



# Horizon Europe

## Graphene & Human Brain Project Flagships and the six preparatory actions

J-F. Buggenhout  
Head of the Flagships Unit  
DG Connect, European Commission

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# EP and Council agreement on Horizon Europe regulation

Revised recital 17a on FET Flagships

*“Activities carried out within the FET Flagships on Graphene, the Human Brain Project and Quantum Technology, which are supported under Horizon 2020, will continue being supported under Horizon Europe through calls for proposals included in the work programme.”*

*“Preparatory actions supported under the FET Flagships part of Horizon 2020 will feed the Strategic Planning process under Horizon Europe and inform the work on missions, co-funded/co-programmed partnerships and regular calls for proposals.”*

<https://www.consilium.europa.eu/media/38902/st07942-en19.pdf>

# Graphene

## Building upon the success and mission/vision of the Graphene Flagship

*Pillar II - Cluster 4: Digital, Industry & Space - Destination 4  
(draft September 2020)*

### Graphene: Europe in the lead

- **Strong European supply and value chain**
- **Concrete innovation opportunities** (TRL 5-8)
- **Improved performances and new functionalities** for devices and systems
- **High-quality production methods** for market-making capacity.
- **Broad portfolio of 2D materials and hetero-structures** for future technologies.

- 2D materials of tomorrow
- Unlock their potential for devices and systems:
  - integration & performances (incl. for sensors)
  - for energy storage/harvesting
  - for biomedical applications
- Experimental pilot line for devices
- Production and manufacturing
- Composites, coatings and foams
- Pan-European Graphene ecosystem  
(2 CSAs + Safe by design 2DM technology)

Advanced spintronics: Unleashing spin in the next generation ICs

# The Human Brain Project (HBP) (WP2021-2022)

## Neuroscience for medicine

- Pillar II Cluster 1: Health, destination 1: The topic “*Towards a molecular and neurobiological understanding of mental health and mental illness for the benefit of citizens and patients*” incorporates the HBP approaches of computational modelling and/or artificial intelligence, although a wider topic.

## EBRAINS Research Infrastructure

- Pillar I Research Infrastructures, destination 3: Specific topic “***Implementing digital services to empower neuroscience research for health and brain inspired technology via EBRAINS***” which ensures continuity with SGA3 EBRAINS development: implementation support, enrichment with new user required services, and ensuring compatibility with EOSC.

# The six Preparatory Actions and their S&T roadmaps

## Relevant possibilities under clusters in Horizon Europe Pillar II

- **Time Machine**, with its Time Machine Organisation (TMO) and several Local TMs
  - Cluster 2 (several subsequent projects are starting in the meantime)
- **Humane AI**,
  - Cluster 4 (a subsequent H2020 project is starting in the meantime)
- **SUNRISE + ENERGY-X**, joined initiative SUNERGY,
  - Cluster 5, e.g. Renewable Energy Sources and Emerging Breakthrough Technologies (a proposal to the H2020 Green Deal Call in the meantime)
- **LifeTime**,
  - Cluster 1, e.g. Advancing innovative AI-based solutions for treatment. Plus Mission Cancer regarding personalised medicine & early diagnosis. European Health Data Space relevance.
- **RESTORE**,
  - Cluster 1, e.g. Next generation advanced therapies.
  - EIC Pathfinder Challenge – Emerging Technologies in Cell and Gene therapy