1 concurrently

Put Dissemin. and Project Mgt WPs at the end!

Structuring Sections 1 & 3: Example

1. Excellence

1.1 Objectives

S&T Objective 1: Screen potential ICT-TADF and Exciplex-TADF compounds with theoretical models

S&T Objective 2: Synthesise the most promising ICT-TADF and Exciplex-TADF model compounds

S&T Objective 3:Characterise and select the best ICT-TADF and Exciplex-TADF synthesised compounds

S&T Objective 4: Design white stack units employing the selected TADF based emitter and block materials

S&T Objective 5: Design close-to-production OLED lighting panel demonstrators

3. Implementation

3.1 Work Plan

WP1: Modelling

WP2: Synthesis

WP3: Characterisation

WP4: Emitter Layer Design and Stack Integration

WP5: OLED Lighting Panel Demonstrators

WP6: Dissem., Exploit. & Communication

WP7: Project Management

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2. How to write Section 1 “Excellence”

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Section 1: Excellence (RIA/IA)

- Section 1.1: Objectives and ambition
  - EC recommended length: 4 pages

- Section 1.2: Methodology
  - EC recommended length: 14 pages

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Section 1.1: Objectives and ambition (RIA/IA)

1. Briefly describe the objectives of your proposed work. Why are they pertinent to the work programme topic? Are they measurable and verifiable? Are they realistically achievable?
2. Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious. Indicate any exceptional ground-breaking R&I, novel concepts and approaches, new products, services or business and organisational models. Where relevant, illustrate the advance by referring to products and services already available on the market. Refer to any patent or publication search carried out.
3. Describe where the proposed work is positioned in terms of R&I maturity (i.e. where it is situated in the spectrum from ‘idea to application’, or from ‘lab to market’). Where applicable, provide an indication of the Technology Readiness Level, if possible distinguishing the start and by the end of the project.

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Section 1.1: Objectives and ambition

"Briefly describe the objectives of your proposed work. Why are they pertinent to the work programme topic?" (1 of 2)

Each WP leader should describe/elaborate the S&T objective for their WP (½ page or less)

1. Excellence		3. Implementation
1.1 Objectives		3.1 Work Plan
Scientific and Technological (S&T) Objective 1	→	WP1: Tasks to achieve S&T Objective 1
S&T Objective 2	→	WP2: Tasks to achieve S&T Objective 2
S&T Objective 3	→	WP3: Tasks to achieve S&T Objective 3
S&T Objective 4	→	WP4: Tasks to achieve S&T Objective 4
		WP5: Dissem., Exploit. & Communication
		WP6: Project Management

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Section 1.1: Objectives and ambition
"*Briefly describe the objectives of your proposed work. __Why are they pertinent to the work programme topic?__*" (2 of 2)

Create a table with each key requirement from the call text. Then, concisely explain how your proposal addresses each of them

Topic addressed by the Call	SIFIS-Home relevance
SU-ICT-02-2018-2020: Building Blocks for Resilience in Evolving ICT Systems	**This is the centre of gravity of the SIFIS-Home project, which especially focuses on solutions for security, privacy and accountability for Smart-Home networked systems.**
Algorithms, software and hardware systems must be designed having security, privacy, data protection and accountability in mind from their design phase in a measurable manner.	The planned work in the project is structured in order to successfully fulfil this requirement from the start. In fact, from a logical and chronological point of view: 1. The work starts with defining an architecture and related security & privacy goals (WP1). This will keep in mind a "measurable approach" from the start. 2. Building on previous results, guidelines/methods/tools for assessing quality and legal aspects will be developed in WP2 throughout the project. 3. Building on previous results, technical solutions such as algorithms and methods, as well as software and hardware systems will be designed and developed in WP3 and WP4. Measures will be produced on testbed level (WP5) and use case level (WP6), as to performance, requirement fulfilment, usability and user experience, as well as perceived and achieved security & privacy level.
Relevant challenges include: (a) to develop mechanisms that measure the performance of ICT systems with regards to cybersecurity and privacy and	Challenge (a) will be especially tackled through the work in WP2, by developing and providing methods, techniques, metrics and tools for performing an evaluation at IoT software level and at IoT infrastructure level. Performance indicators of interest include, but are not limited to: level of security and privacy provided to end users, as to the effectiveness in fulfilling the intended security requirements; impact on infrastructure, system and network functioning; risk of vulnerability exploitation.

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Section 1.1: Objectives and ambition "Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious" (1 of 2)

Example from an organic electronics related project

	Current State-of-the-Art	HyperOLED Target
TADF host and shielded fluorescence emitter materials		
TADF host	Emission peak maximum 465nm	430nm to excite deep blue fluorescence emitters
Shielded fluorescence emitters synthesis	Phosphorescent emitters: Complex metal-organic synthesis and purification	Purely organic material: Easier synthesis and purification
Shielded fluorescence emitters analytics, quality control	Phosphorescent emitters: Difficult chemical analytics (purity, trace impurities etc.)	Well-developed analytical techniques for purely organic materials can be used
White OLED stack		
Simplified white stack	Hybrid tandem (fluorescent blue + phosphorescent red/green), approx. 10-15 organic layers	One-unit stack, approx. 6-8 organic layers
Efficiency	Hybrid tandem 30lm/W @ 1000cd/m², CIE x/y 0.39/0.39 (no outcoupling)	40lm/W with same CIE
Voltage	Hybrid tandem as above, 8.5V @ 10mA/cm²	5.5V @ 10mA/cm²
Lifetime	Full phosphorescent 50lm/W @ 1000cd/m², 1500h LT70 @ 1000cd/m², CIE x/y 0.49/0.42 (no outcoupling)	5000h LT70 (same efficiency etc.)
Blue TADF+shielded fluorescence emitter OLED		
Efficiency	Fluorescent, 11.5% EQE, CIE x/y 0.14/0.09 (EQE is the same for lighter blue)	20% EQE, CIE x/y 0.14/0.20
Lifetime	Phosphorescent 20% EQE, 90h LT70 @ 5mA/cm², CIE x/y 0.14/0.31	300h LT70 @ 5mA/cm² CIE x/y 0.14/0.20
High temperature lifetime	Phosphorescent: Lifetime decrease of factor 3 per 20°C	Factor of 2 per 20°C
OLED Microdisplay		
Brightness, operating voltage and backplane technology	Products: Full colour at 500cd/m² (MOD, eMagin, Sony), two-colour red green at 3000cd/m² (MOD) Prototype under development: full colour with high voltage (5V) CMOS process, proof of concept for 3000-5000cd/m² (MOD)	2000cd/m² using low voltage (2.5V CMOS process) backplane.

Example from a computation-in-memory related project

Table 1a: MNEMOSENE anticipated performance improvements relative to state-of-the-art
Improve the energy-delay product by factor of 100X to 1000X
Improve the computational efficiency (#operations / total-energy) by factor of 10X to 100X
Improve the performance density (# operations per area) by factor of 10X to 100X

Section 1.1: Objectives and ambition
"Describe where the proposed work is positioned in terms of R&I maturity" (1 of 2)

Example from a low TRL project

Level of Development	TRL No.	TRL Definition	Means of Verification	Timing
Basic Technology Research	TRL 1	Basic principles observed	Research papers and patents.	Completed
Research to Prove Feasibility	TRL 2	Technology concept formulated	• The concept of CIM will be developed and demonstrated using real crossbar and memristive devices and by performing experiments and measurements. • Different memristive device technologies (e.g., PCM, RRAM) will be explored for CIM concept.	To be done during project
	TRL 3	Experimental proof of concept	• The potential of the CIM die combined with a conventional CPU will be demonstrated using full simulation and emulation. • Results of tests performed will be used to measure parameters of interest and compare to analytical predictions. • Potential practical applications will be defined and evaluated that will significantly benefit from such architecture. • Calibrated models (micro and macro level) will be provided that can be used to build different optimised versions of the architecture and experimented with it for specific applications.	To be done during project
Technology Development	TRL 4	Technology validated in laboratory environment	• The CIM dies will be integrated with a conventional CPU on a single chip to establish and validate the fact that when combined together on a single die they can deliver the expected system functionality and performance for a range of applications. • The key parameters of the intended approach will be measured and identified (e.g. power/energy, frequency/performance and chip size). • Insights (based on measurements) will be provided on how the architecture can be further refined and optimised for different applications. • Partners will consider potential bi-lateral spin-outs to ensure optimal knowledge transfer and valorisation.	Within 3 years of project completion. Partners envision a follow-up RIA project (TRL 4-7) involving additional industry partners.
	TRL 5	Technology validated in industrially relevant environment	• The basic technological components (CIM die integrated with a CPU, compiler, etc.) will be combined with supporting elements (DRAM, I/O, etc.) so that the whole architecture and its software components can be tested and simulated in an industrial environment. This w ill mimic a new computer based on the new architecture operating in a real application/ in field. • Insights will be obtained based on the experiments on problems - if any - and how to address them to further improve and refine the new CIM based computing sy stem and realize the overall system goals.	Within 3 years of project completion. Partners envision a follow-up RIA project (TRL4-7) involving additional industry partners.

Level of Development	TRL No.	TRL Definition	Means of Verification	Timing
Technology Demonstration	TRL 6	Technology demonstrated in industrially relevant environment	• The implementation of both the hardware and associated software stack of CIM based computer will be prototyped near or at planned operational functionalities. Metrics of interest will be measured and analysed as well as the scalability of the approach. This will be in order to demonstrate the functionality and expected improvements even under different environmental conditions and for variety of realistic applications. • The engineering feasibility of the new computation paradigm will be fully demonstrated. • Insights will be obtained based on a full demonstrator to further refine both the hardware and software components and provide a more "reliable" and "robust" demonstra tor at TRL7.	4 to 7 years after project completion
System Commissionin g	TRL 7	System prototype demonstration in operational environment	• A mature CIM based computer prototype (hardware software integration) will be built to demonstrate the targeted performance for realistic applications in the actual operational environments and platforms. The prototype will have all the all key features needed for demonstration and test.	6 to 9 years after project completion
	TRL 8	System complete and qualified	• The final CIM based computer and final configuration will be demonstrated through test and analysis for its intended realistic applications in operational environments and platforms. The software of the CIM computer will have to be thoroughly debugged and fully integrated with operations CIM computer hardware. • The CIM computer will be characterised, verified and validated. • All user documentation, training documentation, and maintenance documentation will be provided.	8 to 10 years after project completion
System Operations	TRL 9	Actual system proven in operational environment	• The final CIM based computer will be built and its operation successfully demonstrated for the targeted applications in their associated environment. Debug software will be developed and fully integrated with hardware. Full documentation will be provided.	9 to 12 years after project completion

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Section 1.2: Methodology (1 of 2) (RIA/IA)

1. 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. [e.g. 10 pages]
2. Describe any national or international research and innovation activities whose results will feed into the project, and how that link will be established. [e.g. 1 pages]
3. 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. [e.g. 1/2 page]
4. For topics where the work programme indicates the need for the integration of social sciences and humanities, show the role of these disciplines in the project or provide a justification if you consider that these disciplines are not relevant to your proposed project. [e.g. 1/2 page]

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Section 1.2: Methodology (2 of 2) (RIA/IA)

5. Describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's research and innovation content [e.g. 1 page]. If you do not consider such a gender dimension to be relevant in your project, please provide a justification.
6. 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 [e.g. 1 page]. If you believe that none of these practices are appropriate for your project, please provide a justification here.
7. 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/ research outputs will be managed in line with the FAIR principles (Findable, Accessible, Interoperable, Reusable), addressing the following (the description should be specific to your project): [1 page]

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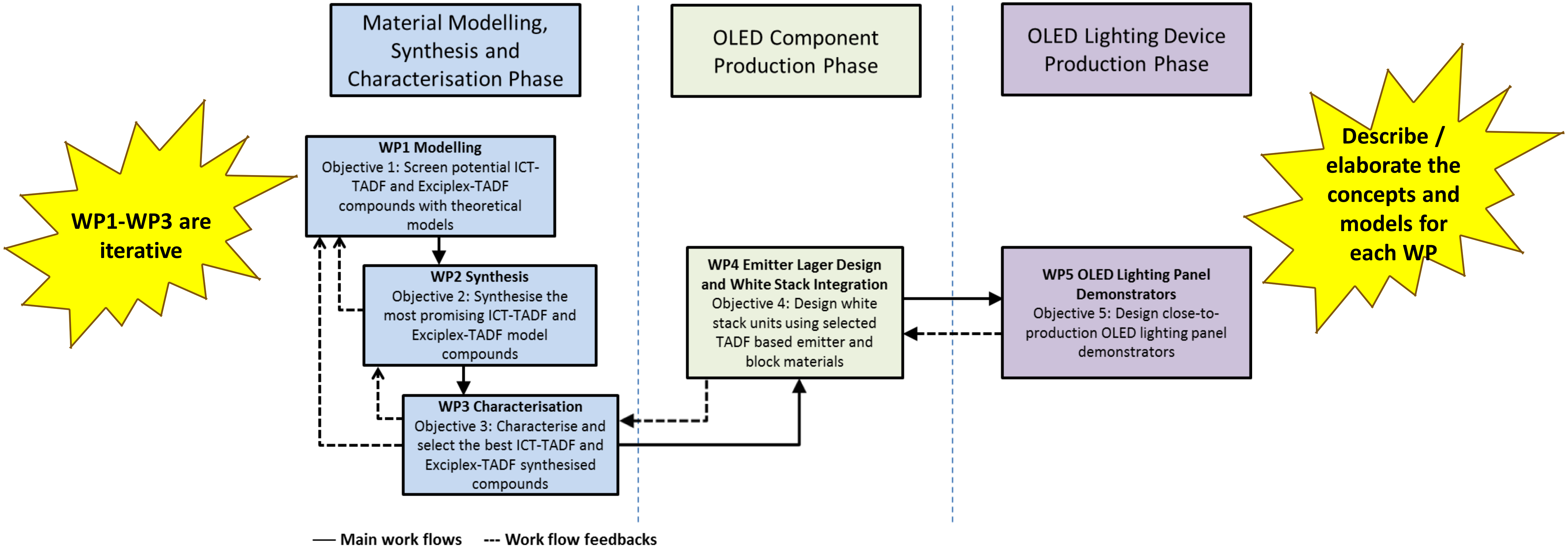
Section 1.2: Methodology
“Describe & explain the overall methodology, including the concepts, models & assumptions that underpin your work” (1 of 2)

Example: The **methodology underpinning the PHEBE project is based on a new technology development process that is broken down into phases**, each with its own set of work packages and objectives. Indeed, the work packages dealing with scientific and technical activities have been defined so that they correlate very closely with the objectives described in Section 1.1. Graphically the technology development process with its phases looks as follows:



Example: To achieve the project targets, a solid strategy has been set up that divides the needed work into four main interrelated components, as shown in Figure 1e:

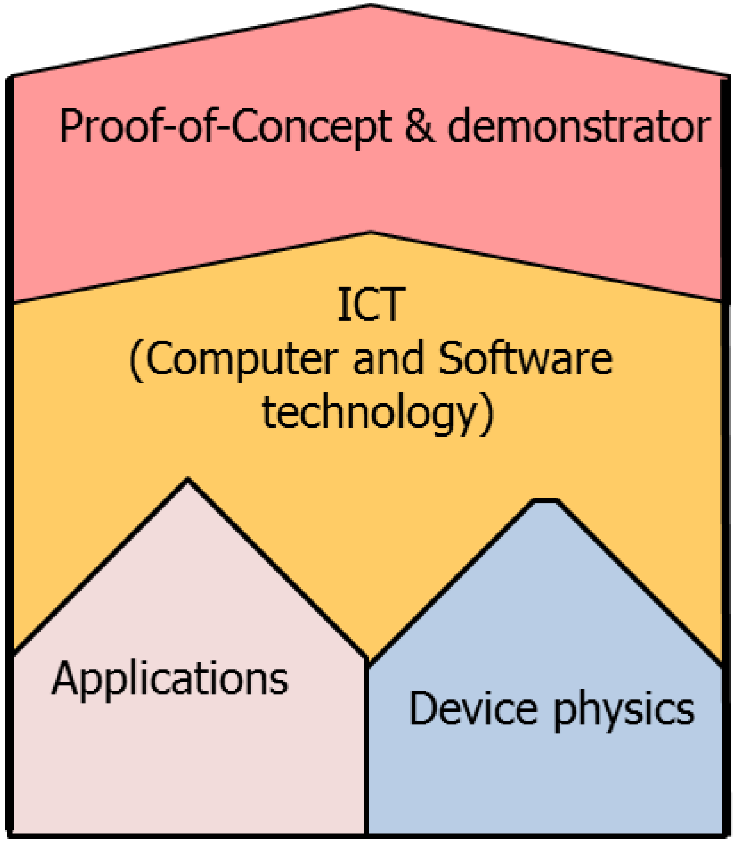
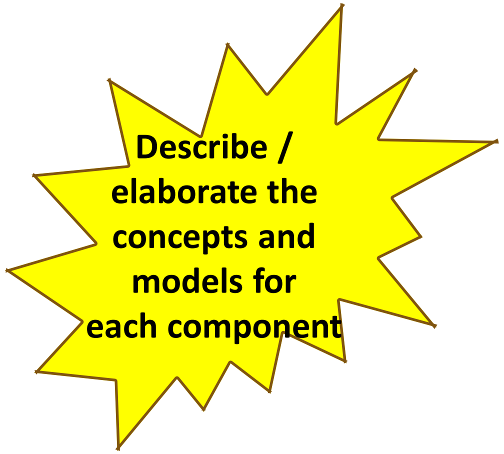


Figure 1e: Main components of the research method



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Section 1.2: Methodology

"Describe any national or international research and innovation activities whose results will feed into the project, and how that link will be established."

Example from a maritime cybersecurity proposal!

Initiative / Project	Duration	Reason for link with the ERA Chair
ECHO	2019-2022	TalTech is a partner in this European network of Cybersecurity centres and competence Hub for innovation and Operations. The ERA Chair will utilise this network as a source of partners and project ideas for EU proposals.
TOOP	2017-2020	TalTech is coordinating this H2020 project involving 20 EU Member States and two Associated Countries. One pilot addresses the introduction of ship and crew e-certificates.
Cyber-MAR	2019-2022	Cyber-MAR is a H2020 innovation action developing an innovative "cyber range" to support the maritime logistics value chain. The ERA Chair will use their expertise for Research Sub-Topic 2: Human Aspects of Cyber Security.
ENISA	2019-	The European Union Agency for Cybersecurity (ENISA) organises cyber exercises and cybersecurity education relevant for the ERA Chair.
EMSA	2018-	The European Maritime Safety Agency (EMSA) offers a course on Awareness in Maritime Cybersecurity relevant for the ERA Chair's Cyber Hygiene training.

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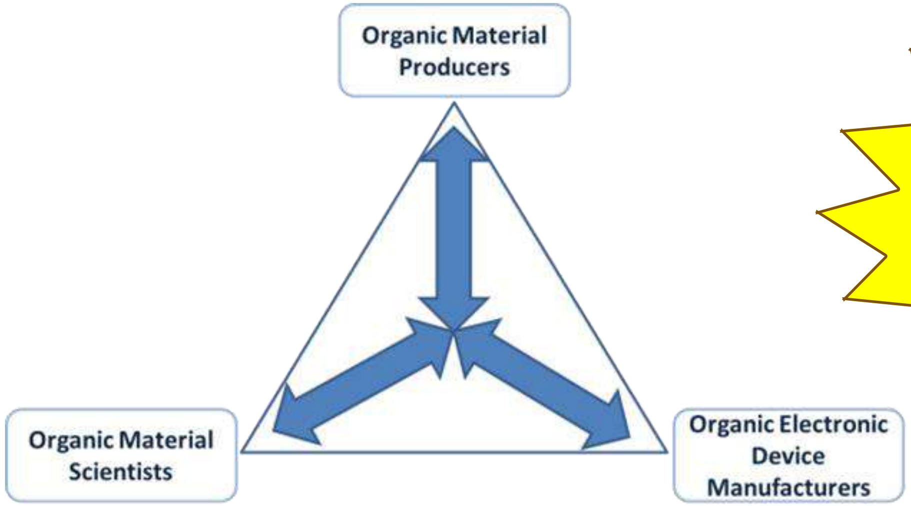
Section 1.2: Methodology
"Explain how expertise and methods from different disciplines will be brought together and integrated in pursuit of your objectives."



Figures are always nice to help clarify

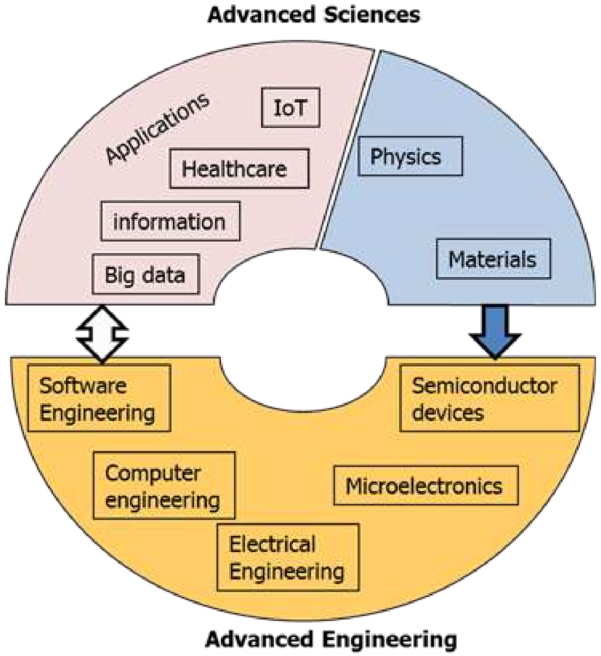


Figure 1d: MNEMOSENE' Interdisciplinarity

Example: Based on the interdisciplinary character of the proposed programme, there will be knowledge integrated from **three main expert groups: organic material scientists, organic material producers and organic electronic device manufacturers.**

Example: MNEMOSENE is a highly interdisciplinary R&D project and collaboration; a cross and deep synergy is needed between different advanced sciences and cutting edge engineering disciplines in order to turn the ideas presented in this project to viable basis for a radically new computation paradigm for data-intensive applications. Figure 1d illustrates the different disciplines involved in this project.

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Section 1.2: Methodology
"Describe how the gender dimension (i.e. sex and/or gender analysis) is taken into account in the project's research and innovation content." (1 of 2)

- See "Gender Analysis" Checklists and Case-Studies on http://genderedinnovations.stanford.edu/index.html
  - Engineering
  - Health and Medicine
  - Tissues and Cells
  - Urban Planning and Design

- **The project is gender-agnostic, i.e., sex or gender separation and privileging do not play any role in the project.** In particular, human beings taking part in the project activities will be fairly considered based on their roles, motivations and abilities. All the project partners are aligned and fully agree with the EC objectives to promote gender equality and encourage the involvement of researchers of both sexes, whose recruitment is based uniquely on their qualifications and technical merit. In particular, the consortium will respect the European policy of non-discrimination and equality between women and men in the Treaty of the European Union (Articles 2 and 3). The project members also agree to encourage the practices for a better work/life balance achievement (e.g. maternity and paternity leave) and flexible work planning (e.g. teleworking), with no sex or gender distinction. Furthermore, our project consortium strives to achieve a balanced distribution of responsibilities and tasks with respect to gender. **This is challenging in IT-Security, due to the low numbers of female specialists in the field.**

- We have also analysed our technical work for possible gender-related aspects and have, at this point, not found relevant gender-specific aspects related to it. The reason for this is that many parts of the solutions we will work on apply to machine-to-machine interactions, which will not involve a human, and that are therefore unlikely to have a gender-related impact. We expect that the human interaction aspects of our work will mostly apply to interactions with back-end services, running on regular desktop PCs and handheld, mobile devices. At this point we cannot find any gender specific aspects to this part of the work either. Nevertheless, in order to ensure a continuity in this line of considerations, we will continuously analyse our results for gender-related aspects and include the corresponding findings in our reports.

Open Science Practices	
Open Access to Publications	The SUSNANO consortium will provide access to peer-reviewed scientific publications via self-archiving ("green" open access) and therefore only journals which are compatible with such policy will be considered for dissemination. Publications and data will be made available via the Zenodo repository, which is hosted by CERN and supported by the EU's OpenAIRE initiative. This guarantees that data will be curated and preserved according to the highest standards available. Additionally, project results may be made available via social media used by the academic community (e.g. ResearchGate) according to the rules defined by the publisher.
Open Research Data	A detailed FAIR (findable, accessible, interoperable and re-usable) data management plan will be produced near the start of SUSNANO in compliance with the Horizon Europe data management plan template (see WP5/Task 5.1). The data generated in the context of SUSNANO will mainly consist of text documents, spreadsheet tables, tab-delimited files, image files, etc. These will be saved in standard formats (txt, jpg, pdf, tiff, png, etc.) and made as FAIR as possible. Researchers aiming to publish the results of research performed in the framework of the project will first submit their paper and data to the Steering Committee, which will check for IP or ethical issues. Legal officers will be consulted on a case-by-case basis to address any concerns, if necessary. Once the researchers receive the authorisation to publish, they will submit their papers to be published in peer-reviewed journals and/or conference proceedings.
Open Societal Actor Engagement	The SUSNANO consortium will invite and train Albanian high school students and bachelor students to support the lab validation testing and field testing of the sustainable nanosensors in Albania.
Open Evaluation	The SUSNANO consortium will follow an open peer review approach - with respect to their peer reviewed scientific publications - to provide transparency about the reviewer and author identities, publication of review reports, and enable the wider research community to contribute to the peer review process. Also, the consortium will provide open metrics – open access to data, methods, and results of bibliometric analyses – to enable traceability and reusability of their evaluation procedures.
Open Methodology	SUSNANO's experienced researchers will document the scientific procedures used in the preparatory research project (WP1) in sufficient detail to enable the early-stage researchers to repeat the work and apply them elsewhere. These procedures will be made available via the project website and Zenodo repository.

3. How to write Section 3 “Implementation”

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Section 3: Implementation (RIA/IA)

- Section 3.1: Work plan and resources
  - EC recommended length: 14 pages – including tables

- Section 3.2: Capacity of participants and consortium as a whole
  - EC recommended length: 3 pages

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Section 3.1: Work plan and resources (14 pages)

1. Provide brief presentation of the overall structure of the work plan;
2. Provide timing of the different work packages and their components (Gantt chart or similar);
3. Provide graphical presentation of the components showing how they inter-relate (Pert chart or similar).
4. Provide detailed work description, i.e.:
   - a list of work packages (table 3.1a);
   - a description of each work package (table 3.1b);
   - a list of deliverables (table 3.1c); Distribute evenly over the project
5. Provide a list of milestones (table 3.1d); Distribute evenly over the project
6. Provide a list of critical risks, relating to project implementation, that the stated project's objectives may not be achieved. Detail any risk mitigation measures. You will be able to update the list of critical risks and mitigation measures as the project progresses (table 3.1e); Rule of thumb: describe at least two critical risks per work package
7. Provide a table showing number of person months required (table 3.1f);
8. Provide a table showing description and justification of subcontracting costs for each participant (table 3.1g);
9. Provide a table showing justifications for ‘purchase costs’ (table 3.1h) for participants where those costs exceed 15% of the personnel costs (according to the budget table in proposal part A);
10. Provide, if applicable, a table showing justifications for ‘other costs categories’ (table 3.1i);
11. Provide, if applicable, a table showing in-kind contributions from third parties (table 3.1j)

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3.1: Work plan and resources

1. Excellence

1.1 Objectives

Scientific and Technological (S&T) Objective 1 → WP1: Tasks to achieve S&T Objective 1

S&T Objective 2 → WP2: Tasks to achieve S&T Objective 2

S&T Objective 3 → WP3: Tasks to achieve S&T Objective 3

S&T Objective 4 → WP4: Tasks to achieve S&T Objective 4

3. Implementation

3.1 Work Plan

WP5: Dissem., Exploit. & Communication

WP6: Project Management

Each WP leader should describe/elaborate the S&T objective for their WP (½ page or less)

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Section 3.1: Work plan and resources
Work Package Description

See
MS Word file!

Section 3.1: Work plan and resources
Work Plan Timing

Deliverables and milestones distributed “evenly” across the project

		WP/Task Leader	Task Support	Month (1–36)
WP1	**Shielded Emitter**	**Merck**		MS1.1, MS1.2
T1.1	Shielding substituents	Merck	-	D1.2, D1.4
T1.2	Emissive core structure	Merck	UDUR	D1.3
T1.3	Shielded deep blue emitter	Merck	UDUR	D1.5
T1.4	Estimate shielding efficiency	Merck	UDUR	D1.1
WP2	**TADF Host**	**UDUR**		MS2.1, MS2.2, MS2.3
T2.1	Synthesise ICT molecules with high triplet levels	UDUR	Merck	D2.1, D2.2, D2.3
T2.2	Batch scale synthesis and purification routes for new materials	UDUR	Merck	D2.4, D2.5
T2.3	Changing molecular shape to induce higher degrees of self-ordering	UDUR	IOF	
WP3	**Photo-physical Characterisation**	**UDUR**		MS3.1, MS3.2, MS3.3, MS3.4
T3.1	Elucidate photo-physics of shielded emitters	UDUR	Merck and IOF	D3.1
T3.2	Determine photo-physical and energetic characteristics of TADF hosts	UDUR	Merck and IOF	D3.2, D3.3
T3.3	Elucidate energy and electron transfer mechanisms	UDUR	Merck and IOF	D3.4
	Determine microcavity and orientation effects on energy transfer	UDUR	Merck and IOF	D3.5
4	**Optical Anisotropy**	**IOF**		MS4.1, MS4.2
T4.1	Anisotropic dispersion of organic thin films in encapsulated samples	IOF	Merck and UDUR	D4.1
T4.2	Emitter orientation and internal emission spectra	IOF	Merck and UDUR	D4.2
T4.3	Orientation ensemble average for different emitter systems	IOF	Merck and UDUR	D4.3
T4.4	Simulation model of energy transfer inside an OLED	IOF	Merck and UDUR	D4.4
T4.5	Experimental verification of energy and anisotropy effects	IOF	Merck and UDUR	D4.5, D4.6
WP5	**Hyperfluorescence OLEDs**	**Merck**		MS5.1, MS5.2, MS5.3, MS5.4, MS5.5, MS5.6, MS5.7
T5.1	Establish reference material system	Merck	UDUR and MOD	D5.1
T5.2	Evaluate consortium materials and optimise stack	Merck	UDUR	D5.2, D5.8
T5.3	"High throughput" characterisation	Merck	UDUR and IOF	D5.3
T5.4	Model emission layer	Merck	UDUR and IOF	D5.5
5.5	Develop white OLED stack	Merck	MOD and IOF	D5.4, D5.6, D5.7
T5.6	Conduct life cycle assessment for OLED stacks	Intelligentsia	Merck and MOD	D5.9
WP6	**Hyperfluorescence Microdisplays**	**MOD**		MS6.1, MS6.2, MS6.3
T6.1	Specifications	MOD	Merck	D6.1, D6.2
T6.2	Microdisplay demonstration	MOD	Merck	D6.3
WP7	**Dissemination and Exploitation**	**Intelligentsia**		MS7.1
T7.1	Produce a data management plan	Intelligentsia	-	D7.1, D7.4, D7.7
T7.2	Create and maintain a project website	Intelligentsia	-	D7.2
T7.3	Create project promotional material	Intelligentsia	-	D7.3
T7.4	Protect intellectual property	MOD	All	D7.5, D7.8
T7.5	Disseminate achieved scientific and technological results	MOD	All	
T7.6	Produce exploitation plan	MOD	All	D7.6, D7.9
T7.7	Cooperate with related European research actions	Intelligentsia	All	
WP8	**Project Management**	**Merck**		MS8.1, MS8.2, MS8.3, MS8.4
T8.1	Collate deliverables, milestones and reports	Merck	Intelligentsia	D8.2, D8.3
T8.2	Manage legal, contractual, financial, ethical and administrative matters	Merck	Intelligentsia	D8.1
T8.3	Ensure communication between partners	Intelligentsia	All	
T8.4	Manage scientific and technical activities	Merck	All	
T8.5	Organise project steering committee meetings	Merck	Intelligentsia	

Deliverables ◆
Milestones ✦

Section 3.1: Work plan and resources
Critical Risks

Rule of thumb: at least two risks per WP!

Risk No.	Description of Risk	WP(s)	Risk Rating	Proposed Risk Mitigation Measures
1	Molecular weight of shielded components could be too high for processing by thermal evaporation.	1	Low	Use compounds in OLEDs processed from solution.
2	If Dexter transfer is efficiently prevented by shielding, Forster coupling could be reduced to a level where efficient energy transfer from the TADF to the shielded emitter is not sufficient.	1	Low	The relative orientation of TADF to fluorescent core has to be optimised very carefully => shift resources to investigation of orientation and anisotropy effects.
3	New material designs cannot be synthesised.	2	Low	UDUR has developed many of the synthetic routes to D-A-D systems, especially the acceptor units, so varied approaches to the target molecules are in place to mitigate failure of one strategy.
4	Sufficiently high purity of materials cannot be achieved.	2	Low	UDUR has state-of-the-art facilities to analyse materials to determine impurities and a sublimation facilities in Physics for high quality purification. Multiple routes to materials exist to provide work-arounds to eliminate impurities that are impossible to separate.
5	Efficient fluorescence emitters will have weak or no phosphorescence making measurement of their triplet states difficult.	3	Med	UDUR has shown that steady state photo-induced absorption can be used to measure dark states in D-A-D molecules and will introduce time resolved PIA measurements in this project to enable the dynamics of dark states to be measured.
6	Host and / or guest molecules do not show FRET.	3	Low	Change shielding configuration to reduce their separation.
7	Host and / or guest molecules do not orient.	3	Low	Induce enhanced shape anisotropy using inert substituents.
8	Etc.	4	Etc.	Etc.

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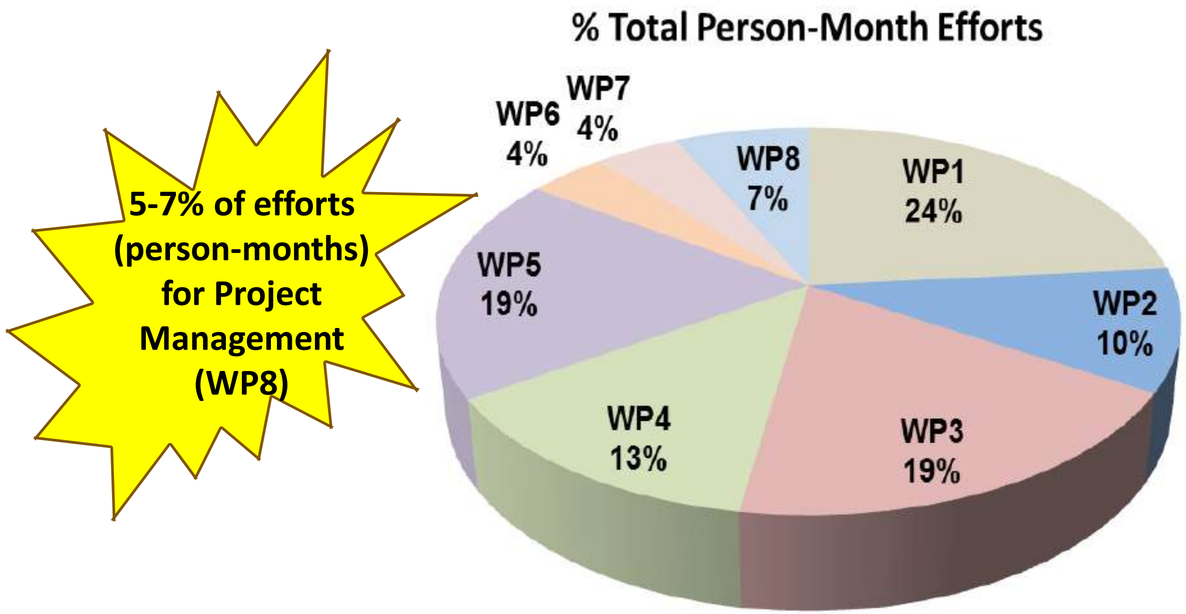
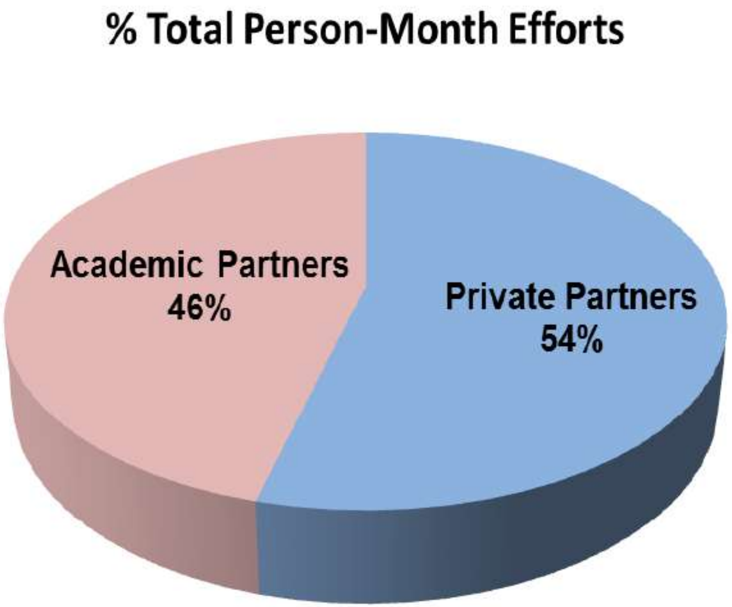
Section 3.1: Work plan and resources
Budget

Distribution of efforts (%)





- Concentration of efforts in WPs 1, 2, 3 and 4 reflects the project's strong focus on development of advanced materials, design and modelling tools and is in line with the call's scope.
- Several tasks/efforts (e.g. Task 5.5) in WP5 also directly contribute to WP6.
- Project management efforts (WP8) consistent with typical EU collaborative R&D projects.
- Good balance between efforts for academic partners (IOF and UDUR) and private partners (Merck, MOD and INT) also reflects the general balance between research and innovation tasks.

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Section 3.2: Capacity of participants and consortium as a whole (3 pages)

1. Describe the consortium. How does it match the project's objectives, and bring together the necessary disciplinary and inter-disciplinary knowledge. Show how this includes expertise in social sciences and humanities, open science practices, and gender aspects of R&I, as appropriate. Include in the description affiliated entities and associated partners, if any.
2. Show how the partners will have access to critical infrastructure needed to carry out the project activities.
3. Describe how the members complement one another (and cover the value chain, where appropriate)
4. In what way does each of them contribute to the project? Show that each has a valid role, and adequate resources in the project to fulfil that role.
5. If applicable, describe the industrial/commercial involvement in the project to ensure exploitation of the results and explain why this is consistent with and will help to achieve the specific measures which are proposed for exploitation of the results of the project (see section 2.2).
6. Other countries and international organisations (based in a country or is an international organisation that is not automatically eligible for such funding).

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3.2: Capacity of participants and consortium as a whole (1 of 4)

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Merck KGaA	Merck	Germany
2	MICROOLED S.A.S	MOD	France
3	Fraunhofer Institute for Applied Optics and Precision Engineering	IOF	Germany
4	Durham University	UDUR	UK
5	Intelligentsia Consultants Sarl	Intelligentsia	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	MZ Denmark GmbH	MOZ	Germany
2	Ericsson AB	ERI	Sweden
3	F-Secure Oyj	FSEC	Finland
4	Intel Deutschland GmbH	INT	Germany
5	Intelligentsia Consultants Sarl	IC	Luxembourg
6	Luminem SRLs	LUM	Italy
7	Mind SRL	MIND	Italy
8	Riots Global Oy	RIO	Finlan
9	Sensative AB	SEN	Swede
10	Consiglio Nazionale delle Ricerche	CNR	
11	RISE Research Institutes of Sweden AB	RISE	Sw
12	Centria Ammattikorkeakoulu Oy	CEN	
13	Politecnico di Torino	POL	

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Technische Universiteit Delft	TUD	Netherlands
2	Technische Universiteit Eindhoven	TUE	Netherlands
3	Rheinisch-Westfälische Technische Hochschule Aachen	RWTH	Germany
4	Institut National de Recherche en Informatique et en Automatique	INRIA	France
5	Eidgenössische Technische Hochschule Zürich	ETHZ	Switzerland
6	Stichting IMEC Nederland	IMEC	Netherlands
7	ARM Limited	ARM	UK
8	IBM Research GmbH	IBM	Switzerland
9	Intelligentsia Consultants Sarl	INT	Luxembourg

Participant no.	Participant organisation name	Part. short name	Country
1 (co-ordinator)	Intelligentsia Consultants *Sàrl*	Intelligentsia	Luxembourg
	Novaled GmbH	Novaled	Germany
3	Astron Fiamm Safety *Sàrl*	Astron-FIAMM	France
4	University of Durham	UDUR	UK
5	Technische Universität Dresden	TUD	Germany
6	Kauno Technologijos Universitetas	KTU	Lithuania

Important to include companies across value chain

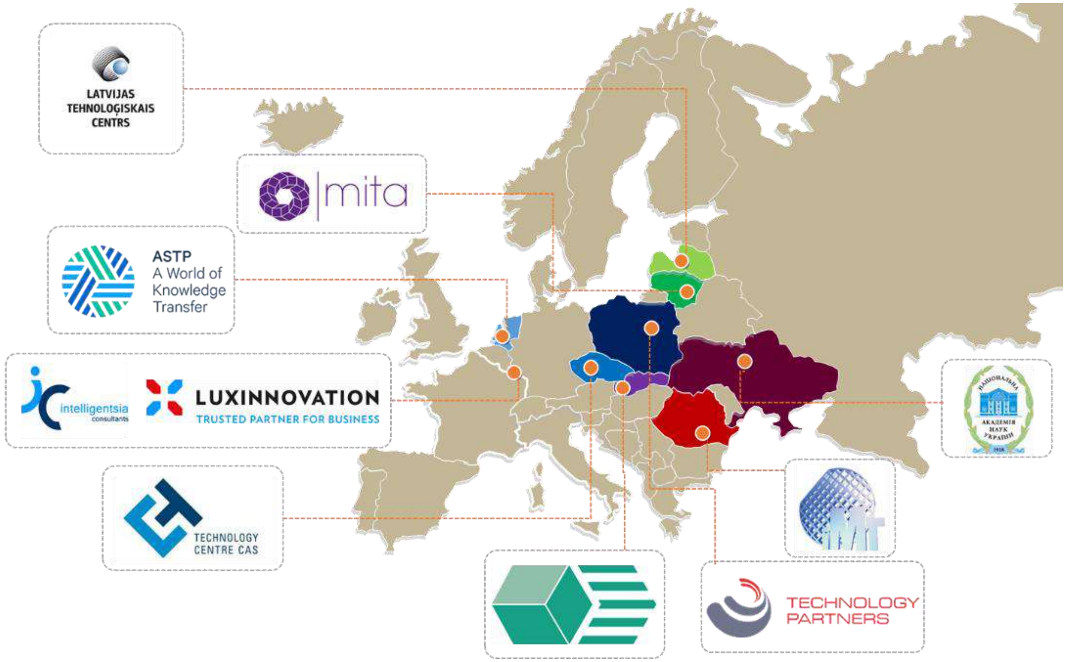
3.2: Capacity of participants and consortium as a whole (2 of 4)

OLED Materials
- Shielded Emitter (Merck)
- TADF Host (UDUR)
- Photo-physical Characterisation (UDUR)

OLED Stacks
- Hyper-fluorescence OLEDs (Merck)
- Optical Anisotropy (IOF)

OLED Micro-displays
- Hyper-fluorescence Microdisplays (MOD)

EU Project Management and Dissemination Support (Intelligentsia)



3.2: Capacity of participants and consortium as a whole (3 of 4)

Example: The project's scientific and technical objectives are perfectly aligned with the consortium partners' capabilities, contributions and complementarities:

No.	Scientific and Technical Objectives	Partner's Capabilities, Contributions and Complementarities
1	Develop new algorithmic solutions for targeted applications for CIM architecture	**IBM (WP leader)** is a pioneer of cognitive computing. The company has formed a new business unit called IBM Watson in 2014 offering services for data analytics and IoT. **TUD (Task leader)** has a strong record in developing and optimising healthcare (genomics and DNA sequencing) and data science algorithms for accelerated multi-core platforms.
2	Develop and design new mapping methods integrated in a framework for efficient compilation of the new algorithms into CIM macro-level operations	**INRIA (WP leader)** has extensive experience with the design and implementation of aggressive optimizations and analyses, including production compilers like Clang/LLVM and domain-specific code generators. **TUE (Task leader)** is specialised in research on low power single and multi-processor architectures, their programmability, and the predictable design of soft- and hard real-time systems.
3	Develop a macro-architecture based on the integration of group of CIM tiles	**TUE (WP leader)** is specialised in research on low power single and multi-processor architectures, their programmability, and the predictable design of soft- and hard real-time systems. **ETHZ (Task leader)** has a proven track record of working on novel processor and memory architectures.
4	Develop and demonstrate the micro-architecture level of CIM tiles and their models	**RWTH (WP leader)** has one of the World's leading groups on the process technology and basic physical-chemical understanding of functional oxide thin films w.r.t future integrated nanoelectronic devices, especially redox-based resistive switching memories (70+ papers, 3000+ citations). **IMEC (Task leader)** has past experience to lead the development of memristor crossbar-based logic/ arithmetic and memory circuit design and simulation.
5	Design a simulator and FPGA emulator for the new architecture in order demonstrate its superiority	**ARM (WP leader)** is a world-renowned semiconductor IP company with around 3000 employees. ARM partners have shipped over 50 billion ARM microprocessors. The company has a strong track record on embedded processors, IoT devices, power-efficient server and HPC chips. **TUD (Task leader)** has a research focus on In-Memory Computing and targets the development, design and demonstration of new architecture paradigms to enable low energy and/or high throughput computing. TUD has a proven track record of implementing demonstrators.

3.2: Capacity of participants and consortium as a whole (4 of 4)

The consortium partners will be able to effectively implement the MNEMOSENE project, because they have extensive past experience of working together on international research projects including:

- FP7 ENCORE involving TUD and ARM (2010-2013)
- H2020 ExaNode involving ARM and ETHZ (2015-2018)
- H2020 Antarex involving ETHZ and INRIA (2015-2018)
- H2020 neuRAM3 involving IMEC and IBM (2016-2018)

Their collaborative research work will also be facilitated by:

- Many researchers and engineers knowing each other on a personal level
- Management and technical issues being discussed during quarterly steering committee meetings
- Face-to-face consortium meetings occurring every six months
- Regularly using email, phone and Skype to communicate over the duration of the project

4. How to write Section 2 “Impact”

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Section 2: Impact (RIA/IA)

- Section 2.1: Project’s pathways towards impact
  - EC recommended length: 4 pages
- Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication
  - EC recommended length: 5 pages, including Section 2.3
- Section 2.3: Summary

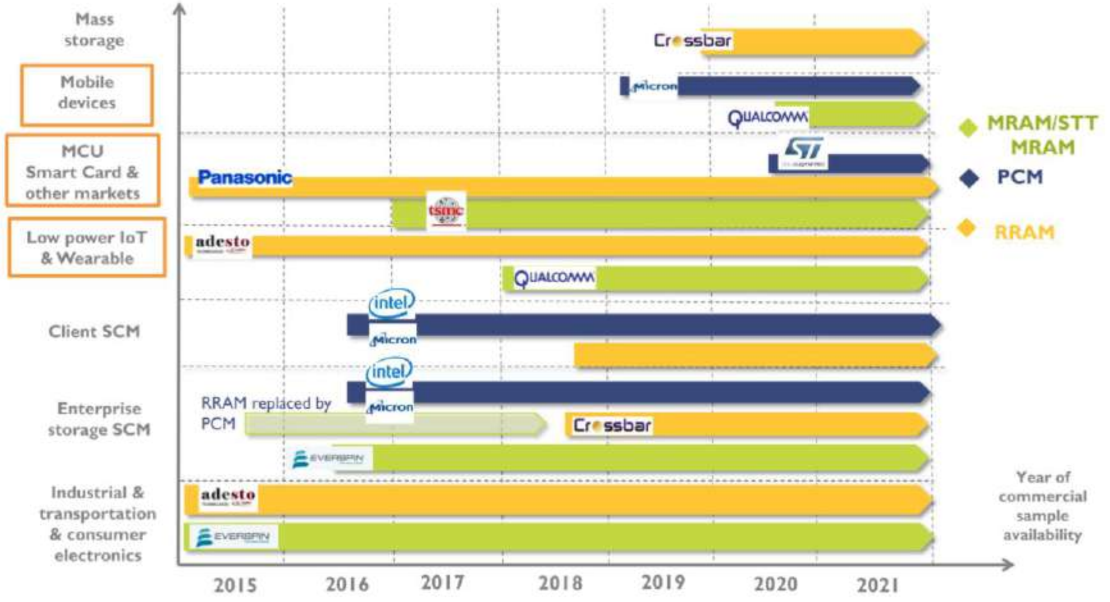
Section 2.1: Project's pathways towards impact

1. 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. The narrative should include the components below, tailored to your project.
   a) Describe the unique contribution your project results would make towards (1) the outcomes specified in this topic, and (2) the wider impacts, in the longer term, specified in the respective destinations in the work programme.
   b) Give an indication of the scale and significance of the project's contribution to the expected outcomes and impacts, should the project be successful. Provide quantified estimates where possible and meaningful.
   c) Describe any requirements and potential barriers - arising from factors beyond the scope and duration of the project - that may determine whether the desired outcomes and impacts are achieved. These may include, for example, other R&I work within and beyond Horizon Europe; regulatory environment; targeted markets; user behaviour. Indicate if these factors might evolve over time. Describe any mitigating measures you propose, within or beyond your project, that could be needed should your assumptions prove to be wrong, or to address identified barriers.

Write in a narrative and engaging style (e.g. Marketing)

2.1.2 Helping to double economic value of semiconductor component production in Europe within 10 years

MNEMOSENE is focused on CIM and memristors which are disruptive technologies that are expected to create vast economic returns over the coming years. MNEMOSENE will assist European organisations to enter and maintain a position in this rapidly evolving technology market place and thereby support the Electronics Leaders Group's target of doubling the economic value of semiconductor component production in Europe within the next 10 years. The anticipated explosive growth for CIM and memristors is reflected in recent market reports. Yole Development forecasts the emerging market for memristor-based non-volatile memory (NVM) will surge from $56 million in 2015 to $4.6 billion by 2021. Similarly, Allied Market Research valued the global memristor market at $3.2 Million in 2015 and expected it to reach $79.0 million by 2022.



Section 2.1: Project's pathways towards impact
"Indicate the scale and significance of the project's contribution to expected outcomes and impacts"

Expected outcomes – see text of call topic

Expected Outcomes	WP	Performance Indicators	Target
Outcome 1: Support the "Economic & Investment Plan" and "Innovation Agenda" for WBC by spurring economic recovery, supporting green and digital transition, fostering regional integration & EU convergence.	1, 2, 3, 4 and 5	• Preparatory research project on sustainable nanosensor on water pollution • Sustainable nanosensors developed to detect different water pollutants • Rivers and lakes in Albania where sustainable nanosensors are demonstrated • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences • SUSNANO workshops for private and public organisations in Albania • Info-days and networking sessions attended about EU calls for proposals • Joint research proposals submitted for EU funding (e.g. Horizon Europe) • Patents submitted by UT researchers involved in SUSNANO • Collaboration agreements between UT and Albanian private companies	1 3 8 9+ 9+ 3+ 5+ 3+ 2+ 3+
Outcome 2: Improved excellence capacity and resources in WBC enabling to close the still apparent research and innovation gap within Europe.	1, 2, 3 and 5	• UT experienced researchers trained in Research Sub-Topics A, B and C • UT early-stage researchers trained in Research Sub-Topics A, B and C • Summer schools hosted by UT, ICN2 and UPO • Joint PhD programme • Joint research papers published in international peer-reviewed journals • Joint research papers presented at international conferences • Increase in average H-Index of UT researchers involved in SUSNANO • Patents submitted by UT researchers involved in SUSNANO • Collaboration agreements between UT and Albanian private companies	5 10 3 1 9+ 9+ >15% 2+ 3+

Section 2.1: Project's pathways towards impact
"*Indicate the scale and significance of the project's contribution to expected outcomes and impacts*"

Expected impacts – see introductory text in work progamme

Expected Impacts for Destination 1 "Improved access to excellence"	Outcome 1	Outcome 2	Outcome 3	Outcome 4	Outcome 5	Outcome 6
Impact 1: Increased science and innovation capacities for all actors in the R&I system in widening countries.	X	X	X			X
Impact 2: Structural changes leading to a modernised and more competitive R&I systems in eligible countries		X	X			
Impact 3: Reformed R&I systems & institutions leading to increased attractiveness & retention of researchers		X	X			X
Impact 4: Higher participation success in Horizon Europe and more consortium leadership roles		X	X	X	X	X
Impact 5: Stronger linkages between academia and business and improved career permeability	X				X	
Impact 6: Strengthened role of the Higher Education sector in research and innovation		X		X	X	
Impact 7: Greater involvement of regional actors in R&I process	X		X			

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Section 2.1: Project's pathways towards impact "*Describe any requirements and potential barriers*" (1 of 2)

Identify challenges / barriers in EU Strategic Research Agendas

Section 2.1: Project's pathways towards impact "*Describe any requirements and potential barriers*" (2 of 2)

Describe project mitigation measures for each barrier / challenge

Potential barriers and requirements specific to sustainable nanosensors based on graphene

Challenge 1: Stability of graphene-based materials. The main challenge is maintaining the stability of graphene-based materials since they are prone to aggregation which results in decreased electrochemical properties.

⇒ SUSNANO's mitigation measure: we will provide graphene-related materials equipped with different functional groups overcoming such drawbacks.

Challenge 2: Limit of detection (LOD) of sustainable nanosensors. Development of novel sustainable nanosensors with a low LOD is essential since target analytes often exist only at trace concentrations in real samples.

⇒ SUSNANO's mitigation measure: we will develop graphene materials exhibiting significantly improved electrical conductivity compared to conventional graphene-based materials, which enable to build ultrasensitive nanosensors with enhanced values of LOD.

Challenge 3: Suppressing the non-specific adsorption of interfering species. The main drawback related to conventional graphene-based nanosensors is connected with non-specific adsorption of interfering species which results in lower selectivity and sensitivity of developed nanosensors.

⇒ SUSNANO's mitigation measure: we will prepare graphene-based materials modified with different functional groups which can selectively capture the target analytes.

Challenge 4: Stability of sustainable nanosensors. The stability of nanosensors is the main challenge limiting their testing in real applications. Nanosensors are often evaluated by their shelf-life. Hence, it is important to develop sensing platforms capable to operate for long time. When using commonly available graphene-based materials, long-term stability becomes a major concern due to the issue related to aggregation of individual graphene flakes.

⇒ SUSNANO's mitigation measure: we will provide graphene-related materials equipped with different functional groups which can overcome such handicap.

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Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication (1 of 2)

1. Describe the planned measures to maximise the impact of your project by providing a first version of your ‘plan for the dissemination and exploitation including communication activities’. Describe the dissemination, exploitation and communication measures that are planned, and the target group(s) addressed (e.g. scientific community, end users, financial actors, public at large).
2. Outline your strategy for the management of intellectual property, foreseen protection measures, such as patents, design rights, copyright, trade secrets, etc., and how these would be used to support exploitation.

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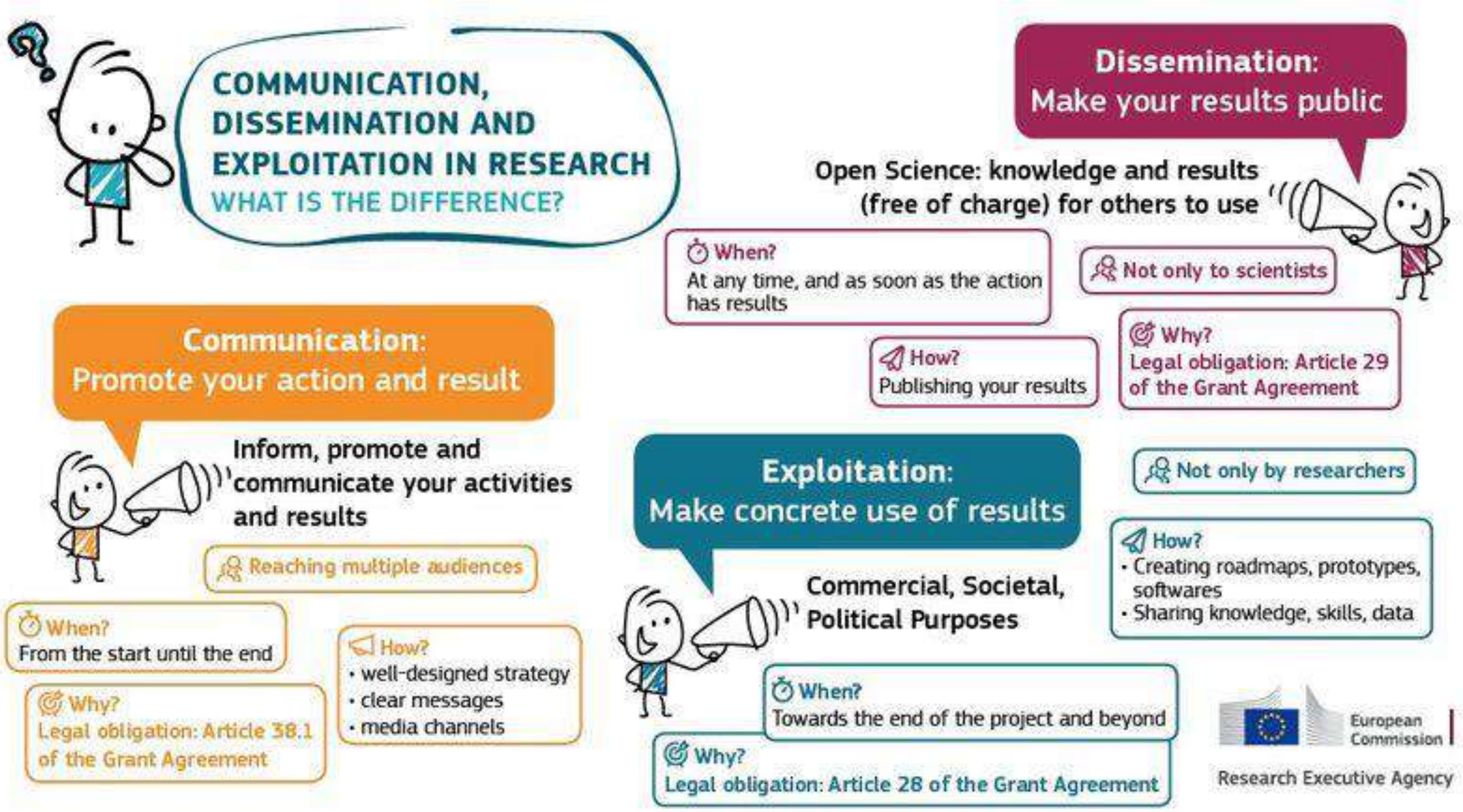
Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication (2 of 2)



Section 2.2: Measures to maximise impact - Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication "*Provide 1st version of plan for dissemination, communication & exploitation*" (1 of 4)

Dissemination and Communication Plan

MNEMOSENE Dissemination and Communication Plan			
Project Result	**Dissemination Activity**	**Target Audience**	**Target Indicator**
Project leaflet and poster	Distribute during international conferences (e.g. ISSCC, ESSCIRC and DATE), public seminars and outreach events.	Scientists, engineers and general public	400+ leaflets distributed, 30+ events where poster displayed (including 9+ outreach events)
Project website	Publish project summary, regular news and event updates on website.	Scientists, engineers and general public	5000+ visitors
Project news	Publish project news releases and distribute through broader scientific news channels e.g. Cordis wire and Alpha Galileo.	Scientists, engineers and general public	3+ news releases, 10+ articles in broader scientific press
	Distribute project news releases via social media (e.g. LinkedIn, Facebook, Twitter, etc)	Scientists, engineers and general public	15+ announcements
Short project film	Publish film on Youtube and project website. Show during public outreach events.	Scientists, engineers and general public	1000+ hits, 9+ public outreach events
Open workshops	Present research results at open workshops: • MemTDAC workshops on memristor technology during the annual HiPEAC conference. • Workshops at DATE conferences (e.g. Workshop on Emerging Memory Solutions) • MemoCiS COST action workshops.	Scientific research community and industrial actors (SMEs and MNEs)	5+ open workshops
Scientific results from development of non-volatile memory domain technologies and methods.	Publish results in international peer reviewed journals (e.g. IEEE Journals). Gold open-access approach scheme will be adopted whenever possible.	Scientific research community	15+ journal papers
	Present results at international scientific conferences: materials and device technology (e.g. ESSCDRC, IEDM, SISPAD), circuit and hardware design (e.g.	Scientific research community	15+ conferences

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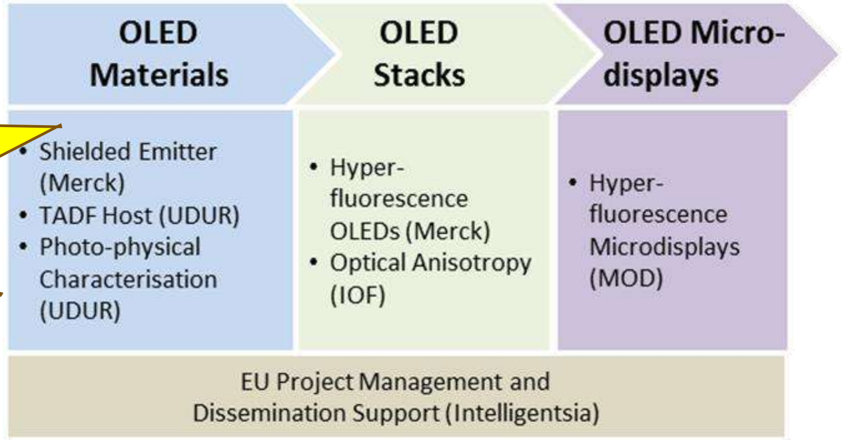
Section 2.2: Measures to maximise impact - Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication “*Provide 1st version of plan for* ***dissemination, communication & exploitation***” (2 of 4)

Value chain for OLED proposal



Partners’ individual exploitation plans

Partner	Individual Exploitation Plan
Merck (industrial partner)	Merck already supplies OLED materials for current state-of-the-art AMOLED display production. This includes an established process of scaling-up material production from small R&D quantities to customer sampling for evaluation and finally into standard production size. As recently reported, Merck is constantly investing to increase the OLED production capacity in Germany to answer to the increasing customer requests. OLED device manufacturers for displays are mostly located in Asia and Merck already intensively cooperates with all display manufacturers in this area (e.g. LG Display, SDC, AUO, EDO, Visionox, BOE, Tianma and JDI). Similar to its successful history in Liquid Crystal material business, Merck is dedicated to develop the OLED technology focussing on the customers’ technological and commercial needs. The core material production technology is developed in Europe and will be marketed to customers worldwide. **Based on HyperOLED’s commercial potential, Merck has prepared the following post-project business plan …**
UDUR (academic partner)	UDUR have a very strong track record of publishing journal papers as well as collaborating with industry in the fields of OLED material synthesis and characterisation. Notably, Professor B. (h-index=57, >14,500 citations, 10 patents) and Professor M. (h-index=53, >10,500 citations, 7 patents) are world-renowned experts in their respective fields. Also, Lomox Ltd funds UDUR for the synthesis of OLED materials and Merck currently funds a PhD studentship at UDUR in photophysical studies of non-TADF OLED materials. Consequently, UDUR’s plans to exploit the HyperOLED results include: • Publishing papers in international journals based on the project results (e.g. Nature Materials) • Attracting further public/private funding for R&D projects requiring their expertise in “OLED material synthesis” and “Photo-physical characterisation” (e.g. Novaled and EPSRC) • Licensing their IP created in the project (see earlier IP Ownership Tables)

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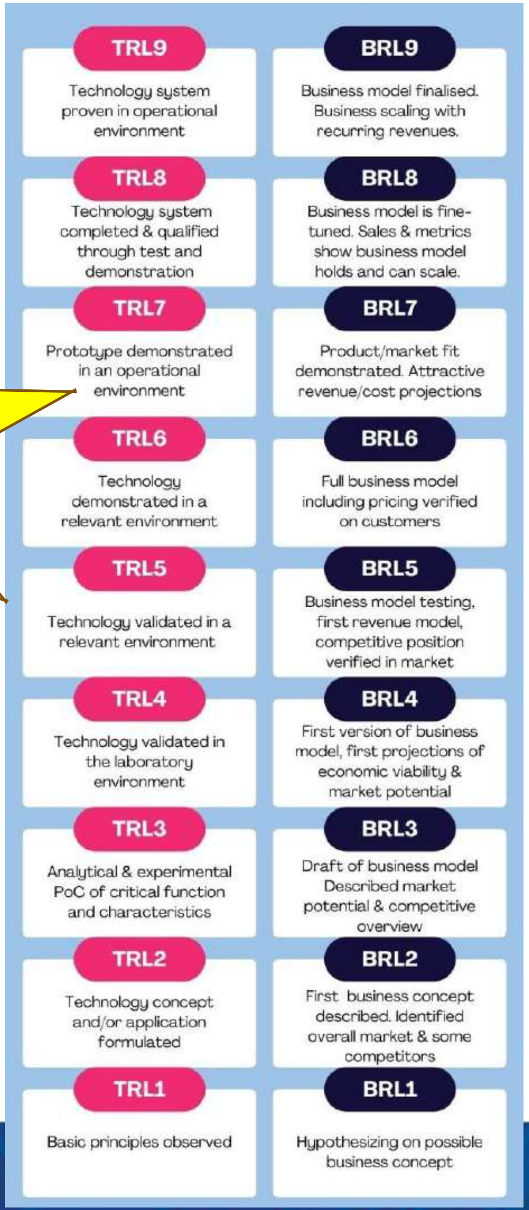
Section 2.2: Measures to maximise impact - Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication “*Provide 1st version of plan for* ***dissemination, communication & exploitation***” (3 of 4)

Technology Readiness Levels (TRL) + Business Readiness Levels (BRL)



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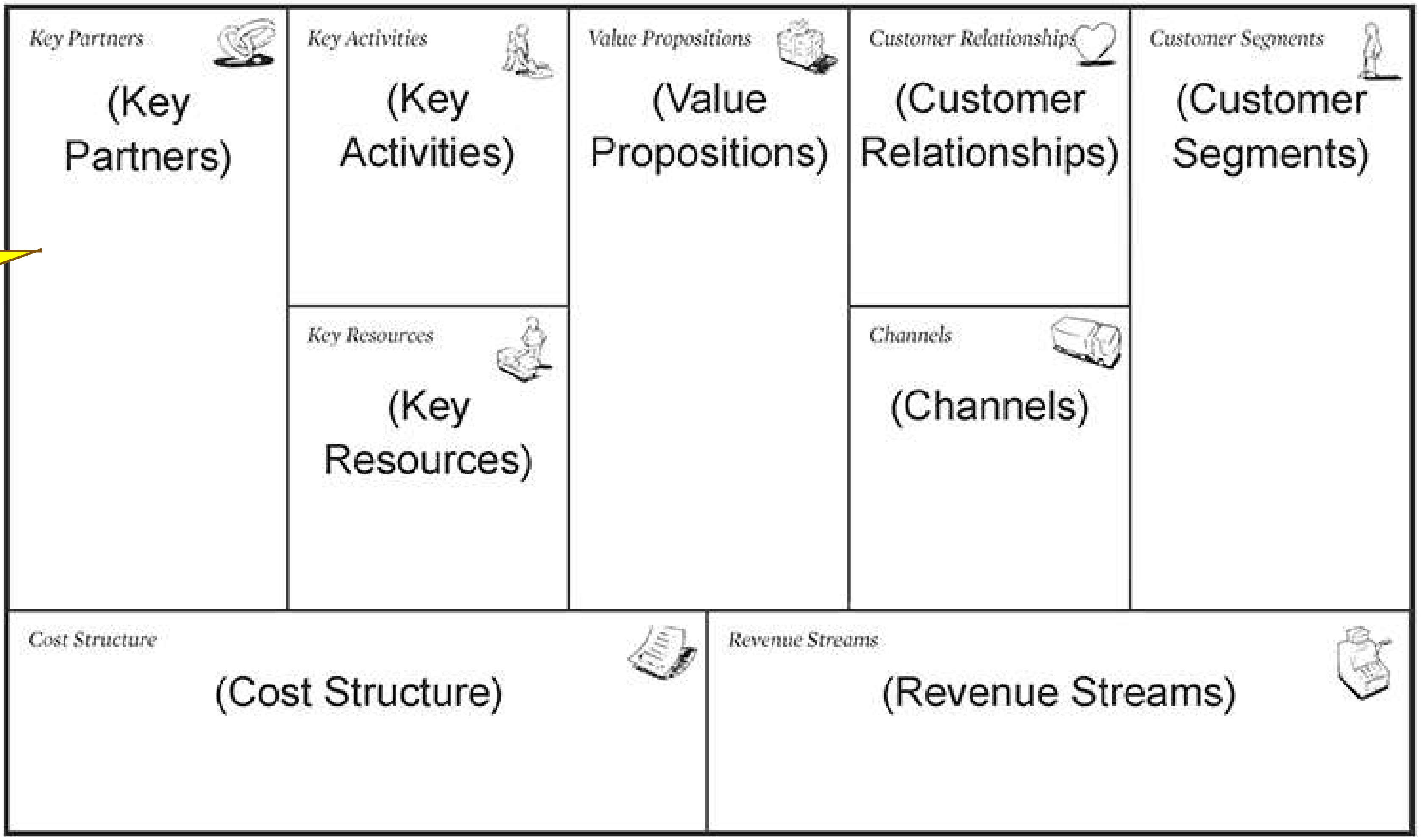
Section 2.2: Measures to maximise impact - Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication "*Provide 1st version of plan for <u>dissemination, communication & exploitation</u>*" (4 of 4)

Business Model Canvas



Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication *"Outline strategy to manage intellectual property"* (1 of 2)

Capture initial strategy for Foreground Knowledge

IP Ownership Tables		
Expected Foreground Knowledge	**Lead Partner Concerned**	**Other Partners claiming Ownership Rights**
Related to WP1		
New algorithms to tackle problems related to data analytics that are optimized for implementation in a CIM-based architecture	IBM, TUD, ARM	TUE
New algorithms to tackle problems related to healthcare and database applications that are optimized for implementation in a CIM-based architecture	TUD	TUE
Related to WP2		
2-D SIMD programming element	TUE, INRIA	ETHZ
Macro-programming interface for CIM tiles	TUE, INRIA	ETHZ
Portable programming model for CIM-accelerated kernels	TUE, INRIA	ETHZ
Related to WP3		
CIM macro architecture	TUE	TUD, ETHZ and ARM
Embedded circuits and energy-efficient digital/analogue interfacing between resistive compute units and external digital compute units	TUE, ARM	TUD, ETHZ
Related to WP4		
Models to enter into the micro-architecture simulator	IMEC, RWTH	-
CIM microarchitectures	IMEC	RWTH, ARM, IBM, TUD
PCM-based logical and arithmetic operations that can be implemented in a CIM module	IBM	-
Designs for parallel bit-wise and arithmetic operations within the crossbar	TUD	RWTH
Related to WP5		
Data collected based on measurements of crossbars (CIM)	TUD, RWTH	TUE, ETHZ, ARM, IBM,
Full CIM simulator	TUD	All

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Section 2.2: Measures to maximise impact - Dissemination, exploitation and communication "*Outline strategy to manage intellectual property*" (2 of 2)

Background Knowledge	Contributing Partner	Included	Excluded
Related to WP2			
PENCIL language for domain-specific compilation	INRIA	X	
Skeleton-based instantiation from Bones framework	TUE	X	
New loop-nest fusion and inter-tile reuse techniques	TUE	X	
Related to WP3			
Two patents filed on resistive computing and computation-in-memory architecture	TUD	X	
Related to WP4			
Low level detailed non-volatile memory compiler models (STT_MRAM, SOT-MRAM, OxRAM, VMCO, CBRAM, NAND Flash)	IMEC		X
Black box models for non-volatile memories (STT_MRAM, SOT-MRAM, OxRAM, VMCO, CBRAM, NAND Flash)	IMEC	X	
PCM-based physical models that are not confidential	IBM	X	
Confidential information concerning PCM device technology	IBM		X
Circuit design schemes within the crossbar	TUD	X	

Don't overlook initial strategy for Background Knowledge!

Section 2.3: Summary

1. Provide a summary of this section by presenting in the canvas below the key elements of your project impact pathway and of the measures to maximise its impact. (1 of 2)

KEY ELEMENT OF THE IMPACT SECTION

SPECIFIC NEEDS

What are the specific needs that triggered this project?

Example 1
Most airports use process flow-oriented models based on static mathematical values limiting the optimal management of passenger flow and hampering the accurate use of the available resources to the actual demand of passengers.

Example 2
Electronic components need to get smaller and lighter to match the expectations of the end-users. At the same time there is a problem of sourcing of raw materials that has an environmental impact.

EXPECTED RESULTS

What do you expect to generate by the end of the project?

Example 1
Successful large-scale demonstrator: Trial with 3 airports of an advanced forecasting system for proactive airport passenger flow management.

Algorithmic model:
Novel algorithmic model for proactive airport passenger flow management.

Example 2
Publication of a **scientific discovery on transparent electronics.**

New product: More sustainable electronic circuits.

Three PhD students trained.

D & E & C MEASURES

What dissemination, exploitation and communication measures will you apply to the results?

Example 1
Exploitation: Patenting the algorithmic model.

Dissemination towards the scientific community and airports: Scientific publication with the results of the large-scale demonstration.

Communication towards citizens: An event in a shopping mall to show how the outcomes of the action are relevant to our everyday lives.

Example 2
Exploitation of the new product: Patenting the new product; Licencing to major electronic companies.

Dissemination towards the scientific community and industry:
Participating at conferences; Developing a platform of material compositions for industry; Participation at EC project portfolios to disseminate the results as part of a group and maximise the visibility vis-à-vis companies.

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Section 2.3: Summary

1. Provide a summary of this section by presenting in the canvas below the key elements of your project impact pathway and of the measures to maximise its impact. (2 of 2)

TARGET GROUPS

Who will use or further up-take the results of the project? Who will benefit from the results of the project?

Example 1

9 European airports:
Schiphol, Brussels airport, etc.

The European Union aviation safety agency.

Air passengers (indirect).

Example 2

End-users: consumers of electronic devices.

Major electronic companies: Samsung, Apple, etc.

Scientific community (field of transparent electronics).

OUTCOMES

What change do you expect to see after successful dissemination and exploitation of project results to the target group(s)?

Example 1

Up-take by airports: 9 European airports adopt the advanced forecasting system demonstrated during the project.

Example 2

High use of the scientific discovery published (measured with the relative rate of citation index of project publications).

A **major electronic company** (Samsung or Apple) **exploits/uses the new product** in their manufacturing.

IMPACTS

What are the expected wider scientific, economic and societal effects of the project contributing to the expected impacts outlined in the respective destination in the work programme?

Example 1

Scientific: New breakthrough scientific discovery on passenger forecast modelling.

Economic: Increased airport efficiency
Size: 15% increase of maximum passenger capacity in European airports, leading to a 28% reduction in infrastructure expansion costs.

Example 2

Scientific: New breakthrough scientific discovery on transparent electronics.

Economic/Technological: A new market for touch enabled electronic devices.

Societal: Lower climate impact of electronics manufacturing (including through material sourcing and waste management).

Section 2.3: Summary
"Canvas showing key elements of the project's impact pathways and measures to maximise its impact"

No.	SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
1	UT's SWOT analysis highlights weaknesses and threats which need to be addressed with respect to its R&I for sustainable nanosensors for water pollution detection (see Section 1.2.2).	See Performance Indicators for Outcomes 2, 3, 4, 5 and 6 in Section 2.1.2	Communication: News releases via Press conferences, Project website, and Social media accounts. Dissemination: Research papers presented at international conferences.
2	Albania's rivers and lakes are polluted with heavy metals, pesticides and antibiotics (see Section 1.2.1).	Development of novel sustainable nanosensors. Extensive environmental assessment of Albania's rivers and lakes (WP1).	Communication: as above. Dissemination: Present env. assessment report to National Environmental Agency and Ministry of Tourism and Environment Exploitation: Industry workshops at UT and NanoAlb.

No.	TARGET GROUPS	OUTCOMES	IMPACTS
1	UT's Dept of Chemistry and UT's Directorate of Scientific Research, Projects and Foreign Relations.	Increased UT research papers in journals / conferences; Increased UT EU grant proposals.	Scientific/Economic: Albania's increased participation in EU R&D funding programmes.
2	Public organisations: e.g. National Environmental Agency, Ministry of Tourism and Environment Academic Associations: e.g. NanoAlb Private companies: e.g. EHW, LUFRA	Evidence-based policy development by Albanian government. Collaboration agreements between UT & Albanian private companies.	Societal: Albania's supported green transition and increased integration with EU. Technological/Economic: Albania's spurred digital transition and economic recovery.

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Thank You – Any Questions?

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Annex B: Project management training materials

B.1 Training workshops during 19-20 June 2023

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Overview of EU Project Management

Giles Brandon (Intelligentsia Consultants), Project Management Training, Monday 19th June 2023

Agenda

1. Overview of EU Research Funding Schemes
2. Project Lifecycle Overview
3. Initiation Phase
4. Planning Phase
5. Execution and Control Phase
6. Closing Phase
7. Project Management Methodologies
8. Roles and Responsibilities of Project Teams

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1. Overview of EU Research Funding Schemes

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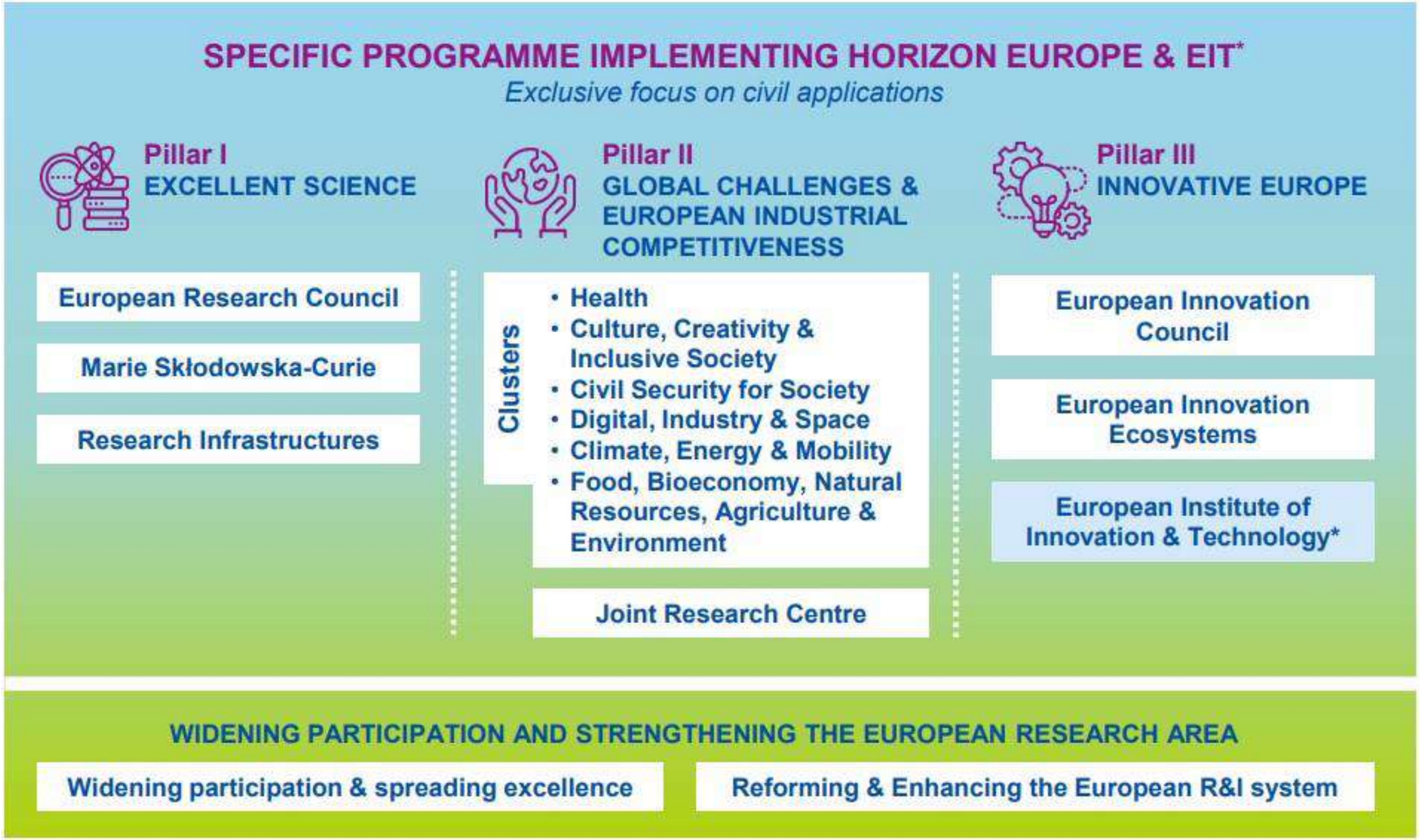
Overview of EU Research Funding Schemes: Horizon Europe

- **Budget:** €95.5 billion
- **Duration:** 2021-2027
- **Structure:** Three pillars: (1) Excellent Science, (2) Global Challenges and European Industrial Competitiveness, and (3) Innovative Europe
- **Support:** Supports a wide variety of projects and initiatives, from fundamental science to close-to-market activities.



Overview of EU Research Funding Schemes: Horizon Europe / European Research Council

Starting Grants

starters
2-7 years after PhD
(≥ 50% commitment)
up to €1.5 Million
for 5 years

Consolidator Grants

consolidators
7-12 years after PhD
(≥ 40% commitment)
up to €2 Million
for 5 years

Advanced Grants

track-record of significant research achievements in the last 10 years
(≥ 30% commitment)
up to €2.5 Million
for 5 years

Proof-of-Concept

bridging gap between research - earliest stage of marketable innovation
up to €150,000 for ERC grant holders **only**

Synergy Grant

Speeding Up the Discovery Process
2-4 Principal Investigators
up to €10 Million for 5 years

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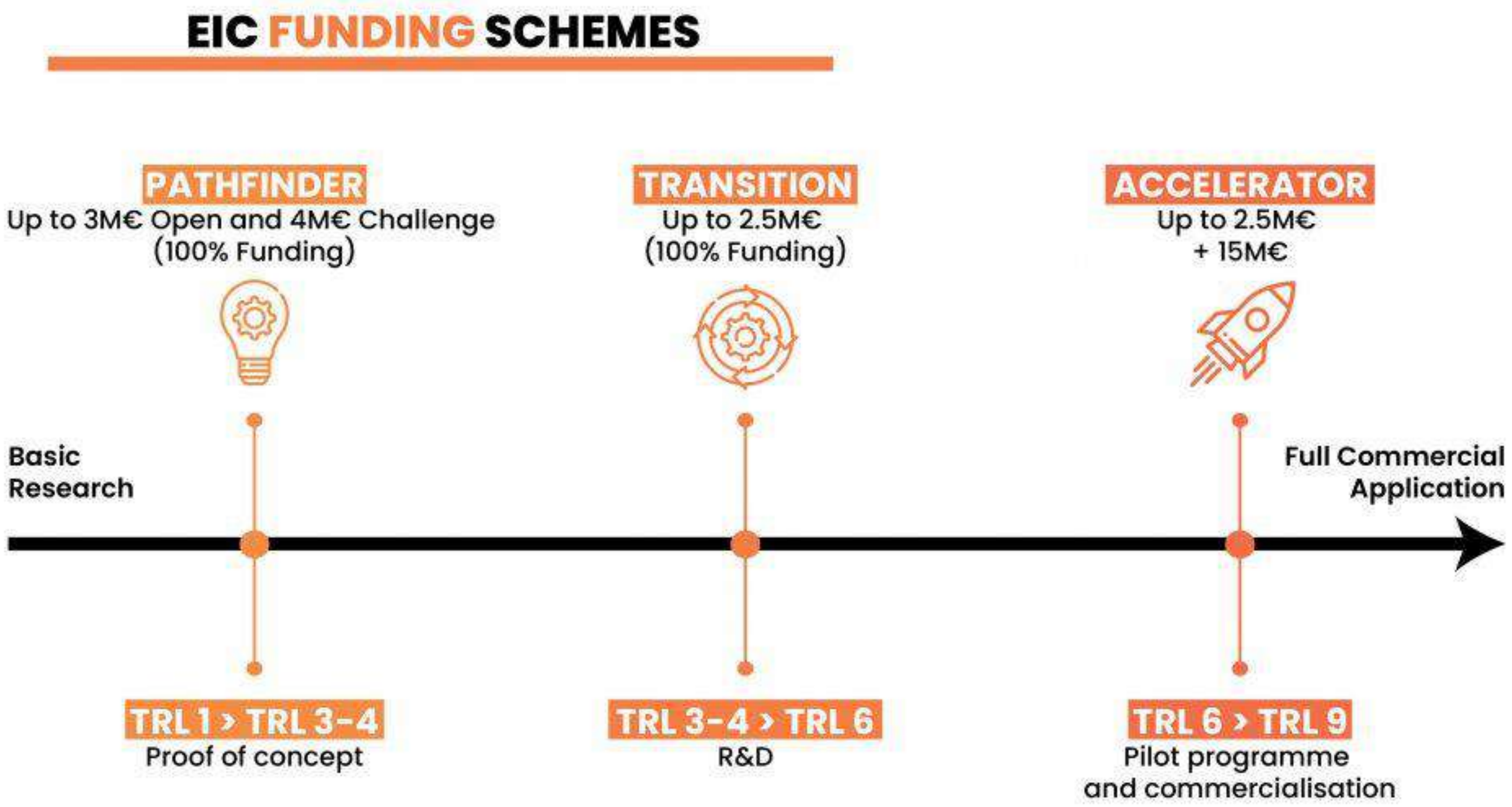
Overview of EU Research Funding Schemes: Horizon Europe / European Innovation Council



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Overview of EU Research Funding Schemes: Horizon Europe / Marie Skłodowska-Curie Actions

DOCTORAL NETWORKS

Training of Doctoral Candidates

Doctoral programmes; Partnerships of universities, research institutions, research infrastructures, SMEs and other socio-economic actors

DN encouraged to lead to Industrial Doctorates and Joint Doctorates

POSTDOCTORAL FELLOWSHIPS

Advanced Training for Excellent Researchers

European and Global PFs

Secondments, Placements in the non-academic sector, Training Activities and Career Development

STAFF EXCHANGE

International, Inter-Sectoral and Interdisciplinary Short-Term Mobility

Open to research, technical, administrative and managerial staff supporting R&I activities

Secondments & Skills Development

COFUND

Co-financing New or Existing Doctoral Programmes and Postdoctoral Fellowship Schemes

Enhancement of human resources in R&I at regional, national or international level

Bottom-Up or Aligned with RIS3

CITIZENS

Bringing Researchers Closer to the Public at Large

Event to Boost public recognition of science and research education

Applications submitted by one or by a consortium of at least two legal entities

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Overview of EU Research Funding Schemes: Horizon Europe / Widening

Teaming

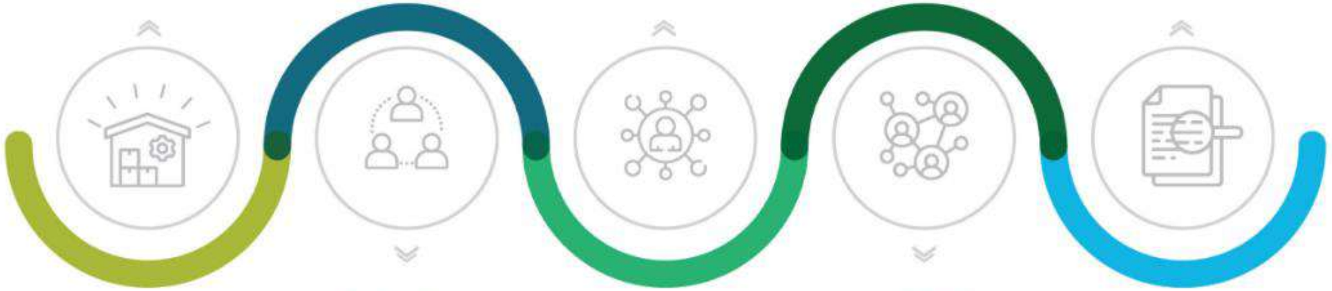
Teaming of excellent research institutions and low performing R&I regions aim at the creation of new (or significant upgrade of existing) centres of excellence in low performing R&I Member States and regions.

ERA Chairs

ERA Chairs aim at attracting outstanding academics to institutions with a clear potential for research excellence, in order to help these institutions fully unlock this potential.

Policy Support Facility

Policy Support Facility (PSF) aims to improve the design, implementation and evaluation of national/regional R&I policies through advice, expertise, best practice and guidance.



Twinning

Twinning of research institutions aim at significantly strengthening a defined field of research in an emerging institution through links with at least two internationally-leading institutions […]." It involves short-term staff exchanges, expert visits, workshops, dissemination and outreach activities.

COST

European Cooperation in Science & Technology (COST) is a cooperation framework that receives EU funding and covers the cost of collaboration/networking

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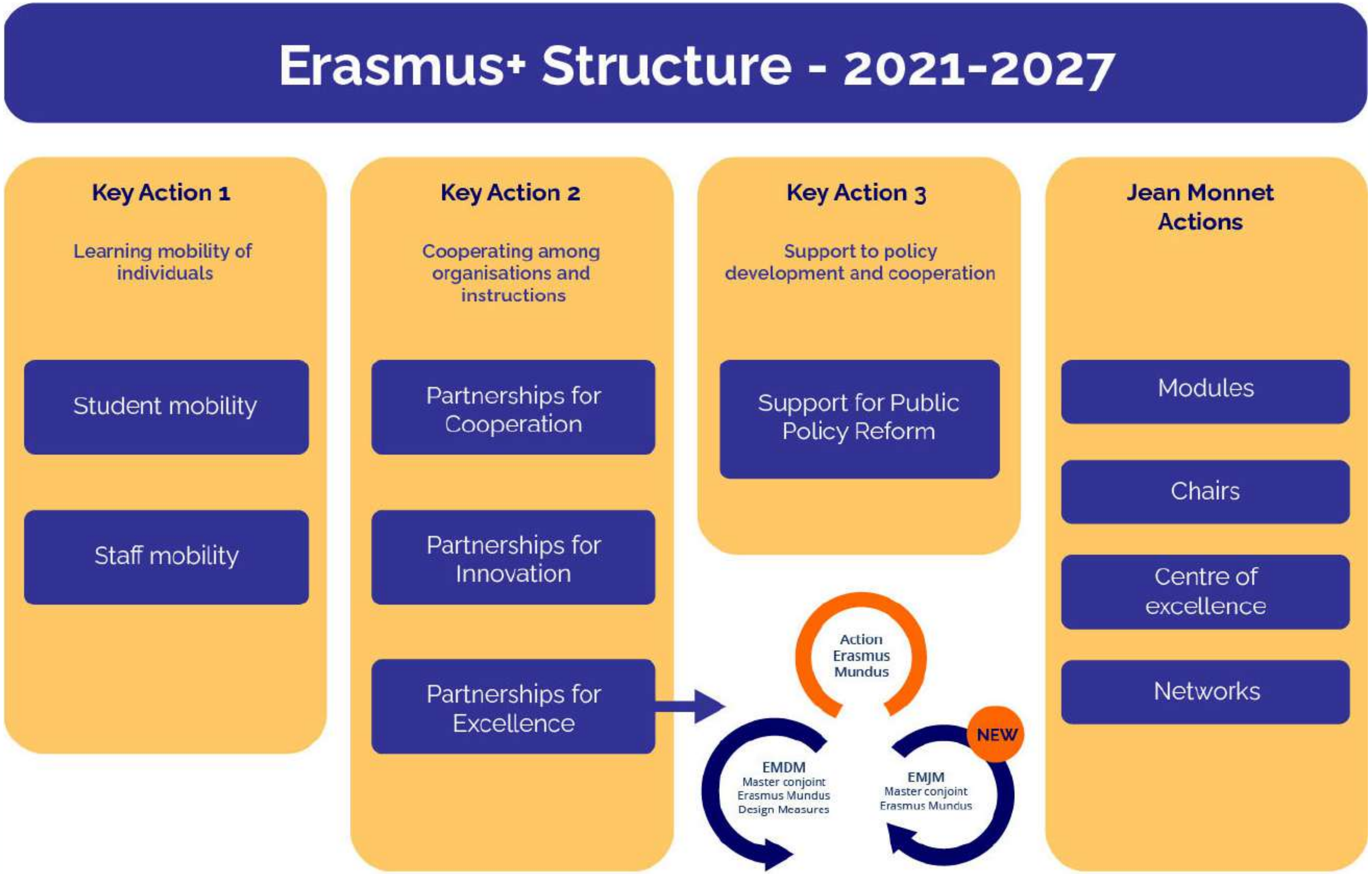
Overview of EU Research Funding Schemes: Erasmus+



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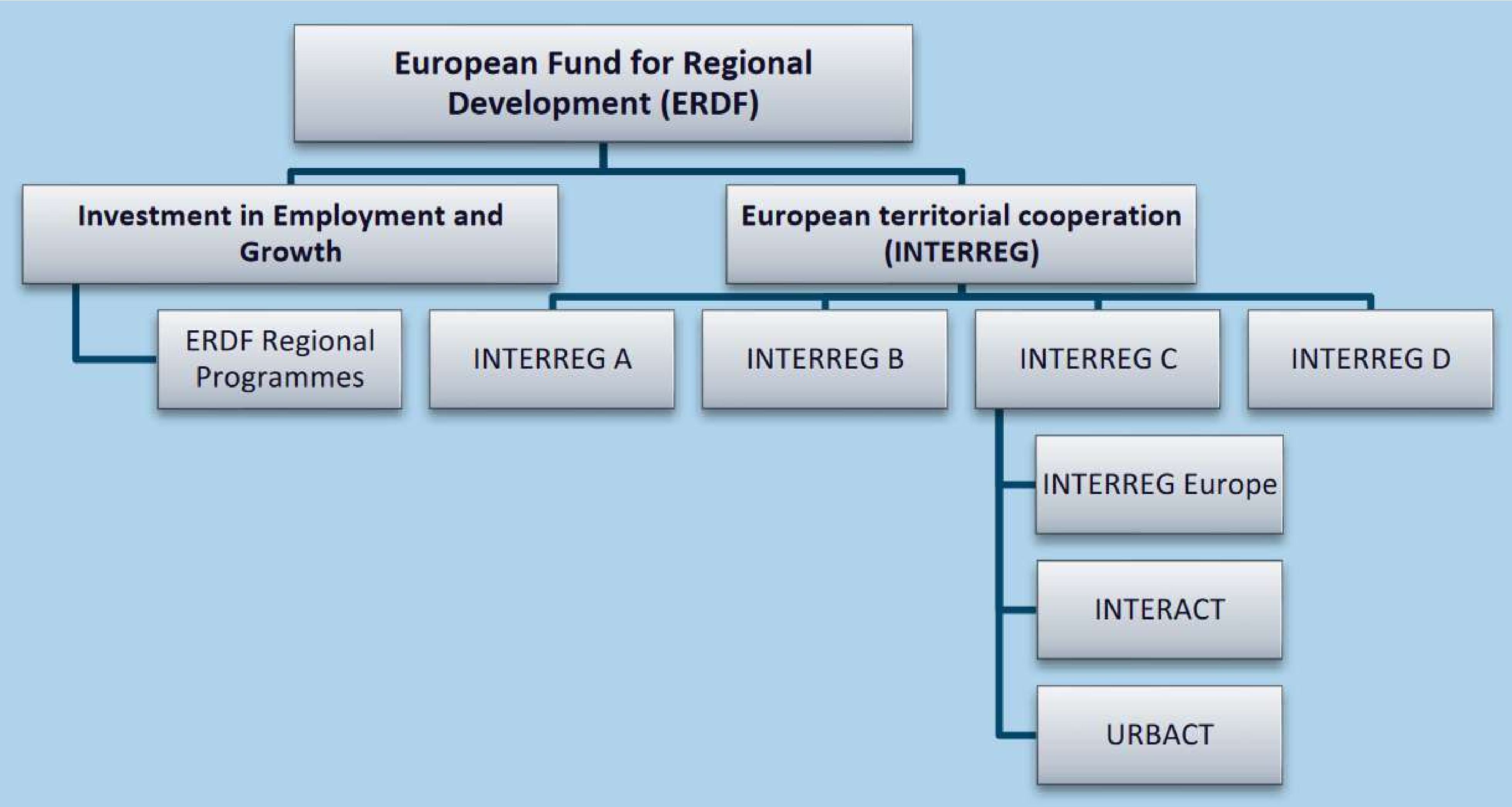
Overview of EU Research Funding Schemes: European Fund for Regional Development



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- **EU Funding Opportunities 2021-2027 – A Practical Guide:** **https://ec.europa.eu/programmes/erasmus-plus/project-result-content/51b12903-16fe-4dbb-aeec-80c6d404d5fe/EU-Learning_Handbook_EU-Funding%20Opportunities%202021-2027_V5-2021.09.29.pdf**

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Overview of EU Research Funding Schemes: Importance of Project Management (1 of 2)

- **Funding Utilization:** Efficient project management ensures that the funding obtained from EU schemes is used effectively and responsibly, aligning with the proposed budget and reducing wastage of resources.
- **Compliance:** Project management helps in ensuring compliance with the rules and regulations set by the EU for these funding schemes, thus avoiding potential legal issues.
- **Time Management:** Proper project management allows for better time management, ensuring that research activities and milestones are completed within the given timelines.
- **Risk Management:** It helps in identifying, assessing, and managing potential risks that may affect the research project's progress or outcomes, thus reducing the likelihood of failure.
- **Quality Control:** Project management practices can help ensure that the research meets the required quality standards and delivers valuable and valid results.

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Overview of EU Research Funding Schemes: Importance of Project Management (2 of 2)

- **Coordination and Collaboration:** Project management facilitates better coordination among different team members, departments, or partner organizations involved in the research, promoting effective collaboration.
- **Communication:** Project management includes developing and implementing a communication plan, which is crucial for keeping all stakeholders informed about the project's progress.
- **Reporting:** Regular reporting, an integral part of project management, is often required by EU funding schemes to demonstrate progress and accountability.
- **Scalability and Adaptability:** Good project management allows a project to be scalable and adaptable, accommodating changes and adjustments in the research project's scope, direction, or resources.
- **Success Measurement:** Finally, project management provides the tools and techniques needed to measure the success of the research project against its initial objectives, enabling continuous improvement and learning.

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2. Project Lifecycle

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Project Lifecycle Overview: Introduction

- **Definition and Context:** The project lifecycle refers to the consecutive stages a project goes through from inception to completion. In the context of EU research funding schemes, it entails the process of developing a research proposal, securing funding, executing the project, and evaluating its outcomes.
- **Initiation Phase:** This is the stage where a project idea is formalized. In the context of EU funding schemes, this often involves identifying a research question that aligns with the priorities of the specific scheme, putting together a project team, and creating an initial project plan including objectives, potential impacts, and an overview of work packages.
- **Planning Phase:** The planning phase involves detailing the steps required to achieve the project goals. In an EU research funding context, this phase is crucial to prepare a detailed proposal for submission.
- **Execution and Control Phase:** Once funding is secured, the project enters the execution phase, which involves carrying out the research activities as planned. This includes regular reporting to the EU funding body, as per the scheme's requirements.
- **Closing Phase:** The closing phase involves finalizing all activities, completing the documentation, and disseminating the results. In the context of EU funded research, this phase often requires a final report or evaluation to the funding body, demonstrating the achievements and impact of the project.

Initiation Phase

Planning Phase

Execution & Control Phase

Closing Phase

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3. Initiation Phase

- **Initiation Phase**
- **Planning Phase**
- **Execution & Control Phase**
- **Closing Phase**

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Initiation Phase (1 of 7)

- **Determine the project's goals and feasibility:**
  - **Define the Research Question:** For example, for a project in the field of renewable energy technologies, a goal could be developing a novel, cost-effective solar panel. The research question might involve exploring new materials or technologies to increase the efficiency of solar panels.
  - **Align with EU Priorities:** One of the key goals of any EU-funded project is alignment with EU priorities. For instance, a project under the Horizon Europe scheme would need to align with key strategic orientations such as promoting open innovation, addressing global challenges, or strengthening the European Research Area.
  - **Assess Technical Feasibility:** If applying for a grant that aims to develop a new medical device for remote monitoring of patients, part of the initiation phase would be understanding whether current technology can support your intended functionality. Need to assess the state-of-the-art in telemedicine, internet connectivity, and wearable sensor technology.
  - **Assess Economic Feasibility:** In a project aiming to develop a more sustainable agriculture method, a goal might be to produce a crop yield equivalent to current methods but with 30% less water usage. The feasibility assessment could involve an analysis of potential methods, costs, and return on investment. This would also include potential market size and economic impact.
  - **Assess Time Feasibility:** An important aspect of project initiation is estimating the time needed to achieve the project goals. For instance, a project aiming to develop a vaccine against a new viral disease would need to take into account the time needed for preclinical development, clinical trials, regulatory approval, and production scale-up.

Initiation Phase (2 of 7)

- **Identify project stakeholders and their interests:**
  - **Project Team Members:** These are the researchers, scientists, and technical staff directly involved in the project. Their interests typically lie in successfully completing the project, advancing their careers, and contributing to their field of study.
  - **Funding Body:** In the case of EU-funded research, the funding body could be the European Commission under schemes like Horizon Europe. Their interest would be in ensuring the project aligns with their strategic priorities, is carried out as planned, and leads to impactful results.
  - **Partner Organizations:** If your project involves collaboration with other universities, research institutes, or companies, these are crucial stakeholders. Their interests may include gaining knowledge, technology transfer, reputational enhancement, or financial benefits.
  - **Regulatory Bodies:** If your project involves activities that require regulatory approval (like clinical trials or environmental impact assessments), regulatory bodies become important stakeholders. Their interests lie in ensuring compliance with the laws and regulations.
  - **End Users or Beneficiaries:** These could be patients (in case of a medical research project), consumers (if you're developing a new product), farmers (for an agricultural project), and so forth. Their interest is in the successful development and implementation of the project's results.
  - **Society at Large:** For projects dealing with societal challenges or public goods (like climate change, public health, etc.), society at large is a stakeholder. Their interest lies in the project contributing to societal well-being, economic growth, or environmental sustainability.

Initiation Phase (3 of 7)

- **Document the project initiation by creating a *Project Charter*:**
  - A ***Project Charter*** (also referred to as *Project Abstract*) serves as an informal contract between the project team and the sponsor, and outlines the scope, objectives, stakeholders, and key deliverables of the project.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Project Title:** "Promoting Water Efficiency in Agriculture Through New Irrigation Methods"
    - **Project Objectives:** To research and develop a novel irrigation method that reduces water usage by 30% without affecting crop yield, and to promote its adoption among European farmers.
    - **Key Stakeholders:** Project team, European Commission (funder), partner universities and research centres, farmer associations, environmental regulatory bodies, potential end-users (farmers).
    - **Expected Deliverables:** Development and testing of the new irrigation method, research papers documenting the method and its benefits, training materials for farmers, a final report to the funding body.
    - **Preliminary Timeline:** 3 years from the project's start date.

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Initiation Phase (4 of 7)

- **Set up initial project team:**
  - Involves identifying key roles, responsibilities, and the skills required to fulfil these roles.
  - **Example: Researching Sustainable Agriculture Methods**

    - **Principal Investigator:** A seasoned researcher in sustainable agriculture or a related field. They will guide the research direction, supervise the team, and communicate with the funding body and other stakeholders.
    - **Agriculture Specialists:** These team members will conduct field experiments to test the new irrigation methods. They should have a strong background in crop science and irrigation technologies.
    - **Environmental Scientist:** This role involves assessing the environmental impact of the new irrigation method, ensuring it aligns with sustainability goals.
    - **Outreach Coordinator:** This role focuses on communicating with farmer associations and promoting the adoption of the new irrigation method. They should have skills in communication, education, and stakeholder engagement.
    - **Project Manager:** They will be responsible for the overall management of the project, ensuring it stays on track with its timeline and budget, and facilitating communication within the team and with external stakeholders.

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Initiation Phase (5 of 7)

- **Secure initial resources, including funding:**
  - In the initiation phase of EU-funded research projects, securing initial resources is a critical step. This includes funding from EU schemes, but also other resources like personnel, equipment, or facilities.
  - Vital to identify what resources are needed for the project, where these can be obtained from, and how they can be secured in a timely and cost-effective manner.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Funding:** The team might apply for funding under the Horizon Europe scheme, specifically targeting calls related to sustainable agriculture or water efficiency. The grant application would detail the project's aims, approach, potential impact, and budget.
    - **Personnel:** The team would need agriculture specialists for field experiments, an environmental scientist for assessing sustainability, and an outreach coordinator for working with farmers. These roles could be filled by existing staff, new hires, or collaborators at partner institutions.
    - **Field Sites:** For testing the new irrigation method, the team would need access to suitable agricultural land. This might be available through the host institution, partner organizations, or local farmers willing to participate in the research.

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Initiation Phase (6 of 7)

- **Define project deliverables:**
  - In the initiation phase of an EU-funded research project, you define the deliverables that the project is expected to produce. Deliverables will vary based on the nature and scope of the project.
  - Deliverables provide tangible proof of the project's progress and outcomes, which is important for accountability to the funding body, communicating with other stakeholders, and disseminating the results to the wider community.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Research Publications:** Peer-reviewed articles detailing the research findings related to the new irrigation method and its benefits.
    - **Training Materials:** Instructional resources designed to teach farmers how to implement the new irrigation method. These could be manuals, online courses, video tutorials, etc.
    - **Field Trial Reports:** Detailed reports on the field trials conducted, including methodology, data, analysis, and conclusions.
    - **Final Report to Funding Body:** A report detailing the project's achievements, use of funds, impact on water efficiency in agriculture, and any potential next steps for further research or implementation.

Initiation Phase (7 of 7)

- **Prepare for possible challenges:**
  - During the initiation phase of EU-funded research projects, identifying potential challenges (risks) and developing mitigation strategies is an important step.
  - Identifying challenges early on allows the project team to anticipate them, develop strategies to address them, and thus increase the chances of project success.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Field Trial Challenges:** Field trials could be affected by unpredictable factors like weather conditions, pests, or crop diseases. The team could set up multiple trial sites to mitigate this risk and plan for longer trials to account for variability.
    - **Adoption by Farmers:** New irrigation methods might be resisted by farmers due to the cost of implementation or lack of awareness. Outreach activities, training sessions, and demonstrating the cost-effectiveness and benefits of the new method could be planned from the beginning.
    - **Delays in Funding:** Delays in funding could impact project timelines. Having a contingency plan with alternative funding sources or adjusted timelines would be beneficial.

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4. Planning Phase

Initiation Phase

Planning Phase

Execution & Control Phase

Closing Phase

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Planning Phase (1 of 4)

- **Develop a detailed project plan:**
  - Developing a detailed project plan is a crucial step in the planning phase of EU-funded research projects.
  - Plan serves as a roadmap for the project, outlining the activities to be performed, the resources required, and the timeline for completion.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Work Breakdown Structure (WBS):** Tasks might include literature review, design of the irrigation method, setup of field trials, data collection and analysis, outreach to farmers, etc. Each of these would be broken down into sub-tasks.
    - **Resource Allocation:** The project plan would detail the personnel, equipment, budget, and other resources required for each task. For instance, field trials would require agriculture specialists, farmland, irrigation equipment, and a portion of the project budget.
    - **Timeline:** The project plan would specify when each task should begin and end. For example, design of the irrigation method might take place in the first two months, field trials from month 3 to month 24, etc.
    - **Milestones:** Key points in the project would be marked as milestones. These could include the start of field trials, the completion of data analysis, the first training session for farmers, etc.

Planning Phase (2 of 4)

- **Set up budgeting and scheduling plans:**
  - Crucial to establish budgeting and scheduling plans. This ensures that the project has the resources it needs to achieve its objectives on time.
  - They also provide a basis for monitoring project performance and accountability to the funding body and other stakeholders.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Budgeting Plan:** This would cover costs for field trials (land, seeds, irrigation equipment, etc.), personnel salaries, overhead costs, outreach activities, publication costs, and so forth. The budget would be distributed across these categories according to their importance and the project's funding constraints.
    - **Scheduling Plan:** The schedule would specify the timeline for each task in the project. For example, designing the irrigation method might take 2 months, setting up and conducting field trials might take 24 months, data analysis and report writing might take an additional 6 months, etc.

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Planning Phase (3 of 4)

- **Define quality metrics and objectives:**
  - Defining quality metrics and objectives during the planning phase of EU-funded research projects is vital to ensure the project meets the expected standards and achieves its goals.
  - Quality metrics and objectives provide a clear definition of what constitutes "success" for the project. They provide a standard against which project performance can be measured and evaluated, which is essential for accountability to the funding body and other stakeholders.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Water Efficiency:** The new irrigation method should achieve a certain percentage of water savings compared to traditional methods. This percentage should be defined as a target objective.
    - **Crop Yield:** Despite water savings, crop yield should not decrease and ideally should increase. A target yield per hectare could be defined.
    - **Adoption Rate:** A certain percentage of participating farmers should adopt the new irrigation method after the project. This percentage should be set as a target.
    - **Publication Quality:** The number of high-impact, peer-reviewed publications resulting from the research could be set as a target.

Planning Phase (4 of 4)

- **Communicate the project plan to stakeholders:**
  - Communicating the project plan to stakeholders is an essential step.
    - Ensures that everyone involved understands the project's objectives, approach, and expectations.
    - Ensures alignment among all stakeholders and their engagement in the project. This can help prevent misunderstandings, manage expectations, and build support for the project.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Team Meetings:** Team meetings must be held to present the project plan and facilitate discussions.
    - **Farmer Workshops:** Workshops could be organized with participating farmers to introduce the project, explain its objectives and methodology, discuss the expected benefits, and address any concerns.
    - **Project Plan Document:** A detailed project plan could be written and shared with all stakeholders, providing a comprehensive overview of the project.
    - **Regular Updates:** Regular updates through email, newsletters, or meetings could be planned to keep stakeholders informed about the project's status.

5. Execution & Control Phase

- Initiation Phase
- Planning Phase
- **Execution & Control Phase**
- Closing Phase

Funded by the European Union

Execution and Control Phase: Execution Aspects (1 of 4)

- **Deploy resources and execute the project plan:**
  - Resources are deployed, and the project plan is put into action.
  - Involves coordinating people and materials, conducting project activities, and ensuring tasks completed as planned.
  - Busy phase that requires effective coordination, problem-solving, and communication to ensure that the project stays on track and achieves its objectives.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Field Trials:** The project team begins setting up the field trials, which could involve preparing the land, installing the irrigation equipment, and planting the crops.
    - **Data Collection:** Team members start their assigned tasks, such as designing the data collection protocol, collecting and analysing data, or conducting outreach to farmers.
    - **Collaboration:** Farmer associations or other partners begin their roles in the project, such as promoting the new irrigation method to farmers or providing practical advice.
    - **Reporting:** The project manager starts tracking progress, documenting activities, and preparing reports for the funding body and other stakeholders.

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Execution and Control Phase: Execution Aspects (2 of 4)

- **Manage teams and their tasks:**
  - Involves ensuring that everyone knows what they need to do, coordinating team activities, resolving any issues that arise, and maintaining a productive and positive work environment.
  - Good team management helps to ensure that project activities are carried out effectively, that team members feel valued and motivated, and that any issues are addressed promptly.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Task Allocation:** Tasks must be assigned based on the work breakdown structure (WBS), and team members must be briefed on their roles and deadlines.
    - **Field Coordination:** The project manager must coordinate field activities, ensure that all necessary resources are available, and troubleshoot any problems that occur.
    - **Performance Monitoring:** The project manager must track the performance of team members and the quality of their work, providing feedback and guidance as needed.
    - **Conflict Resolution:** If conflicts emerge, the project manager must facilitate discussions to find a resolution and maintain a positive team climate.
    - **Team Building:** Team-building activities could be beneficial in this project to strengthen team relationships and boost morale.

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Execution and Control Phase: Execution Aspects (3 of 4)

- **Implement approved changes:**
  - Implementing approved changes is a common part of the execution phase in EU-funded research projects.
  - Despite careful planning, circumstances can change, new information can emerge, and adjustments may be needed to keep the project on track.
  - The process typically involves reviewing and approving the changes, communicating them to all stakeholders, and updating the project plan accordingly.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Methodology Changes:** If initial field trials suggest that the new irrigation method isn't as effective as expected, it might be necessary to modify the method. This change would need to be documented, approved, and communicated to all stakeholders.
    - **Location Changes:** If a planned trial site becomes unavailable or unsuitable, it might be necessary to select a different site. This change would need to be approved and communicated to all stakeholders.
    - **Staff Changes:** If key team members leave the project, new personnel might need to be recruited, which could involve adjustments to roles and responsibilities, timeline, and budget. These changes would need to be approved and communicated to all involved parties.

Execution and Control Phase: Execution Aspects (4 of 4)

- **Ensure quality control:**
  - Involves monitoring the project activities to ensure they meet the defined quality standards, taking corrective action if necessary, and documenting quality control efforts.
  - It helps to prevent errors, improve results, and build trust among all stakeholders.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Field Trial Monitoring:** The field trials could be closely monitored to ensure that the new irrigation method is implemented correctly and that data collection is accurate and reliable. Any issues identified could be resolved promptly.
    - **Data Quality Checks:** Regular checks could be conducted on the collected data to ensure its quality and reliability. Any discrepancies or anomalies could be investigated and addressed.
    - **Peer Review:** Research findings could be peer-reviewed to ensure their quality before publication.
    - **Documentation:** All quality control activities and their results could be documented, providing a record for the project team, the funding body, and other stakeholders.

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Execution and Control Phase: Control Aspects (1 of 4)

- **Track, review, and regulate project progress:**
  - Crucial to track, review, and regulate project progress to ensure alignment with the project plan, detect any issues early, and take corrective action if necessary.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Project Dashboard:** A project dashboard should be used to monitor key project metrics.
    - **Field Visits:** The project manager or designated team members should make regular visits to the field trial sites to check on progress, resolve any issues, and collect feedback from farmers.
    - **Status Reports:** Regular status reports should be prepared for the funding body, farmer associations, and other stakeholders, providing updates on the project's progress and any issues or changes.
    - **Data Quality Checks:** Regular checks should be conducted on the collected data to ensure its quality and reliability. Any issues identified should be investigated and addressed.

Execution and Control Phase: Control Aspects (2 of 4)

- **Compare actual performance with planned performance:**
  - Helps to ensure that the project is progressing as expected, identify any deviations from the plan, and take corrective action if necessary.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Timeline Tracking:** The actual progress should be compared with the planned timeline to check if the project is on schedule.
    - **Budget Comparison:** The actual spending should be compared with the budget plan to monitor costs and identify any areas of overspending.
    - **Data Quality Measures:** The actual quality and quantity of the collected data should be compared with the defined data quality objectives.
    - **Farmer Adoption:** The actual adoption of the new irrigation method by farmers should be compared with the planned level of adoption to see if the project is achieving its impact goals.

Execution and Control Phase: Control Aspects (3 of 4)

- **Identify issues and implement corrective actions:**
  - Identifying issues and implementing corrective actions are critical for maintaining the progress and quality of the project.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Field Trial Problems:** If the new irrigation method is not working as expected in field trials, the project team could troubleshoot the problem, identify the cause, and modify the method or the trial setup as necessary.
    - **Data Quality Issues:** If the collected data is not reliable or sufficient, the project team could review the data collection process, identify any problems, and improve the process or the training of data collectors.
    - **Budget Overruns and Delays:** Budget overruns and delays should be managed by identifying the causes and implementing corrective actions.
    - **Farmer Resistance:** If farmers are reluctant to adopt the new irrigation method, the project team should investigate the reasons, such as lack of knowledge or perceived risks, and implement measures such as additional training, demonstrations, or modifications to the method.

Execution and Control Phase: Control Aspects (4 of 4)

- **Report project progress to stakeholders:**
  - Reporting project progress to stakeholders is crucial.
  - Regular and transparent communication helps maintain stakeholder engagement, build trust, and ensure accountability.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Status Reports:** Regular status reports should be prepared and distributed to stakeholders.
    - **Field Visit Reports:** After each field visit, a report should be prepared and shared with stakeholders, detailing observations, findings, challenges, and actions taken.
    - **Meetings:** Regular meetings should be held with various stakeholder groups, such as farmer associations, government agencies, and the funding body.
    - **Webinars or Workshops:** Periodic webinars or workshops should be organized to share project progress and findings, demonstrate the new irrigation method, gather feedback, and address questions or concerns.

Initiation Phase
Planning Phase
Execution & Control Phase
Closing Phase

6. Closing Phase

Funded by the European Union

Closing Phase (1 of 4)

- **Deliver the final product or service:**
  - This refers to the final output of the project being ready for use or implementation.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Method Documentation:** The new irrigation method should be fully documented and the documentation provided to farmer associations and agricultural extension services. This represents the delivery of the final product in the form of a new farming practice that can be implemented.
    - **Training Programmes:** Training programmes should be developed and delivered to train farmers in using the new irrigation method. This represents the delivery of the final product in the form of a capacity-building service.
    - **Publication:** The research findings should be published in a scientific journal.
    - **Policy Briefs:** Policy briefs could be prepared and distributed to government agencies, advocating for the wider adoption of the new irrigation method.

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Closing Phase (2 of 4)

- **Release project resources:**
  - Involves ensuring that human, physical, and financial resources that were tied up in the project are properly closed off, redirected or reassigned.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Human Resources:** Project team members could be reassigned or their contracts terminated.
    - **Physical Resources:** Field trial sites, equipment, and other resources used in the project would be cleaned up and returned to their original state or reassigned to other projects or purposes.
    - **Financial Resources:** Any unspent project funds would be accounted for and returned or reallocated according to the terms of the funding agreement.

Closing Phase (3 of 4)

- **Document lessons learned:**
  - Involves reflecting on what went well and what could be improved in the future.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Field Trials:** The project team could document lessons learned from conducting field trials, such as effective ways of engaging with farmers or strategies for collecting reliable data.
    - **Project Management:** The project manager could document lessons learned about various aspects of project management.
    - **Stakeholder Engagement:** Lessons about engaging with stakeholders, such as strategies for motivating farmers to adopt the new irrigation method or effective ways of communicating with government agencies, could be documented.
    - **Use of Resources:** Lessons about the use of resources could be documented.

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Closing Phase (4 of 4)

- **Celebrate project success:**
  - Celebrating project success is a wonderful way to acknowledge the hard work of the team and the accomplishment of the project goals.
  - Helps to promote the project outcomes, and enhance motivation and team spirit.

  - **Example: Researching Sustainable Agriculture Methods**
    - **Farmer Celebration:** A celebration could be held with the farmers who participated in the project, acknowledging their contributions and sharing the project outcomes.
    - **Project Closing Ceremony:** A project closing ceremony could be held to recognize team members and stakeholders.
    - **Public Announcement:** A public announcement could be made, possibly in collaboration with farmer associations or government agencies, to share the project success.
    - **Policy Briefs or Reports:** The project success could be documented in policy briefs or reports, sharing the project outcomes and lessons learned with policymakers and the wider public.

7. Project Management Methodologies

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Project Management Methodologies (1 of 10)

- **PRINCE2 (Projects IN Controlled Environments):** PRINCE2 is a process-based approach that provides a detailed roadmap for how the project should be managed and executed. It is widely used by the UK government and in many sectors and countries worldwide.
- **Agile Methodology:** Agile methodology is iterative and flexible, allowing for regular adjustments throughout the project. Although it's widely used in software development, it can also be applied to research projects, especially those involving complex tasks, rapid changes, or a high level of uncertainty.

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Project Management Methodologies (2 of 10)

- **PRINCE2 Methodology:**
  - **Advantages**
    - **Widely Recognized and Understood:** PRINCE2 is used globally and is recognized as a standard for project management in many industries.
    - **Flexible and Scalable:** PRINCE2 can be tailored to suit the size, complexity, importance, capability, and risk of a project.
    - **Clear Roles and Responsibilities:** PRINCE2 provides a clear framework for team structure, with defined roles and responsibilities.
    - **Focus on Business Justification:** A project managed under PRINCE2 must have a clear business justification, with defined benefits, which are reviewed throughout the project. This ensures that the project remains aligned with its business goals.
    - **Emphasis on Learning from Experience:** Encourages recording and sharing of lessons learned throughout project lifecycle.
  - **Disadvantages**
    - **Complexity:** PRINCE2 is a detailed and complex methodology, with a steep learning curve.
    - **Documentation Heavy:** Requires much documentation, which can be time-consuming and unnecessary for small projects.
    - **Costly to Implement:** Training and certification in PRINCE2 can be expensive.
    - **Rigid Structure:** While PRINCE2 is designed to be adaptable, in practice it can be quite rigid, especially if implemented strictly.
    - **Less Emphasis on Soft Skills:** While PRINCE2 provides a clear framework for project processes and roles, it provides less guidance on leadership, team management, or other soft skills that are crucial for project success.

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Project Management Methodologies (3 of 10)

- **Applying the PRINCE2 Methodology to “Researching Sustainable Agriculture Methods” (1 of 2):**

  - **Starting Up a Project:** Define the project's objectives, scope, and deliverables. Identify the key stakeholders and appoint the project team.
    - *Example: Define the sustainable agriculture practices to be researched and the objectives of the research. Identify key stakeholders such as farmers, agricultural organizations, and environmental agencies.*
  - **Initiating a Project:** Develop a detailed project plan, including the project's timeline, budget, and risk management strategies.
    - *Example: Plan the field trials or surveys, estimate the resources needed, and develop a timeline for data collection and analysis. Identify potential risks, such as weather impacts on field trials or difficulties in data collection.*
  - **Directing a Project:** Establish the project's governance structure and decision-making processes. The project board, composed of the project executive and senior users, oversees the project's progress.
    - *Example: Establish a project board consisting of the principal investigator, senior researchers, and representatives of key stakeholders. The board will make key decisions, approve project plans, and review project progress.*

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- **Applying the PRINCE2 Methodology to "Researching Sustainable Agriculture Methods" (2 of 2):**

  - **Controlling a Stage:** Manage project on a stage-by-stage basis, with regular reviews and approvals before moving to next stage.
    - *Example: Manage the project in stages, such as literature review, field trials, data analysis, and report writing. Review the progress at the end of each stage and gain approval from the project board before proceeding to the next stage.*
  - **Managing Product Delivery:** Ensure that the project's outputs meet quality criteria and delivered on time and within budget.
    - *Example: Ensure that the field trials are conducted properly, the data is collected and analysed accurately, and the research report is written to a high standard. Monitor the project timeline and budget to ensure that the project is on track.*
  - **Managing Stage Boundaries:** Review the project's progress at the end of each stage, update the project plan if needed, and plan next stage.
    - *Example: At the end of each stage, review the project's progress against the plan, update the risk register, and plan the next stage. Present a report to the project board for their review and approval.*
  - **Closing a Project:** Review project's performance against its objectives, document lessons learned, and formally close the project.
    - *Example: At the end of the project, review whether the research objectives were met and what lessons were learned. Document these in a project closure report and present this to the project board for their approval.*

Project Management Methodologies (5 of 10)

- **AGILE Methodology:**
  - **Advantages**
    - **Flexibility and Adaptability:** Designed to embrace changes. If the project's requirements change, teams can adjust quickly and move in the new direction.
    - **Frequent Feedback and Improvement:** Involves regular reviews and retrospectives, which allow teams to continuously improve their processes and products.
    - **High Customer Satisfaction:** Customers are frequently involved and their feedback is incorporated resulting in high customer satisfaction.
    - **Risk Management:** Regular iterations allow potential issues or obstacles to be identified and dealt with early, reducing project risk.
    - **Motivation and Productivity:** The self-organizing nature of Agile teams can lead to higher motivation and productivity.
  - **Disadvantages**
    - **Less Predictability:** Agile projects can be less predictable compared to traditional methodologies, as the plan can constantly evolve.
    - **Requires Experienced Team Members:** Requires team members who are experienced in Agile methods and can work well in self-organizing teams.
    - **Requires Active Customer Participation:** Relies on frequent customer feedback and involvement, which may not always be possible.
    - **Difficulty in Estimating Time and Cost:** With the emphasis on flexibility, it can be harder to estimate the total time or cost at the start.
    - **Not Suitable for all Types of Projects:** While Agile is great for projects that require flexibility and have evolving requirements, it may not be suitable for projects with a clearly defined scope and unchanging requirements.

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- **Applying the AGILE Methodology to "Researching Sustainable Agriculture Methods" (1 of 2):**

  - **Product Backlog Creation:** Identify the research objectives, questions, and hypotheses that will form the basis of your 'product backlog'. This will guide the iterative development of your research.
    - *Example: Identify the sustainable agriculture practices to be researched, and list these as items in the product backlog.*
  - **Sprint Planning:** Determine the scope of the first iteration or 'sprint' of your research. This could involve planning the first set of experiments or field trials.
    - *Example: Plan to investigate the impact of a specific sustainable farming technique on crop yield during the first sprint.*
  - **Sprint Execution:** Conduct the research activities planned for the sprint. This might involve field work, data collection, and preliminary analysis.
    - *Example: Conduct field trials, collect and analyse data on crop yield, and document the results.*
  - **Daily Stand-ups:** Regular short meetings to discuss progress, obstacles, and plans for the next day's work.
    - *Example: Meet daily to discuss progress of field trials, any issues encountered, and plans for the next day.*

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- **Applying the AGILE Methodology to "Researching Sustainable Agriculture Methods" (2 of 2):**

  - **Sprint Review:** At the end of each sprint, review the results and present them to the stakeholders for feedback. Adjust the product backlog as needed based on the findings and feedback.
    - *Example: Review the findings on the impact of the sustainable farming technique on crop yield, present the results to stakeholders, and adjust the future research plans as needed.*
  - **Sprint Retrospective:** Reflect on the process followed during the sprint, identify areas for improvement, and plan how to implement these improvements in the next sprint.
    - *Example: Reflect on how the field trials and data analysis were conducted, identify any issues or inefficiencies, and plan how to improve these processes in the next sprint.*
  - **Next Sprint Planning:** Based on the review and retrospective, plan the next sprint, considering any changes to the product backlog and improvements to the research process.
    - *Example: Plan the next sprint, which might involve investigating another sustainable farming technique or conducting further trials on the first technique.*

Project Management Methodologies (8 of 10)

- **The choice of methodology should always be tailored to the specific characteristics of each project and the preferences and expertise of the project team.**
- **To find out about PRINCE2 training and professional certification, see https://www.prince2.com**
- **To find out about AGILE training and professional certification, see https://www.pmi.org/search#q=Agile&sort=relevancy**

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Project Management Methodologies (9 of 10)

- **Because many European grant projects (e.g. Horizon Europe) are so structured, you are “forced” to follow the European Commission’s “project management methodology”.**
- **Regardless of the methodology followed, it is vital that the project manager/coordinator and partners are focused on the project’s objectives, tasks and indicators.**
- **Some practical things to help maintain the necessary focus:**
  - Printout a hardcopy of the grant agreement, have it on your desk, and read it often!
  - Create a common online folder (e.g. Dropbox) containing project documents which all partners can access.
  - Create an action item list detailing actions for each of the work packages.
  - Arrange a weekly Zoom/Teams calls with the partners (same day/same time e.g. Tuesdays at 10:00).
  - Review the action item list during the weekly Zoom/Teams calls with the partners.

Project Management Methodologies (10 of 10)

FIT-4-NMP Project - WP3 Training

Work package number	3		**Lead beneficiary**		ASTP	
Work package title	Training					
Participant short name	INT	TC-CAS	MITA	LXI	LTC	ASTP
Person months per participant	5	3	-	1.7	3	5
Participant short name	TPF	IMT	IMSAS	NASU	-	-
Person months per participant	4	4	3	3	-	-
Start month	6		**End Month**		36	

Work Packages	Performance Indicators	Final Target	Current Total
WP3: Training	3.1 Number of tech-transfer training courses given in underrepresented regions	6	2 (Period 1) 1 (Period 2)
	3.2 Number of talented newcomers participating in tech-transfer training courses	60+	76 (Period 1) ?? (Period 2)
	3.3 Number of NMP Top Innovators participating in tech-transfer training courses	10+	2 (Period 1) ?2? (Period 2)
	3.4 Number of trainings given on proposal preparation for other EC calls	6	5 (Period 1) 2 (Period 2)
	3.5 Number of talented newcomers participating in proposal preparation training courses	60+	278 (Period 1) 50 (Period 2)

WP/Task	Action Item	Responsible	Due Date
WP3/T3.1	Organise tech-transfer training workshop in Bucharest in 18-19 September 2023. • Determine venue location and event budget. • Agree workshop agenda. • Distribute workshop announcement.	Lead partner: ASTP/IMT Support: All	31/08/23
WP3/T3.1	Tech-transfer training workshop in Bratislava in late 26-27 October 2023. • To be held at IMSAS. • Determine event budget (catering). • Agree workshop agenda. • Distribute workshop announcement.	Lead partner: ASTP/IMSAS Support: All	15/10/23

8. Roles and Responsibilities of Project Teams

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Roles and Responsibilities of Project Teams (1 of 4)

- **Key Roles in an EU-Funded Research Project Team:**
  - **Project Manager:** Responsible for overall project management, coordination, and delivery of the project on time and within budget.
  - **Principal Investigator:** The lead researcher who is responsible for the scientific and technical direction of the project.
  - **Project Administrator:** Handles administrative tasks such as financial management, reporting, and compliance with EU funding requirements.
  - **Research Associates/Assistants:** Conduct the research tasks under the direction of the Principal Investigator.
  - **Stakeholder Representatives:** Individuals who represent the interests of different stakeholder groups, often providing valuable inputs, feedback, and support.
  - **Dissemination and Communication Officer:** Develops and implements a communication strategy, promotes project results, organizes events, engages with stakeholders, and fulfils reporting requirements.

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Roles and Responsibilities of Project Teams (2 of 4)

- **Responsibilities of a Project Manager:**
  - Planning and defining the project scope, objectives, and deliverables.
  - Coordinating with team members and ensuring tasks are completed on time.
  - Monitoring project progress, budget, and risks, and making necessary adjustments.
  - Ensuring compliance with EU reporting requirements and project deliverables.
  - Facilitating communication among team members and with stakeholders.
- **Responsibilities of a Principal Investigator:**
  - Leading the scientific and technical aspects of the project.
  - Developing and overseeing the research methodology and analysis.
  - Guiding and mentoring the research associates/assistants.
  - Ensuring high quality and ethical standards in the research.
  - Communicating research findings to stakeholders and at scientific conferences.

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Roles and Responsibilities of Project Teams (3 of 4)

- **Responsibilities of a Project Administrator:**
  - Handling project finances and budget.
  - Ensuring compliance with EU funding rules and requirements.
  - Coordinating reporting to the EU and other stakeholders.
  - Managing project documentation and record keeping.
  - Assisting in communication between project team and stakeholders.
- **Responsibilities of Research Associates/Assistants:**
  - Conducting research tasks such as literature review, data collection, and data analysis.
  - Assisting in the preparation of research reports and publications.
  - Participating in team meetings and contributing to project discussions.
  - Supporting the principal investigator in various research activities.
  - Ensuring ethical and quality standards in their research work.

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Roles and Responsibilities of Project Teams (4 of 4)

- **Responsibilities of Stakeholder Representatives:**
  - Providing inputs and feedback on the project plan and outputs.
  - Representing the interests and perspectives of their stakeholder group.
  - Communicating between the project team and their stakeholder group.
  - Assisting in the dissemination of research findings to their stakeholder group.
  - Supporting the project team in various ways, such as providing access to resources, facilitating field work, or promoting the project.
- **Responsibilities of a Dissemination and Communication Officer:**
  - Developing and implementing a Communication Strategy.
  - Promoting project outputs such as newsletters, websites, press releases, social media, and professional networks.
  - Organizing events and conferences such as workshops, conferences, webinars, etc.
  - Engaging stakeholders including project partners, funders, policymakers, practitioners, researchers, and the general public.
  - Ensuring reporting requirements regarding dissemination and communication activities are properly documented.

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Thank You – Any Questions?

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www.susnano.eu

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SUSNANO

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UNIVERSITETI I TIRANËS

ICN2 Institut Català de Nanociència i Nanotecnologia

Palacký University Olomouc

intelligentsia consultants

SUSNANO

Project Financial Management (for Horizon Europe projects)

Giles Brandon (Intelligentsia Consultants), Project Management Training, Tuesday 20th June 2023

Agenda

1. **Horizon Europe Funding Rates**
2. **Eligible Costs and Ineligible Costs**
3. **Budget Planning at the Proposal Stage**
4. **Record Keeping**
5. **Financial Reporting and Auditing**

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Horizon Europe Structure and Budget

HORIZON EUROPE: STRUCTURE
FUNDING - €95.5 billion

EUR 25,0 b (26%)
Pillar I – Excellent Science
- European Research Council (ERC) — **EUR 16,0 b**
- Marie Skłodowska-Curie Actions (MSCA) — **EUR 6,6 b**
- Research Infrastructures — **EUR 2,4 b**

EUR 53,5 b (56%)
Pillar II – Global Challenges & European Industrial Competitiveness
Clusters
1. Health — **EUR 8,2 b**
2. Culture, Creativity & Inclusive Society — **EUR 2,2 b**
3. Civil Security for Society — **EUR 1,6 b**
4. Digital, Industry & Space — **EUR 15,3 b**
5. Climate, Energy & Mobility — **EUR 15,1 b**
6. Food, Bioeconomy, Natural Resources, Agriculture & Environment — **EUR 9 b**

Joint Research Centre (JRC)

EUR 13,6 b (14%)
Pillar III – Innovative Europe
- European Innovation Council (EIC) — **EUR 10,1 b**
- European Innovation Ecosystems — **EUR 0,5 b**
- European Institute of Innovation and Technology (EIT) — **EUR 3 b**

EUR 3,4 b (4%)
Widening Participation and Strengthening the European Research Area
- Widening Participation and Spreading Excellence — **EUR 3 b**
- Reforming and Enhancing the European R&I System — **EUR 0,4 b**

1. Horizon Europe Funding Rates

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Horizon Europe Funding Rates (1 of 2)

- A **beneficiary** receives a **certain percentage %** of their **total eligible costs**, depending on the specific funding rate (see table on next slide).
- **Eligible costs** of a Horizon Europe action are made up of **direct costs** and **indirect costs**.
- **Direct costs** such as personnel costs, travel costs or costs of goods and services, are directly linked to the project implementation.
  - Funded based on actual costs or at various fixed rates.
- **Indirect costs** ("overheads") such as office rent or operating costs are not directly linked to the project but are nonetheless necessary for its implementation.
  - Funded at a flat rate of 25% of the direct eligible costs (minus certain costs e.g. subcontracting costs).

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Horizon Europe Funding Rates (2 of 2)

Project type	Direct costs (€)	Indirect costs (€)	Total costs (€)	Funding rate	Grant amount (€)
Research and Innovation Actions (RIA); Coordination and Support Actions (CSA)	100.-	25.-	125.-	100 %	**125.-**
Innovation Actions (IA) – regular rate	100.-	25.-	125.-	70 %	**87.50**
Innovation Actions (IA) – rate for non-profit organisations	100.-	25.-	125.-	100 %	**125.-**

- **RIA** are collaborative projects funding research activities upstream of a commercial product or service (technology readiness levels TRLs 2-6). Enable exploration of new technologies, methods, products, or improvement of existing ones.
- **IA** are collaborative projects funding research activities closer to a commercial product or service (TRLs 6-8).
- **CSA** improve cooperation to strengthen the European Research Area including standardisation, dissemination, awareness-raising, communication and networking activities, policy dialogues, mutual learning or studies.

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2. Eligible Costs and Ineligible Costs

Eligible Costs (1 of 2)

- **Personnel costs:**
  - **Actual costs:** Gross monthly salary + Employer's contributions to social security and pension.
  - **Unit costs:** Used by beneficiaries who calculate average rates for their staff as part of their analytical cost accounting system.
  - **SME owners (who don't receive a salary):** Monthly rate = 5.080€ x country-specific coefficient (e.g. 98.3% for Germany).
- **Subcontracting costs:**
  - Subcontractor is called upon by a beneficiary to implement an "action task" specified in the project and issues an invoice for the service provided (work or service, delivery of goods) at regular market prices.
  - Eligible cost = Subcontracting cost – Deductible VAT (i.e. VAT that can be reclaimed from tax administration).
  - Subcontracting costs are not considered when calculating the 25% flat rate for indirect costs.
- **Purchase costs:**
  - Travel and subsistence; equipment (depreciation); other goods (e.g. research consumables), works and services (e.g. catering).
  - Eligible cost = Purchasing cost – Deductible VAT (i.e. VAT that can be reclaimed from tax administration).
- **Other cost categories:**
  - Internally invoiced goods and services. Use the actual costs for the good or service recorded according to the beneficiary's usual cost accounting practices.

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Eligible Costs (2 of 2)

- **Eligible costs** need to meet the following requirements:
  - **Be actually incurred by the beneficiary** (no estimated/imputed/budgeted costs),
  - **Be incurred in the project period** (exception: costs of final report submitted within 60 days of the end of the project),
  - **Be included in the budget** (indicated in the estimated budget of the Grant Agreement; for more information see budget transfers),
  - Be incurred in **connection with the action** and **necessary for its implementation** (according to the Description of the Action of the Grant Agreement),
  - **Be identifiable and verifiable** and recorded in the beneficiary's accounts in accordance with the applicable accounting standards and **usual cost accounting practices**,
  - Comply with the applicable national laws on taxes, labour and social security, and
  - **Be reasonable and justified** and comply with the principle of sound financial management (in particular regarding **economy and efficiency**).

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Ineligible Costs

- **Interest owed**
- **Currency exchange losses**
- **Bank charges for transfers from the EU Commission**
- **Deductible VAT**
  - Please note: Non-deductible VAT is eligible if the beneficiary is not entitled to deduct input tax.
  - Example: Intelligentsia Consultants expert flying from Luxembourg to Tirana to give training …
    - 3% VAT paid on air ticket (recoverable from Luxembourg tax authorities -> not an eligible project cost)
    - 20% VAT paid on hotel bill (non-recoverable from Luxembourg tax authorities -> an eligible project cost)

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3. Budget Planning at the Proposal Stage

Budget Planning at the Proposal Stage: Overview

- **Lump Sum Funding versus Reimbursement of Actual Costs**
- **Guidelines for Allocation of Costs**

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Budget Planning at the Proposal Stage: Lump Sum Funding versus Reimbursement of Actual Costs

- **Lump Sum Funding** versus **Reimbursement of Actual Costs**
  - **Lump sums grants** are defined **per work package** in the grant proposal and fixed in the grant agreement. Funds are triggered upon completion of the activities in work packages. The payment of lump sums follows the usual EC payment schedule (prefinancing, interim, final payment).
  - **Reimbursement grants** are defined according to eligible costs (personnel, travel, equipment, etc.). Funds are triggered upon submission of financial statements showing actual costs (Period 1, Period 2, …). The payment reimbursement grants follows the regular EC payment schedule (prefinancing, interim, final payment).
- **Currently in transition from Reimbursement Grants to Lump Sum Grants in Horizon Europe**
  - e.g. SUSNANO funded under 2021 Twinning WBC call is based on **reimbursement of actual costs.**
  - However, 2023 Twinning calls will be based on **lump sum funding.**

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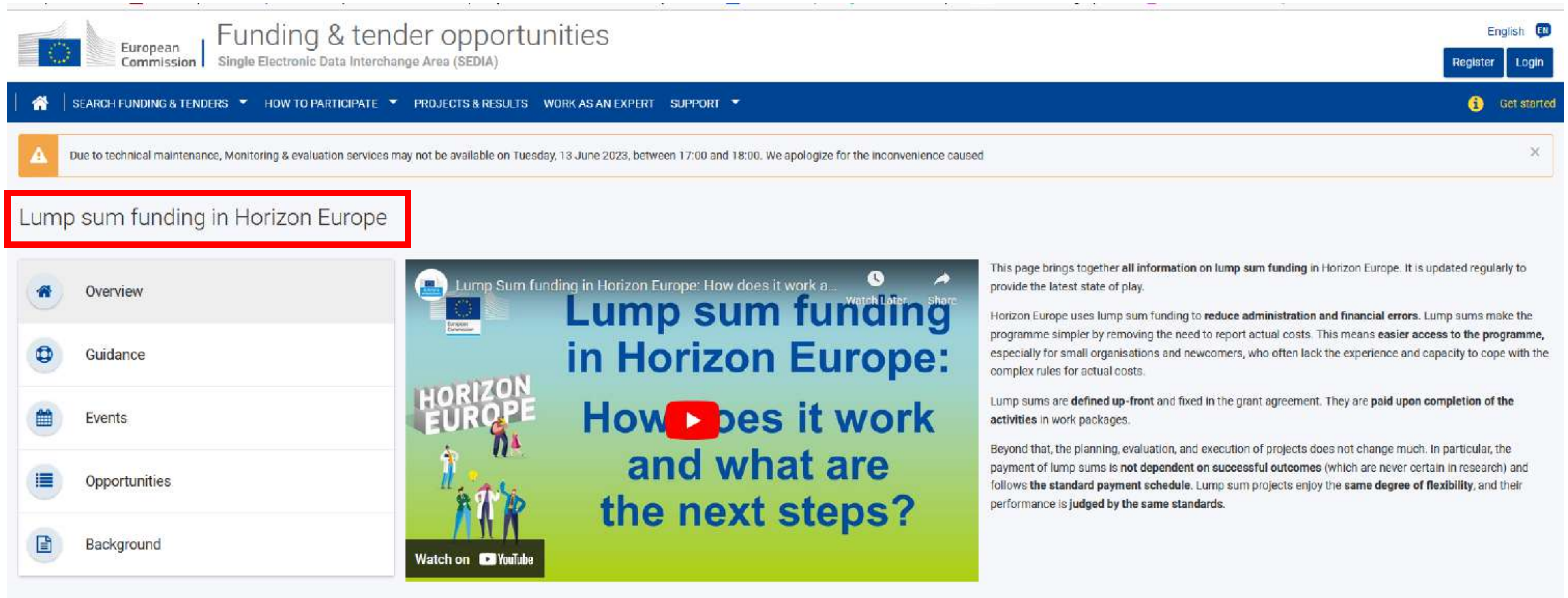
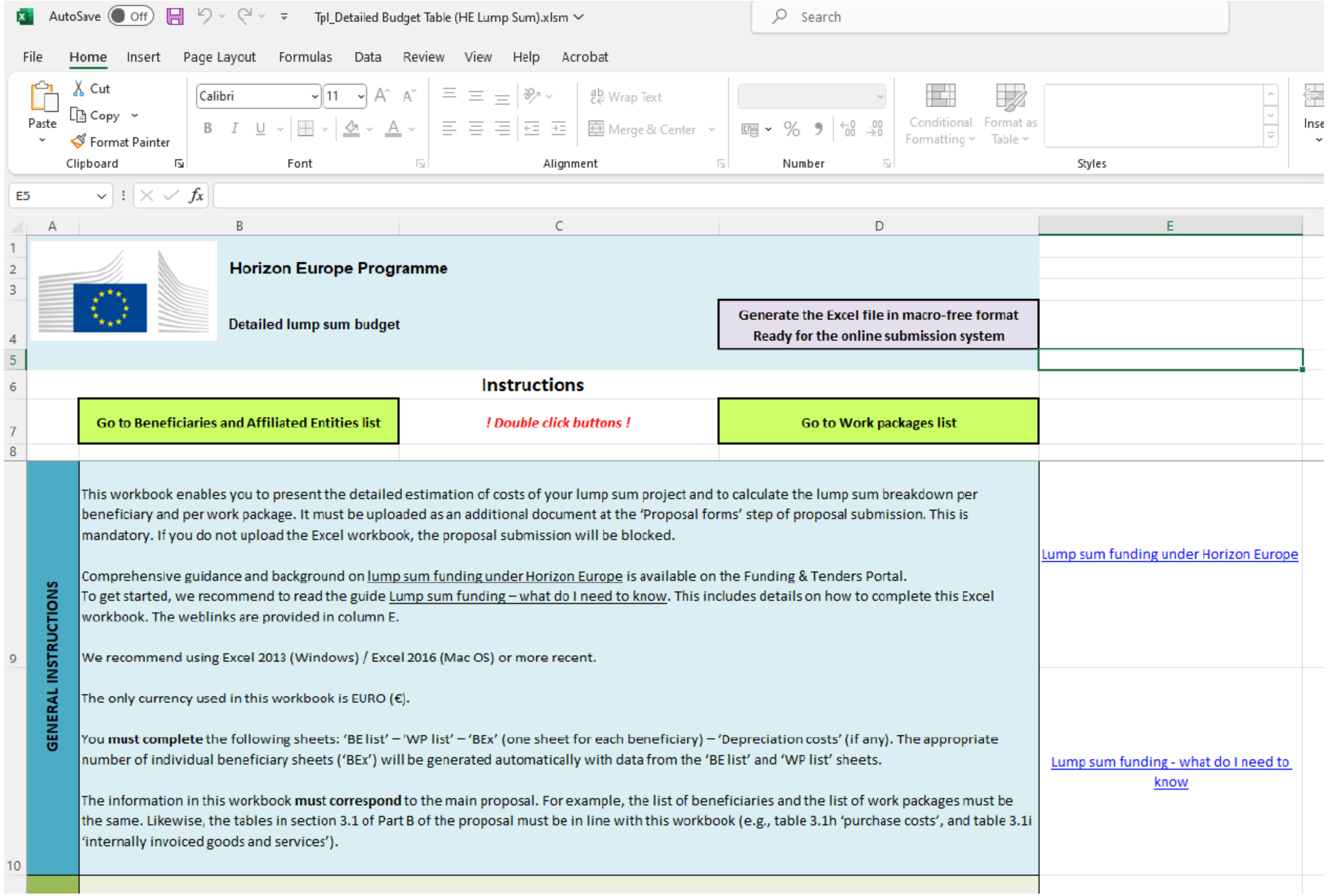
Budget Planning at the Proposal Stage: Lump Sum Funding



- European Commission website where Lump Sum Funding is explained in detail – see QR code.
  - Training Video
  - Training Presentations
  - Useful Excel budget tool

Budget Planning at the Proposal Stage: Lump Sum Funding

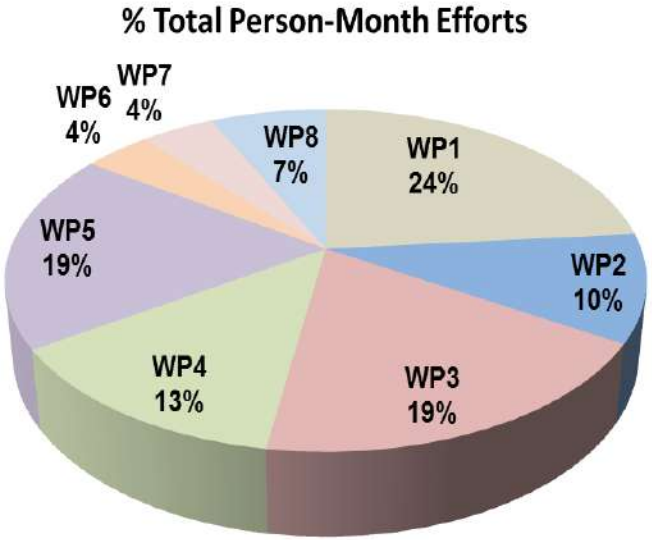
- **European Commission's Lump Sum Funding Excel budget tool (see QR code)**
  - Warning: But make sure to download the Excel budget tool provided for the Horizon Europe call that you are applying to!
- **Completed Lump Sum Funding Excel budget tool must be uploaded with a proposal to the European Commission's portal.**

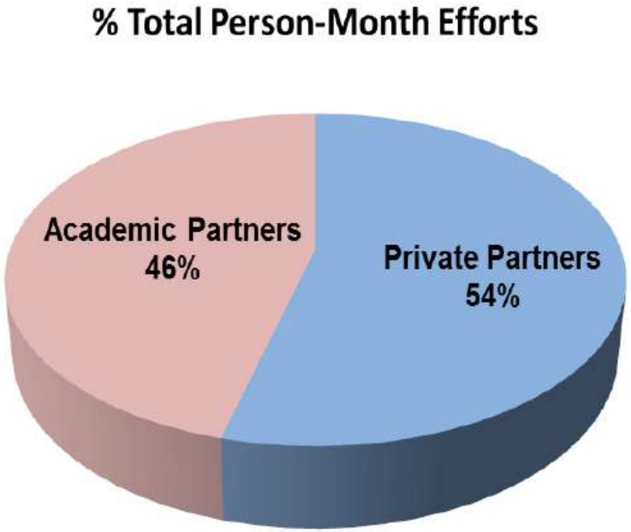


Budget Planning at the Proposal Stage: Guidelines for Allocation of Costs

- WP dedicated to **Project Management**: 5%-7% of total person-months.
- WP dedicated to **Dissemination, Promotion and Exploitation**: <10% of total person-months. Otherwise, explain.
- WPs dedicated to **Research and Innovation activities**: Try to spread the person-months "evenly". Otherwise, explain the WP exceptions.
- **Research and Innovation Action (RIA):** Okay to have majority of person-months allocated to either academic partners or private partners.
- **Innovation Action (IA):** Preferable to have majority of person-months allocated to private partners.

Distribution of efforts (%)





- Concentration of efforts in WPs 1, 2, 3 and 4 reflects the project's strong focus on development of advanced materials, design and modelling tools and is in line with the call's scope.
- Several tasks/efforts (e.g. Task 5.5) in WP5 also directly contribute to WP6.
- Project management efforts (WP8) consistent with typical EU collaborative R&D projects.
- Good balance between efforts for academic partners (IOF and UDUR) and private partners (Merck, MOD and INT) also reflects the general balance between research and innovation tasks.

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Budget Planning at the Proposal Stage: Guidelines for Allocation of Costs

- **Personnel costs:**
  - **Actual costs:** Gross monthly salary + Employer's contributions to social security and pension.
  - **Unit costs:** Used by beneficiaries who calculate average rates for their staff as part of their analytical cost accounting system.
  - **SME owners (who don't receive a salary):** Monthly rate = 5.080€ x country-specific coefficient (e.g. 98.3% for Germany).
- **Subcontracting costs:**
  - Double-check to see if the cost is really a "subcontracting cost" or a "purchase cost".
  - Try to keep total subcontracting costs below 5% total direct costs.
  - Remember to complete Table 3.1g "Subcontracting costs" in the proposal:

Participant Number/Short Name		
	Cost (€)	Description of tasks and justification
Subcontracting		

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Budget Planning at the Proposal Stage: Guidelines for Allocation of Costs

- **Purchase costs:**
  - If **purchase costs > 15% personnel costs**, then need to provide cost breakdown and justifications in Table 3.1h "Purchase costs" in the proposal.

Participant Number/Short Name		
	Cost (€)	Justification
Travel and subsistence		
Equipment		
Other goods, works and services		
Remaining purchase costs (<15% of pers. Costs)		
Total		

  - **Travel and subsistence:** Provide a cost breakdown (Twinning proposals).

1 / UT	Cost (€)	Justification
Travel	143,700	• 24PMs of training exchanges involving approximately 11 different ESRs to ICN2 & UPO for WP3/T3.1 and T3.2 [(€70/day x 30-day trip duration x 24 trips) + (€400/flight x 24 flights) = €60,000]; • 12PMs of exchanges of involving approximately 5 different ERs to ICN2 & UPO for WP2/T2.1 and T2.2 [(€130/day x 15-day trip duration x 24 trips) + (€400/flight x 24 flights) = €56,400]; • Short trips involving approximately 4 different UT administrative staff members to receive EU research training and networking for WP4/T4.4 [(€130/day x 3,75-day trip duration x 12 trips) + (€400/flight x 12 flights) = €10,650];

  - **Equipment:** Can claim **depreciation of equipment**, but not the cost.
  - **Other goods:** Research consumables (itemise), works and services (e.g. catering).

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Budget Planning at the Proposal Stage: Guidelines for Allocation of Costs

- **Other cost categories:**
  - If there are any internally invoiced goods and services, then need to complete Table 3.1i in the proposal.

Participant Number/Short Name		
	Cost (€)	Justification
Internally invoiced goods and services		
...		

4. Record Keeping

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Record Keeping: Personnel Costs

- **Personnel costs:**
  - Keep signed timesheets for each expert.
  - Make sure the signature dates are no later than 1-2 months after the relevant month.
  - Make sure the timesheets fall within the reporting period.
  - Use the timesheet template recommended by the European Commission.
  - **See QR cord to download the timesheet template.**

EU GRANTS DECLARATION OF DAYS WORKED ON A PROJECT *To be filled in and uploaded as deliverable in the Funding & Tenders Portal Grant Management System, at the due date foreseen in the system.*	YEAR:	

Project acronym:		Project number:	
Participant name:			
Name of the person:		Type of personnel: (employee/ natural person under direct contract/ seconded/ other)	

Month	Days worked in the action[1] (e.g.15, 7,5, 0,5)	Work Packages worked on (e.g. WP2; WP5)	Date and signature of the person	Name, date and signature of the supervisor
January			Signature: Date:	Name: Signature: Date:
February			Signature: Date:	Name: Signature: Date:
March			Signature: Date:	Name: Signature: Date:
April			Signature: Date:	Name: Signature: Date:
May			Signature: Date:	Name: Signature: Date:

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Record Keeping

- **Subcontracting costs:**
  - Keep all invoices relating to subcontracting.
  - Make sure the dates on the invoices fall within the reporting period.
  - Remember to remove deductible VAT from the cost claim made to the European Commission.
- **Purchase costs:**
  - Keep all invoices relating to purchasing.
  - Make sure the dates on the invoices fall within the reporting period.
  - Remember to remove deductible VAT from the cost claim made to the European Commission.
- **Other cost categories:**
  - Keep all invoices relating to other cost categories (e.g. internally invoiced products or services).
  - Make sure the dates on the invoices fall within the reporting period.
  - Remember to remove deductible VAT from the cost claim made to the European Commission.

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5. Financial Reporting and Auditing

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Financial Reporting: Overview

- **Financial reporting** needs to be done at the **end of each project period**.
  - Usually, projects have two periods (Period 1 and Period 2) but they can have more periods in the case of projects of longer duration e.g. > 4 years duration.
  - Financial reports (online financial statements) must be submitted by each beneficiary (consortium partner) within 60 days of the end of the project period.
- **Distinction** between **financial reporting** for **Lump Sum Grants** and **Reimbursement Grants**

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Financial Reporting: Lump Sum Funding

- **Financial reporting** involves indicating the work packages that have been completed in an online form on the European Commission’s Funding and Tender portal.
- **Interim payments** reimburse the **eligible lump sum contributions** claimed only for **completed work packages** implemented during the **respective reporting periods**.
- European Commission has said that **financial audits will not be conducted**, because actual costs are not reported in lump sum projects.
  - However, the dedicated Lump Sum Grant Agreement still includes the option of financial audits like any other project under Horizon Europe.
  - Lump sum beneficiaries are required to keep a so-called “adequate” level of records (presented officially in contrast to the ‘Actual costs’ model requirements).

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Financial Reporting: Reimbursement Grants

- **Financial reporting** is done by completing an online form on the European Commission’s Funding and Tender portal.
- **Interim payments** reimburse the **eligible actual costs** claimed during the **respective reporting periods**.

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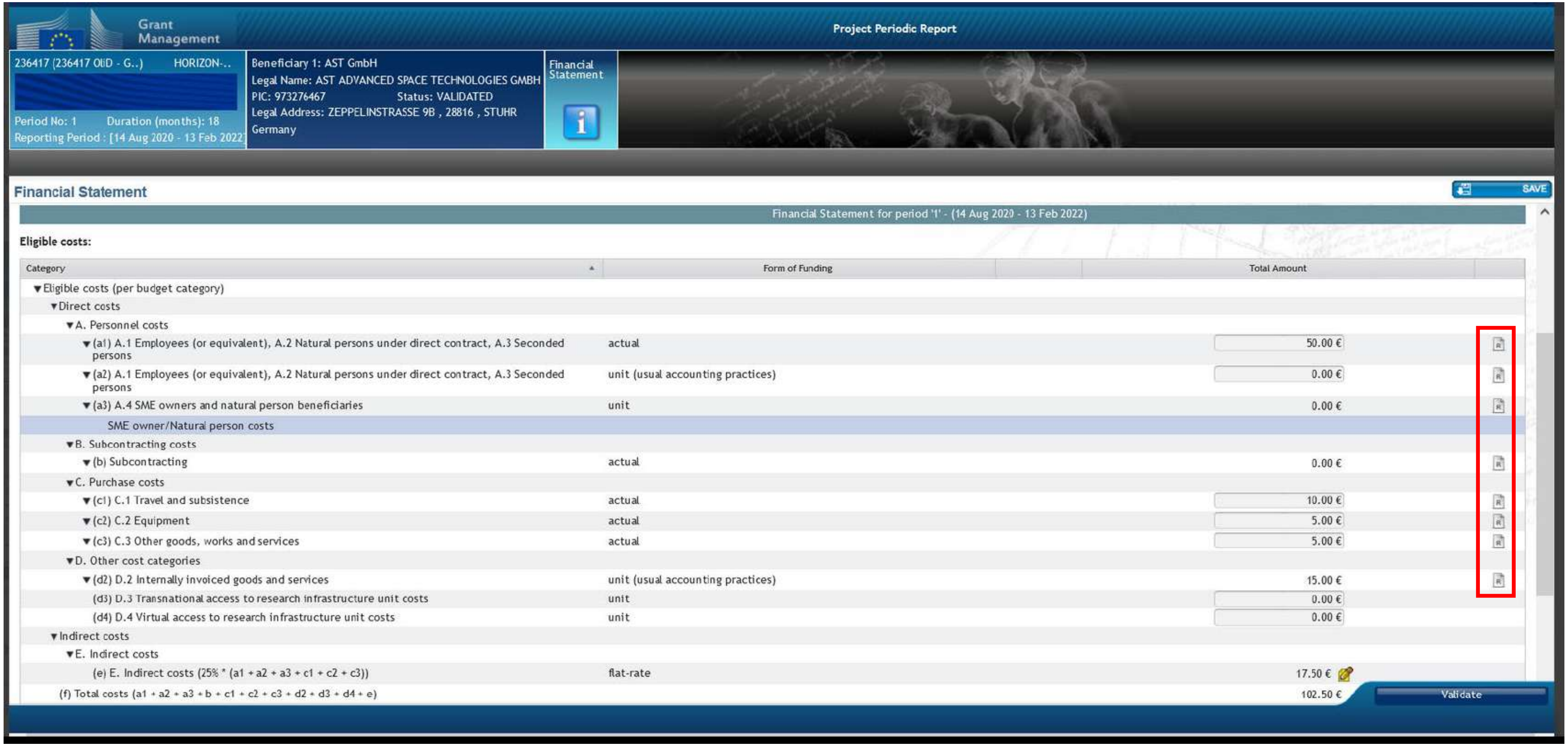
Financial Reporting: Reimbursement Grants (Example Financial Statement)



Grant Management

Project Periodic Report

236417 (236417 OliD - G..) HORIZON-..
Period No: 1 Duration (months): 18
Reporting Period : [14 Aug 2020 - 13 Feb 2022]

Beneficiary 1: AST GmbH
Legal Name: AST ADVANCED SPACE TECHNOLOGIES GMBH
PIC: 973276467 Status: VALIDATED
Legal Address: ZEPPELINSTRASSE 9B , 28816 , STUHR Germany

Financial Statement

Financial Statement

SAVE

Financial Statement for period '1' - (14 Aug 2020 - 13 Feb 2022)

Eligible costs:

Category	Form of Funding	Total Amount
▼Eligible costs (per budget category)		
▼Direct costs		
▼A. Personnel costs		
▼(a1) A.1 Employees (or equivalent), A.2 Natural persons under direct contract, A.3 Seconded persons	actual	50.00 €
▼(a2) A.1 Employees (or equivalent), A.2 Natural persons under direct contract, A.3 Seconded persons	unit (usual accounting practices)	0.00 €
▼(a3) A.4 SME owners and natural person beneficiaries	unit	0.00 €
SME owner/Natural person costs		
▼B. Subcontracting costs		
▼(b) Subcontracting	actual	0.00 €
▼C. Purchase costs		
▼(c1) C.1 Travel and subsistence	actual	10.00 €
▼(c2) C.2 Equipment	actual	5.00 €
▼(c3) C.3 Other goods, works and services	actual	5.00 €
▼D. Other cost categories		
▼(d2) D.2 Internally invoiced goods and services	unit (usual accounting practices)	15.00 €
(d3) D.3 Transnational access to research infrastructure unit costs	unit	0.00 €
(d4) D.4 Virtual access to research infrastructure unit costs	unit	0.00 €
▼Indirect costs		
▼E. Indirect costs		
(e) E. Indirect costs (25% * (a1 + a2 + a3 + c1 + c2 + c3))	flat-rate	17.50 €
(f) Total costs (a1 + a2 + a3 + b + c1 + c2 + c3 + d2 + d3 + d4 + e)		102.50 €

Validate

Important: Remember to complete descriptions of costs where required.

Financial Reporting: Reimbursement Grants (Descriptions of Costs)

- **Personnel costs:**
  - Personnel costs (for each Person) = Daily Rate x Days Worked on the Project
    - Daily Rate = Actual Annual Personnel Costs for the Person / 215
  - How to convert hours into person-months: Hours / 1720 / 12 (i.e. Hours / 143.33)
  - Indicate the person-months booked to each work package during the period e.g. WP1 (8.4 person-months), WP2 (21.3 person-months), etc.
- **Subcontacting costs:** Indicate the name of the contractor, the service provided, the amount of the invoice, the date of the invoice, and reference the section in the Part B (Description of Action, DoA) of the Grant Agreement (GA) where the project would have subcontracting costs.

Financial Reporting: Reimbursement Grants (Descriptions of Costs)

- **Purchase costs:**
  - **Note:** Description only required if total purchase costs > 15% total personnel costs. The description is only required for the amount above the 15% limit. For example, if total purchase costs were 16,000 euro and total personnel costs were 100,000 euro, then description is only required for 1000 euro of purchase costs.
  - **Travel and subsistence costs:** Indicate the names of the expert(s), the destination, the dates of the trip, the purpose of the trip, and reference the work package/task to which the trip relates to.
  - **Equipment costs:** Indicate the name of the supplier, the name of the equipment, the amount of the invoice, the date of the invoice, indicate the amount of the depreciation over the reporting period, and reference the section in the Part B (DoA) of the GA where it is indicated that the project would have equipment costs.
  - **Other goods (e.g. research consumables):** Indicate the name of the supplier, the name of the goods, the amount of the invoice, the date of the invoice, and reference the section in the Part B (DoA) of the GA where the project would have other goods costs.
  - **Works and services (e.g. catering):** Indicate the name of the supplier, the name of the service, the amount of the invoice, and the date of the invoice, and reference the section in the Part B (DoA) of the GA where it is indicated that the project would have works and services costs.
- **Other cost categories (e.g. internally invoiced goods and services):** Indicate the name of the supplier, the service provided, the amount of the invoice, the date of the invoice, and reference the section in the Part B (DoA) of the GA where it is indicated that the project would have other cost categories.

Financial Reporting: Reimbursement Grants (Certificate on the financial statements)

- **Certificate on the financial statements (CFS)** (i.e. audit certificate) is required at the end of the project for each beneficiary whose **total eligible costs (direct costs + indirect costs) > 430k euro.**
  - **CFS** must be issued by a qualified auditor using the **European Commission's template**.
  - Template consists of the "Terms of Reference" (model for the agreement between the beneficiary/affiliated entity and the auditing firm) and the model for the certificate itself. **See QR code to download the template.**
  - Auditor will indicate any irregularities and errors in his/her report. The EU Commission/funding agency is responsible for deciding on the consequences of the errors indicated by the auditor.
  - CFS must be uploaded to the European Commission's Funding and Tender portal.

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Thank You – Any Questions?

SUSNANO

CONTACTS

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www.susnano.eu

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UNIVERSITETI I TIRANËS

ICN2 Institut Català de Nanociència i Nanotecnologia

Palacký University Olomouc

intelligentsia consultants

SUSNANO

Project planning and monitoring (for Horizon Europe projects)

Giles Brandon (Intelligentsia Consultants), Project Management Training, Tuesday 20th June 2023

Agenda

1. **Detailed project plans**
2. **Resource allocation**
3. **Risk management**
4. **Monitoring and evaluation**
5. **Reporting requirements**

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1. Detailed Project Plans

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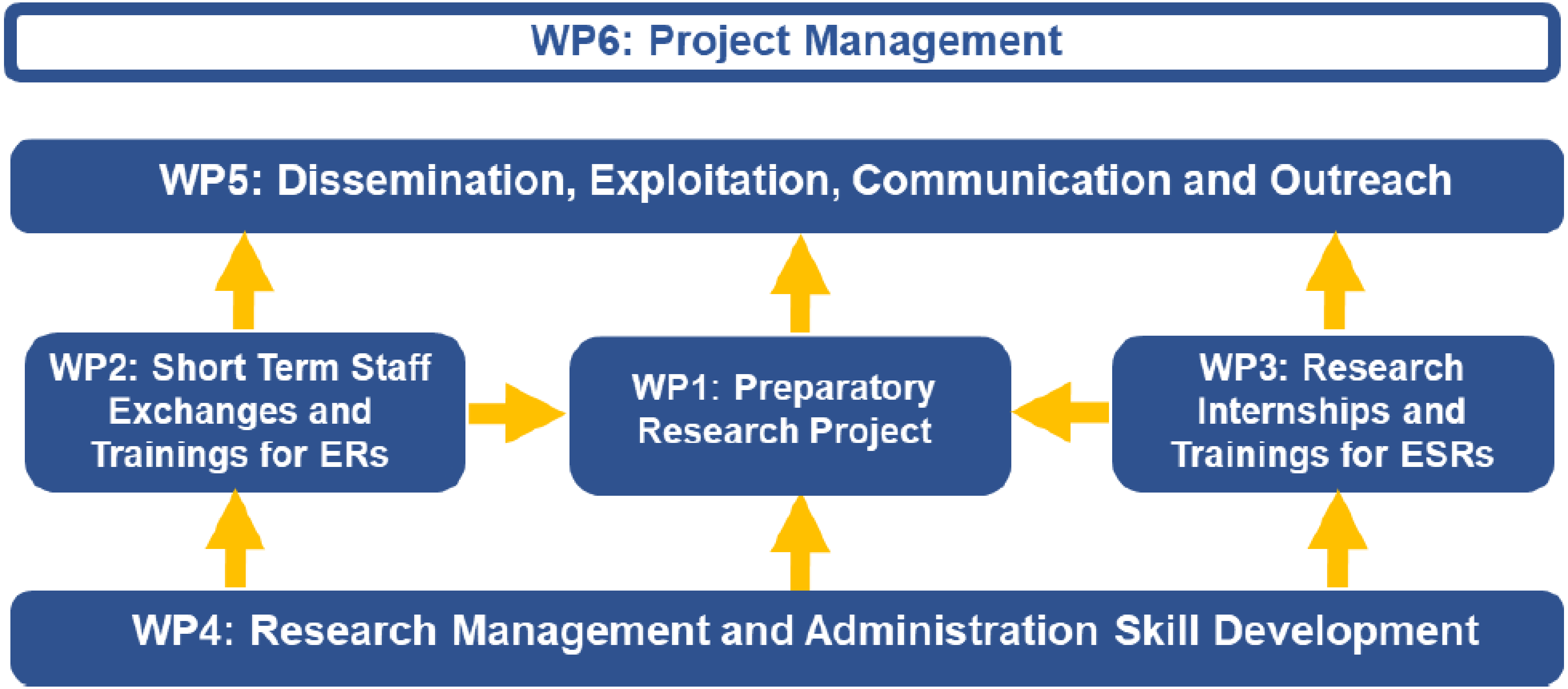
Detailed Project Plans: Work Package Structure



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Detailed Project Plans: Work Package Descriptions (including Task Descriptions)

Work package WP1 – Preparatory Research Project

Work Package Number	WP1	**Lead Beneficiary**	1. UT
Work Package Name	Preparatory Research Project		
Start Month	1	**End Month**	36

Objectives
• Objective 1.1: Investigate Research Sub-Topic A • Objective 1.2: Investigate Research Sub-Topic B • Objective 1.3: Investigate Research Sub-Topic C • Objective 1.4: Conduct field tests with the sustainable nanosensors

Description

Task 1.1: Investigate Research Sub-Topic A: Composite electrodes for sustainable nanosensors (Leader: UT; Support: ICN2 and UPO)
The development of composite electrodes can be done based on bulk modification of the electrode material or surface modification of the electrode. Each method has its advantages and disadvantages and both methods will be evaluated experimentally to develop optimal sensor characteristics.

Bulk modified electrodes: Carbon paste electrodes are easily modifiable. Graphite powder, binder (e.g. paraffin oil, mineral oil) and modifiers (e.g. enzyme, nanomaterials) will be mixed until a homogeneous paste is formed. The ratio between the components will be optimized to prepare compact and stable material. The presence of the modifier in the carbon paste increases the number of electroactive sites, catalysing the electrode reactions and considerably improves the shape of the signals, the sensitivity and the limit of the sensor to detect antibiotics.

Surface modified electrodes: Carbon based nanomaterial (e.g. CNTs), graphene and its derivates and metal-nanoparticles (MN) will be used to modify glassy carbon electrodes to detect different pollutants (e.g. antibiotics). Also, modifications based on the nanohybrid structures resulting from the combination of MN/graphene and MN/CNTs will be explored to obtain sensors with improved analytical performance.

The modified sensors will be tested with electrochemical techniques (cyclic voltammetry, differential pulse voltammetry, etc). In each case, the experimental conditions will be optimized. The analytical performance of the sensors will be initially tested and validated in the laboratory in terms of sensitivity, limit of detection and limit of determination, linear range of analyte concentration, accuracy, reproducibility and selectivity.

Task 1.2: Investigate Research Sub-Topic B: Paper-based substrates with graphene derivatives for sustainable nanosensors (Leader: UPO; Support: UT and ICN2)
The synthesis and subsequent functionalization of new graphene derivatives will be developed primarily on top of

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Detailed Project Plans: List of Deliverables

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Progress report on the design and development of the sustainable nanosensors	WP1	1 - UT	R — Document, report	PU - Public	12
D1.2	Report on laboratory validation of sustainable nanosensors	WP1	1 - UT	R — Document, report	PU - Public	27
D1.3	Report on field test validation of sustainable nanosensors	WP1	1 - UT	R — Document, report	PU - Public	34
D1.4	Environmental assessment report of pollutants in Albania's rivers and lakes	WP1	1 - UT	R — Document, report	PU - Public	36
D2.1	Year 1 report on ER training exchanges	WP2	2 - ICN2	R — Document, report	SEN - Sensitive	12
D2.2	Year 2 report on ER training exchanges	WP2	2 - ICN2	R — Document, report	SEN - Sensitive	24
D2.3	Year 3 report on ER training exchanges	WP2	2 - ICN2	R — Document, report	SEN - Sensitive	36
D3.1	Year 1 report on ESR training exchanges and summer school	WP3	3 - UPO	R — Document, report	SEN - Sensitive	12
D3.2	Year 2 report on ESR training exchanges and summer school	WP3	3 - UPO	R — Document, report	SEN - Sensitive	24
D3.3	Year 3 report on ESR training exchanges and	WP3	3 - UPO	R — Document, report	SEN - Sensitive	36

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Detailed Project Plans: Descriptions of Deliverables

Deliverable – Progress report on the design and development of the sustainable nanosensors

Deliverable Number	D1.1	**Lead Beneficiary**	1. UT
Deliverable Name	Progress report on the design and development of the sustainable nanosensors		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	12	**Work Package No**	WP1

Description
Progress report describing the design and development of the sustainable nanosensors achieved by M12.

Deliverable – Report on laboratory validation of sustainable nanosensors

Deliverable Number	D1.2	**Lead Beneficiary**	1. UT
Deliverable Name	Report on laboratory validation of sustainable nanosensors		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	27	**Work Package No**	WP1

Description
Report describing the laboratory validation of the sustainable nanosensors.

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Detailed Project Plans: Lists of Milestones

Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
1	Project Kick-off	WP6	1-UT	Kick-off meeting, Year 1 activities agreed, minutes issued.	1
2	Launch website	WP5	4-INT	D5.2 Project website and promotional materials	4
3	Year 1 Summer School	WP3	1-UT	D3.1 Year 1 report on ESR training exchanges & summer school	7
4	Nanosensors designed	WP1	1-UT	D1.1 Progress report on design and development of the three nanosensors	12
5	Midterm review with EC	WP6	1-UT	Period 1 milestones completed + Period 1 Management Report	18
6	Year 2 Summer School	WP3	2-ICN2	D3.2 Year 2 report on ESR training exchanges & summer school	19
7	International Conference held	WP5	1-UT	D5.5 Report on Workshops & Conferences during Period 2	24
8	Lab validated nanosensors	WP1	1-UT	D1.2 Report on laboratory validation of the three nanosensors	27
9	Year 3 Summer School	WP3	3-UPO	D3.3 Year 3 report on ESR training exchanges & summer school	31
10	Field validated nanosensors	WP1	1-UT	D1.3 Report on the field test validation of the three nanosensors	34
11	Environmental Assessment Completed	WP1	1-UT	D1.4 Environmental assessment report	36
12	Final review with EC	WP6	1-UT	All milestones completed, all deliverables completed	36

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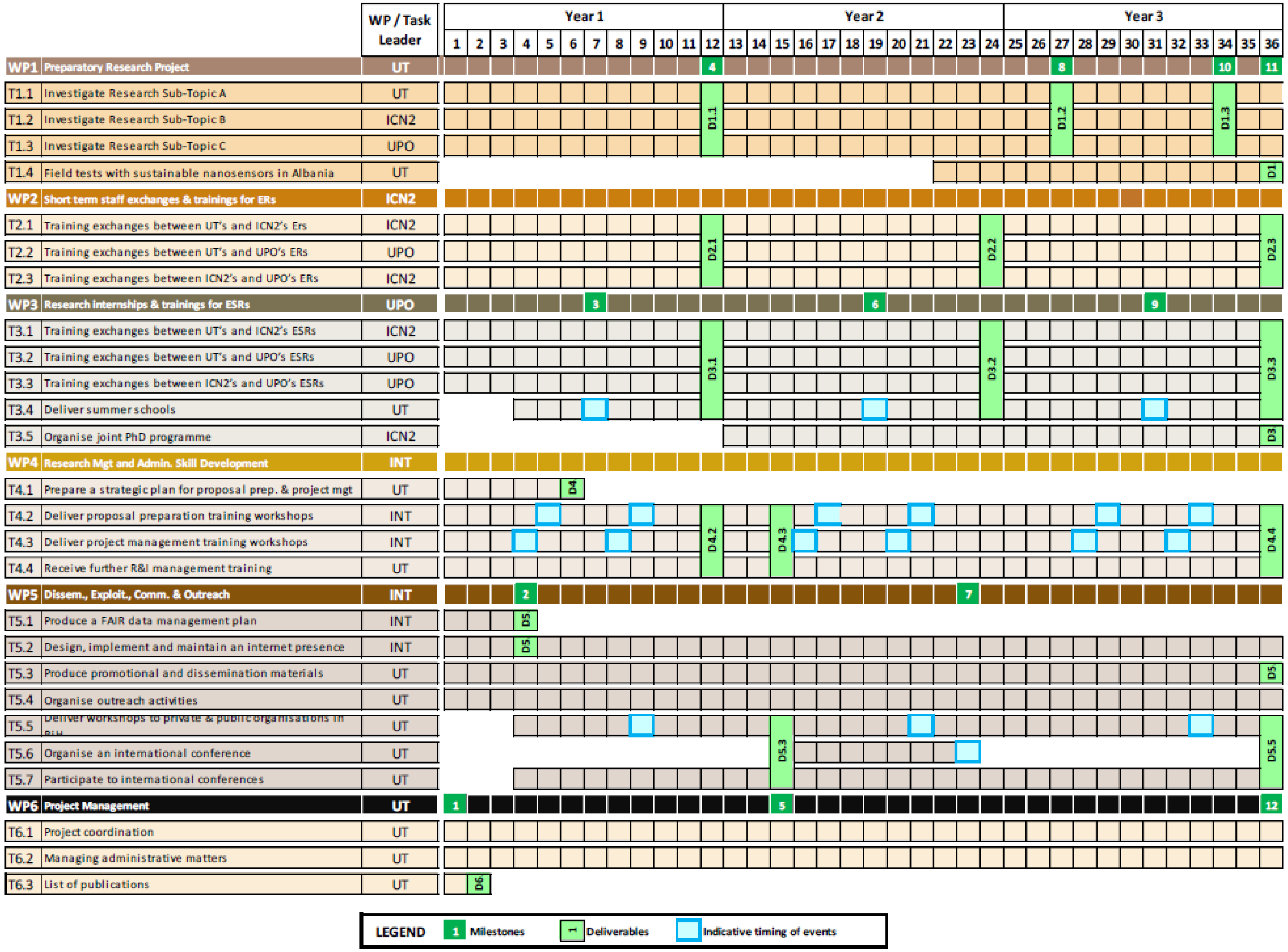
Detailed Project Plans: Gantt Chart showing Work Packages, Deliverables, Milestone

Gantt Chart

The relationships between WPs, tasks, deliverables and milestones are shown in the following **Gantt chart**.



2. Resource Allocation

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Resource Allocation: Estimated Budget for the Action

	Estimated eligible[1] costs (per budget category)										Estimated EU contribution[2]			
	Direct costs								Indirect costs	Total costs	EU contribution to eligible costs			Maximum grant amount[6]
	A. Personnel costs			B. Subcontracting costs	C. Purchase costs			D. Other cost categories	E. Indirect costs[3]		Funding rate %[4]	Maximum EU contribution[5]	Requested EU contribution	
	A.1 Employees (or equivalent) A.2 Natural persons under direct contract A.3 Seconded persons		A.4 SME owners and natural person beneficiaries	B. Subcontracting	C.1 Travel and subsistence	C.2 Equipment	C.3 Other goods, works and services	D.2 Internally invoiced goods and services	E. Indirect costs					
Forms of funding	Actual costs	Unit costs (usual accounting practices)	Unit costs[7]	Actual costs	Actual costs	Actual costs	Actual costs	Unit costs (usual accounting practices)	Flat-rate costs[8]					
	a1	a2	a3	b	c1	c2	c3	d2	e = 0,25 * (a1 + a2 + a3 + c1 + c2 + c3)	f = a + b + c + d + e	U	g = f * U%	h	m
1 - UT	296 000.00	0.00	0.00	0.00	143 700.00	80 000.00	57 000.00	0.00	144 175.00	720 875.00	100	720 875.00	720 875.00	720 875.00
2 - ICN2	205 000.00	0.00	0.00	0.00	60 150.00	0.00	16 500.00	0.00	70 412.00	352 062.00	100	352 062.00	352 062.00	352 062.00
3 - UPO	171 600.00	0.00	0.00	0.00	74 850.00	0.00	15 000.00	0.00	65 362.00	326 812.00	100	326 812.00	326 812.00	326 812.00
4 - INT	66 500.00	0.00	0.00	0.00	12 500.00	0.00	500.00	0.00	19 875.00	99 375.00	100	99 375.00	99 375.00	99 375.00
Σ consortium	739 100.00	0.00	0.00	0.00	291 200.00	80 000.00	89 000.00	0.00	299 824.00	1 499 124.00		1 499 124.00	1 499 124.00	1 499 124.00

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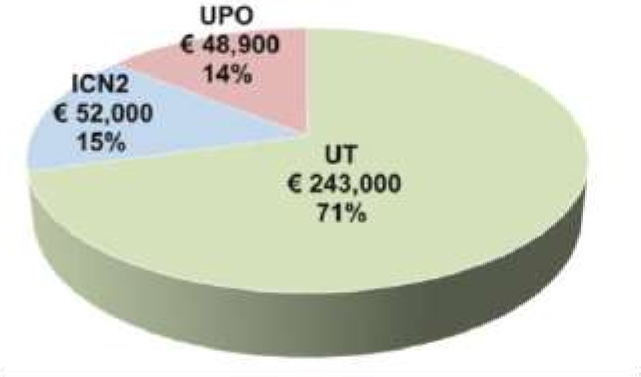
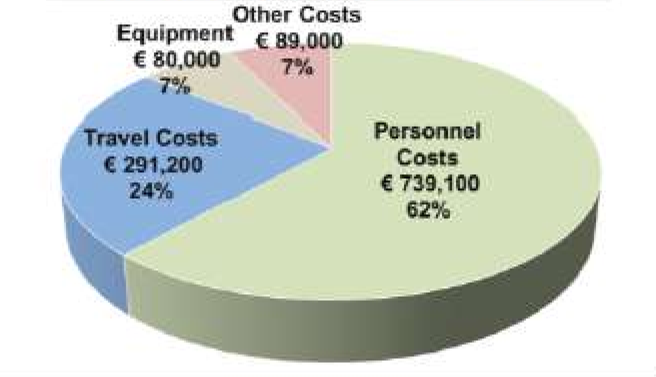
Resource Allocation: Resources to be committed (1 of 3)

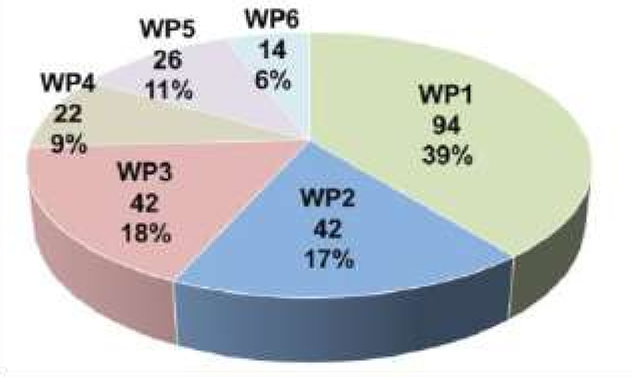
WP1 Budget Distribution (€, %)



Budget Distribution (€, %)



Efforts Distribution (PMs, %)



- WP1 Costs (€343,900, 29%) represent less than 30% of Total Direct Costs (€1,199,300).
- UT's WP1 Costs (€243,000, 71%) represent over 70% of WP1 Costs (€343,900).
- Bulk of costs allocated to Personnel (€739,100, 62%) and Travel (€291,200, 24%) reflective of a Twinning action.
- Equipment Costs (€80,000, 7%) represent less than 10% of Total Direct Costs (€1,199,300).
- Research Capacity Building Efforts (110PMs, 46%): Nearly half of all efforts dedicated to WP2, WP3 and WP5.
- Administrative Capacity Building Efforts (22PMs, 9%): Nearly 10% of all efforts dedicated to WP4.
- Project Management Efforts (14PMs, 6%): Within the typical range for EU projects (5-7%).
- Costs for Travel and costs for Other Goods and Services: see justifications below.

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Resource Allocation: Resources to be committed (2 of 3)

Table 3.1 h: 'Purchase costs' items (travel and subsistence, equipment and other goods, works and services)

1 / UT	Cost (€)	Justification
Travel	143,700	• 24PMs of training exchanges involving approximately 11 different ESRs to ICN2 & UPO for WP3/T3.1 and T3.2 [(€70/day x 30-day trip duration x 24 trips) + (€400/flight x 24 flights) = €60,000]; • 12PMs of exchanges of involving approximately 5 different ERs to ICN2 & UPO for WP2/T2.1 and T2.2 [(€130/day x 15-day trip duration x 24 trips) + (€400/flight x 24 flights) = €56,400]; • Short trips involving approximately 4 different UT administrative staff members to receive EU research training and networking for WP4/T4.4 [(€130/day x 3,75-day trip duration x 12 trips) + (€400/flight x 12 flights) = €10,650]; • Short trips involving approximately 5 different UT researchers to attend international conferences in WP5/T5.7 [(€130/day x 3,75-day trip duration x 12 trips) + (€400/flight x 12 flights) + (€500/conference fee x 12 conferences) = €16,650]; • UT confirms that the travel, accommodation and subsistence costs are correctly identified and are consistent with their usual policy for work trips and with the activities planned (i.e. trips are directly linked to the project).
Equipment	80,000	Small equipment used in WP1: UV-Vis NIR spectrometer (€40,000) to analyse liquid and solid samples plus characterise NMs, powders and thin films used as modifiers in the composite sensors; Autolab PGSTAT302N - High Performance (€30,000) to perform electrochemical measurement tests on sensors; and Semi-automatic screen-printing machine (€10,000) to produce SPEs.
Other Goods and Services	57,000	• Materials used in WP1 including graphite powder, MWCNTs, High viscosity paraffin, Graphene oxide, Metal NPs, Conducting polymers, Enzymes, Penicillin, Pesticides, etc. (€15,000). • Hosting one summer school in WP3 (€8,000); • Hosting one international conference in WP5 (€28,000); • Hosting three industry workshops in WP5 (€3,000); • Promotional materials in WP5 e.g. posters and leaflets (€1,000); • Audit certificate on financial statements in WP6 (€2,000).
Total	**280,700**	

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Resource Allocation: Resources to be committed (3 of 3)

Table 3.1 k: Research component

Have you included a research component in your project?	Y
Please confirm that the research component does not exceed 30% of the total Horizon Europe grant amount	Y
Please confirm that at least 70% of the research component is allocated to the coordinator?	Y
Please indicate the total amount of budget allocated to the research activities?	343,900
Please indicate the amount of the research budget which will go to the coordinator?	243,000
For each Beneficiary, please indicate the amount of budget allocated to research:	
Beneficiary 1 (UT)	243,000
Beneficiary 2 (ICN2)	52,000
Beneficiary 3 (UPO)	48,900
Beneficiary 4 (INT)	-
Please indicate the WP and/or tasks which will be dedicated to research?	WP1

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Resource Allocation: Staff Efforts (Person-Months)

Staff effort per participant

Grant Preparation (Work packages - Effort screen) — Enter the info.

Participant	WP1	WP2	WP3	WP4	WP5	WP6	Total Person-Months
1 - UT	74.00	19.00	19.00	12.00	17.00	7.00	148.00
2 - ICN2	9.00	12.00	12.00	3.00	3.00	2.00	41.00
3 - UPO	11.00	11.00	11.00	4.00	4.00	3.00	44.00
4 - INT				3.00	2.00	2.00	7.00
Total Person-Months	94.00	42.00	42.00	22.00	26.00	14.00	240.00

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3. Risk Management

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Risk Management (1 of 2)

Critical risks & risk management strategy			
Grant Preparation (Critical Risks screen) — Enter the info.			
Risk number	**Description**	**Work Package No(s)**	**Proposed Mitigation Measures**
1	Stability of graphene-based materials. The main challenge is maintaining the stability of graphene-based materials since they are prone to aggregation which results in decreased electrochemical properties.	WP1	We will provide graphene-related materials equipped with different functional groups overcoming such drawbacks.
2	Limit of detection (LOD) of sustainable nanosensors. Development of novel sustainable nanosensors with a low LOD is essential since target analytes often exist only at trace concentrations in real samples.	WP1	We will develop graphene materials exhibiting significantly improved electrical conductivity compared to conventional graphene-based materials, which enable to build ultrasensitive nanosensors with enhanced values of LOD.
3	Suppressing the non-specic adsorption of interfering species. The main drawback related to conventional graphene-based nanosensors is connected with non-specific adsorption of interfering species which results in lower selectivity and sensitivity of developed nanosensors.	WP1	We will prepare graphene-based materials modified with different functional groups which can selectively capture the target analytes.

Risk Management (1 of 2)

nbrangil (EXTERNAL) ?

Grant Management

Project Continuous Report

101059266 (SUSNANO) HORIZON-..

Call: HORIZON-WIDERA-2021-ACCESS-02
Topic: HORIZON-WIDERA-2021-ACCESS-02-01

Project Summary | Researchers involved in the project | Deliverables | Milestones | Critical Risks | Publications | Results | Disseminati... activities | Standards | Patents (IPR) | Communic... Activities | Datasets | Impact | Impact Continuati... | Other Results

Critical Implementation Risks and Mitigation Actions

SAVE

At the end of each period beneficiaries should give the state of play of every risk identified in Annex 1 and if necessary give new mitigation measures.

Foreseen Risks

The following table lists the risks identified in Annex 1. The risk information is read-only and it is provided as a reference for the state of play information.

Risk No	Description	Work Package No(s)	Risk Mitigation Measures	State of the Play Period	State of the Play Did you apply risk mitigation measures?	State of the Play Did your risk materialise?	State of the Play Comments	Actions
1	Stability of graphene-based materials. The main challenge is maintaining the stability c	1	We will provide graphene-related materials equipped with different functional groups					
2	Limit of detection (LOD) of sustainable nanosensors. Development of novel sustainable	1	We will develop graphene materials exhibiting significantly improved electrical conduc					
3	Suppressing the non-specic adsorption of interfering species. The main drawback rel	1	We will prepare graphene-based materials modified with different functional groups w					
4	Stability of sustainable nanosensors. The stability of nanosensors is the main challeng	1	We will provide graphene-related materials equipped with different functional groups					
5	Travel restrictions due to Covid-19 pandemic prevent exchanges of ERs, ESRs and Adm	2, 3, 4 ...	Provide online lecture seminars and training workshops covering design, fabrication, c					

Unforeseen Risks

Add Unforeseen Risk

There are no unforeseen critical risks.

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4. Monitoring and Evaluation

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Monitoring and Evaluation: Are deliverables being submitted on schedule?

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Progress report on the design and development of the sustainable nanosensors	WP1	1 - UT	R — Document, report	PU - Public	12
D1.2	Report on laboratory validation of sustainable nanosensors	WP1	1 - UT	R — Document, report	PU - Public	27
D1.3	Report on field test validation of sustainable nanosensors	WP1	1 - UT	R — Document, report	PU - Public	34
D1.4	Environmental assessment report of pollutants in Albania's rivers and lakes	WP1	1 - UT	R — Document, report	PU - Public	36
D2.1	Year 1 report on ER training exchanges	WP2	2 - ICN2	R — Document, report	SEN - Sensitive	12
D2.2	Year 2 report on ER training exchanges	WP2	2 - ICN2	R — Document, report	SEN - Sensitive	24
D2.3	Year 3 report on ER training exchanges	WP2	2 - ICN2	R — Document, report	SEN - Sensitive	36
D3.1	Year 1 report on ESR training exchanges and summer school	WP3	3 - UPO	R — Document, report	SEN - Sensitive	12
D3.2	Year 2 report on ESR training exchanges and summer school	WP3	3 - UPO	R — Document, report	SEN - Sensitive	24
D3.3	Year 3 report on ESR training exchanges and	WP3	3 - UPO	R — Document, report	SEN - Sensitive	36

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Monitoring and Evaluation: Are KPIs being achieved?

Objective 1: Conduct exploratory research on sustainable nanosensors to detect water pollution in Albania

The objective is to develop innovative sustainable nanosensors to detect heavy metals, pesticides and antiobiotics. The validated sensors will be used in field tests to provide an environmental assessment of rivers and lakes in Albania.

	Key Performance Indicators	Targets
Objective 1 (via WP1)	Sustainable nanosensors for detecting heavy metals	1 set
	Sustainable nanosensors for detecting pesticides	1 set
	Sustainable nanosensors for detecting antibiotics	1 set
	Environmental assessment of antibiotics, heavy metals and pesticides in Albania's rivers and lakes	1
	Joint research papers published in international peer-reviewed journals	9+
	Joint patent applications	2+
	Collaboration agreements between UT and Albanian private companies	3+

Objective 2: Transfer knowledge between experienced researchers (ERs) of UT and the Twinning partners

The objective is to organise short term staff exchanges, trainings and seminars for UT's ER's and the Twinning partners' ERs to complement the preparatory research undertaken in Objective 1.

	Key Performance Indicators		Targets
Objective 2 (via WP2)	UT ▶ ICN2	Total combined duration of exchanges of experienced researchers [PMs]	6
	ICN2 ▶ UT	Total combined duration of exchanges of experienced researchers [PMs]	1.5
	UT ▶ UPO	Total combined duration of exchanges of experienced researchers [PMs]	6
	UPO ▶ UT	Total combined duration of exchanges of experienced researchers [PMs]	3
	ICN2 ▶ UPO	Total combined duration of exchanges of experienced researchers [PMs]	1.5
	UPO ▶ ICN2	Total combined duration of exchanges of experienced researchers [PMs]	3
	Training workshops and seminars during exchanges		15+

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Monitoring and Evaluation: Are the indicators for dissemination and communication being achieved?

Dissemination and Communication Plan				
Project result	**Partners Concerned**	**Dissemination Activity**	**Target audience**	**Indicator & Target**
Project leaflet and poster	UT, ICN2, UPO, INT	Distribute during international conferences (e.g. Graphene Week, IEEE-NANO, etc.), training workshops and outreach events	Scientists, engineers and general public	300+ leaflets distributed, 30+ posters displayed
Press conferences	UT	Press conferences at the start and end of the project	Regional and national news media (radio, TV and print newspapers)	2 conferences, 8+ journalists
Project news	UT, ICN2, UPO, INT	Publish project news releases and distribute through broader scientific news channels	Scientists, engineers and general public	3+ press releases
Project website	UT, ICN2, UPO, INT	Publish project summary, regular news and event updates on website	Scientists, engineers and general public	2500+ visitors
Short project film	UT, ICN2, UPO, INT	Publish project film on Youtube and project website	Scientists, engineers and general public	500+ hits
EU proposal writing training workshops	INT, UT	Training workshops on how to write competitive proposal for EU grant funding schemes.	Administrative staff and scientists	2+/year
EU project mgt training workshops	INT, UT	Training workshops on how to manage EU research projects.	Administrative staff and scientists	2+/year

Monitoring and Evaluation: Are Expected Outcomes being achieved?

Expected Outcomes	WP	Performance Indicators	Target
Outcome 1: Support the "Economic & Investment Plan" and "Innovation Agenda" for WBC by spurring economic recovery, supporting green and digital transition, fostering regional integration & EU convergence.	1, 2, 3, 4 and 5	• Preparatory research project on sustainable nanosensor on water pollution	1
		• Sustainable nanosensors developed to detect different water pollutants	3
		• Rivers and lakes in Albania where sustainable nanosensors are demonstrated	8
		• Joint research papers published in international peer-reviewed journals	9+
		• Joint research papers presented at international conferences	9+
		• SUSNANO workshops for private and public organisations in Albania	3+
		• Info-days and networking sessions attended about EU calls for proposals	5+
		• Joint research proposals submitted for EU funding (e.g. Horizon Europe)	3+
		• Patents submitted by UT researchers involved in SUSNANO	2+
		• Collaboration agreements between UT and Albanian private companies	3+
Outcome 2: Improved excellence capacity and resources in WBC enabling to close the still apparent research and innovation gap within Europe.	1, 2, 3 and 5	• UT experienced researchers trained in Research Sub-Topics A, B and C	5
		• UT early-stage researchers trained in Research Sub-Topics A, B and C	10
		• Summer schools hosted by UT, ICN2 and UPO	3
		• Joint PhD programme	1
		• Joint research papers published in international peer-reviewed journals	9+
		• Joint research papers presented at international conferences	9+
		• Increase in average H-Index of UT researchers involved in SUSNANO	>15%
		• Patents submitted by UT researchers involved in SUSNANO	2+
		• Collaboration agreements between UT and Albanian private companies	3+

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Monitoring and Evaluation: Are costs in line with the budget?

	Estimated eligible[1] costs (per budget category)										Estimated EU contribution[2]			
	Direct costs								Indirect costs	Total costs	EU contribution to eligible costs			Maximum grant amount[6]
	A. Personnel costs			B. Subcontracting costs	C. Purchase costs			D. Other cost categories	E. Indirect costs[3]		Funding rate %[4]	Maximum EU contribution[5]	Requested EU contribution	
	A.1 Employees (or equivalent) A.2 Natural persons under direct contract A.3 Seconded persons		A.4 SME owners and natural person beneficiaries	B. Subcontracting	C.1 Travel and subsistence	C.2 Equipment	C.3 Other goods, works and services	D.2 Internally invoiced goods and services	E. Indirect costs					
Forms of funding	Actual costs	Unit costs (usual accounting practices)	Unit costs[7]	Actual costs	Actual costs	Actual costs	Actual costs	Unit costs (usual accounting practices)	Flat-rate costs[8]					
	a1	a2	a3	b	c1	c2	c3	d2	e = 0,25 * (a1 + a2 + a3 + c1 + c2 + c3)	f = a + b + c + d + e	U	g = f * U%	h	m
1 - UT	296 000.00	0.00	0.00	0.00	143 700.00	80 000.00	57 000.00	0.00	144 175.00	720 875.00	100	720 875.00	720 875.00	720 875.00
2 - ICN2	205 000.00	0.00	0.00	0.00	60 150.00	0.00	16 500.00	0.00	70 412.00	352 062.00	100	352 062.00	352 062.00	352 062.00
3 - UPO	171 600.00	0.00	0.00	0.00	74 850.00	0.00	15 000.00	0.00	65 362.00	326 812.00	100	326 812.00	326 812.00	326 812.00
4 - INT	66 500.00	0.00	0.00	0.00	12 500.00	0.00	500.00	0.00	19 875.00	99 375.00	100	99 375.00	99 375.00	99 375.00
Σ consortium	739 100.00	0.00	0.00	0.00	291 200.00	80 000.00	89 000.00	0.00	299 824.00	1 499 124.00		1 499 124.00	1 499 124.00	1 499 124.00

Funded by the European Union

Monitoring and Evaluation: Period 1 (Midterm Evaluation) and Period 2 (Final Evaluation)

AGENDA		
Time	**Topic**	**Lead**
09:00-09:05	Time for participants to join Zoom meeting	
09:05-09:15	**Welcome Address** Welcome & introduction to the review process	**EC Project Advisor:** Sylvia Osipof
09:15-09:25	Tour de Table	**Project Coordinator:** Dr. Aram Manukyan (IPR-NAS) **Partners involved:** UDE, AUTH, INT
09:25-10:00	**MaNaCa Introduction** Concept / Objectives / WPs / Expected Results / Impact / Achieved Results	**Project Coordinator:** Dr. Aram Manukyan (IPR-NAS)
10:00-10:30	**WP1: Exchange of senior researchers** • Highlights and Challenges • Progress on Tasks, Deliverables and Milestones • Q&A	**WP leader:** Prof. Makis Angelakeris (AUTH) **Partners involved:** IPR-NAS, UDE, INT
10:30-11:00	**WP2: Exchange of early-stage researchers** • Highlights and Challenges • Progress on Tasks, Deliverables and Milestones • Q&A	**WP leader:** Prof. Michael Farle (UDE) **Partners involved:** IPR-NAS, AUTH, INT
11:00-11:20	**WP3: Dissemination and Outreach** • Highlights and Challenges • Progress on Tasks, Deliverables and Milestones • Q&A	**WP leader:** Giles Brandon (INT) **Partners involved:** IPR-NAS, UDE, AUTH
11:20-11:45	**WP4: Project Management & WP5: Ethics requirements** • Highlights and Challenges • Progress on Tasks, Deliverables and Milestones • Q&A	**WP leader:** Dr. Aram Manukyan (IPR-NAS) **Partners involved:** UDE, AUTH, INT
11.45-12.30	**Break to allow EC Project Advisor and Project Reviewer to discuss privately and synthesise their evaluation findings**	
12:30-13:00	General Feedback, Conclusions & Next Steps	**EC Project Advisor:** Sylvia Osipof, **Project Reviewer:** Dr. Dagmar Schneider

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5. Reporting Requirements

Funded by the European Union

SUSNANO

Twinning to boost the scientific and innovation capacity of the Universiteti i Tiranës to develop sustainable nanosensors for water pollution detection

Reporting Requirements: Deliverables

Deliverables, Ethics, DMP, Other Reports

For each Deliverable, a single file (max 52MB) can be uploaded

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Deliverables

WP No	Del Rel. N	Del No	Title	Description	Lead B	Nature	Disseminat	Est. Del. Date	Rev. Due Date	Receipt Date	Approval Date	Status
WP1	D1.1	D6	Year 1 Report on short term excl	A report describing the short term exchanges of...	AUTH	Report	Confiden	30 Sep 2020		30 Sep 2020	09 Jun 2021	Approved
WP1	D1.2	D10	Year 2 Report on short term excl	A report describing the short term exchanges of...	AUTH	Report	Confiden	30 Sep 2021		27 Sep 2021		Submitted
WP1	D1.3	D13	Final Report on short term excha	A report describing the short term exchanges of...	AUTH	Report	Confiden	31 Mar 2023		29 Mar 2023		Submitted
WP2	D2.1	D7	Year 1 Report on short and mediu	A report describing the short term exchanges of...	UDE	Report	Confiden	30 Sep 2020		30 Sep 2020	09 Jun 2021	Approved
WP2	D2.2	D11	Year 2 Report on short and mediu	A report describing the short term exchanges of...	UDE	Report	Confiden	30 Sep 2021		27 Sep 2021		Submitted
WP2	D2.3	D14	Final Report on short and mediun	A report describing the short term exchanges of...	UDE	Report	Confiden	31 Mar 2023		30 Mar 2023		Submitted
WP2	D2.4	D15	Report on organization of a joint	A report describing the outcome of the activiti...	IPR N/	Report	Confiden	31 Mar 2023		17 Apr 2023		Submitted
WP3	D3.1	D2	Data management plan - initial vei	Initial version of the DMP in compliance with t...	INT	ORDP: Op	Confiden	31 Jan 2020		31 Jan 2020	09 Jun 2021	Approved
WP3	D3.2	D3	Project leaflet and poster	A project leaflet and poster will be prepared a...	INT	Websites,	Public	31 Jan 2020		07 Apr 2020	09 Jun 2021	Approved
WP3	D3.3	D4	Project website	A project website will be prepared and made ava...	INT	Websites,	Public	31 Jan 2020		07 Apr 2020	09 Jun 2021	Approved
WP3	D3.4	D9	Data management plan - midterm	Midterm version of the DMP in compliance with t...	INT	ORDP: Op	Confiden	31 Mar 2021		15 Mar 2021		Submitted
WP3	D3.5	D16	Project Newsletter	Project newsletters will be released on a regul...	INT	Report	Public	31 Mar 2023		30 Mar 2023		Submitted
WP3	D3.6	D17	Data management plan - final vers	Final version of he DMP in compliance with the ...	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Submitted
WP4	D4.1	D1	Evolution of the publications in h	One-page statement that Task 4.3 (introduction ...	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	09 Jun 2021	Approved
WP4	D4.2	D8	Year 1 Report on Events (Workshc	A report describing the events (workshops, conf...	IPR N/	Report	Public	30 Sep 2020		12 Jun 2021	14 Jun 2021	Approved

Project newsletters will be released on a regular basis. A report containing all newsletters issued during the course of the project will be provided.

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Reporting Requirements: Milestones

nbrangil (EXTERNAL) ?

Grant Management

Project Continuous Report

857502 (MaNaCa) CSA

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION HORIZON 2020

Call: H2020-WIDESPREAD-2018-2020

Topic: WIDESPREAD-03-2018 Unit: REA/C/03

Summary for publication | Deliverables Ethics, DMP, Other Reports | Milestones | Critical Risks | Publications | Disseminati... and Communic... | Patents (IPR) | SME Impact | Open Data | Gender | ABS Regulation

Milestones

SAVE

Number	Name	Lead Beneficiary	Delivery Date (Annex I)	Achieved	Delivery Date (actual)	Comments
1	Project Kick-off	IPR NAS	31 Oct 2019	☑	04 Oct 2019	Kick-off meeting held at UDE during 4 October 2...
2	Launch Website	INT	31 Jan 2020	☑	07 Apr 2020	Deliverable D3.3 “Project website” submitted 7 ...
3	Year 1 Workshops	AUTH	30 Sep 2020	☑	30 Sep 2020	Deliverable D4.2 “Year 1 Report on Events (Work...
4	Year 1 Established researcher exchang	AUTH	30 Sep 2020	☑	30 Sep 2020	Deliverable D1.1 “Year 1 Report on short term e...
5	Year 1 Summer school	UDE	30 Sep 2020	☑	30 Sep 2020	Deliverable D4.2 “Year 1 Report on Events (Work...
6	Year 1 Early stage researcher exchang	UDE	30 Sep 2020	☑	30 Sep 2020	Deliverable D2.1 “Year 1 Report on short- and m...
7	Midterm scientific and technical revie	IPR NAS	31 Dec 2020	☑	12 May 2021	EC reviewer's report
8	Year 2 Workshops	AUTH	30 Sep 2021	☑	27 Sep 2021	Deliverable D4.3 “Year 2 Report on Events (Work...
9	Year 2 Established researcher exchang	AUTH	30 Sep 2021	☑	27 Sep 2021	Deliverable D1.2 “Year 2 Report on short term e...
10	Year 2 Summer school	UDE	30 Sep 2021	☑	27 Sep 2021	Deliverable D4.3 “Year 2 Report on Events (Work...
11	Year 2 Early stage researcher exchang	UDE	30 Sep 2021	☑	27 Sep 2021	Deliverable D2.2 “Year 2 Report on short- and m...
12	International Conference “Magnetic n	IPR NAS	31 Dec 2022	☑	[illegible]	Deliverable D4.4 “Final Report on Events (Works...

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Reporting Requirements: Critical Risks

nbrangil (EXTERNAL) ?

Grant Management

Project Continuous Report

101059266 (SUSNANO) HORIZON-..

Call: HORIZON-WIDERA-2021-ACCESS-02

Topic: HORIZON-WIDERA-2021-ACCESS-02-01

Project Summary	Researchers involved in the project	Deliverables	Milestones	Critical Risks	Publications	Results	Disseminati... activities	Standards	Patents (IPR)	Communic... Activities	Datasets	Impact	Impact Continuati...	Other Results

Critical Implementation Risks and Mitigation Actions

SAVE

At the end of each period beneficiaries should give the state of play of every risk identified in Annex 1 and if necessary give new mitigation measures.

Foreseen Risks

The following table lists the risks identified in Annex 1. The risk information is read-only and it is provided as a reference for the state of play information.

Risk No	Description	Work Package No(s)	Risk Mitigation Measures	State of the Play Period	State of the Play Did you apply risk mitigation measures?	State of the Play Did your risk materialise?	State of the Play Comments	Actions
1	Stability of graphene-based materials. The main challenge is maintaining the stability c	1	We will provide graphene-related materials equipped with different functional groups					
2	Limit of detection (LOD) of sustainable nanosensors. Development of novel sustainable	1	We will develop graphene materials exhibiting significantly improved electrical conduc					
3	Suppressing the non-specic adsorption of interfering species. The main drawback relı	1	We will prepare graphene-based materials modified with different functional groups w					
4	Stability of sustainable nanosensors. The stability of nanosensors is the main challeng	1	We will provide graphene-related materials equipped with different functional groups					
5	Travel restrictions due to Covid-19 pandemic prevent exchanges of ERs, ESRs and Adm	2, 3, 4 ...	Provide online lecture seminars and training workshops covering design, fabrication, c					

Unforeseen Risks

Add Unforeseen Risk

There are no unforeseen critical risks.

Reporting Requirements: Publications

nbrangil (EXTERNAL) ?

Grant Management

Project Continuous Report

857502 (MaNaCa) CSA

HORIZON 2020

Call: H2020-WIDESPREAD-2018-2020

Topic: WIDESPREAD-03-2018 Unit: REA/C/03

Summary for publication | Deliverables Ethics, DMP, Other Reports | Milestones | Critical Risks | Publications | Disseminati... and Communic... | Patents (IPR) | SME Impact | Open Data | Gender | ABS Regulation

Publications

SAVE

☐ This project does not currently have any scientific publication

Suggested publications from OpenAIRE (9 publications)

No.	Type	Title	Authors	Title of the Journal/Proc./Book	Date of Acceptance	DOI	Repository Link	Actions
1	Article in Journ	Structure and Magnetism of Few-Layer Nanographene Clusters in Carbon Mic	Aram Manukyan; Harutyun Gyulasaryan; Armen	Crossref	04/01/2022	10.1021/acs.jpcc.1c06748		×
2	Article in Journ	Toward the Separation of Different Heating Mechanisms in Magnetic Particle	Eirini Myrovali; Kyrillos Papadopoulos; Georgia	Crossref	30/03/2023	10.1021/acsomega.2c05962		×
3	Article in Journ	Structural and magnetic properties of carbon-encapsulated Fe/Fe3C nanopar	E. Papadopoulou; N. Tetos; H. Gyulasaryan; G.			10.5281/zenodo.7913892		×
4	Article in Journ	Control of multiferroic features in BiFeO3 nanoparticles by facile synthetic p	Kyrillos Papadopoulos; Eirini Myrovali; Lamprini			10.5281/zenodo.7913983		×
5	Article in Journ	Journal of Magnetism and Magnetic Materials	H. Gyulasaryan; L. Avakyan; A. Emelyanov; N. Si			10.5281/zenodo.7913835		×

Project publications (16 publications)

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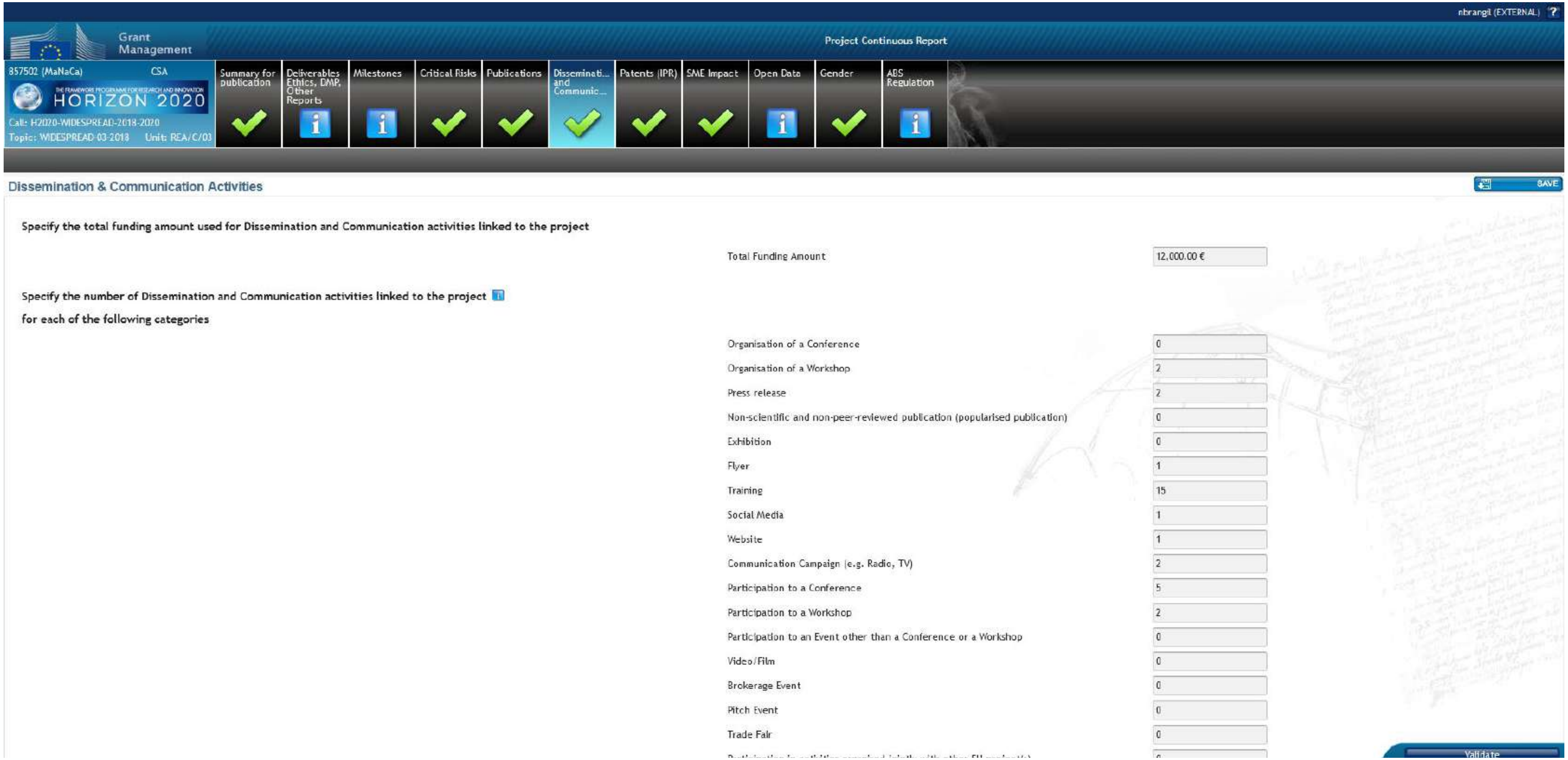
Publications Manually add publication

No.	Type	Title	Authors	Title of the Journal/Proc./Book	Number, date or freq. of the Journal/Proc./Book	Is Peer-reviewed?	Is Open Access?	DOI	Repository Link	Actions
1	Article in Jou	Ferromagnetism and giant paramagnetism of copper nanoparticles in	A. Manukyan, H. Gyulasaryan, A. Kocharia	Journal of Magnetism and Magnetic Materials	488	Yes	Green	10.1016/j.jmmm.2019.165336		×
2	Article in Jou	Structure and size dependence of the magnetic properties of Ni@C r	A. Manukyan, A. Elsukova, A. Mirzakhanyai	Journal of Magnetism and Magnetic Materials	467	Yes	Green	10.1016/j.jmmm.2018.07.056		×
3	Article in Jou	Ferromagnetism and Giant Paramagnetism of Copper Nanoparticles in	Armen Kocharian, Harutyun Gyulasaryan,	IEEE Transactions on Magnetics	55/2	Yes	Green	10.1109/tmag.2018.2862413		×
4	Article in Jou	Formation of nickel nanoparticles and magnetic matrix in nickel phth	Aram S. Manukyan, Leon A. Avakyan, Anna	Materials Chemistry and Physics	214	Yes	Green	10.1016/j.matchemphys.2018.04.068		×
5	Article in Jou	Formation of nickel magnetic nanoparticles and modification of nicke	N. A. Kolpacheva, M. V. Avramenko, L. A.	Technical Physics	62/10	Yes	Green	10.1134/s1063784217100152		×
6	Article in Jou	FMR and EPR in Ni@C nanocomposites: Size and concentration effect	E. G. Sharoyan, A. A. Mirzakhanyan, H. T.	Journal of Contemporary Physics (Armenian Academy of	52/2	Yes	Green	10.3103/s1068337217020086		×
7	Article in Jou	Synthesis and investigation of the structure of nanocomposites basec	N. A. Kolpacheva, L. A. Avakyan, A. S. Man	Physics of the Solid State	58/5	Yes	Green	10.1134/s1063783416050103		×
8	Article in Jou	Structural, dielectric, and Mossbauer studies of multiferroic (1-x)PbF	S. I. Raevskaya, S. P. Kubrin, A. V. Pushkar	Ferroelectrics	509/1	Yes	Green	10.1080/00150193.2017.1292596		×
9	Article in Jou	Characterization of zinc and zinc cyanide nanoparticles in carbon ma	A. A. Mirzakhanyan, A. S. Manukyan, H. T.	Journal of Contemporary Physics (Armenian Academy of	51/2	Yes	Green	10.3103/s1068337216020134		×
10	Article in Jou	Ferromagnetism of Nanographite Structures in Carbon Microspheres	Eduard Sharoyan, Armen Mirzakhanyan, H	IEEE Transactions on Magnetics	52/7	Yes	Green	10.1109/tmag.2016.2527792		×

Reporting Requirements: Dissemination and Communication



Dissemination & Communication Activities

Specify the total funding amount used for Dissemination and Communication activities linked to the project

Total Funding Amount	12,000.00 €

Specify the number of Dissemination and Communication activities linked to the project for each of the following categories

Organisation of a Conference	0
Organisation of a Workshop	2
Press release	2
Non-scientific and non-peer-reviewed publication (popularised publication)	0
Exhibition	0
Flyer	1
Training	15
Social Media	1
Website	1
Communication Campaign (e.g. Radio, TV)	2
Participation to a Conference	5
Participation to a Workshop	2
Participation to an Event other than a Conference or a Workshop	0
Video/Film	0
Brokerage Event	0
Pitch Event	0
Trade Fair	0

Funded by the European Union

Reporting Requirements: Patents

nbrangil (EXTERNAL) ?

Grant Management

Project Continuous Report

641725 (PHEBE) RIA

HORIZON 2020

Call: H2020-ICT-2014

Topic: ICT-29-2014 Unit: CNECT/A/03

Summary for publication | Deliverables Ethics, DMP, Other Reports | Milestones | Critical Risks | Publications | Disseminati... and Communic... | Patents (IPR) | Innovation | SME Impact | Open Data | Gender | ABS Regulation

Patents (IPR)

SAVE

☐ This project does not have any Registered Intellectual Property Right yet

Important! If a filed application is rejected by the IPR authority during the course of the EU funded action (the project's duration) then you must remove the concerned item from the IPR list

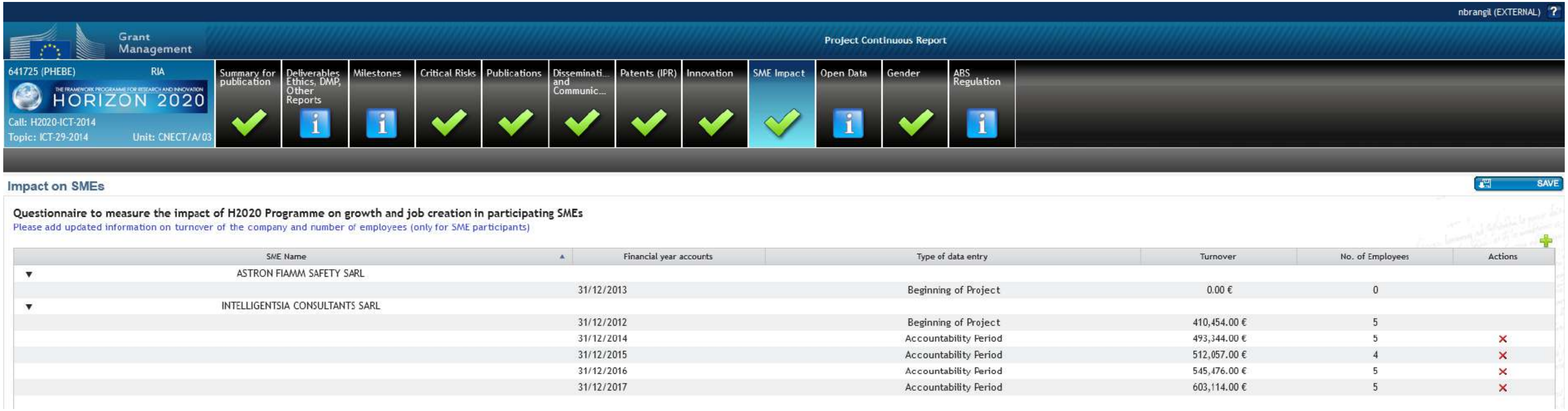
Add IPR

Type of IP Right	Official Title of the Application	Applicants	Application Reference	Date of the Application	IPR Protection Awarded	Award Publication Number	Actions
Patent	Blaue Fluoreszenzemitter ("Blue 1")	TECHNISCHE UNIVERSITAET DRESDEN	DE102015101767A1	06/02/2015	Not applicable	-	✕
Patent	Neue Emittermaterialien und Matrixmaterialien für optoelektronische und elektronische Bauelement	TECHNISCHE UNIVERSITAET DRESDEN	DE102015122869A1	28/12/2015	Not applicable	-	✕
Patent	Effiziente lichtemittierende Emittermoleküle für optoelektronische Anwendungen durch gezielte Ver	TECHNISCHE UNIVERSITAET DRESDEN	DE102016110970A1	15/06/2016	Not applicable	-	✕

SUSNANO

Twinning to boost the scientific and innovation capacity of the Universiteti i Tiranës to develop sustainable nanosensors for water pollution detection

Reporting Requirements: SME Impact


nbrangil (EXTERNAL)

Grant Management

Project Continuous Report

641725 (PHEBE) RIA

HORIZON 2020

Call: H2020-ICT-2014

Topic: ICT-29-2014 Unit: CNECT/A/03

Summary for publication | Deliverables Ethics, DMP, Other Reports | Milestones | Critical Risks | Publications | Disseminati... and Communic... | Patents (IPR) | Innovation | SME Impact | Open Data | Gender | ABS Regulation

Impact on SMEs

SAVE

Questionnaire to measure the impact of H2020 Programme on growth and job creation in participating SMEs

Please add updated information on turnover of the company and number of employees (only for SME participants)

SME Name	Financial year accounts	Type of data entry	Turnover	No. of Employees	Actions
ASTRON FIAMM SAFETY SARL					
	31/12/2013	Beginning of Project	0.00 €	0	
INTELLIGENTSIA CONSULTANTS SARL					
	31/12/2012	Beginning of Project	410,454.00 €	5	
	31/12/2014	Accountability Period	493,344.00 €	5	✕
	31/12/2015	Accountability Period	512,057.00 €	4	✕
	31/12/2016	Accountability Period	545,476.00 €	5	✕
	31/12/2017	Accountability Period	603,114.00 €	5	✕

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Reporting Requirements: Period 1 and Period 2 Management Reports

Project Number: 857502

Project Acronym: MaNaCa

Project title: Magnetic Nanohybrids for Cancer Therapy

Periodic Technical Report

Part B

Period covered by the report: from 01/01/2021 to 31/03/2023

Periodic report: 2nd

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Thank You – Any Questions?

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