TECHNOLOGY CENTRE PRAGUE

EIC PATHFINDER OPEN: HOW TO PREPARE A PROPOSAL

TC Prague, April 10, 2025

AGENDA: SPEAKERS

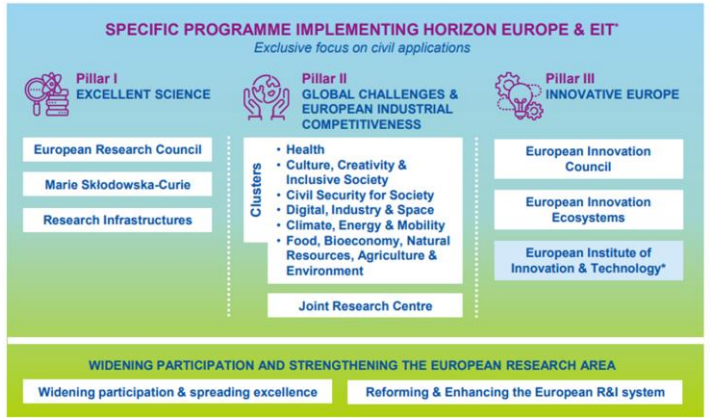
- **Michaela Vlková** (Czech national contact for the EIC programmes, Technology Centre Prague)
- **Katarzyna Roszak** (Evaluator of the EIC Pathfinder, Instititute of Physics CAS)
- **Michal Hlavačka** (Czech national contact for Financial & Legal and other cross-cutting apects of Horizon Europe, Technology Centre Prague)

STRUCTURE

- Fit into the programme
- Get to know important features of the programme
- Common shortcomings
- Your team
- Recommendations (from a beneficiary)

PATHFINDER OPEN CALL 2025 IN A NUTSHELL

- **Horizon Europe Pillar III** (European Innovation Council)
- The call has opened on **February 20**
  - **DEADLINE: May 21st (17:00)**
- Overall budget: **€ 142 M**
  - **EC contribution up to € 3 M** (higher amounts must be justified)
- **Bottom-up** approach
- Expected activities between **TRL 1 and 4**
- International collaborative research (**at least 3 partners from 3 different countries EU/AC**)
  - Open to **all types** of legal entities



SUCCESS RATE OF PATHFINDER OPEN CALLS UNDER HORIZON EUROPE

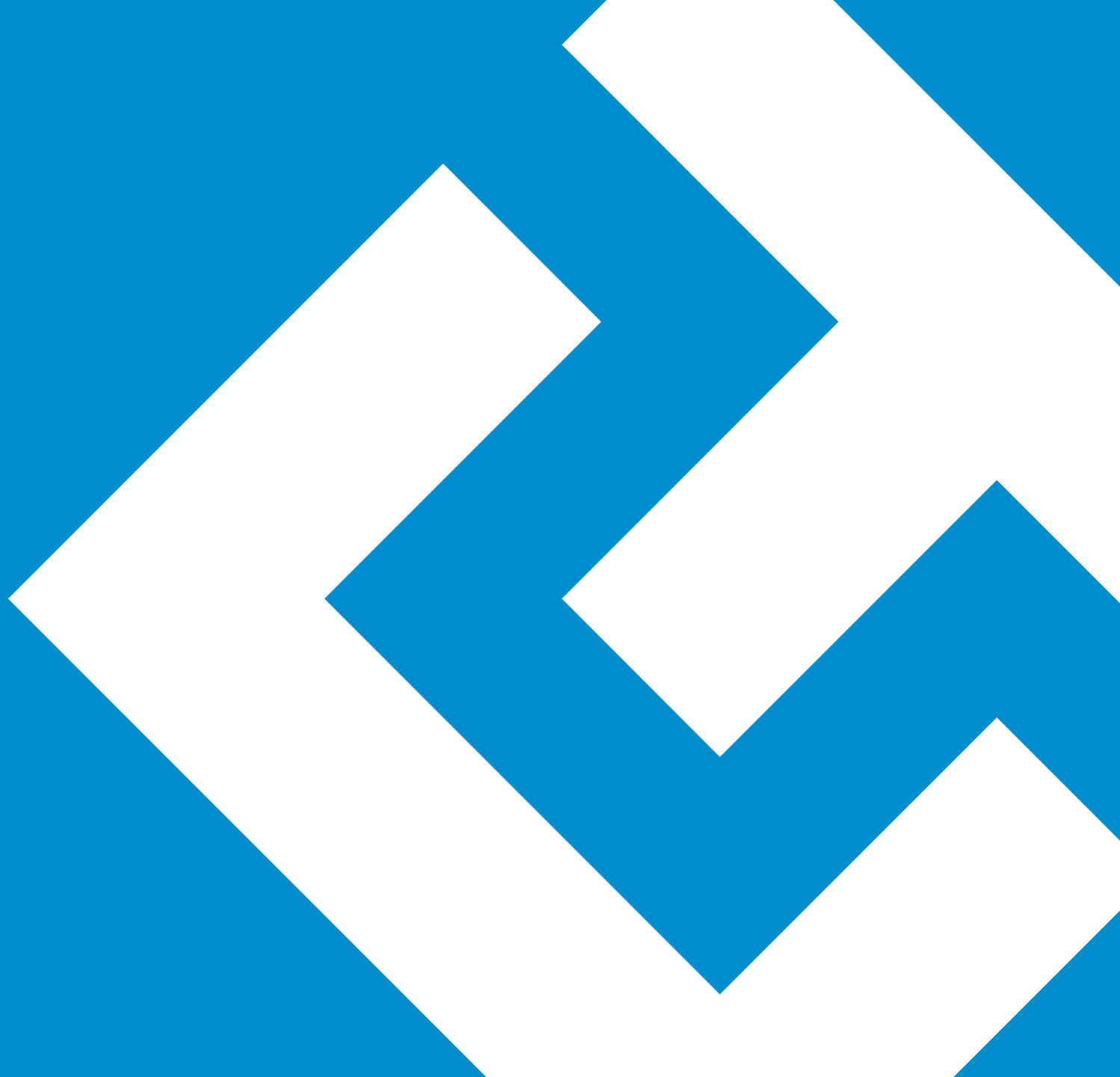
Year	Proposals evaluated	Proposals above tresholds	Projects retained for funding	Projects on reserve list (funded)
2021	868	495 (57 %)	56 (6 %)	6 (4)
2022	858	460 (54 %)	57 (7 %)	10 (9)
2023	783	400 (51 %)	53 (7 %)	10 (9)
2024	1 100	566 (52 %)	45 (4 %)	0

- Minimum overall score to be retained for funding was: 4,6 – 4,7 (out of 5)

➢ Do not underestimate any part of the proposal, they are ALL equally important and every (half)point in the evaluation matters !

➢ Get prepared: read available documents, watch videos, use any type of support

DOES YOUR IDEA FIT INTO THE PROGRAMME?



WHAT PROJECTS DO NOT FIT

- **EIC Pathfinder ≠ blue sky research**
  - The programme does not support projects focused on pushing boundaries of a scientific field with no potential/ambition to develop a new technology/innovation
  - „*The research must provide the foundations of the technology you are envisioning*“ (EIC WP 2025)

- **EIC Pathfinder does not support projects that lack ambition**
  - i.e. Focus on an incremental advancement or development of methods/principles that are already known

WHAT IS THE PROGRAMME LOOKING FOR?

- Research of **new directions** in science and technology
- **High-risk approach** with the aim to bring **breakthrough technological solutions** and **create market opportunities**
- **Interdisciplinary approach** combining different perspectives opening up **new technological pathways**
- A **high potential** to have a positive effect on the **society and economy**
- Further **(market) exploitation of results**

DOES YOUR PROJECT FULFILL THE GATEKEEPERS?

- Convincing **long-term vision** of a **radically new technology** that has the potential to have a transformative positive effect to **solving a challenge** in our economy and society

- Concrete, novel and ambitious **science-towards-technology breakthrough**, providing **advancement towards the envisioned technology**

- **High-risk/high-gain** research approach and methodology, with **concrete and plausible objectives**

Make sure you convincingly cover these elements in your proposal

GET PREPARED

KEY DOCUMENTS

GO THROUGH RELEVANT PARTS OF THE WORK PROGRAMME

- Detailed information on calls
- General EIC objectives and KPIs
- Proposal evaluation processes + criteria

➢ https://eic.ec.europa.eu/eic-2025-work-programme_en

WHAT TO READ IN THE WORK PROGRAMME

Pay attention not only to **the call text** but also the **general parts** (Introduction) and the **Annexes**:

- **EIC strategic goals & KPIs (strategic purpose of the programmes)**
  - Pathfinder is a „generator“ of ideas and develops scientific basis to technologies that can be futher transformed into innovations and accelerated to the market
- **Summary of main changes 2025 (what´s new)**
  - Additional emphasis on the potential solutions to be provided in applicants proposals for technology visions
- **Annex 2 (what can affect eligibility/credibility of the project or partners, e.g.)**
  - Restrictions for the protection of **European communication networks** (cybersecurity of 5G networks, affects eligibility of certain entities)
  - **Do Not Significant Harm (DNSH) principle** (innovations that significantly harm the environment, social welfare or that are primarily designed for military applications will not be funded)
  - **Trustworthy Artificial Intelligence** (all AI-based systems or techniques need to be developed in a safe, secure and responsible manner, with a clear identification of and preventative approach to risks and in accordance with the AI Act)

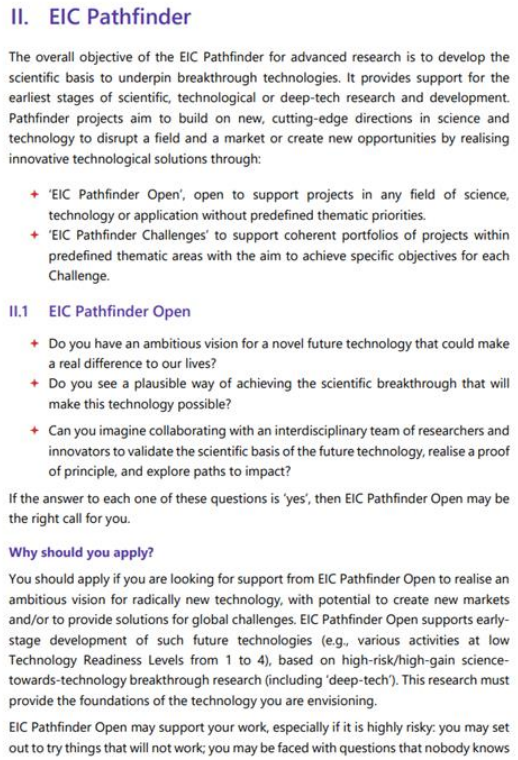
HOW TO READ THE CALL TEXT

- Read it carefully (it is not too long)

- **Pay attention to expressions such as**: *you must*, *the project should*, *it is expected*, *it is (highly) recommended*, *you are (strongly) encouraged*…

…those elements should be **covered and highlighted in your proposal**

- Do not omit **non-scientific aspects**



II. EIC Pathfinder

The overall objective of the EIC Pathfinder for advanced research is to develop the scientific basis to underpin breakthrough technologies. It provides support for the earliest stages of scientific, technological or deep-tech research and development. Pathfinder projects aim to build on new, cutting-edge directions in science and technology to disrupt a field and a market or create new opportunities by realising innovative technological solutions through:

- 'EIC Pathfinder Open', open to support projects in any field of science, technology or application without predefined thematic priorities.
- 'EIC Pathfinder Challenges' to support coherent portfolios of projects within predefined thematic areas with the aim to achieve specific objectives for each Challenge.

II.1 EIC Pathfinder Open

- Do you have an ambitious vision for a novel future technology that could make a real difference to our lives?
- Do you see a plausible way of achieving the scientific breakthrough that will make this technology possible?
- Can you imagine collaborating with an interdisciplinary team of researchers and innovators to validate the scientific basis of the future technology, realise a proof of principle, and explore paths to impact?

If the answer to each one of these questions is 'yes', then EIC Pathfinder Open may be the right call for you.

Why should you apply?

You should apply if you are looking for support from EIC Pathfinder Open to realise an ambitious vision for radically new technology, with potential to create new markets and/or to provide solutions for global challenges. EIC Pathfinder Open supports early-stage development of such future technologies (e.g., various activities at low Technology Readiness Levels from 1 to 4), based on high-risk/high-gain science-towards-technology breakthrough research (including 'deep-tech'). This research must provide the foundations of the technology you are envisioning.

EIC Pathfinder Open may support your work, especially if it is highly risky: you may set out to try things that will not work; you may be faced with questions that nobody knows

MAIN EXPECTATIONS?

- **Proof of principle** that the main ideas of the envisioned future technology are **feasible**, thus **validating its scientific and technological basis**
- Project results **should include top-level scientific publications in open access**
- Projects **are expected** to take the necessary measures to allow future uptake to take place, for instance through an **adequate formal protection of the generated Intellectual Property (IP)** and **an assessment of relevant aspects related to regulation, certification, and standardization**
- Projects **are encouraged to involve and empower** in their teams key actors that have the potential to become **future leaders** in their field such as **excellent early-career researchers** or promising **high-tech SMEs**, including start-ups
- Project are also **encouraged** to **empower female researchers** and to achieve **gender balance among the work package leaders**

UPTAKE OF PROJECT RESULTS

- Increasing emphasis on **future exploitation of results**

EIC Work Programmes 2021, 2022 and 2023:

- EIC Pathfinder consortia "are expected to take the necessary measures to allow future uptake [of project results] to take place, for instance through an adequate formal protection of the generated Intellectual Property"

EIC Work Programmes 2024 and 2025:

- EIC Pathfinder consortia "are expected to take the necessary measures in the course of the project to allow future uptake [of project results] to take place. This includes: an adequate formal protection of the generated Intellectual Property (IP), a plan for future exploitation and an assessment of relevant aspects related to regulation, certification, and standardization."

FOCUS ON THE EVALUATION CRITERIA

Excellence (treshold 4/5, weight 60 %)	Impact (treshold 3,5/5, weight 20 %)	Implementation (treshold 3/5, weight 20 %)
Long-term vision	Long-term impact	Work plan
Science-towards-technology breakthrough	Innovation potential	Allocation of resources
Objectives	Communication & Dissemination	Quality of the consortium
Interdisciplinarity		

ADJUSTMENT IN EXCELLENCE IN 2025

- **Excellence: Long-term vision**

➢ **Before:** How convincing is the vision of a radically new technology towards which the project would contribute in the long term?

➢ **In 2025:** How convincing is the vision of a radically new technology **and relevant potential solutions**, towards which the project would contribute in the long term?

ADDITIONAL CRITERIA

- In case there are proposals with **the same scoring**, the following factors will be taken into consideration (in this order):

  - Higher score under the criterion **Excellence**
  - Higher score under the criterion **Impact**
  - **Gender balance** among the **work package leaders** as identified in the proposal
  - Number of applicants that are **SMEs**
  - Number of **Member States and Associated Countries** represented in the consortium

THE APPLICATION FORM

- Use **always** the **most recent version** (the editable one can be downloaded from the submission system at FTOP)
- Read the instructions you´ll find at the **beginning** and **throughout the document**
- Follow the structure of the template, **cover ALL the bullet points**

- If your project involves **clinical studies**, you have to add a specific Annex (Information on clinical studies)
  - Do NOT use the annex to add extra details of your project (unrelated to CS), the evaluators will disregard those

- https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/HORIZON-EIC-2025-PATHFINDEROPEN

Instructions, please remove

Horizon Europe Programme

Application Form EIC PATHFINDER OPEN

Project proposal – Technical description (Part B)

Version 6.0
21 January 2025

FURTHER INFORMATION AND SUPPORT TO APPLICANTS

- **Annotated template Pathfinder Open (Access2EIC)**
  - https://horizoneuropencpportal.eu/store/new-annotated-template-eic-pathfinder

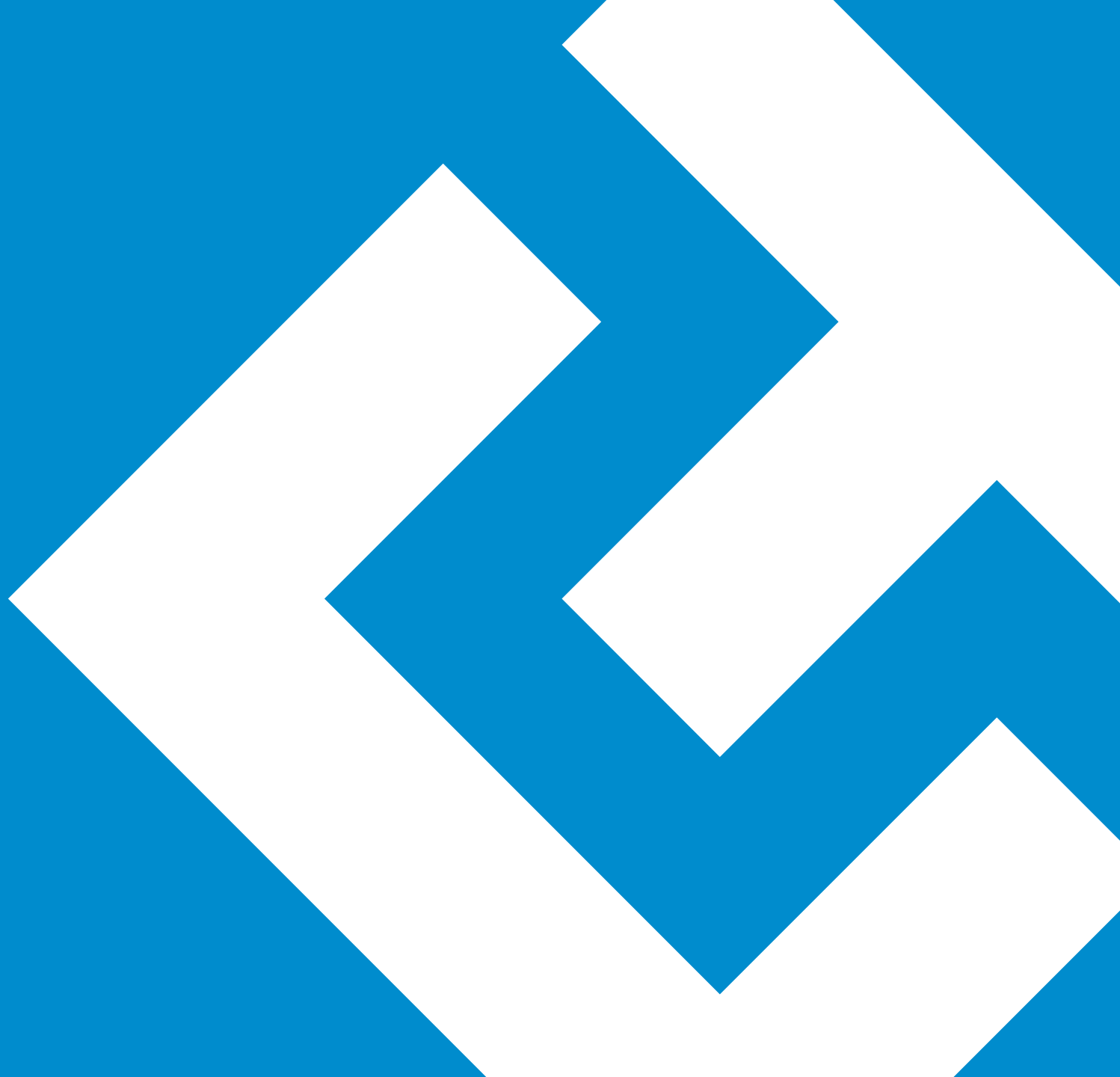
- **Proposal pre-check (WIDERA)**
- For proposals with a coordinator or a WP leader from a widening country
  - https://www.ncpwideranet.eu/wideraexperts/

- **FAQ**
  - https://eic.ec.europa.eu/eic-frequently-asked-questions_en

- **EIC 2025 Information day**
  - https://eic.ec.europa.eu/events/european-innovation-council-online-info-day-work-programme-2025-2024-11-05_en

- **EIC Pathfinder Beneficiaries day 2024**
  - https://eic.ec.europa.eu/events/eic-pathfinder-beneficiaries-day-2024-2024-11-20_en

AVOID COMMON SHORTCOMINGS



EXCELLENCE

- Lack of **clarity** in objectives, outcomes, and vision
- Objectives lack **clarity**, **specificity** and **quantifiability**
- Lack of **quantifiable** or **measurable** outcomes

Suggest SMART objectives, concrete metrics, KPIs

- **Lack of novelty** and breakthrough innovation, focus on incremental improvements
- **Limited evidence** of novelty or advantages **compared to the state-of-the-art**

Show clearly the shift in comparison to the state-of-the-art

- High-risk aspects with **inadequate viability justification**
- Ambition without **concrete evidence of achievability**
- Feasibility and technical robustness **lack support**

Balance ambition with credible proof of feasibility, support ambitious goals with concrete data

- Objectives lack sound **methodological support and clear rationale**
- **Inadequate methodology description** for key technologies and processes
- **Weak methodology design** and unclear research objectives

Justify the methodological approach, ensure coherence between objectives, hypothesis, methods, and expected results

- Insufficient consideration of **gender dimensions and open science**

Be specific on your approach to gender dimension of the research and to open science

IMPACT

- **Overestimated or vague** claims about **transformative** effects and benefits
- **Insufficient articulation** of long-term impact and transformative potential

Define what “transformative” means in your field, develop a credible pathway to impact that extends beyond the project’s duration

- **Insufficient analysis** of economic, environmental, and societal impacts
- **Disjointed or unclear** long-term economic, environmental, and societal impacts

Be specific, do not focus on R&I only, refer to the EU strategies

- **Weak evidence** for overcoming adoption **barriers** and **addressing competition**

Refer to barriers that are not R&D related

- **Communication strategies are underdeveloped**, with **limited dissemination plans** and **stakeholder engagement** beyond standard measures
- **Inadequacy** of communication and dissemination strategies

Be specific, differentiate between C&D

- **Insufficient stakeholder engagement** and collaboration
- **Insufficient involvement** of key actors and stakeholders

Identify relevant actors, outline their roles, define collaboration mechanisms

- **Lack of concrete measures for IP** protection and exploitation
- **Lacks clear strategies** for intellectual property protection and innovation potential

IMPLEMENTATION

You work plan and allocation of resources need to be all through coherent, pay attention to potential risks

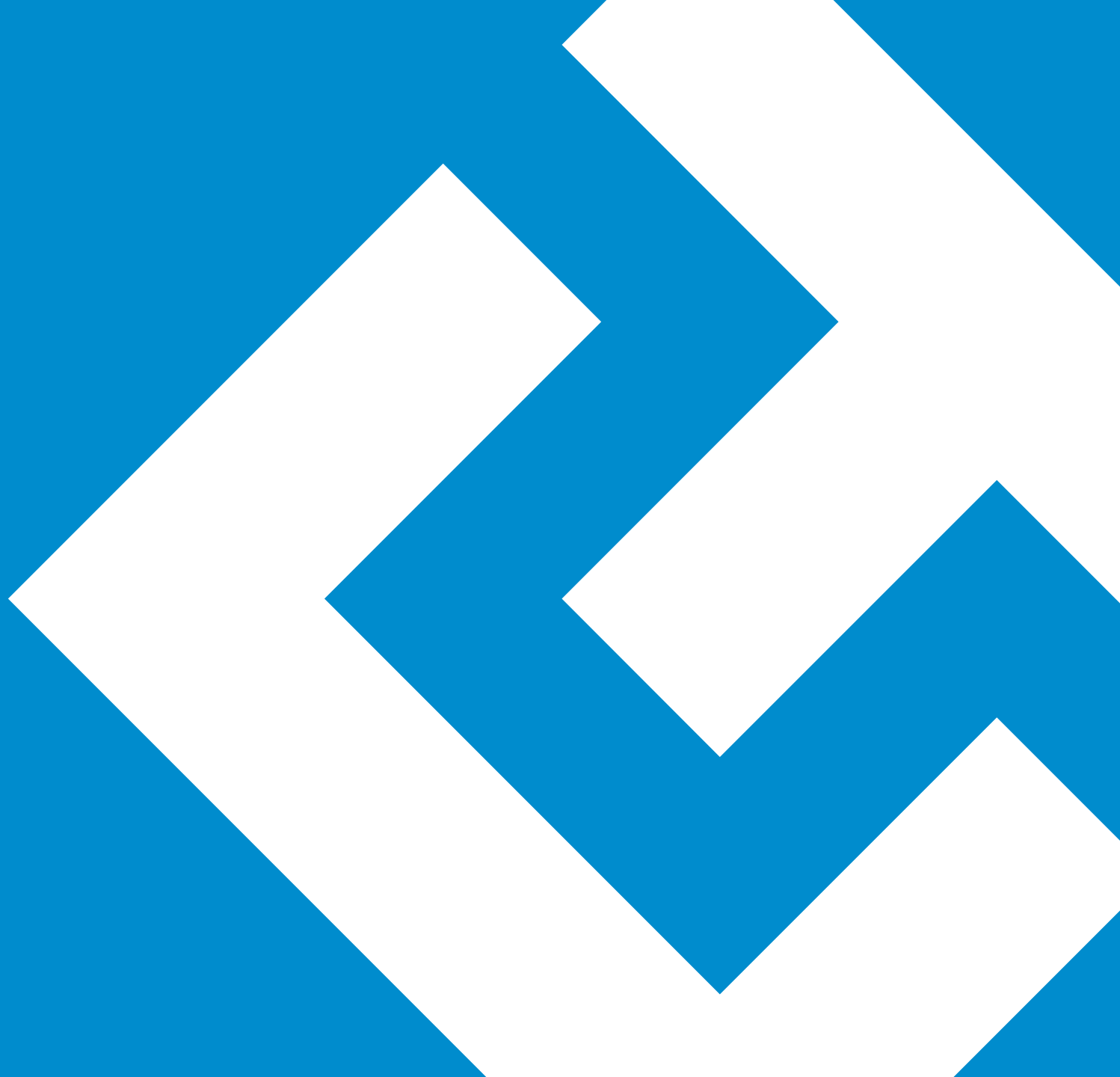
- Resource **allocation is imbalanced**, **underjustified, or misaligned with objectives**
- Consortium capacity and resource allocation create **imbalances in workload** and collaboration efforts

- Consortium **lacks necessary expertise and capacity** for ambitious goals
- Consortium expertise in key areas is **insufficient** or **not adequately explained**

- Dependencies, interdependencies, and feedback mechanisms among **work packages** are inadequately addressed
- **Work packages lack coherence**, overlap, or proper justification for task assignments

- **Risk mitigation strategies** lack specificity, detail, or concrete implementation plans
- **Risks are not properly identified**, prioritized, or mitigated with sufficient detail

BUILD A STRONG TEAM



SIZE AND COMPOSITION OF CONSORTIA

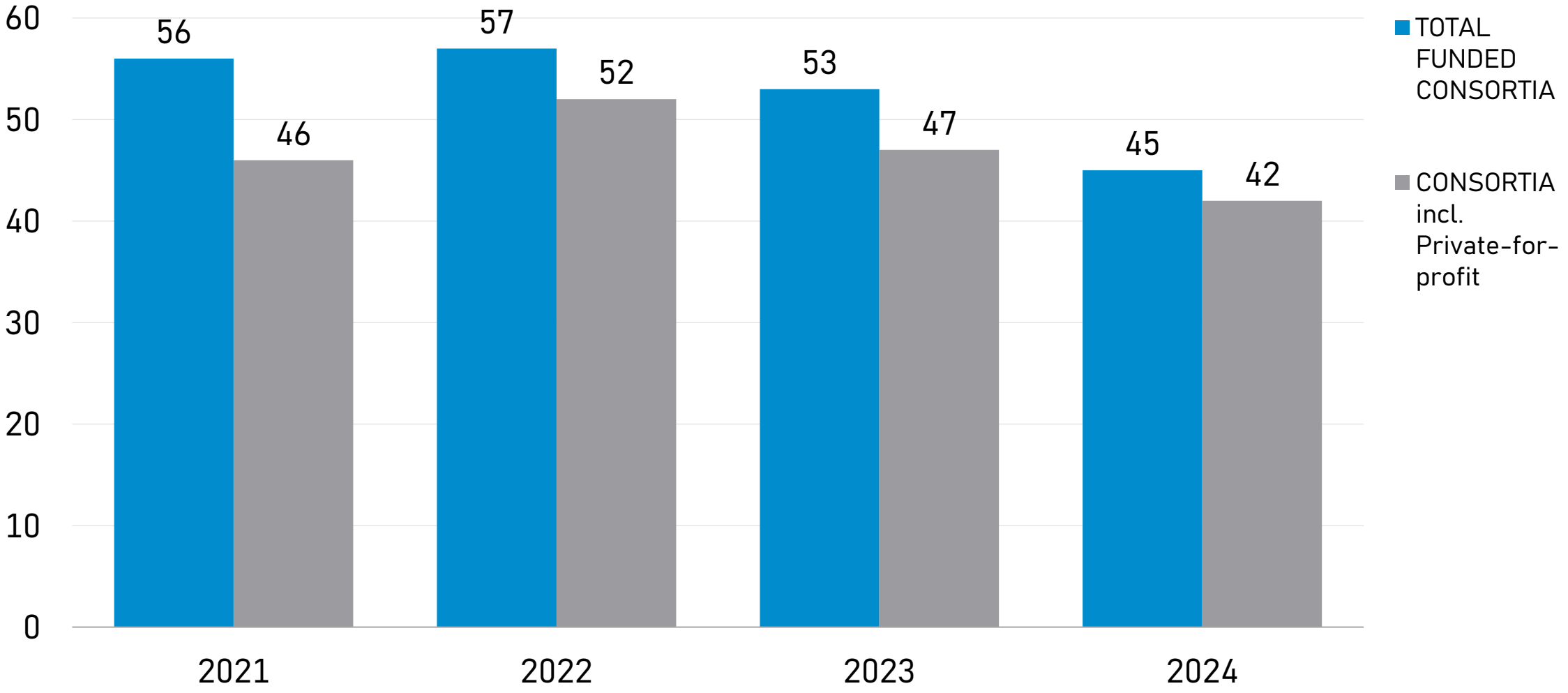
- Show European collaboration **across disciplines** and **geographies**
- Each partner should have a **clear role and added value**

- A typical consortium has on **average 6 – 7 partners**
- But there is no rule nor recommendation
- **In 2024**
  - The largest successful consortium **had 15 partners**
  - The smallest successful consortia **had 4 partners**

- Most consortia are **a mixture of partners** coming from:

  - Higher or secondary education
  - Research Organisation
  - Private for Profit

PRIVATE ENTITIES IN SUCCESSFUL CONSORTIA



SOME RECOMMENDATIONS

Aristeidis Bakandritsos
CATRIN – Palacky University Olomouc
VSB – Technical University of Ostrava
EIC Pathfinder project GlaS-A-Fuels

Proposal writing

1. Be clear and understandable

2. Read many times and optimize structure, language, clarity

3. Hard work / time is needed – only top 8 % will receive funding

Proposal writing

Be very specific with objectives – add measurable KPIs

Objective 1 (O1): Develop heterostructured single atom photocatalysts for fast and selective CO_2-to MeOH conversion, providing to communities and remote areas reliable and sustainable fuels.

Heterostructured nanoparticulate photocatalysts that will be developed within the *PHAROS* project will harness the sunlight by using semiconductor or plasmonic low-dimensional materials and will be electronically coupled to highly active SACs. In existing photocatalytic processes, MeOH production rates typically range from 20 to 300 µmol g_{cat}^{-1} h^{-1}, (*Table 1.2*), with selectivity for MeOH conversion typically around 70-00%. The conversion efficiency of CO_2 to MeOH via conventional syngas methods is generally between 15-30%. **KPI:** Based on the discussion above and to ensure the success of the PHAROS project, we aim to achieve the following KPIs, which exceed current benchmarks: (i) MeOH production rate target: > 500 µmol g_{cat}^{-1} h^{-1} (ii) Conversion target: > 40%

2

Call: [HORIZON-EIC-2024-PATHFINDERCHALLENGES-01] — [EIC Pathfinder Challenges 2024]

CO_2 conversion to MeOH. (iii) Selectivity target: > 85% selectivity for MeOH from CO_2. The numbers depend on the reactions conditions (pressure, temperature, pH, purity of CO_2).

Table 1.2: *Indicative MeOH production rates as described from* ***state-of-the-art photocatalysts****.*

Catalyst System	Max Conversion or Activity	Max Selectivity	Reaction Conditions	Links
C_3N_4	130 µmol g_{cat}^{-1} h^{-1} (510 µmol g_{cat}^{-1} h^{-1} with laser)	90%	35°C, 1 atm, solar-driven	Ref
Cu_3P/C_3N_4	15%	73%	40°C, 1 atm, solar-driven	Ref
Cu/C_3N_4	316 µmol g_{cat}^{-1} h^{-1}	99%	25°C, 1 atm, UV-visible light	Ref
graphene oxide/CuO	73%	91%	30°C, 1 atm, visible light irradiation	Ref
Bi2S3/CdS	20 µmol g_{cat}^{-1} h^{-1}	82%	35°C, 1 atm, sunlight	Ref
ZnS	90 µmol g_{cat}^{-1} h−1	80%	28°C, 1.5 atm, solar light	Ref

Proposal writing

Be very specific even for example when you want to convince about going beyond the state of the art

Table 1-3: *StoR-Net's strategy beyond the state of the art to bypass limitations for transformative SCs.*

	Current technology limitations		StoR-Net's ground-breaking R&I strategy	
	Carbon SC components		*f*-graphenes	
✗	Porous carbons have reached their limits in absolute numbers of pore volume and surface area and in pore architecture control.		High mass-density, densely functionalized, and holey graphenes will be employed with capacitances well surpassing that of 2000 m^2/g SC carbons.	✓
✗	The pores are flooded with electrolyte, increasing the inactive electrode mass. High-performance SC active carbons have 1 cm^3/g porosity, meaning that for every gram of electrode material there is almost an equal mass of electrolyte flooding the pores.[31] Considering this, a 50% gain in specific capacitance can be achieved anticipated by decreasing the inactive electrolyte.		*f*-graphenes ultra-low permanent surface area and porosity (ca 130 m^2/g).[19] However, upon solvation the ionic liquid ions easily penetrate, avoiding electrolyte flooding in the electrode pores. This is expected to lead to a substantial benefit in costs and energy density (both gravimetric and volumetric).	✓
✗	The mass densities are well below 1 g/cm^3, significantly limiting volumetric energy densities.		*f*-graphenes have demonstrated mass density of 2.8 g/cm^3, delivering record energy densities of 200 Wh/L.[19]	✓
✗	Electron conductivities on low sp^2 porous carbons are suboptimal, ranging from 10^{-1} to 10^{-2} S/cm (or lower) for active carbons with appreciable surface area and capacitance.[32]		*f*-graphenes, despite being densely functionalized, have much higher conductivity (i.e., 5 S/cm[33]). Their electrochemical internal resistance (related to the electrolyte charge transport at the interfaces) is also half of that of Kuraray for example.[19]	✓

Proposal writing

Use attractive figures to explain and make reviewers' life easier

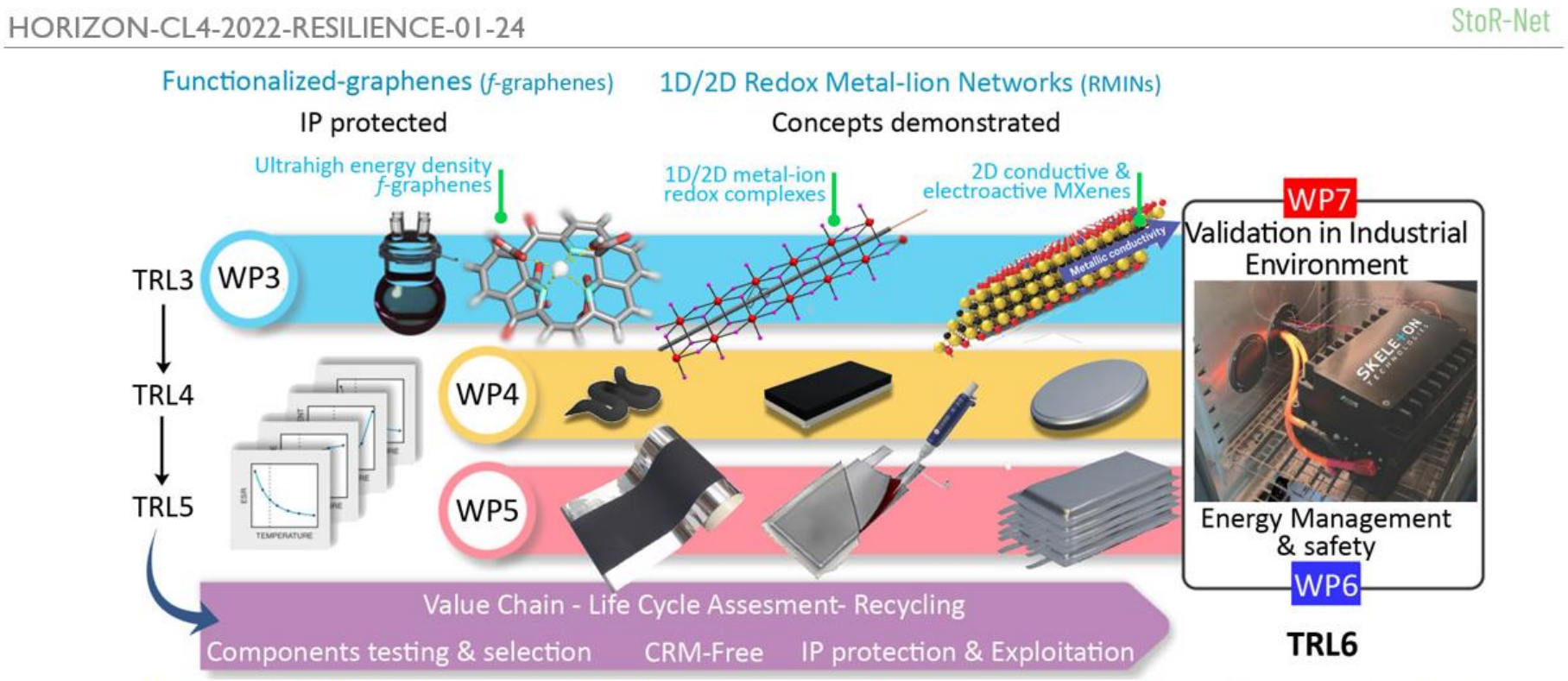


Figure 1-6. *StoR-Net's big picture of TRL positioning and advancement, components and processes involved.*

Consortium

How to build the consortium

- Is there a suggested number of partners in the guide? Widening countries?
- Shape the general idea, what partners (expertise) do you need – Complementarity; show it in WPs
- Check the budget and make rough distribution to possible partners
- Start contacting early - have few slides / general information for the idea

3.2.2 Consortium partners' main contribution to the project

Each partner of PHAROS has a valid role along with adequate resources to fulfil that role within the project. The main capacities of project partners, as well as their role in the project are concisely presented below.

	Main capacities	Key roles
VSB-CEET	Research organisation in energy and environmental technologies. Extended experience in the development of nanomaterials and nanotechnologies on applications in catalysis. Special focus on graphene and derivatives and their exploitation for single atom engineering. Experienced in leading multi-disciplinary consortia in EU projects and scientific excellence.	**Project Coordinator & WP2 Leader, Technology Provider** Leading the design of the graphene-based platforms for the development of heterostructured single atom photocatalysts. Supporting the overall co-design activities and extraction of requirements. Supporting the overall integration and pilot deployment, evaluation, and assessment.
POLIMI	POLIMI stands as Italy's largest and highest-ranked scientific-technological university. With over 45,000 students and 1,400 faculty members across seven campuses, it excels in research and education. In 2015, POLIMI was awarded "European Excellence in Research" by the European Commission. The Department of Chemistry, Materials, and Chemical Engineering "Giulio Natta" boasts 127 permanent faculty, 50 technical staff, 32 laboratories, and over 120 early-career researchers, generating an annual turnover exceeding €8 million.	**WP3, WP5 Leader.** Prof. Gianvito Vilé will lead the design and optimization of photochemical reactors and the design of a catalytic process for CO_2-to-MeOH (WP3). Contribute to the development of novel catalysts for efficient CO_2 utilization and MeOH production (WP2). Prof. Flavio Manenti will oversee the application of CFD modeling to optimize reactor design and process conditions for the conversion of CO_2-MeOH (WP3). He will conduct comprehensive TEA and LCA for the CO_2-to-MeOH conversion (WP5).
	CeNTI provides applied R&D for industrial endogenization of new disruptive technologies, product engineering and upscale of innovative functional & smart materials and devices for companies via a B2B approach. CeNTI's mission is to drive the development of material solutions for product innovation across multi-TRL stages, specifically in	

Each of the partners contributes to the project in a complementary way, as follows:

Experience/ Skills/ Expertise					
Low dimensional materials chemistry	X	X	X		
Nanotechnology / Nanoengineering	X	X	X	X	
Nanostructured solutions		X			
Functional glasses and coatings				X	
Microfabrication		X	X		
New sustainable composites, materials and membranes		X			
Structural and reactors engineering		X	X		
Catalyst development	X		X		
Qualified testing of catalysts for CO_2-to-MeOH solar conversion			X		
Materials characterization	X	X	X	X	
Stakeholder Networking – strong industrial links					X
Technoeconomic analysis and LCA			X		X

Key persons involved:

FURTHER RECOMMENDATIONS

- Make sure to start working on the application early enough
- Make sure you are eligible and your idea fits into the programme
- Tell a convincing story, provide specific and measurable details/indicators
- Be ambitious but do not overpromise
- Make the application coherent
- Make sure that the evaluators find easily what they are looking for
- Show clearly your intentions to further develop the outcomes after the end of your Pathfinder project
- Submit on time, do not wait until the deadline, the submission system may get overloaded

THANK YOU!

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