Horizon Europe's Pillar II for DESY
What's in it for us?
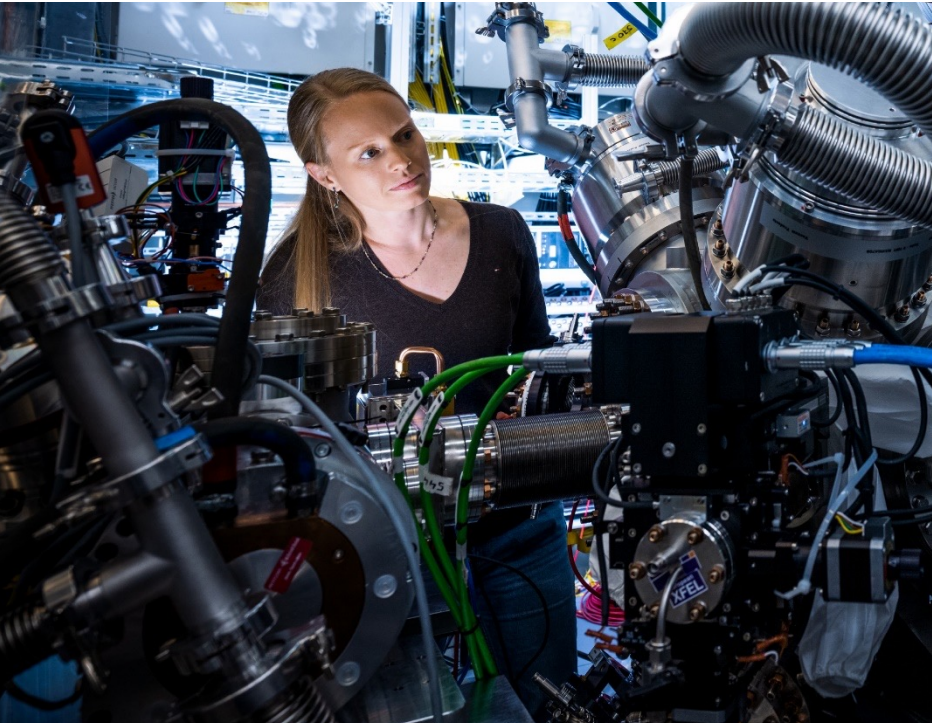## A summary based on the Work Programme 2023-24 of Horizon Europe

Nicolas Villacorta

Helmholtz delegate for research field Matter in Brussels

6/9/2023, DESY

Overview

DESY Research in the Clusters

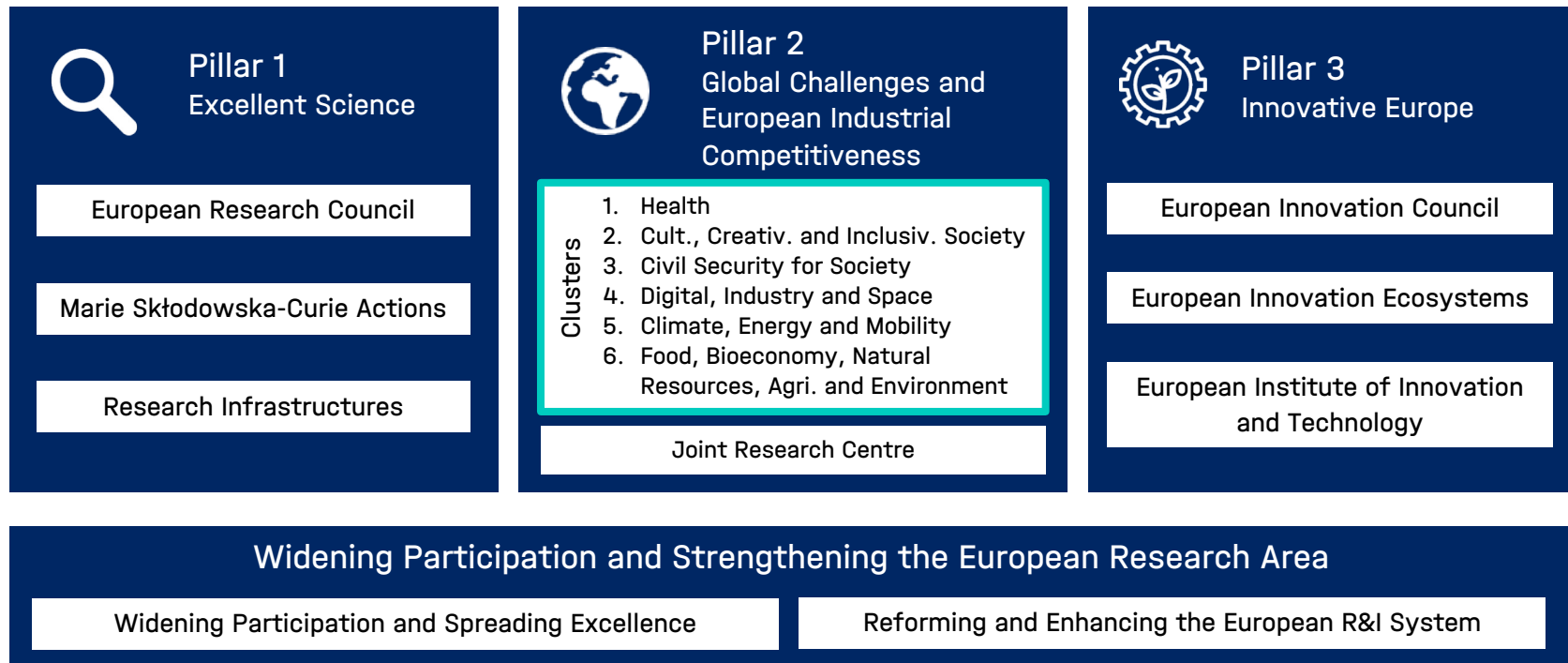# DESY Research in the Clusters
Overview

European XFEL

- Structure of Horizon Europe

- What's in the Clusters for 2024?

- EU-Partnerships

- EU-Missions

- How DESY researchers should proceed?

Structure of Horizon Europe
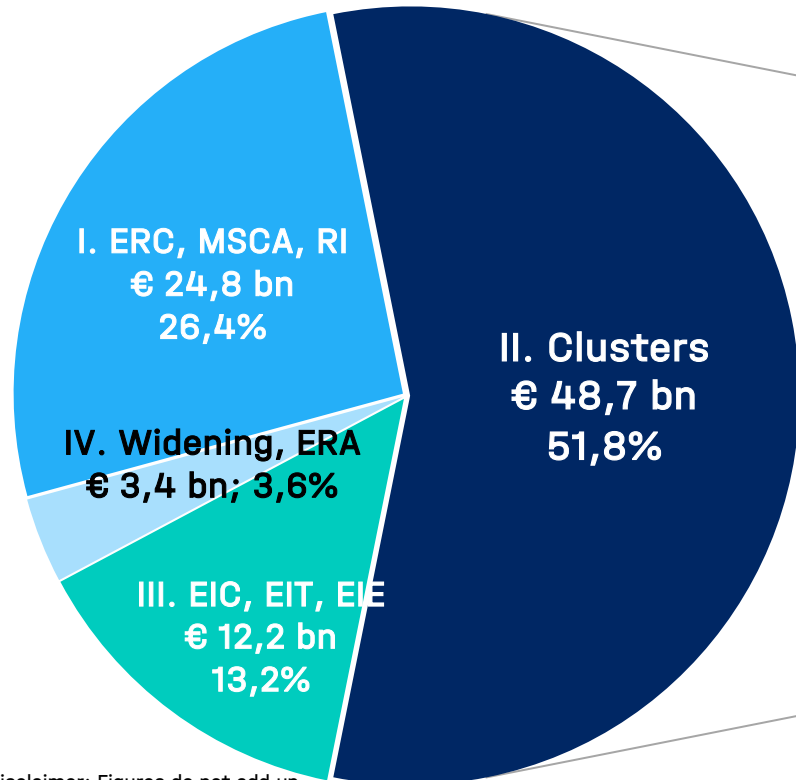
DESY Research in the Clusters

Structure of Horizon Europe
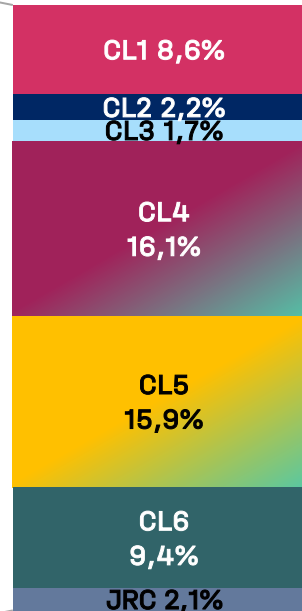## Work programme parts in Horizon Europe's structure

Pillar 1
Excellent Science

European Research Council

Marie Skłodowska-Curie Actions

Research Infrastructures

Pillar 2
Global Challenges and European Industrial Competitiveness

Clusters
1. Health
2. Cult., Creativ. and Inclusiv. Society
3. Civil Security for Society
4. Digital, Industry and Space
5. Climate, Energy and Mobility
6. Food, Bioeconomy, Natural Resources, Agri. 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

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Structure of Horizon Europe
Budget 2021 - 2027 acc. regulation 28/4/2021. Current prices

Budget: € 94,12 billion

I. ERC, MSCA, RI
€ 24,8 bn
26,4%

IV. Widening, ERA
€ 3,4 bn; 3,6%

III. EIC, EIT, EIE
€ 12,2 bn
13,2%

II. Clusters
€ 48,7 bn
51,8%

CL1 8,6%
CL2 2,2%
CL3 1,7%
CL4 16,1%
CL5 15,9%
CL6 9,4%
JRC 2,1%

Figures in € bn

- ERC: 15,89
- RI: 2,38
- CL1 Health: 8,14
- CL2 Cult., Society: 2,07
- CL3 Civil Security: 1,56
- CL4 Digital, Ind. Space: 15,18
- CL5 Clima, Ener, Mob.: 14,98
- CL6 Env. & Bioeconomy: 8,95
- EIC: 10
- Widening: 2,94

Disclaimer: Figures do not add up

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What's in the Clusters for 2024?
DESY Research in the Clusters

Complete published work programme 2023-24: https://go.fzj.de/bs9rx
Differences between Pillar I and Pillar II

Pillar I:

- Mainly bottom-up (exceptions in INFRA)
- Fundamental research prominent
- Evaluation based on excellence
- INFRA might disappear in FP10

Pillar 1
Excellent Science

European Research Council

Marie Skłodowska-Curie Actions

Research Infrastructures

Pillar II:

- Only top-down topics
- Applied research is in focus
- TRL for projects varies in topics: 3 - 7
- Industry/SME in consortia almost a must

Pillar 2
Global Challenges and European Industrial Competitiveness

1. Health
2. Cult., Creativ. and Inclusiv. Society
3. Civil Security for Society
4. Digital, Industry and Space
5. Climate, Energy and Mobility
6. Food, Bioeconomy, Natural Resources, Agri. and Environment

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Complete published work programme 2023-24: https://go.fzj.de/bs9rx
Clusters: Topics and areas of pot. interest in 2024 for DESY

CL1: Health

- Validation of fluid-derived biomarkers for the prediction and prevention of brain disorders

CL3: Civil Security for Society

- Forensics approach on drugs analysis
- On-site detection of biological toxins

CL4: Digital, Industry and Space

- Advanced materials; recycling of critical materials; steel production
- Raw materials; rare earth-based magnets; safety of chemicals; applications of nanomaterials;

CL5: Climate, Energy and Mobility

- safe pre-processing technologies for EoL battery recycling
- high-throughput production processes for stable lithium metal anodes in nextgen batts
- low-power PV
- post-Li-ion tech for mobility applications

CL6: Food, bioeconomy, nat. resources, agriculture and environment

- Tackling food fraud
- Impact of dev. of novel foods from alt. proteins
- Techniques to recover or recycle fertilising products from secondary raw materials
- Increasing circularity in plastics/electronics value chains

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CL1: Health

#	destinations in CL1	call code
1	Staying healthy in a rapidly changing society	HLTH-STAYHLTH
2	Living and working in a health-promoting environment	HLTH-ENVHLTH
3	Tackling diseases and reducing disease burden	HLTH-DISEASE
4	Ensuring access to innovative, sustainable and high-quality health care	HLTH-CARE
5	Unlocking the full potential of new tools, technologies and digital solutions for a healthy society	HLTH-TOOLS
6	Maintaining an innovative, sustainable and globally competitive health industry	HLTH-IND

NOTE: For call deadlines check https://go.fzj.de/uNpY3

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Topic HORIZON-HLTH-2024-DISEASE-03-13-two-stage

Validation of fluid-derived biomarkers for the prediction and prevention of brain disorders

Project budget: € 6-8 m. (Total: € 25 m.)
Deadline: 19 Sep. 2023 (1st stage); 11 Apr. 2024
Instrument: Research and Innovation Actions (RIA)

Applicants: Neuroscientists & clinicians in collaboration w/ DESY researchers

Outcome: Sci./clinical communities make effective use of state-of-the-art information, data, technologies, tools & best practices for dev. diagnostics. Sci./clinical communities advance understanding of brain disorders @ molec., cell & systemic level. Practitioners use biomarkers tests

Scope: Develop simple fluid-derived tests for markers on early signs of the brain disorders for treatment eligibility of potential patients

Proposal aspects:
- First stage will undergo a blind evaluation
- Lump sums apply
- USA organisations eligible for funding
- Threshold of 12 points (4+4+3 min.)
- Address brain disorders under chap. 6 & 8 of International Classification of Diseases
- Aim at validating biomarkers for early stages
- Provide evidence on regulatory acceptance
- Exploit existing biobanks, dbs. and cohorts
- Include patient organisations, funders & policy makers & regulators

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Complete published work programme 2023-24: https://go.fzj.de/bs9rx

CL2: Culture, creativity and inclusive society

#	destinations in CL2	call code
1	Innovative research on democracy and governance	CL2-DEMOCRACY
2	Innovative research on European cultural heritage and cultural and creative industries – building our future from the past	CL2-HERITAGE
3	Innovative research on social and economic transformations	CL2-TRANSFORMATIONS

NOTE: For call deadlines check https://go.fzj.de/uNpY3

Complete published work programme 2023-24: https://go.fzj.de/bs9rx
CL3: Civil security for society

#	destinations in CL3	call code
1	Better protect the EU and its citizens against Crime and Terrorism	CL3-FCT
2	Effective management of EU external borders	CL3-BM
3	Resilient Infrastructure	CL3-INFRA
4	Increased Cybersecurity	CL3-CS
5	Disaster-Resilient Society for Europe	CL3-DRS
6	Strengthened Security Research and Innovation	CL3-SSRI

NOTE: For call deadlines check https://go.fzj.de/uNpY3

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Complete published work programme 2023-24: https://go.fzj.de/bs9rx
CL4: Digital, industry and space

#	destinations in CL4	call code
1	Climate neutral, Circular and Digitised Production	CL4-TWIN-TRANSITION
2	Increased Autonomy in Key Strategic Value Chains for Resilient Industry	CL4-RESILIENCE
3	World-leading Data and Computing Technologies	CL4-DATA
4	Digital & Emerging Technologies for Competitiveness and Fit for the Green Deal	CL4-DIGITAL-EMERGING
5	Open Strategic Autonomy in Developing, Deploying and Using Global Space-Based Infrastructures, Services, Applications and Data	CL4-SPACE
6	A human-centred and ethical development of digital and industrial technologies	CL4-HUMAN

NOTE: For call deadlines check https://go.fzj.de/uNpY3

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Complete published work programme 2023-24: https://go.fzj.de/bs9rx
Substructure CL4: Digital, industry and space

sections in destination #1 (CL4-TWIN-TRANSITION)	contribution EU-Partnership(s)
Manufacturing industry	Made in Europe / Photonics
A new way to build, accelerating disruptive change in construction	
Energy intensive process industries: - Enegy efficient and climate neutral process industries - Circularity and zero pollution in process industries - Clean Steel	Process4Planet Clean Steel

sections in destination #2 (CL4-RESILIENCE)	contribution EU-Partnership(s)
Raw materials for EU strategic autonomy and successful transition to a climate-neutral and circular economy	
Safe and Sustainable by Design (SSbD) Chemicals and Materials	
Strategic Innovation Markets Driven by Advanced Materials	
Improving the resilience of EU businesses, especially SMEs and Startups	

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Topic HORIZON-CL4-2024-RESILIENCE-01-04

Technologies for processing and refining of critical raw materials (IA)

Project budget: € 7,3 m. (Total: € 22 m.)

Deadline: 7 Feb. 2024

Instrument: Innovation Action

Applicants: RTOs in material science w/ SMEs (reimbursement 70 %). DESY does not cover all

Outcome: Increase access to specific critical raw and secondary raw materials. Increase recovery rate and cost-efficiency in mineral processing & metallurgical processes. Improve health, safety & env. performance. Waste reduction. Improve responsible supply and sustainable access.

Scope: Demonstrate more energy-efficient systems integrating processing & refining tech with less waste. Reach TRL 6-7 by eop.

Proposal aspects:
- Some countries not allowed in proposal
- Reduce toxic compounds in final products
- Proposed solutions adaptable to diff. CRM
- Minimise losses during mineral-rock extraction
- Recycle end-of-life products excluded
- Facilitate market update of dev. solutions by industry
- Include business case and exploitation strategy
- Preempt commitment of industry for eop.

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Substructure CL4: Digital, industry and space

sections in destination #3 (CL4-DATA)	contribution EU-Partnership(s)
Data sharing and analytics capacity	AI, data and robotics
From Cloud to Edge to IoT for European Data	AI, data and robotics

sections in destination #4 (CL4-DIGITAL-EMERGING)	contribution EU-Partnership(s)
European Innovation Leadership in Photonics	Photonics
AI, Data and Robotics	AI, data and robotics
Open Source for Cloud/Edge and Software Engineering Fundamentals to support Digital Autonomy	
European Leadership in Emerging and Enabling Technologies	
Flagship on Quantum Technologies: a Paradigm Shift	Quantum flagship
Graphene and 2D materials: Europe in the lead	Graphene flagship

Complete published work programme 2023-24: https://go.fzj.de/bs9rx
Substructure CL4: Digital, industry and space

sections in destination #5 (CL4-SPACE)	contribution to
Foster competitiveness of space systems	EU space sector at large
Reinforce EU capacity to access & use space	EU space sector at large
Evolution of services: Copernicus	Space Programme components
Development of applications for Galileo, EGNOS and Copernicus and PRS and GOVSATCOM user activities	Space Programme components
Innovative space capabilities: Quantum	Space Programme components / Quantum Flagship
Development of SSA-SST and GOVSATCOM capabilities, including actions preparing for the Secure Connectivity initiative	EU space sector at large
Specific activities related to Space entrepreneurship ecosystems	EU space sector at large

Complete published work programme 2023-24: https://go.fzj.de/bs9rx
CL5: Climate, energy and mobility

#	destinations in CL5	call code
1	Climate sciences and responses for the transformation towards climate neutrality	CL5-D1
2	Cross-sectoral solutions for the climate transition	CL5-D2
3	Sustainable, secure and competitive energy supply	CL5-D3
4	Efficient, sustainable and inclusive energy use	CL5-D4
5	Clean and competitive solutions for all transport modes	CL5-D5
6	Safe, Resilient Transport and Smart Mobility services for passengers and goods	CL5-D6

NOTE: For call deadlines check https://go.fzj.de/uNpY3

Complete published work programme 2023-24: https://go.fzj.de/bs9rx
Substructure CL5: Climate, energy and mobility

sections under destination #2 (CL5-D2)	contribution EU-Partnership(s)
A competitive and sustainable European battery value chain	Industrial Battery Value Chain (BATT4EU)
Emerging breakthrough technologies and climate solutions	

sections under destination #3 (CL5-D3)	contribution EU-Partnership(s)
Global leadership in renewable energy: - PV, wind energy and heat pumps - Renewable fuels - Diverse renewable energy technologies (bioenergy, hydropower, ocean energy, solar thermal, cross technology)	
Energy, systems, grids and storage	
Carbon capture, utilization and storage (CCUS)	
Cross-cutting issues	

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Topic HORIZON-CL5-2024-D2-01-01

Advanced sustainable/safe pre-processing tech. for EoL batt. recycling

Project budget: € 8 m. (Total: € 16 m.)
Deadline: 18 Apr. 2024
Instrument: Research and Innovation Actions (RIA)

Applicants: Batt. researchers on recycling w/ DESY researchers

Outcome: Dev. pre-treatment processes to increase recycling rate of Li-Ion batts. Make batts to recycle ready to extract high-value metals in subsequent processes. Separate toxic chemicals. Reduce scrap volume and allow separation of components. Direct EU batt. industry towards zero-waste. Decrease CO_2 footprint of metals & raw mats for batts.

Scope: Focus on no-Co batt contents (metal shells, foils, binders, Li salts, anode active materials). Dev. separation methods. Reach TRL 5 by eop.

Proposal aspects:
- Contribute & liaise w/ Batt4EU partnership
- Up-scale pre-treatment proc from lab to fab
- Recovery and valorisation of anode materials
- Electrolyte valorisation by recovering Li-salts
- Recover electrode current collectors
- Reduce env. impact and system losses
- Demonstrate circular business practices
- Include a strong business case
- Consider involving JRC
- Liaise w/ topics CL5-2023-D2-01-02 CL5-2022-D2-01-08

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Topic HORIZON-CL5-2024-D3-01-02

Low-power PV

Project budget: € 3 m. (Total: € 6 m.)
Deadline: 16 Jan. 2024
Instrument: Innovation Actions (IA)

Applicants: PV researchers & industry (70 % reimbursement) w/ DESY researchers

Outcome: Support dev. of energy autonomous applications. Increase pot. of PV for low power, low irradiation applications: Harvesting energy in low light intensity or artificial light conditions

Scope: PV energy harvesting such as indoors or from artificial or diffuse light for low-power electronics. Combine w/ storage units. Reach TRL 5-7 by eop.

Proposal aspects:
- Lump sums apply
- Validate novel and low-env impact PV materials
- Test suitable substrates for low-power applications.
- Include JRC for conducting pre-normative research or suggest characterisation methods

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Complete published work programme 2023-24: https://go.fzj.de/bs9rx
CL6: Food, bioeconomy, nat. resources, agri. and environment

#	destinations in CL6	call code
1	Biodiversity and ecosystem services	CL6-BIODIV
2	Fair, healthy and environment-friendly food systems from primary production to consumption	CL6-FARM2FORK
3	Circular economy and bioeconomy sectors	CL6-CIRCBIO
4	Clean environment and zero pollution	CL6-ZEROPOLLUTION
5	Land, ocean and water for climate action	CL6-CLIMATE
6	Resilient, inclusive, healthy and green rural, coastal and urban communities	CL6-COMMUNITIES
7	Innovative governance, environmental observations and digital solutions in support of the Green Deal	CL6-GOVERNANCE

NOTE: For call deadlines check https://go.fzj.de/uNpY3

Destination CL6.3: CL6-CircBio
Topic HORIZON-CL6-2024-CIRCBIO-02-3-two-stage

Increasing the circularity in electronics value chains

Project budget: € 5 m. (Total: € 10 m.)
Deadline: 22 Feb. 2024 (1st stage); 17 Sept. 2024
Instrument: Innovation Actions (70 % reimbursement for SMEs)

Applicants: Manuf. & recycling SMEs w/ DESY researchers

Outcome: Enhance European industrial sustainability & resource independence. Improve consumer & citizen benefits. Emergence of new value chains of re-/upcycled resources or increase rates for targeted mat. Streams. Increase resource efficiency. Diffuse new circular business practices

Scope: Support Circular Economy Action Plan (CEAP) by re-/upcycling electronics. Increase circularity of related secondary raw materials. Reach TRL 6-8 by eop.

Proposal aspects:
- First stage will undergo a blind evaluation
- Address related priorities of CEAP
- Demonstrate & deploy large-scale solutions
- Demonstrate increased recovery, re-/upcycling rates
- Increase circularity of CRM
- Demonstrate circular business practices
- Support traceability as in digital product passport
- Assess env., social & economic impact of prod.
- Develop training material for workers

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Topic HORIZON-CL6-2024-ZEROPOLLUTION-01-2

Best available techniques to recover or recycle fertilising products from secondary raw materials

Project budget: € 2 m. (Total: € 4 m.)
Deadline: 22 Feb. 2024
Instrument: Coordination and Support Actions (CSA)

Applicants: Agri researchers w/ DESY researchers

Outcome: Deliver recommendation to policy makers and practicioners on alternative fertilising products to balance N & P flows within safe ecological boundaries. Contribute to restore ecosystems. Lower impact on soil, water and air quality of fertilisers recovered from secondary raw materials

Scope: Analysis of best available technologies for recovering/recycling fertilising products from secondary raw materials in Europe

Proposal aspects:
- Lump sums apply
- Collect data on case studies of existing installations recovering secondary raw materials
- Analyse technical aspects of available tech. in characterising secondary raw materials
- Assess impact of recovery on soil, water and air quality. Pollution prevention
- Compare energy-cost & efficiency of solutions
- Analyse market & regulatory framework of identified practices
- Link to EU-Mission Restore our ocean and waters by 2030

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EU-Partnerships
DESY Research in the Clusters

Types of EU-Partnerships in Horizon Europe

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- Simple architecture and toolbox
- Coherent life-cycle approach
- Strategic orientation

Co-programmed

Partner: Industry / MS

Implementation: Memoradum of Understanding (MoU)

Topics: In Clusters in Horizon Europe

E.g.: Batt4EU, EOSC, Photonics

Co-funded

Partner: Member States

Implementation: Joint programme. In-kind & financial

Topics: Independent annual workprogrammes

E.g.: EP PerMed, M-ERA.NET, CETPartnership,

Institutionalised

Partner: Industry / MS

Implementation: Art. 185(MS)/187(Ind.) TFEU

Topics: Independent annual workprogrammes

E.g.: CBE, CleanH2, Metrology, ChipsJU, IHI, EIT

Source: EU Commission

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EU-Partnerships

Relevant EU-Partnerships for DESY research

partnership	related cluster	implementation under Horizon Europe
Innovative Health Initiative (IHI)	CL1	Institutionalised. Calls in separate work programme
Personalised medicine (EP PerMed)	CL1	Co-funded. Calls in separate work programme
Photonics Europe	CL4	Co-programmed. Topics: Destination #4
European Metrology (METPART)	CL4	Institutionalised. Calls in separate work programme
Key Digital Technologies/Chips JU	CL4	Inst. Low-TRL topics: Destination #4
Industrial Battery Value Chain (BATT4EU)	CL5	Co-programmed. Topics: Destination #2
Clean Energy Transition (CET)Partnership	CL5	Co-funded. Calls in separate work programme
Clean Hydrogen (Clean H2 JU)	CL5	Institutionalised. Calls in separate work programme
Circular Biobased Europe (CBE)	CL6	Institutionalised. Calls in separate work programme
European Open Science Cloud (EOSC)	-	Co-programmed. Topics: HORIZON-INFRA-EOSC part

NOTE: Further EU-Partnerships and calls https://go.fzj.de/QHLYt

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EU-Missions

DESY Research in the Clusters

EU-Missions work programme 2023-24: https://go.fzj.de/bs9rx
Relevant EU-Missions (MISS) for DESY research

abbr.	name	objective
CLIMA	Mission Adaptation to Climate Change	Support at least 150 European regions and communities to become climate resilient by 2030
CANCER	Mission on Cancer	Improving the lives of more than 3 million people by 2030 through prevention, cure and for those affected by cancer including their families, to live longer and better
CITIES	Climate-Neutral and Smart Cities Mission	100 Climate-Neutral and Smart cities by 2030
OCEAN	Mission Ocean and Waters	Restore our Ocean and Waters by 2030
SOIL	Mission: A Soil Deal for Europe	100 living labs and lighthouses to lead the transition towards healthy soils by 2030

NOTE: Focus of Missions is relatively away from DESY research

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How to proceed?
DESY Research in the Clusters

DESY research in the clusters

I've found a topic! Where do I start?

1. Identify your area of interest in the previous slides

2. Open the right PDF document in folder: https://go.fzj.de/bs9rx

3. Search for your keywords in PDF

4. Check submission deadline here: https://go.fzj.de/uNpY3

5. Check whether your EU partners are successful with EU projects in the area

6. Contact EUP

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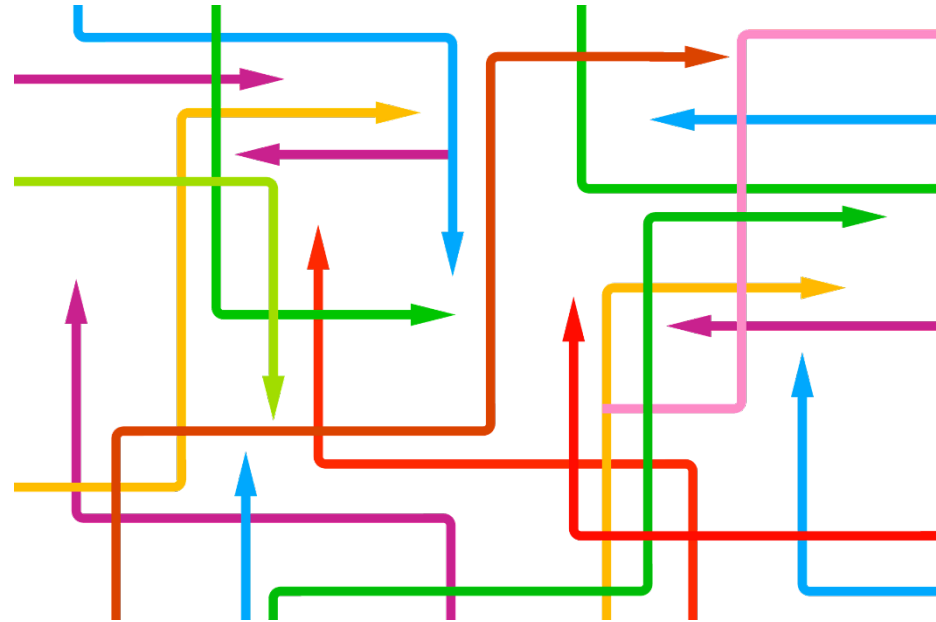
No topic for me. How can I place my research? (EUP helps)

Think strategically

- Which partners in the EU do I collaborate with?
- Are they active in Clusters of Horizon Europe?
- Which research contributes to "hype" policy areas?: Critical Raw Materials; Chips Act; Synthetic Fuels(?), Fusion

Programme Committee

- Reps. national ministries discuss drafts work programme (started this summer for 2025)
- Every cluster has different representatives
- Delegations DE: BMBF + PT + Federal state
- Ideas for topics coming from several national delegations have more chances

Scouting for themes in DE for 2025 on

- CL1: NCP Health https://www.nksgesundheit.de/ Symposium 24/05: https://go.fzj.de/LMLQk
- CL4: NCP DIT https://www.nks-dit.de/en/home
- CL5: NCP KEM https://www.nks-kem.de/energie/

Lobbying for 2025 and 2026-27

- Helmholtz and EUP have provided themes to EC and BMBF: https://go.fzj.de/GUyGP
- Your research partners in other EU countries are key!

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Helmholtz in Brussels

Colleagues in Brussels office: Who can further help?

Delegate	Helmholtz research field	Cluster	Further areas
Holger Ihssen	Energy	CL5.2, CL5.3, CL5.4	European Energy Research Alliance (EERA), WIDENING
Andreas Krell	Earth & Environment	CL3.5; CL5.1; CL6	EU-Missions; Informal support ECRA
Jens Jäger	Health	CL1	Programme part EIC; Mission Cancer; EU Health Data Space
Anna Cattani-Scholz	Information	CL3; CL4	Programme part ERC; Digital Europe Programme
Nicolas Villacorta	Matter	CL2	Programme part INFRA; ESFRI; Programme part ERA; EU-Partnerships

NOTE: DESY requests for further help to be done through EUP

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DESY research in Horizon Europe
Take-home messages

Do not forget

- Read carefully the work programme, not only the topic text: Introduction of the relevant destination with the expected impacts
- In a consortium: You are not taking care of everything!
- Keep the political priorities in mind when writing the proposal:
  - Relevant strategies (e.g. European Green Deal, UN SDGs, Critical Raw Materials Act, Farm4Fork strategy; Circular Economy Action Plan)
- Check Commission's web with official Work Programme

If coordinating a consortium

- Topic-Text Analysis (Table):
  - Scope & Outcome of Topic
  - Partners with expertise
- Missing cells in Table:
  - Which expertise is missing?
  - Potential partners from Widening Countries?
  - Expertise of industrial partner(s)?

Underline in your proposal:

- Relevant Missions / Partnerships
- Political priorities of the Commission
- Own contribution of consortium to project

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Thank you for your attention!

Questions?
Please contact the Brussels Office:
https://t1p.de/buoe