



FET in Horizon 2020

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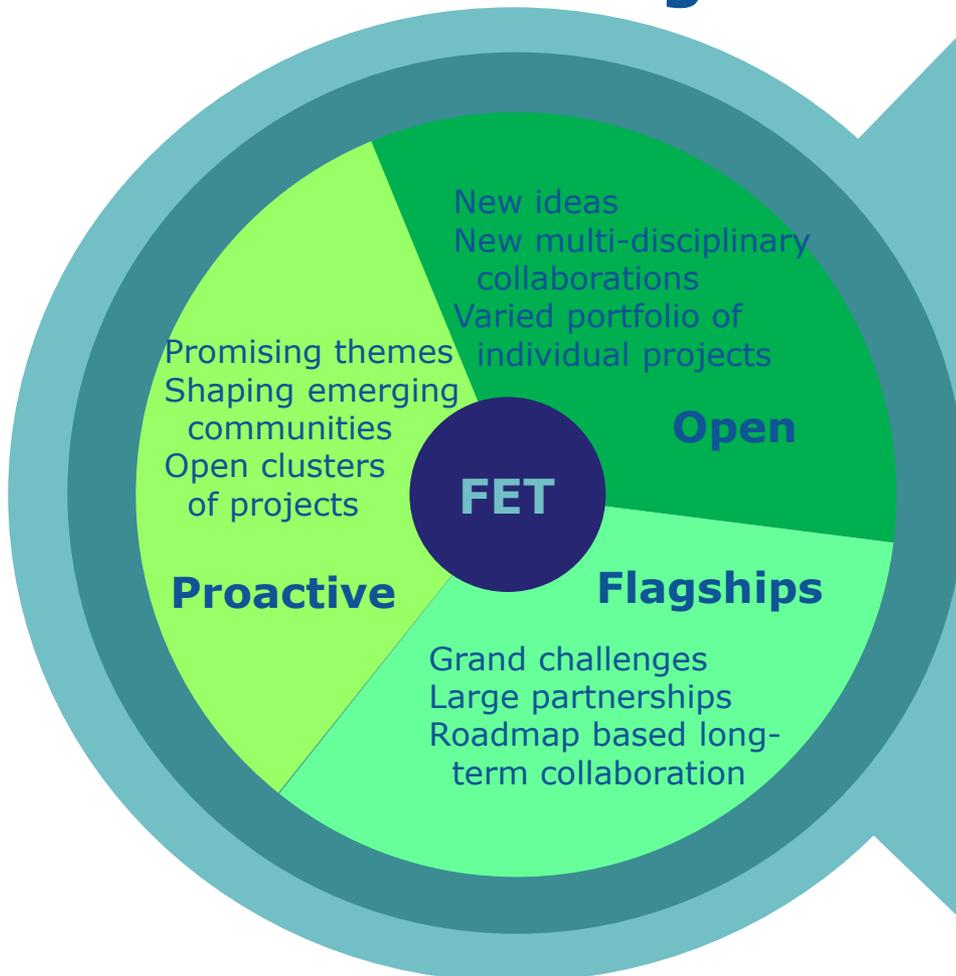
Warning.

- **Horizon 2020 legislation not yet approved
(expected December 2013)**
- **All information in this presentation is
therefore subject to change**

Overview

- FET in Horizon 2020
- FET-Open – *fostering novel ideas*
- FET-Proactive - *nurturing emerging themes and communities*
 - **Global Systems Science (GSS)**
 - **Knowing, doing, being: cognition beyond problem solving**
 - **Quantum simulation (QSYM)**
 - **Towards exascale high performance computing (HPC)**
- FET Flagships - *tackling grand interdisciplinary science and technology challenges*
 - **Graphene**
 - **Human Brain Project**

FET action lines and cross-cutting issues



New synergies and collaborations

- New interdisciplinary synergies linking sciences, technologies and the humanities
- Attracting new high-potential actors, e.g., high-tech SMEs and young researchers
- Programme synergies at European level
- International (global) cooperation

Promoting new approaches and tools for doing science

- Exploring creative R&I methodologies
- Future generation computing to enable advanced simulation, data capture,...
- Digital Science and e-infrastructures

Innovation

- European leadership for FETs
- Encouraging new ideas and actors
- Kick-starting new innovation eco-systems (small and large) around new technologies
- Delivery of new technology options and baselines to industry and spin-offs
- Digital science, open data for wider and faster transfer, spin-off and education

Responsible research and innovation

- Social Sciences and Humanities are relevant
- Promoting societal debate and exchange
- FET Advisory Board and FET Observatory to capture views and needs widely
- Open access, open data policies
- Ethics of methods as well as of results

FET's missions

- *To promote and support the emergence of radically new technology areas that will renew the basis for future European competitiveness and growth and will make a difference for society in the decades to come.*
- *To initiate and shape the development of European research and innovation eco-systems around such future and emerging technologies, as seeds of future industrial leadership and potential solutions for societal challenges.*
- *To turn Europe into the best environment for responsible and dynamic multi-disciplinary collaborations on such future and emerging technologies, including facilitating the wider training of researchers in new areas.*

FET: a bridge from scientific research to innovation

Main changes since FP7

- *All technologies now addressed, no focus on ICT as in FP7*
- *Multidisciplinary research now a core part of FET*
- *Proposal format requirements*
 - **Single stage for all, incl. FET Open**
 - **Not anonymous**
 - **Page limits: FET Open, GSS, KDB(Cognition), QSYM**
Title page + 15 pages (excluding ethics section)
- *Arrangements for FET Flagships*
- *Evaluation sub-criteria and criteria weights*

Draft Workprogramme for 2014-15

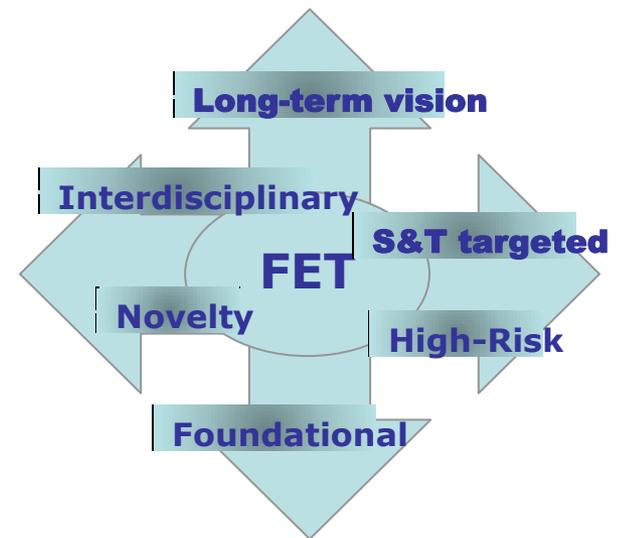
Can be downloaded from:

**[http://ec.europa.eu/research/horizon2020/
index_en.cfm?pg=h2020-documents](http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents)**

Check for updates often!

FET Open: fostering novel ideas

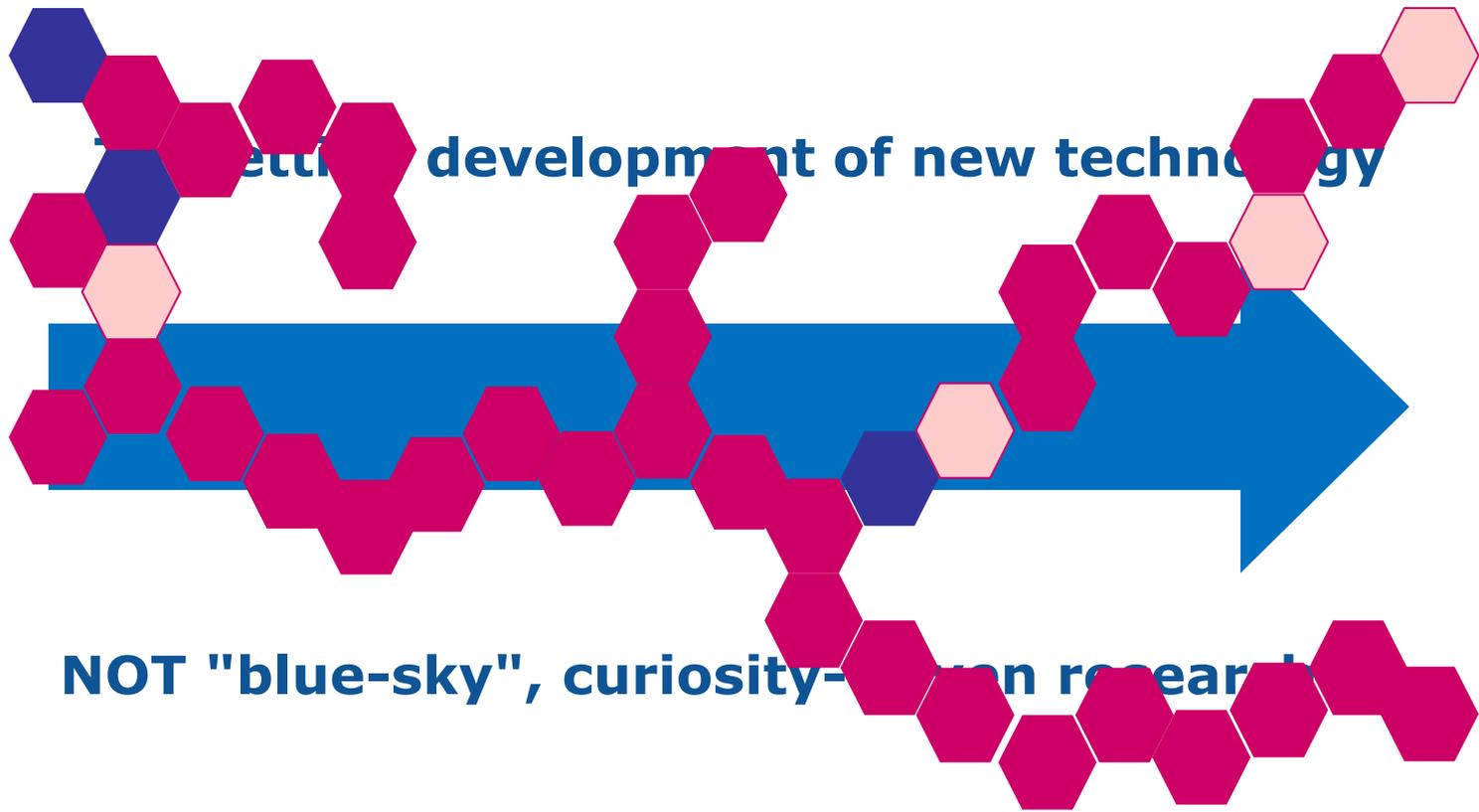
- 'Open is open': all technologies, no other topical scope limitation.
- 40% of the FET budget in H2020 (>1B€).
- FET gatekeepers define the kind of research that FET is looking for.
- Overall goal – contribute to innovation by:
 - Encouraging the application of existing scientific knowledge to solve technological problems
 - Facilitating new scientific research to fill today's gaps in technology
 - Supporting the development of expertise in new technological areas within the EU



FET Gatekeepers

FET's role in innovation for H2020

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FET-Open: calls planned in 2014-15

Research + Innovation actions

Deadline 30/9/2014: Budget 77 M€

Deadline 31/3/2015: Budget 37 M€

Deadline 29/9/2015: Budget 40 M€

Expected project size: 2-4 M€

FET-Open: evaluation criterion 1

Excellence (60% weight)

- **Clarity of targeted breakthrough and its specific science and technology contributions towards a long-term vision.**
How does the planned research contribute to new technology?
- **Novelty, level of ambition and foundational character.**
FET is not looking for incremental research
- **Range and added value from interdisciplinarity.**
Novel combinations of disciplines especially welcome
- **Appropriateness of the research methods.**
Are all steps in the methodology considered in the proposal?

FET-Open: evaluation criterion 2

Impact (20% weight)

- **Importance of the new technological outcome with regards to its transformational impact on technology and/or society**
Would the new technology be useful?
- **Quality of measures for achieving impact on science, technology and/or society.**
Are dissemination measures/exploitation plans appropriate?
- **Impact from empowerment of new and high potential actors towards future technological leadership.**
Are women, young researchers, high tech SMEs involved if appropriate?

FET-Open: evaluation criterion 3

Implementation (20% weight)

- *Quality of the workplan and clarity of intermediate targets.*
Can the workplan be managed?
- *Relevant expertise in the consortium.*
Does the consortium description demonstrate they know how to do the work?
- *Appropriate allocation and justification of resources (person-months, equipment, budget).*
Are all the necessary resources described?
Are all the described resources necessary?

FET-Open: Coordination and Support Actions

2014

- ***FET Observatory: identifying new FET topics***
- ***FET Communication: dissemination of FET results***
- ***FET Exchange: facilitating interaction between FET projects***
- ***FET Conference: follow up to FET09 and FET11 conferences***
- ***FET Prizes: Identifying areas for prizes and competitions***
- ***FET Impact: Assessing the direct and indirect impacts of FET***
(for items in red no more than 1 project to be funded)

2015

- **FET Exchange: facilitating interaction between FET projects**
- **FET Take-Up: actions for stimulating take-up of FET results**

FET-Open: calls planned in 2014-15

Coordination and Support Actions

Deadline 30/9/2014: Budget 3 M€

Deadline 31/3/2015: Budget 1.5 M€

Deadline 29/9/2015: Budget 1.5 M€

Expected project size: 0.3-0.5 M€ except FET conference: 1M€

FET-Open CSA: evaluation criterion 1

Excellence (40% weight)

- **Clarity of objectives**
Which topic is being addressed? One only.
- **Contribution to co-ordination and/or support in FET**
Will the proposed work help FET research?
- **Appropriateness of the coordination and/or support activities.**
All relevant tasks should be covered.

FET-Open CSA: evaluation criterion 2

Impact (40% weight)

- Transformational impact on the communities and/or practices
Will the proposed work make a difference to FET research?
- Appropriateness of measures for spreading excellence, use of results, and dissemination of knowledge, including engagement with stakeholders.

FET-Open CSA: evaluation criterion 3

Implementation (20% weight)

- *Quality of the workplan and management.*
Is the project likely to deliver on time and budget?
- *Relevant expertise in the consortium.*
Does the consortium description demonstrate they know how to do the work?
- *Appropriate allocation and justification of resources (person-months, equipment, budget).*
Are all the necessary resources described?
Are all the described resources necessary?

FET Proactive 1

Global Systems Science (GSS)

- The challenge is to improve the way scientific knowledge can stimulate, guide, and help evaluate policy and societal responses to global challenges eg
 - climate change
 - financial crisis
 - Pandemics
 - global growth of cities.
- Policy challenges shall be addressed by radically novel tools for producing and delivering scientific knowledge to the policy processes.

FET Proactive 2

Knowing, doing and being: cognition beyond problem solving (KDB)

- New interdisciplinary combinations for knowledge, cognition etc
- New foundations for future robotics and other artificial cognitive systems
- Deeper understanding of non-performing aspects of social robotics
- Development and interaction in mixed human/technological settings
- Improved understanding of the impacts of the technologically enhanced environments on the human behaviour, at the individual and collective levels
- Understanding the origins and development of synergies and divides in socio/technical contexts and ways to influence them

FET Proactive 3

Quantum Simulation (QSYM)

- Practical applications of quantum computing technology to solve problems beyond the capabilities of classical computers
- Collaborations between quantum engineers and application scientists expected
- Proposals should specify the application domain they will address
- Topics addressed in the LEIT WP are excluded from this FET proactive (QKD, sensors, new devices)

FET Proactive 4

Towards exascale high-performance computing (HPC)

- **Development of new technology to enable exascale computing by 2020**
 - **Hardware (processors, memory, interconnects, storage)**
 - **Software (methodologies, languages, tools)**
 - **APIs and system support**
 - **Algorithms**
- **Complementary to calls in LEIT and ECSEL**
- **Coordination and support actions to enable collaboration with related activities elsewhere in H2020 and explore means for self-sustainability**

FET-Proactive: calls planned

Deadline 1/4/2014: GSS Budget 10 M€ (2-3 M€ project size)
KDB Budget 15 M€ (2-4 M€ project size)
QSYM Budget 10 M€ (2-4 M€ project size)

Evaluation criteria: same as FET Open

Deadline 25/11/2014: HPC R+I Budget 93.4 M€
HPC CSA Budget 4 M€

Evaluation criteria: standard H2020 criteria

Expected project size: 2-8 M€

FET Flagships – salient features

FET Flagships are highly ambitious, large-scale, long-term, science-driven, goal-oriented, roadmap-based research initiatives, which will:

- provide strong scientific, technological and IPR basis for establishing areas of European leadership and bringing substantial benefits for society
- help overcome fragmentation and increase the impact of European research and innovation efforts

and which will require:

- cooperation among a range of scientific communities/disciplines, with industries and with the involvement of representatives from the civil society
- a long-term commitment of all key stakeholders sharing a common scientific vision and under a strong leadership
- a joint effort of EU and national programmes to provide a large financial support (~ 100 M€/year) over a long period (~ 10 years)

Graphene & Human Brain Project selected



Stimulating ideas & structuring the scientific community
2009 - 2010

Call for Preparatory Actions
21 → 6
July 2010

Preparatory Phase Pilots
05/2011 - 04/2012

Flagship selection
6 → 2
end 2012

FP7 ramp-up phase
10/2013- 03/2016

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Brain Simulation and Graphene Research Receive Billion Euro Each

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Mark Hoffman

First Posted: Jan 28, 2013 09:57 AM EST

The result of the highly anticipated decision of which two research projects will receive a one billion Euro research grant, the largest single research award ever, from the European Commission were announced by the European Commission's Vice-President Neelie Kroes today.



The first project is the [Human Brain Project](#), led by neuroscientist Henry Markram at the Swiss Federal Institute of Technology (EPFL) in Lausanne, which aims to simulate the human brain in a supercomputer, in order to aid medical advancement in brain disorders.

Like Us on [Facebook](#)  

The second, called [Graphene Project](#), is led by theoretical physicist Jari Kinaret at Chalmers University of Technology in Gothenburg, Sweden. It's goal is to develop the awesome

Graphene FET Flagship

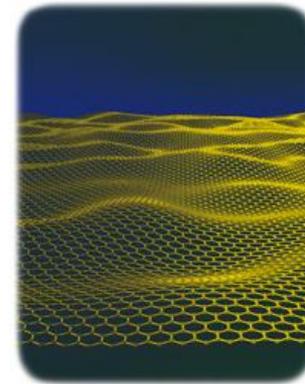
Graphene, is a 2D material , a single layer of carbon atoms, stronger than diamond, yet lightweight and flexible and an exceptional electricity conductor.

The Graphene Flagship will bring graphene, and related 2D materials, **from academic labs to industry, manufacturing and society.**

Examples Applications:

- ✓ electronic paper; bendable smartphones; enhanced solar cells and batteries; lighter and more energy efficient airplanes ...
- ✓ On the longer term, graphene is expected to give rise to new computers and revolutionary medical applications such as artificial retinas.

<http://graphene-flagship.eu/>



*Artistic impression of a corrugated graphene sheet
Credit: Jannik Meyer*





European Commission



HBP

The Human Brain Project

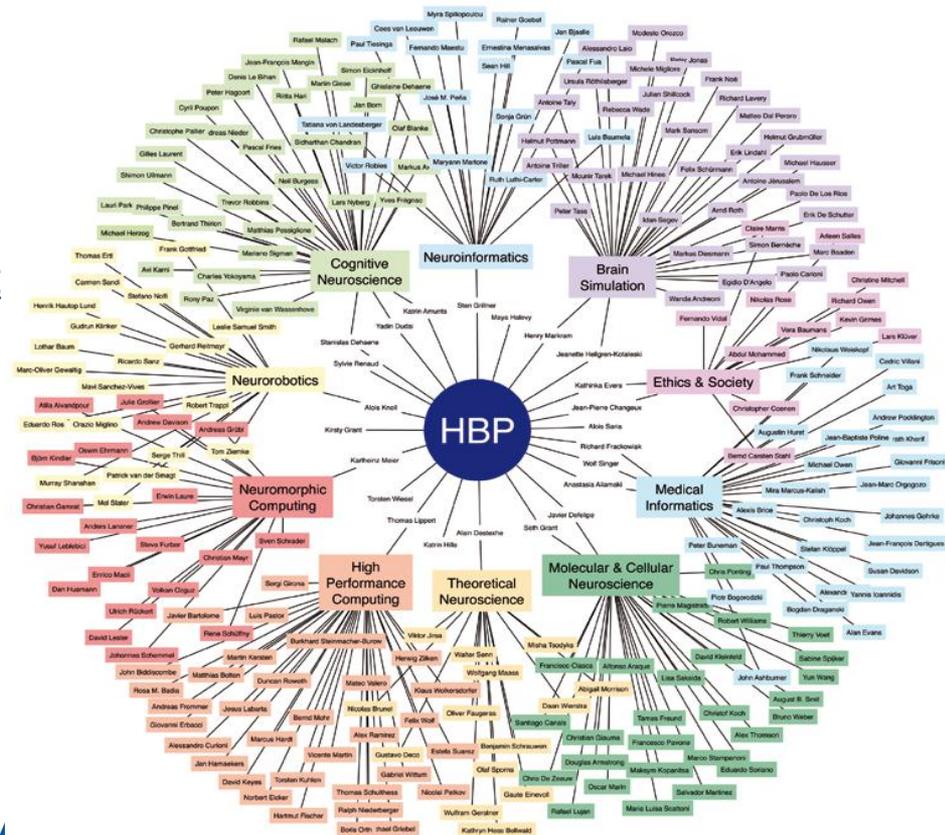
The Human Brain Project (HBP)

HBP will create the world's largest **experimental facility for developing the most detailed models of the brain** (from genes to mind), for studying how the human brain works and ultimately for simulating and developing personalised treatment of brain diseases.

This research lays the scientific and **technical foundation for medical progress**: identifying new drug targets and treatment, in response to the urgent need to combat brain diseases and their associated costs to society.

HBP will also produce brain-inspired **'neuromorphic' computing** systems that could drastically reduce power-consumption for super-computers and enhance robots.

<https://www.humanbrainproject.eu/>



FET Flagships in FET WP14-15 (1)

Framework Partnership Agreement (FPA) - 2014

- Two Framework Partnership Agreements between the EC and the Flagship partners will be established through a call in 2014 in order to formalise in particular:
 - the EC long-term commitment to support the Flagships, and
 - the partners' commitment to establish, maintain and implement the strategic research agenda of each of the Flagships
- At later stages, specific grant agreements will be signed, using the modalities set out in the FPA. Initially this will be the follow-up core projects called for in 2015.

FET Flagships in FET WP14-15 (2)

Core projects - 2015

The core project should progress FET Flagship research tasks in accordance with the defined roadmap, and also (amongst others)

- ensuring the overall continuity and coherence
- governance of the initiative
- collaboration with other initiatives or programmes at regional, national, transnational or global level (e.g. related ERANET projects)

Complementary projects are foreseen in future WPs.

Coordination and support actions - 2014

- Impact analysis
- Policy support

FET-Flagships: calls planned

Deadline 10/4/2014:

Framework Partnership Agreement – up to 2 projects : Budget 0€

Coordination and support actions: Budget 1.6 M€

Successful FPA consortia will be invited to submit proposals for core projects in 2015 (89M€ per flagship).

Evaluation criteria: FET Flagship specific

Contacts for more information:

FET Open:

FET GSS:

FET KDB:

FET QSYM:

FET HPC:



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FET Flag Graphene:

FET Flag HBP:



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