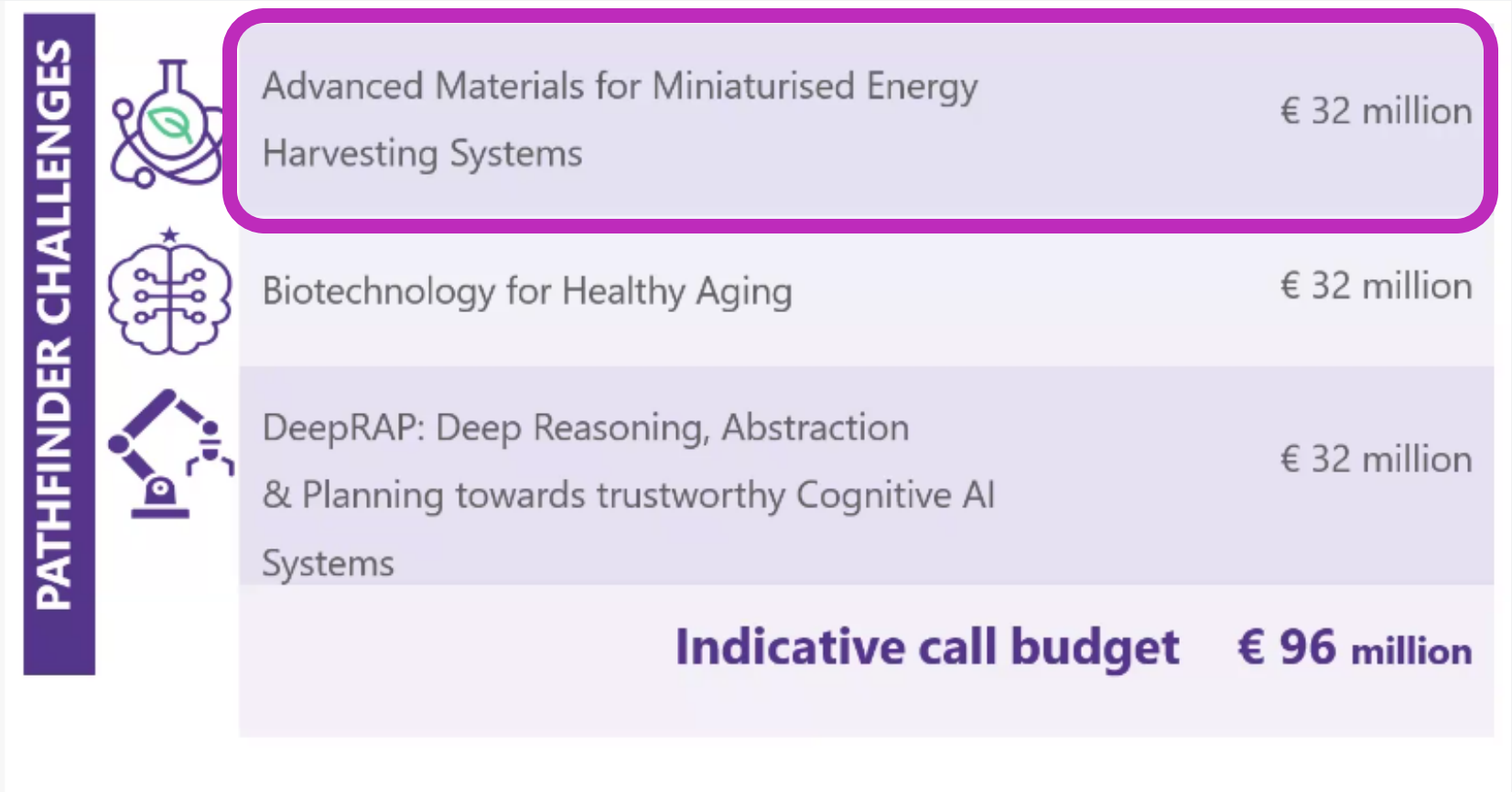
EIC Pathfinder Challenge Advanced Materials for Miniaturised Energy Harvesting

Claire Griffin
UK's NCP for EIC and EIE

2 December 2025

EIC Pathfinder Challenges 2026



Info day planned for Spring 2026

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Pillar 1
EXCELLENT SCIENCE

- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures

Pillar 2
GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

Clusters

1. Health
2. Culture, Creativity and Inclusive Society
3. Civil Security for Society
4. Digital, Industry and Space
5. Climate, Energy and Mobility
6. Food, Bioeconomy, Natural Resources, Agriculture and Environment

- Joint Research Centre

Pillar 3
INNOVATIVE EUROPE

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

- Widening participation and spreading excellence
- Reforming and Enhancing the European R&I system

Pillar 3 - Innovative Europe

Supporting and Connecting Innovators Across Europe

- Europe has solid research and industrial base
- Yet it ‘could do better’ at strengthening the use of scientific excellence and industrial prowess to accelerate innovation and turn innovative SMEs into Technology Giants.
- Focus on supporting the development of disruptive and market-creating innovations and on enhancing European Innovation Ecosystems

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Pillar III

INNOVATIVE EUROPE:

European Innovation Council

stimulating **market-creating breakthroughs** and **ecosystems** conducive to innovation

European Innovation Council

Support to innovations with breakthrough and market creating potential

European innovation ecosystems

Connecting with regional and national innovation actors

European Institute of Innovation and Technology (EIT)

Bringing key actors (research, education and business) together around a common goal for nurturing innovation

The budget: **€10.6 billion**, incl. up to **€527 million** for ecosystems (including NGEU – Recovery Fund parts dedicated to EIC).

circa **€3 billion**

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Six Strategic Goals for the EIC

- To be investor of choice for those with visionary ideas
- To crowd in €30-50 B investment into European **Deep-tech**
- To pull through high-risk technologies in critical areas for society and open strategic autonomy
- To increase the number of **European Unicorns** and Scale-Ups
- To catalyse innovation impacts from European public research and innovation
- To achieve operational excellence

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What is deep-tech?

- Technology that is based on cutting edge scientific advances and discoveries
- Is characterised by the need to stay at the technological forefront by constant interaction with new ideas and results from the lab
- NOT – High-tech which refers to R&D intensity

- Unicorn – private company valued at over 1B€

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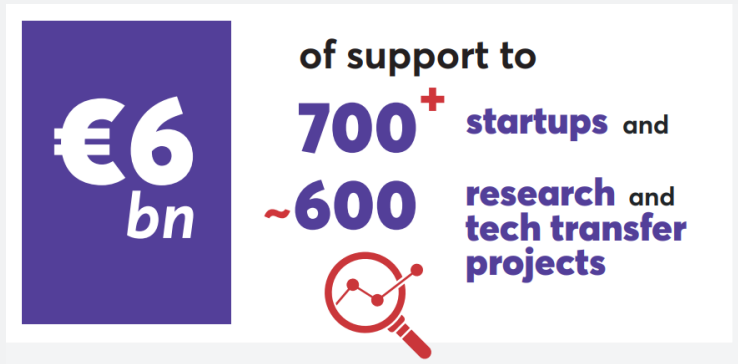
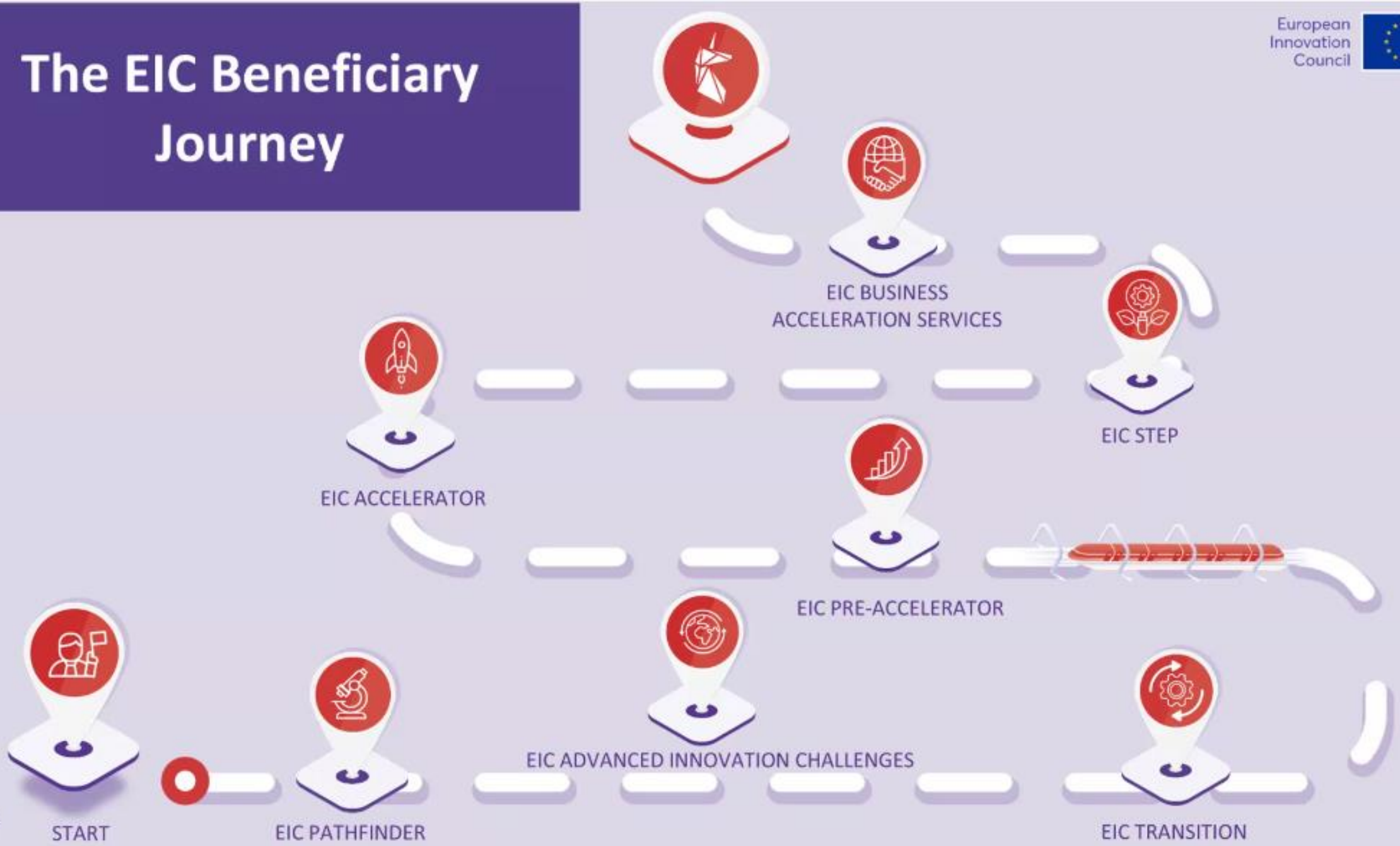
EIC Impact Report 2025

- EIC Impact Report 2025
- Generating new technologies from EU's research base
  - Translating research into market-ready innovations
- EIC Pathfinder & EIC Transition projects have spawned over 1300 innovations and had led to the creation of more than 100 spinout companies
- Includes ~100 projects that are commercialising results from ERC



The EIC Beneficiary Journey

European Innovation Council



What is the EIC Pathfinder

- Funds research to develop the scientific basis to underpin breakthrough technologies
- Supports the earliest stages of scientific, technological or deep-tech R&D
- Aims to build on new, cutting-edge directions in science & technology to disrupt a field and a market or create new opportunities
- Realises innovative technological solutions to identify, develop and scale-up breakthrough technologies and disruptive innovations in Europe

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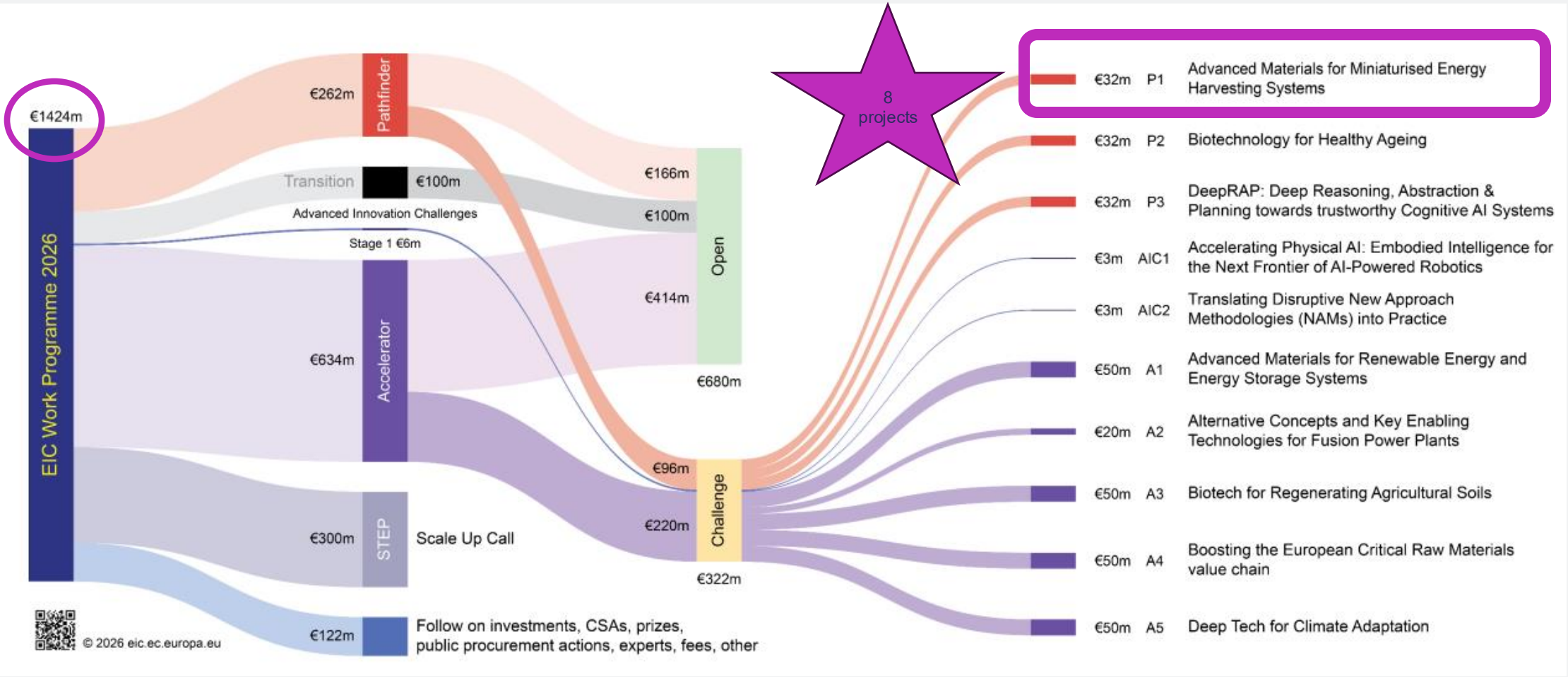
EIC Work Programme Budget 2026



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Backing visionary entrepreneurs

EIC Pathfinder Open vs Challenge

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

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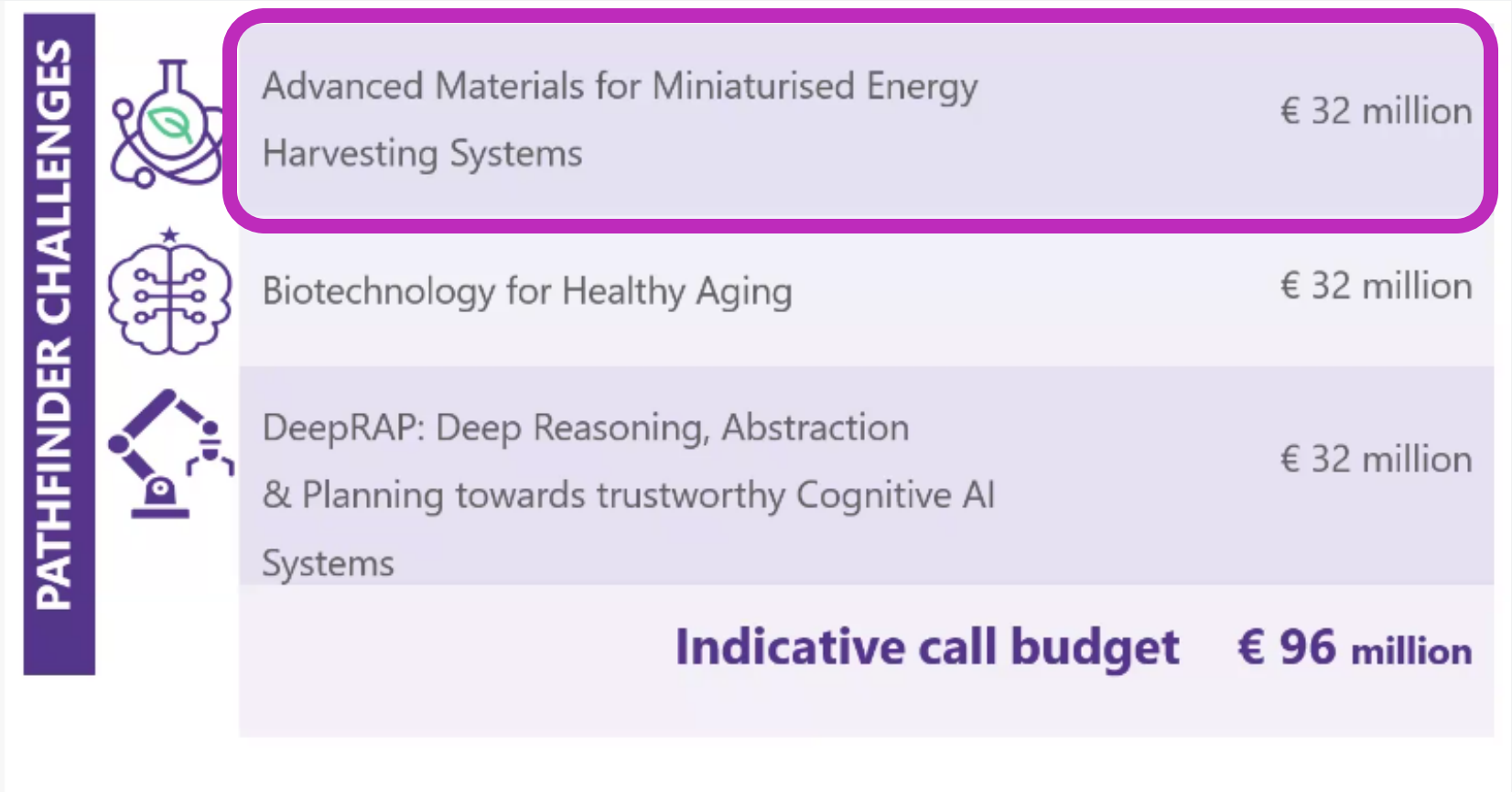
EIC Pathfinder Challenges 2026



Info day planned for Spring 2026

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EIC Pathfinder Challenges

- Build on new, cutting-edge directions in science and technology
- Disrupt a market or create a new opportunities by realising innovative technological solutions grounded in high-risk/high-gain research and development
- Establish a portfolio of projects for each Challenge that explore different perspectives, competing approaches or complementary aspects
- Proactively steered by EIC Programme Managers

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Why Can Apply

- Realise an ambitious vision for radically new technology, with potential to create new markets and/or to address global challenges
- Early-stage development of future technologies – Low TRLs
- Based on high-risk/ high-gain science-towards-technology breakthrough research (including deep-tech)
- Research must provide the foundations of the technology you are envisioning

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EIC Programme Manager

- Follow on LinkedIn and listen to their 'Tech Talks'
- Establishes a common roadmap
- Proactively steers the portfolio towards the goal of each challenge
- Projects are expected to:
  - Interact and exchange
  - Remain flexible & reactive
  - Progress together toward goals

[EIC Programme Managers - European Commission (europa.eu)]

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Call statistics EIC Pathfinder 2021-2025

European Innovation Council

Open	eligible proposals	funded proposals	EU contribution	success rate
2021	868	60	183.1 M€	6,9%
2022	858	66	206.5 M€	7,7%
2023	783	62	186.9 M€	7,9%
2024	1110	45	137.3 M €	4,1%
2025	2069	44	140.7 M €	2,1%
Total	**5688**	**277**	**854,5 M €**	**4,9%**

Challenges	eligible proposals	funded proposals	EU contribution	success rate
2021	403	42	146.9 M€	10,4%
2022	436	49	182.7 M€	11,2%
2023	365	46	168.2M€	12,3%
2024	401	32	119,6 M€	8,0%
2025	in evaluation	~30 @ 4M but 667 submitted	indicative 120 M€	~4.5%
Total	**1605**	**169**	**617.4M€**	**10,5%**

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EIC Pathfinder Challenges 2026

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EIC Pathfinder - Expected outcomes

- As defined in the respective challenge
- Top-level scientific publications
- Adequate formal protection of the generated IP, as well as an assessment of relevant aspects related to regulations, certification and standardisation
- Projects are encouraged to involve and empower key actors that have potential to become future leaders
- Empower female researchers and achieve gender balance among work package leaders

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Who can apply?

- Single legal entity
  - From MS or AC
  - Unless otherwise specified in specific Challenge
- Consortia of two entities
  - Independent legal entities from two different MS or AC
- Consortia of three or more entities
  - At least three legal entities, independent from each other and each established in a different countries
    - At least one legal entity established in a MS
    - At least two other independent legal entities, each established in different MR or AC
- What is a Legal entity - universities, research organisations, SMEs, startups, natural persons. In single beneficiary projects, mid-caps and larger companies will not be permitted.

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Need to know

- Deadline – 28 October 2026
- Application form will be available before call opens
  - 28 July 2026
  - 30 page proposal Part B
- Up to 4M€ per proposal
  - Does not preclude you to request larger amounts if duly justified
  - Or stated in the specific Challenge
- Funding rate 100% of eligible costs
- Eligible costs will take form of Lump Sum
  - EU Funding & Tenders Portal

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EIC Pathfinder 2026 Challenges Guide

Will provide more info about:

- Objectives of the Challenge
- Technical information underpinning the objectives
- Portfolio Considerations used for the final selection of proposals to be funded.
- Strategic plan for challenge & Common roadmap
- Read in conjunction with EIC 2026 Work Programme!
- EIC Pathfinder Challenges 2026 - European Innovation Council

EIC Programme Manager

- Paolo Bondavalli
- Follow on LinkedIn and listen to their 'Tech Talks'
- Read the relevant Challenge Guides!!!!
- Establishes a common roadmap
- Proactively steers the portfolio towards the goal of each challenge
- Projects are expected to:
  - Interact and exchange
  - Remain flexible & reactive
  - Progress together toward goals

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EIC Programme Managers - European Commission (europa.eu)

Advanced Materials for miniaturised Energy Harvesting Systems

- **Nr of connected sensors and internet of things is rising and** affecting strongly energy consumption and CO2 emissions
- **Strong impact on sustainability:** if we use batteries, we need to change each day around **80 millions of batteries (10 trillions by 2027)**

We need to find solutions to reduce energy consumption and develop sensors that are energetically autonomous and sustainable

To do that we need a new generation of advanced materials to implement highly efficient miniaturized energy harvesting systems with performances higher than the existing ones

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Specific Objectives, 1 of 2

- All should be addressed
- Identification and development of innovative advanced materials for energy harvesting, harnessing new physical/ chemical phenomena
  - leading to a radical shift in application range and performance while reducing the reliance on Critical Raw Materials (CRMs)
- Implementation of the advanced materials in a miniaturised energy harvesting module, e.g. but not limited to, miniaturised solar cells, thermoelectric generators (e.g. TEG), nanotribological/ piezoelectric devices, electromagnetic wave harvesting devices

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Specific Objectives, 2 of 2

- Integration of the miniaturised energy harvesting modules in energetically autonomous systems (e.g. wireless integrated sensors) and
- Benchmarking harvesting modules in a representative use case in a laboratory environment (TRL 4) with a view to demonstrating significant efficiency improvements, in terms of energy harvested, cf. state of the art.
- Leveraging digital tools e.g. AI to accelerate the process of identifying, designing, fabricating, and characterising these new materials
- All proposals should also identify potential markets and the associated impacts of their innovations

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Expected Outcomes

- Ambitious proposals put forward under this call will:
  - identify a new generation of advanced materials for miniaturised energy harvesting modules, and
  - achieve TRL 4 for the resulting energetically autonomous systems

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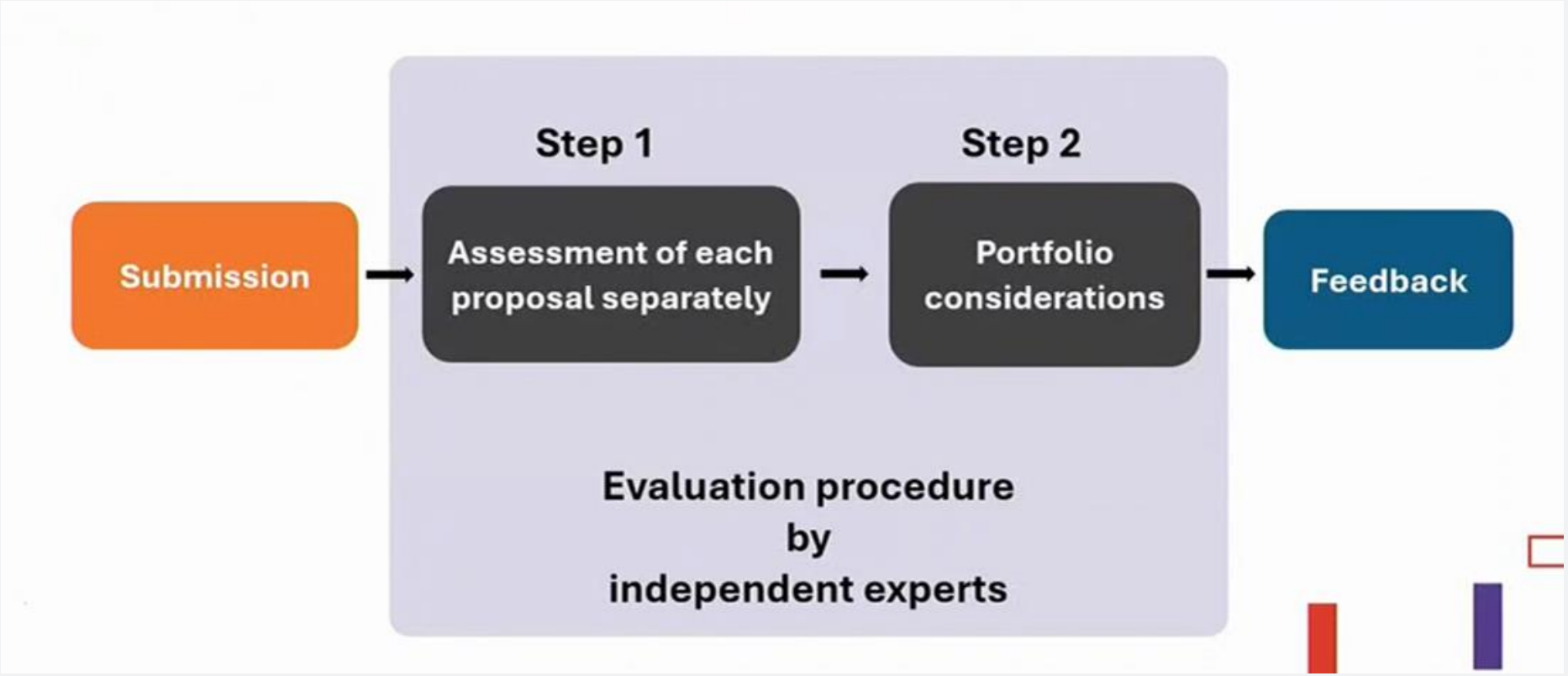
How is proposal funding determined



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Step 1: Assessment of each proposal separately

- At least 3 EIC expert evaluators evaluate and score each proposal individually wrt award criteria
- After individual evaluation – consensus group to agree common position on comments & scores (introduced in 2024)
- Evaluation Committee will check consistency across the evaluation of each individual proposal & finalise the scores and comments for all proposals.
  - EIC expert evaluators and EIC Programme Managers

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Award Criterion - Excellence

Threshold 4/5

Weight 50%

- Objectives and relevance to the challenge
  - Are they clear
  - Contribution to overall goal and specific objectives of the Challenge
- Novelty
  - To what extent is ambitious and goes beyond the state-of-the-art?
- Plausibility of the methodology
  - Sound?
  - Underlying concepts, models, assumptions, appropriate consideration of the gender dimension in research content, and the quality of open science practices

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Award Criterion - Impact

Threshold 3.5/5

Weight 30%

- Potential impact
  - Credible pathways to achieve expected outcomes and impacts of the Challenge
  - Would successful completion of the project contribute to this
- Innovation potential
  - How realistic is proof of principle for demonstrating impact of technology of the Challenge
  - Adequate protection of results & other exploitation measures
  - Societal, economic or environmental impact
  - Empowering key actors with potential to lead translating research into innovations
- Communication and dissemination
  - Suitable proposed measures to maximise expected outcomes and Impacts
  - Addressing global challenges and establishing new markets

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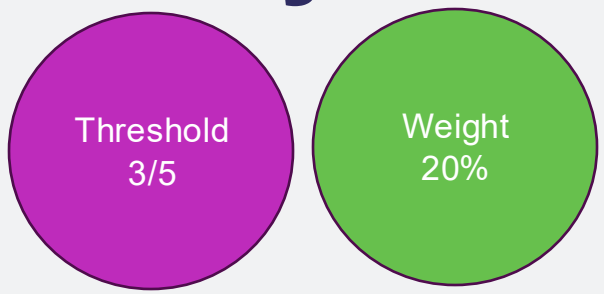
Award Criterion – Quality & efficiency of the implementation



- Work plan
  - Coherent & effective to achieve project objectives
    - work plan – work packages, deliverables, milestones, timelines etc)
    - Risk mitigation
- Allocation of resources
  - Appropriate & effective (person months & other cost items)
  - To work packages & consortium members
- Quality of the applicant/consortium
  - To what extend does the applicant / do all consortium members have the necessary capacity & high quality expertise for performing the project tasks

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Step 2: Portfolio Considerations

- See Challenge Guide
- All proposals that meet threshold defined in award criteria will be considered in Step 2
- Mapping of proposals in categories based on objectives & goal of the Challenge
  - Building blocks or subsystems, technical areas and/or competing technologies, platforms, applications areas, risk level, size and TRL
- Suitable portfolio of projects – portfolio considerations
  - Selected by evaluation committee
  - Coherent with the scope and specific objectives, to the development of a variety of advanced materials applied to a range of miniaturised energy harvesting modules and final integrated systems
  - Include 10 person months
- Evaluation committee may also propose minor adjustments

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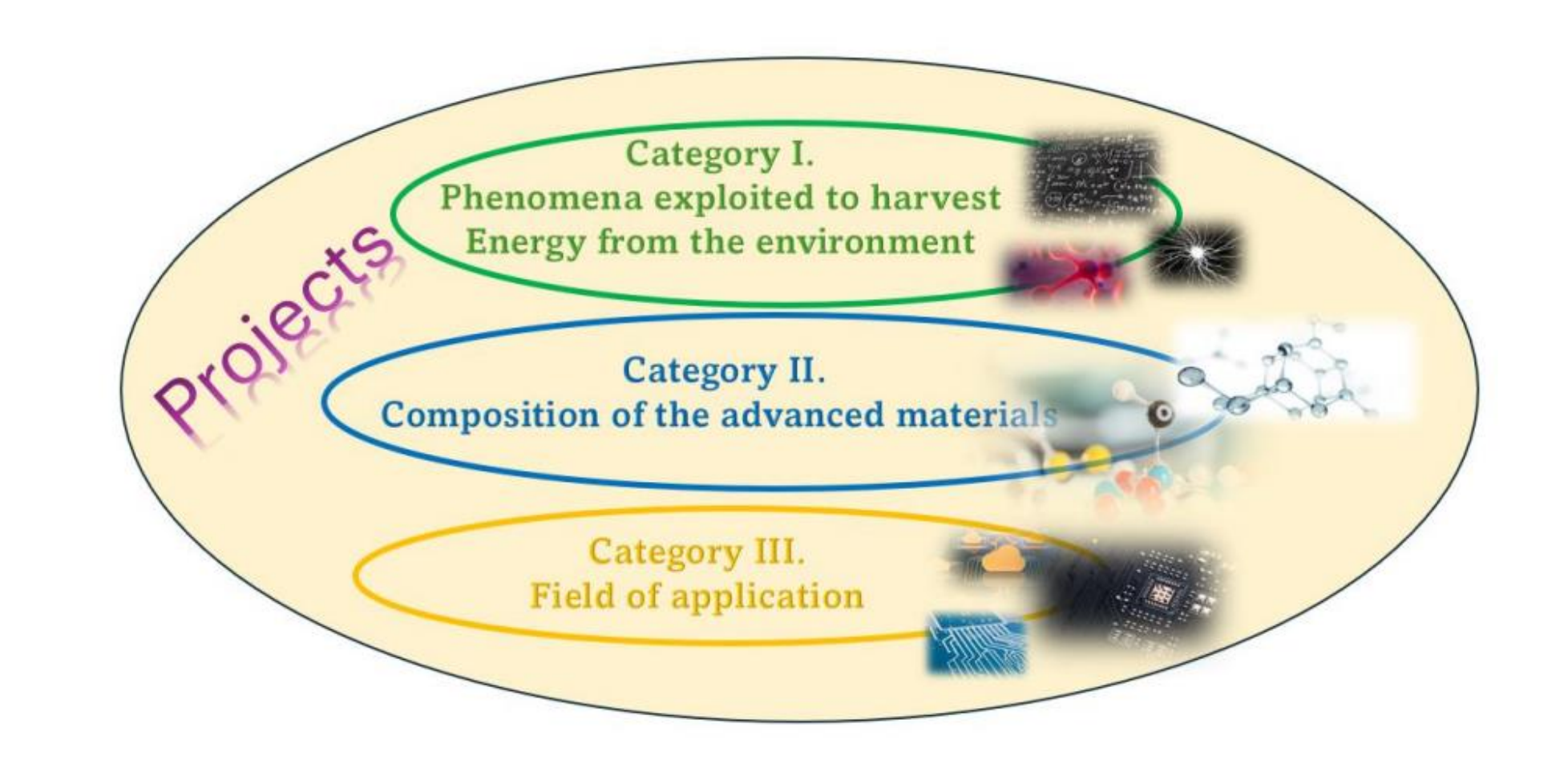
Classification Categories



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Portfolio categories (1)

- Phenomena exploited to harvest energy from the environment e.g.
  1. Thermoelectricity
  2. Solar (PV)
  3. Piezoelectric
  4. Nanotribological
  5. Electromagnetic wave harvesting
  6. …….

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Portfolio categories (2)

- Composition of the proposed advanced materials
  1. Topological materials
  2. New generation of perovskites
  3. Nanostructured materials
  4. Polymers, polymer nanocomposites
  5. Low dimensional materials (2D and 1D)
  6. …….

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Portfolio categories (3)

- Field of application
  1. Automotive (e.g. for autonomous driving)
  2. Industrial monitoring (e.g. autonomous sensors for gas leakages)
  3. Health monitoring (e.g. Point of care diagnostics)
  4. Wearables sensors/devices
  5. Smart city management sensors (e.g. traffic management)
  6. Energy management (e.g. energy consumption reduction)
  7. Agrifood, agriculture industry
  8. Drones (e.g. miniaturized drone for surveillance)
  9. Sensors for security (e.g. sensors for harmful gases)
  10. ……

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Elements for portfolio building

- Variety in the subcategories for each of the three above subcategories
- No more than two projects related to each subcategory for each of the three categories
- Every project should have a synergy or complementarity with another project

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Governance through Working Groups

- To organise & implement activities
  1. Technology / Science
  2. Regulatory issues
  3. Transition of technology to innovation
  4. Communication, dissemination and outreach activities
- One annual meeting – each group presenting progress
- Fall under Non-disclosure obligations (Annex 6, section 2)
- Refer to provided template in Challenge Guide

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Expected impacts

- The main impacts of this Challenge will be:
- A new generation of energetically autonomous systems enabling new services that will improve the life of European citizens through applications in areas such as point of care diagnostics, smart sustainable cities etc.
- Supporting sustainability in energy consumption and production in keeping with the ambitions of RePowerEU* and the Green Deal**, and
- Enhancement of the sustainability of IoTs and energetically autonomous systems in general.

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*REPowerEU and ** The European Green Deal - European Commission

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Opportunities in Pillar 2

Conall McGinley
UK National Contact Point
– Horizon Europe (Energy)

Opportunities in Pillar 2

Full Access to Horizon Europe

- UK organisations have full eligibility for funding and coordination in Horizon Europe Pillar II collaborative calls

Equal Participation Rights

- UK entities can lead consortia and participate on equal terms with EU Member States

Strategic Innovation Opportunities

- Access enables UK innovators to engage in cutting-edge projects in materials, energy, and digital technologies.

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Cluster 4 - Digital, Industry & Space

Advanced Materials for Industry

- Focus on developing advanced materials that enable miniaturization and improved energy harvesting performance.

Sustainability and Circularity

- Initiatives promoting circularity and resource efficiency support sustainability and low-carbon industrial objectives.

AI and Smart Manufacturing

- AI-driven design and smart manufacturing optimize production and enhance energy harvesting device capabilities.

Opportunities for UK Organisations

- UK organisations can leverage these calls to develop next-generation materials and align with digitalisation and decarbonization trends.

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Cluster 5 – Climate, Energy & Mobility

Accelerating Climate Neutrality

- Cluster 5 funds projects that promote climate neutrality and energy system transformation through innovative technologies.

Cross-sectoral Energy Solutions

- Focus on energy harvesting in autonomous devices and integrating renewables with smart grids for efficient energy use.

UK's Role in Energy Innovation

- UK participants contribute to large-scale renewable and advanced mobility projects, leading energy innovation efforts.

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Bid Writers & Consultants

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EIC Board Observations on the use of Consultants

- EIC Board observations on the use of consultants for the EIC applications - European Innovation Council
- Applicants are free to seek consultancy services
- BUT success is possible without them
- Highlights the main support options, such as National Contact Points (NCPs), University TTOs, insights from previous applicants, BAS and Enterprise Europe Network (EEN)
- Code of Conduct - ethical standards – verify adherence
- Read the small print

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Working with Consultants/ bid writers

- Read the small print
- Contract considerations – be cautious of exclusivity clauses, IP rights and the nature of consultancy contracts
- Assess their capabilities, compare multiple offers, consider sector specific expertise & ensure compliance with Code of Conduct.
- Be aware of success rates
- Applicants must remain engaged and responsible for applications

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Business Acceleration Services (BAS)

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BAS Aims for EIC

- View is - Financial Support is beginning of journey
- Mechanisms to help bring innovations to the market & grow your business

- Some are compulsory
- All are worth considering

- BAS - European Innovation Council - European Commission

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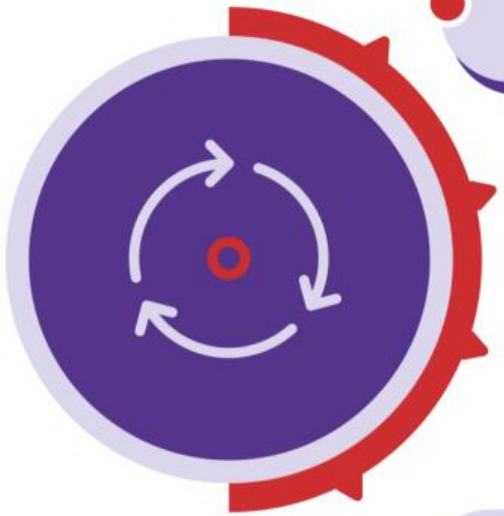
Additional opportunities for EIC Pathfinder Awardees

Projects

or their beneficiaries funded through

EIC Pathfinder & EIC Transition are eligible to apply for



- **EIC Booster grants** of up to €50,000 to undertake complementary activities
- **EIC Transition** to transform their research results into innovation on the market
- EIC Accelerator support via the **Fast Track** scheme
- a wide range of **Business Acceleration Services**, including coaching and networking

Coaching for Transition projects becomes mandatory!!!

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Thank you!

Pillar 3 – Innovative Europe

Claire Griffin
UK's NCP for EIC and EIE

20 November 2025

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UK Research and Innovation

Questions?

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