THE EU RESEARCH AND INNOVATION PROGRAMME (2021-27)

Destination 4
Objective "European Innovation Leadership in Photonics"

European Commission

Calls "Digital & Emerging Technologies for Competitiveness and Fit for the Green Deal"

European Innovation Leadership in Photonics

- HORIZON-CL4-2024-DIGITAL-EMERGING-01-54: Smart photonics for joint communication & sensing and access everywhere (Photonics Partnership) (RIA)
- HORIZON-CL4-2024-DIGITAL-EMERGING-01-55: Photonics Innovation Factory for Europe (Photonics Partnership) (IA)

European Commission

HORIZON-CL4-2024-DIGITAL-EMERGING-01-54:
Smart photonics for joint communication & sensing and access everywhere

What we are looking for:

Scope

Address at least one of the two:

- **Light-based solutions to let the communication network sense, while transporting data, for example**
  - To enhance the security and resilience of the network
  - To make network resources more energy efficient
  - To warn and protect against natural disasters, earthquakes etc.
  - To monitor the infrastructure where the fibre is deployed (traffic, stress in bridges…)

- **Light-based solutions to bring internet everywhere, with the most relevant access technologies**
  - Fiber to the home, fiber to the antenna or fiber to the sky (satellite), for example with coherent passive optical networks, free space optics, Lifi or optical beamforming and steering
  - while enabling the integration of all access technologies in one system

European Commission

HORIZON-CL4-2024-DIGITAL-EMERGING-01-54:
Smart photonics for joint communication & sensing and access everywhere

Budget and TRL

PROJECTS

- **RIA**

- EU contribution/project: **3-5 million Euro**

- Implementing the European **Partnership in Photonics**

BUDGET

- **18 million Euro**

- Call in **2024**

TRL (TECHNOLOGY READINESS LEVEL)

- **From 2 to 5** by the end of the project

European Commission

HORIZON-CL4-2024-DIGITAL-EMERGING-01-54:
Smart photonics for joint communication & sensing and access everywhere

Why are we are looking for that ?

Expected Outcomes:

Contribution to:

- Sensors/probes to monitor the quality of the communication network and of photonic signals transported in the communication network

- Methods to use the network as large-scale distributed sensor

- Development of foundational optical technologies, systems and networks that provide the future access infrastructure

European Commission

HORIZON-CL4-2024-DIGITAL-EMERGING-01-54:
Smart photonics for joint communication & sensing and access everywhere

Background

Photonics21 Strategic Research and Innovation Agenda 2023-2030

Is this new or has it been called before?

Implements the European Partnership in Photonics

European Commission

Photonics Innovation Factory for Europe
HORIZON-CL4-2024-DIGITAL-EMERGING-01-55

PROJECTS

- **IA**
- EU contribution/project: **up to 15 million Euro**
- Implementing the European Partnership in **Photonics**

BUDGET

- **15 million Euro**
- Call in **2024**

TRL (TECHNOLOGY READINESS LEVEL)

- **From 2-5 to 4-7** by the end of the project

European Commission

Expected Outcome   CL4-DigEm-01-55 **Photonics Innovation Factory**

- Substantially improved penetration of core photonics technologies into multiple end-user application domains and industry sectors

- Substantial contribution to the creation of a sustainable streamlined ecosystem for photonics innovation in Europe from TRL 2-7, providing European Cross-Border Added Value with a high leveraging effect on investments made at national and regional level in photonics.

European Commission

Scope 1   CL4-DigEm-01-55 **Photonics Innovation Factory**

Provide a virtual innovation platform with a flexible and open structure

- allowing for a multiplicity of competitive actors and services

- operating as a sustainable fully integrated European ecosystem

- lowering the entry threshold to the use of photonics

- facilitating its broad uptake and integration in new products and processes

European Commission

Scope 2

CL4-DigEm-01-55 **Photonics Innovation Factory**

- **Platform should offer a streamlined virtual access to a supply chain of photonic technologies**

- **Support through a network of competence centers acting as a single consortium**

- **Platform should target primarily first users and early adopters**

- **Create innovation pathways from initial concept through to production**

- **Support cases should be innovative and industrially relevant.**

    - Depending on the specific need they may start at TRLs from 2 to 5

    - They should increase the TRL by at least two levels

Scope 3

CL4-DigEm-01-55 **Photonics Innovation Factory**

- **The action should provide strong linkages with established European industry and investment networks in the photonics area**

- **The action should address innovation-readiness support in the form of Demonstration Centers and Experience Centers**

    - to help prepare business cases

    - to offer additional supports such as technology, business, investment, and intellectual property coaching

- **The action should develop plans to sustain its activities beyond the end of the project**

CL4-DigEm-01-55 **Photonics Innovation Factory**

❑ What does the EC <u>NOT</u> want?

- Geographic concentration of activities in one region
- Activities without connection to use in industry

❑ Is this new or has it been called before?

- The call is about an innovation hub operating in the photonics area.
- There have been predecessors starting in Horizon2020 (the ACTPHAST projects)

Photonics Innovation Factory **– Key actors and Background**

❑ The main stakeholders are universities and RTOs able to provide building blocks of photonic technology

❑ The activity is driven by the Photonics partnership

❑ Background: Photonics21 Strategic Research and Innovation Agenda 2023-2030

Future Outlook

- The Photonics Partnership cooperates with the Chips Joint Undertaking to facilitate activities on photonic chips

- The partnership also plans to cooperate with the virtual worlds initiative

THE EU RESEARCH AND INNOVATION PROGRAMME (2021-27)

Destination 4
Objective "AI, Data and Robotics"

HORIZON-CL4-2024-DIGITAL-EMERGING-01-03: Novel paradigms and approaches, towards **AI-powered robots**– step change in functionality (AI, data and robotics partnership) (RIA)

We are looking for:

- Substantial next step in the ability of robots to perform non-repetitive functional tasks in realistic settings (e.g. guidance, navigation, manipulation, interaction, etc.), demonstrated in key high impact sectors to deliver significant economic and/or societal benefits.
- Step change in the enabling conditions for the diffusion of robots in various industries, sectors and services.
- Major advances in science and technology to maintain Europe's scientific excellence in robotics.
- TRL 2~3 -> TRL 4~5
- Project size ~8M€   (indicative budget 30M€)

HORIZON-CL4-2024-DIGITAL-EMERGING-01-03: Novel paradigms and approaches, towards AI-powered robots – step change in functionality (AI, data and robotics partnership) (RIA)

We do <u>NOT</u> want:

- Proposals with limited ambition on AI-powered robotics delivering only incremental progress over the state of the art.
- Non-realistic settings disconnected from actual needs of key industries, sectors and services (end-users involvement is key)
- Focus on low impact sectors with little potential to deliver economic or societal benefits.

- *DO NOT DEVIATE FROM ADMIN/FORMAL requirements: e.g. transfer of essential information to annexes to overcome page limits, font size and formatting imposed by the templates…*

HORIZON-CL4-2024-DIGITAL-EMERGING-01-03 – topic evolution

The main focus of this topic is new, but it has close relationship with some topics of the work-programmes 2021-2022 and 2023-2024:

- HORIZON-CL4-2021-DIGITAL-EMERGING-01-11
  Pushing de limit of robotic cognition (RIA)

- HORIZON-CL4-2021-DIGITAL-EMERGING-01-12
  European Network of Excellence Centres in Robotics (RIA)

- HORIZON-CL4-2022-DIGITAL-EMERGING-02-06
  Pushing de limits of physical intelligence and performance (RIA)

- HORIZON-CL4-2023-DIGITAL-EMERGING-01-01
  Novel paradigms and approaches, towards AI-driven autonomous robots (AI, data and robotics partnership) (RIA)

This topic is complemented by the topic:

- HORIZON-CL4-2024-DIGITAL-EMERGING-01-04
  Industrial leadership in AI, Data and Robotics boosting competitiveness and the green transition (AI Data and Robotics Partnership) (IA)

HORIZON-CL4-2024-DIGITAL-EMERGING-01-03 – topic evolution

Project portfolio of RIAs in robotics (HE 2022 & 2023)

101119774	SPEAR
101120408	S.W.A.G.
101120727	PRIMI
101120823	MANiBOT
101136067	INVERSE
101135082	IRE
101135959	ARISE
101133807	ROBOSAPIENS

HORIZON-CL4-2023-DIGITAL-EMERGING-01-03 - Key actors

Types of stakeholders that are addressed:

- Academy and research organizations
- Robot system manufacturers and integrators
- End users
  - Pay attention to requirements on multidisciplinarity + SSH (if human interaction)

Key group of actors driving this:

- AI, Data and Robotics Partnership
  https://adr-association.eu/

NCPs are invited to encourage all their stakeholders to become members of the ADRA Association, take an active role in shaping the strategy, and benefit from the networking opportunities.

Future Outlook

The AI, Data and Robotics Partnership is driving the future outlook in this area

https://adr-association.eu/

Events / information days

Horizon Europe info day – cluster 4

11 & 12 October 2023

https://research-and-innovation.ec.europa.eu/events/horizon-europe-info-days_en

HORIZON-CL4-2024-DIGITAL-EMERGING-01-04: Industrial leadership in AI, Data and Robotics boosting competitiveness and the green transition (AI Data and Robotics Partnership)

We are looking for:

Two possible outcomes (to choose only one)

- Systems to address large scale challenges with significant impact on the objectives of the green deal
  - ➤ using combined robotics, data and AI solutions
  - ➤ using combined AI and data solutions

Two possible scopes for multidisciplinary innovation (to choose only one)

- ➤ Large scale-pilots bringing major industries from key application sectors in Europe with the goal of exploiting and integrating existing tools, sub-systems and solutions that are re-usable from other sectors. No FSTP.
- ➤ Development of large-scale pilots addressing key applications on the green deal. FSTP (40% of the budget) should be used to allow third parties (usually small companies) using pilots for developing, testing and validating innovative solutions

HORIZON-CL4-2024-DIGITAL-EMERGING-01-04: Industrial leadership in AI, Data and Robotics boosting competitiveness and the green transition (AI Data and Robotics Partnership)

We are looking for:

- Sectors and application domains with wide-scale deployment potential and contribution to the green deal.
- Clear business case and exploitation strategy.
- Proposals with FSTP should delineate the contributions from main beneficiaries and from third parties
- TRL 3~5 -> TRL 6~7
- Project size ~10M€   (indicative budget 60M€)

HORIZON-CL4-2024-DIGITAL-EMERGING-01-04: Industrial leadership in AI, Data and Robotics boosting competitiveness and the green transition (AI Data and Robotics Partnership)

We do <u>NOT</u> want:

- Proposals loosely connected with the green transition.
- Academic exercises with limited potential for commercial exploitation of the results after the end of the project.
- Non-realistic settings disconnected from actual needs.
- Focus on low impact sectors or applications with little potential to deliver economic or societal benefits.

- *DO NOT DEVIATE FROM ADMIN/FORMAL requirements: e.g. transfer of essential information to annexes to overcome page limits, font size and formatting imposed by the templates…*

HORIZON-CL4-2024-DIGITAL-EMERGING-01-04 – topic evolution

The main focus of this topic has close relationship with some topics of the work-programmes 2021-2022 and 2023-2024:

- HORIZON-CL4-2021-DIGITAL-EMERGING-01-11
  AI, data and Robotics for the Green Deal (IA)
- HORIZON-CL4-2021-DIGITAL-EMERGING-01-12
  AI, Data and Robotics at work (IA)
- HORIZON-CL4-2022-DIGITAL-EMERGING-02-05
  AI, data and robotics for industry optimisation (including production and services) (IA)
- HORIZON-CL4-2022-DIGITAL-EMERGING-02-07
  Increased robotics capabilities demonstrated in key sectors (IA)
- HORIZON-CL4-2023-DIGITAL-EMERGING-01-02
  Industrial leadership in AI, Data and Robotics – advanced human robot interaction (AI Data and Robotics Partnership) (IA)

This topic is complemented by the topic:

- HORIZON-CL4-2024-DIGITAL-EMERGING-01-03
  Novel paradigms and approaches, towards AI-powered robots– step change in functionality (AI, data and robotics partnership) (RIA)

HORIZON-CL4-2024-DIGITAL-EMERGING-01-04 – topic evolution

Project portfolio of IA (Horizon Europe 2022 & 2023):

101120276	*SoliDAIR*	*101135707*	*FORTIS*
101119800	*EMERALD*	*101135784*	*ARISE*
101120640	*COROB*	*101135708*	*JARVIS*
101118511	*SeConRob*		
101120323	*PERKS*		
101120732	*AUTOASSESS*		
101120990	*SOPRANO*		
101120731	*MAGICIAN*		
101119744	*TALOS*		

5. Who are the types of main stakeholders that are addressed?

6. Is there a key group of actors (eg. Partnership or other) driving this?

HORIZON-CL4-2023-DIGITAL-EMERGING-01-04 - Key actors

Types of stakeholders that are addressed:

- Robot system manufacturers and integrators
- Tech-transfer institutions (e.g. DIHs, competence centers…)
- Academy and research organizations
- End users
  - Pay attention to requirements on multidisciplinarity + SSH (if human interaction)

Key group of actors driving this:

- AI, Data and Robotics Partnership
  https://adr-association.eu/

NCPs are invited to encourage all their stakeholders to become members of the ADRA Association, take an active role in shaping the strategy, and benefit from the networking opportunities.

Future Outlook

The AI, Data and Robotics Partnership is driving the future outlook in this area

https://adr-association.eu/

THE EU RESEARCH AND INNOVATION PROGRAMME (2021-27)

Destination 4
Objective "Open Source for Cloud/Edge and Software Engineering Fundamentals to support Digital Autonomy"

LUIS C. BUSQUETS PÉREZ
PROGRAMME OFFICER

European Commission
DG CONNECT E2
Cloud and Software

European Commission

HORIZON-CL4-2024-DIGITAL-EMERGING-01-21: **Open Source for Cloud/Edge to support European Digital Autonomy (RIA)**

1. What are you looking for?

- Prototypes of cloud and edge servers demonstrated in relevant centralised and distributed environments

- Full computing infrastructure deployments based on European processor technology

- A full Open Computing Architecture stack, which supports emerging processing architectures (e.g. RISC-V).

- Standards and best practices

HORIZON-CL4-2024-DIGITAL-EMERGING-01-21: **Open Source for Cloud/Edge to support European Digital Autonomy (RIA)**

2. What do you <u>NOT</u> want?

- Developments at the upper layers of the cloud computing that do not take into account the underlying processor architecture
- Orchestration systems
- IaaS, PaaS, SaaS unless linked to emulation or design of Data servers.

HORIZON-CL4-2024-DIGITAL-EMERGING-01-21

topic evolution

3. Is this new or has it been called before?

- Upgrade of HORIZON-CL4-2022-DIGITAL-EMERGING-01-26 Open source for cloud-based services (RIA)
- From theoretical prototype to actual demonstrator in real production
- Not linked to other topic sin this WP

Work Programme topic – topic evolution

4. Current project portfolio

- Building on the outcomes of EPI and its continuation

- Relevant previous projects:
  - AERO
  - RISER
  - VITAMIN-V
  - OpenCUBE

HORIZON-CL4-2024-DIGITAL-EMERGING-01-21
Key actors

5. Who are the types of main stakeholders that are addressed?

• Mixed consortia including academia and industry

6. Is there a key group of actors (eg. Partnership or other) driving this?

No

HORIZON-CL4-2024-DIGITAL-EMERGING-01-22:

Fundamentals of Software Engineering (RIA)

1. What are you looking for?

- Responsible software engineering methods and tools
- Best practices leveraging, among others, novel AI and data technologies to accelerate the development and maintenance of software
- Methods and tools for multi-architecture systems
- Efficient and agile modelling, verification and validation, vulnerability assessment and mitigation.

HORIZON-CL4-2024-DIGITAL-EMERGING-01-22:

Fundamentals of Software Engineering (RIA)

2. What do you <u>NOT</u> want?

- Specific Application development

- Software for specific usage, but
  - We want at least three use cases

HORIZON-CL4-2024-DIGITAL-EMERGING-01-22 topic evolution

3. Is this new or has it been called before?

- *Software Engineering as a recurrent topic for at least the past three framework programmes*
- *Focus on methods and tools but advances with the state of the art of other technologies*
- *Current key subjects: cybersecurity, AI*

HORIZON-CL4-2024-DIGITAL-EMERGING-01-22: topic evolution

4. Current project portfolio *(if relevant)*

- *ICT40:*
  - *PHYSICS*
  - *DATACLOUD*
  - *CHARITY*
  - *SERRANO*
  - *Ai-SPRINT*

- *ICT50:*
  - *COSMOS*
  - *ELEGANT*
  - *FOCETA*
  - *PIACERE*
  - *VeriDevOps*
  - *XANDAR*

HORIZON-CL4-2024-DIGITAL-EMERGING-01-22:
Key actors

5. Who are the types of main stakeholders that are addressed?

- Academia, universities
- Industry
- Research institutes

6. Is there a key group of actors (eg. Partnership or other) driving this?

No

HORIZON-CL4-2024-DIGITAL-EMERGING-01-23: Public recognition scheme for Open Source (CSA)

1. What are you looking for?

- Establishment of a system of European annual awards that acts as a spotlight stirring up contributions to Open Source Software and Hardware projects.
- Increased interest for the contribution to, integration of and exploitation of Open Source assets
- Development of a scheme including a list of fields related to Open Source
- Elaboration of an adequate process to:
  - scrutinize different fields of action relevant to open source
  - select appropriate candidates for being recognized
  - implement adequate award ceremonies.

HORIZON-CL4-2024-DIGITAL-EMERGING-01-23:
Public recognition scheme for Open Source (CSA)

2. What do you <u>NOT</u> want?

- Coordination and Support actions to organize software projects
- Coordination of portfolio of projects
- Limitation to the research framework programme
- A world-wide impact is sought

HORIZON-CL4-2024-DIGITAL-EMERGING-01-23: topic evolution

3. Is this new or has it been called before?

- CSAs in the area of Software have been funded since FP7

- However, the objective of a public scheme has never been targeted (Result from the OS study)

HORIZON-CL4-2024-DIGITAL-EMERGING-01-23: topic evolution

4. Current project portfolio

Previous CSAs in the software area, e.g. SWForum.eu

However, very different expected outcome.

Other CSAs in the Cloud-Edge-IoT Continuum maybe of relevance to succeed in impacting as expected.

HORIZON-CL4-2024-DIGITAL-EMERGING-01-23:
Key actors

5. Who are the types of main stakeholders that are addressed?

- No specific group of addressees, but
- Consortia including relevant SMEs with focus on ICT communication are expected

6. Is there a key group of actors (eg. Partnership or other) driving this?
   No

THE EU RESEARCH AND INNOVATION PROGRAMME (2021-27)

Destination 4
Objective "Flagship on Quantum Technologies: a Paradigm Shift"

European Commission

Flagship on Quantum Technologies – a Paradigm Shift

HORIZON-CL4-2024-DIGITAL-EMERGING…

Ref	Name	Type	22.5	TRL	Budget
-01 -42	Stimulating transnational research and development of next generation quantum technologies, including basic theories and components	RIA, Cascading grant with FSTP	No	TRL 1-4 → TRL 6	15M€
-01 -45	Quantum sensing and metrology for market uptake	IA	Yes	TRL 4-5 → TRL 6-7	15M€ (4-5M€ /project)

HORIZON-CL4-2024-DIGITAL-EMERGING-01-42: Stimulating transnational research and development of next generation quantum technologies, including basic theories and components (Cascading grant with FSTP)

Expected Outcomes:

- Support to transnational projects in quantum technologies, fostering synergy between European, national and regional initiatives and promoting broader partnerships between the EU stakeholders.

- Achieve closer coordination and greater mobilisation and pooling of resources.

- Support the Quantum Flagship by implementing calls for proposals resulting in grants to third parties.

Indicative budget: EUR 15.00 million
EU contribution per project: EUR 15.00 million
Type of Action: RIA, Cascading grant with FSTP (can only be provided in the form of grants)

- **The maximum amount to be granted to each third party is EUR 700.000**

- **Minimum 85% of EU funding to be allocated to FSTP, selected through joint calls**

- **Third parties will be funded through projects of around EUR 2.5 million per project**

TRL: Start at TRL 1-4 and achieve TRL up to 6

Eligibility conditions: MS, associated countries, OECD and Mercosur countries

Call Opening: 16 April 2024   Call Deadline: 18 September 2024.

DISCLAIMER: This topic will be cancelled but will be reinserted in a new 2024 DIGITAL EMERGING Call to be added in the upcoming amendment of the Work Programme. This amendment has not been adopted by the European Commission yet. Only the adopted work programme will have legal value. The adoption of the amended WP will be announced on the F&T Portal.

European Commission

HORIZON-CL4-2024-DIGITAL-EMERGING-01-45: Quantum sensing and metrology for market uptake (IA)

Expected Outcomes:

- Contribute to **mature quantum sensing technologies and devices**
- In a **broad range of application sectors**
- Goal to **establish a reliable, efficient supply chain** – first standardisation and calibration efforts
- → Demonstrate **advanced prototypes** with unprecedented level of precision and stability
- → Target miniaturised, integrated, transportable sensors and plans for further **industrialisation**
- → Importance of targeted **collaborations**

Indicative budget:	**MEUR 15**
EU contribution per project:	**MEUR 4-5**
Type of Action:	**Innovation Action**
TRL:	**from TRL 4-5 to TRL 6-7**
Eligibility conditions:	Participation limited to: **MS, Iceland, Norway, Israel**
	Entities directly or indirectly controlled by a non-eligible country/country entity, may not participate (unless **guarantees** provided)

European Commission

Flagship on Quantum Technologies

1. What are you looking for?

- Build on Flagship ramp-up success stories
- Move the technologies up the TRL scale
- Lab to infrastructures, fab, market
- Build EU quantum ecosystem

Flagship on Quantum Technologies

2. What do you <u>NOT</u> want?

- Topic 01-42 (Transnational): Divide the national funding agencies in multiple proposals
- Topic 01-45 (Q sensing): Lack of industrialization focus
- Pure academic consortia
- Splitting competences, incoherent approaches
- Non-addressed supply-chain weaknesses

Flagship on Quantum Technologies – Topic evolution

3. Is it new or has it been called before?

- Continuation of activities of the Quantum Flagship ramp-up phase, WP21-22, WP23
- Technology demonstration phase → support deployment activities
- In line with Strategic Research and Industry Agenda

Flagship on Quantum Technologies – Topic evolution

4. Current project portfolio

- Quantum Flagship projects under H2020 and HE (RIAs & FPAs/SGAs)
  - Quantum computing (platforms, software, EuroHPC)
  - Quantum simulations
  - Quantum communications (infrastructure: EuroQCI)
  - Quantum sensing and metrology
  - Basic science
  - Pilot lines and testing facilities

Flagship on Quantum Technologies – Key actors

5. Who are the types of main stakeholders that are addressed?

- Research institutes, universities, RTOs, foundations, industry, SMEs & other organizations
- Key: academia & industry participation
- RTOs: role as facilitators for tech. transfer
- Importance of SMEs and of potential users

Flagship on Quantum Technologies – Key actors

6. Is there a key group of actors driving this?

- The Quantum Flagship Community
  - Quantum Community Network (QCN)
  - European Quantum Industry Consortium (QuIC)
- The Quantum Flagship Governance
  - Strategic Advisory Board (SAB)
  - Quantum Coordination Board (QCB) (former SEB)
- CSA: QUCATS

Flagship on Quantum Technologies – Additional information

7. Are there any additional / background documents?

- qt.eu – Resources
- Quantum (europa.eu)

- CNECT.C2
  High Performance Computing & Quantum Technologies
  cnect-c2@ec.europa.eu, cnect-c2-evaluations@ec.europa.eu

Flagship on Quantum Technologies – Future outlook

8. Do you have information about future trends, emerging initiatives, roadmaps, key stakeholders in this area?

Reference:

Strategic Research and Industry Agenda

(being updated)

Destination 4
Objective "Graphene and 2D materials: Europe in the lead"

European Commission

Graphene and 2D materials: Europe in the lead

- Starting point and continuation of the Graphene Flagship
- Build on its achievements, pursue R&I activities and accelerate the technology developments
- Concrete innovation opportunities and production capabilities
- Strong supply and value chains in graphene and 2DM in Europe.

Graphene and 2D materials: Europe in the lead

8 topics: 7 RIAs/IAs and 1 CSA - 94.5M€

WP 2021-2022
- Electronics: New generation of advanced electronic and photonic 2D materials-based devices, systems and sensors (RIA, 16,5M€)
- Energy: 2D materials-based devices and systems for energy storage and/or harvesting (RIA, 9M€)
- Biomedical: 2D materials-based devices and systems for biomedical applications (RIA, 6M€)
- Composites: 2D-material-based composites, coatings and foams (IA, 9M€)
- Supporting the coordination of the Graphene Flagship projects (CSA, 3M€)

WP2023-2024
- Sustainable and Safe by Design 2D materials (RIA, 6M€)
- 2D materials of tomorrow (RIA, 12M€)
- **Pilot line(s) for 2D materials-based devices (RIA, 33M€)**

HORIZON-CL4-2024-DIGITAL-EMERGING-01-31: Pilot line(s) for 2D materials-based devices (RIA)

We are looking for:

➤ (co-)integration of 2DM with established technologies such as CMOS integration and heterogeneous integration, including supply of standard semiconductor technologies (CMOS, ASICs, planarized waveguides already adapted/optimized for 2DM co-integration)

- Building the toolkit and design modules necessary for creating prototype devices and systems
- Process characterization and monitoring to control and guarantee quality of relevant device parameters
- Adaptation of standard semiconductor technologies
- Reliability and packaging requirements
- Implementing multiple wafer runs or other offering to best cover business opportunities;

HORIZON-CL4-2024-DIGITAL-EMERGING-01-31: Pilot line(s) for 2D materials-based devices (RIA)

We are looking for:

- Business case and exploitation strategy
- Contribution to the governance and overall coordination of the Graphene Flagship initiative
- Synergies and relate to activities and outcomes of the projects selected under the other topics of 'Graphene and 2D materials: Europe in the lead' and where relevant of the KDT JU.
- Electronics: starting TRL 3 with ending TRL 5 / Photonics: starting TRL 3-4 and ending TRL 5-6

Indicative budget: 33M€

Expected EU contribution per project: 33M€

Graphene and 2D materials: Europe in the lead
Topic evolution

3. Is this new or has it been called before?
- Continuation of the Graphene Flagship,
- Continuation of the 2D experimental Pilot Line, build on the IP developed therein
- Significant change in implementation: FPA/SGAs + ERANET vs RIAs/IA and one CSA

Graphene: Europe in the lead – topic evolution

4. Current project portfolio
   - Graphene Flagship
     https://graphene-flagship.eu/
     Annual reports: https://graphene-flagship.eu/research/annual-report/
   - 2D Experimental Pilot Line
     https://graphene-flagship.eu/innovation/pilot-line/
   - 2D Experimental Pilot Line
     https://www.flagera.eu

Graphene: Europe in the lead – Key actors

5. Who are the types of main stakeholders that are addressed?
   - ❑ Academic and industrial partners

6. Is there a key group of actors (eg. Partnership or other) driving this?
   - ❑ The Graphene Flagship consortium is a key group: https://graphene-flagship.eu/collaboration/our-partners/

Graphene: Europe in the lead

7. Are there any additional / background documents?
   - Consultation workshop, Jan. 2020, report:
   https://digital-strategy.ec.europa.eu/en/library/consultation-report-graphene-and-related-materials-now-available

8. Do you have information about future trends, emerging initiatives, roadmaps, key players in this area?
   - Technology and Innovation roadmap:
   https://graphene-flagship.eu/innovation/industrialisation/roadmap/