

#DSM

# Digital Single Market

## FUTURE AND EMERGING TECHNOLOGIES FLAGSHIPS AND LARGE RESEARCH INITIATIVES

Boosting the delivery of cutting-edge technologies  
and aiming for game-changing effects



These visionary, **long-term, large-scale** research initiatives address **major science and technology challenges in Europe**. They involve **hundreds of research teams** with the aim of boosting the EU's scientific and industrial landscape.



Activities based on  
**jointly defined Research  
& Innovation roadmaps**



**Alignment of Research  
& Innovation agendas**  
at EU, national and regional  
levels



**Joint governance**  
by EU and national  
funding authorities

## FUTURE AND EMERGING TECHNOLOGIES FLAGSHIPS

Supported under Horizon 2020. They will continue to be supported under Horizon Europe.



### GRAPHENE FLAGSHIP

Since 2013

Unlock the potential of graphene, a carbon-based material one atom thick, and other 2D materials



**9 spin-offs, 160 prototype systems,  
46 products launched,  
400 academia/industry collaborations**



**Cost-effective scalable** graphene  
production



**Ultrafast components** for 5G  
communications



**Lightweight materials** for aeroplanes and  
cars



**Higher efficiency & long-lasting**  
photovoltaic cells



**Flexible sensors** for medical sector

[graphene-flagship.eu](http://graphene-flagship.eu)



### Human Brain Project

Since 2013

Understand and model the brain



**Brain atlases and models for brain  
interventions** (e.g. stroke, epilepsy)



Exploring **consciousness mechanisms**



Building a **neuroscience data  
& computing infrastructure**



Using **brain models** to equip robots with  
more efficient artificial intelligence



More than **1000 publications**  
**200 doctoral students**

[humanbrainproject.eu](http://humanbrainproject.eu)



Since 2018

Use quantum effects - the laws of physics that apply to molecules, atoms and even smaller particles - to make advances in science, industry and society



Make **communications** ultra-secure



Build first ever **quantum computer**



**Understand complex systems** with quantum simulation



Develop breakthrough **sensing** devices

<https://qt.eu>

## NEW LARGE RESEARCH INITIATIVE



Starting in 2020



Develop **ultra-performing, safe and sustainable batteries**

Use **artificial intelligence** to accelerate discovery of new **battery chemistries**, develop monitoring through **smart sensing** at the heart of the battery, increase longevity through **self-healing**, and more.

Battery 2030+ is part of the EU's [Strategic Action Plan on Batteries](#), supported under Horizon 2020 and with continued support proposed under Horizon Europe.

<https://battery2030.eu>

## IDEAS/PLANS FOR NEW RESEARCH INITIATIVES

Under the Horizon 2020 Future and Emerging Technologies programme, and to be taken up in Horizon Europe missions, partnerships, and strategic programming.

### Energy, Environment & Climate Change



Artificial photosynthesis for a clean energy future



Transformative chemistry for a sustainable future

### ICT & Connected Society



Human-centred artificial intelligence



Using AI to make sense of complex historical datasets

### Health & the Life Sciences



Understanding and treating human cells during diseases



Bring advanced therapies to clinical practice



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@EU\_H2020

@EUScienceInnov

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