

H2020 2018-2020 CALL SELECTION FET DRAFT WP

TOTAL CALLS	CODE	TOPIC/NAME	TYPE OF ACTION	TRL		BUDGET OF CALL	SUGGESTED PROJECT BUDGET	STAGE	OPENING DATE	DEADLINE
				FROM	TO					
5										
	FETOPEN-01	FET-Open Challenging Current Thinking	RIA			184.50	3		03 oct 2017	15 May 2018 23 Jan 2019
						162.00	3		03 Oct 2017	18 Sep 2019 13 May 2020
	FETHPC-01	HPC PPP - International Cooperation on HPC	RIA			2	2	Single	31 Oct 2017	22 Mar 2018
	FETHPC-02	HPC PPP - Extreme scale computing technologies, methods and algorithms for key applications and support to the HPC ecosystem	RIA			64	4-8	Single	31 Oct 2017	14 Sep 2019
			CSA			4	4-8	Single		
	FETFLAG-01	Preparatory Actions for new FET Flagships	CSA			6	1	Single	31 Oct 2017	20 FEB 2018
	FETFLAG-02	ERA-NET Cofund for FET Flagships	ERA-NET Cofund			10		Single	31 Oct 2017	20 Feb 2018

FETOPEN-01-2018-2019-2020: FET-OPEN CHALLENGING CURRENT THINKING

Scope: proposals are sought for cutting-edge **high-risk / high-impact interdisciplinary research with all of the following essential characteristics** ("FET gatekeepers"):

- **Radical vision:** the project must address a clear and radical vision, enabled by a new technology concept that challenges current paradigms. In particular, research to advance on the roadmap of a well-established technological paradigm, even if high-risk, will not be funded.
- **Breakthrough technological target:** the project must target a novel and ambitious science-to-technology breakthrough as a first proof of concept for its vision. In particular, blue-sky exploratory research without a clear technological objective will not be funded.
- **Ambitious interdisciplinary research** for achieving the technological breakthrough and that opens up new areas of investigation. In particular, projects with only low-risk incremental research, even if interdisciplinary, will not be funded.

The inherently high risks of the research proposed must be mitigated by a flexible methodology to deal with the considerable science-and-technology uncertainties and for choosing alternative directions and options.

FETHPC-01-2018: HPC PPP - INTERNATIONAL COOPERATION ON HPC

Scope: Collaboration for the development of state-of-the-art HPC applications (codes, algorithms, software tools, etc.) in domains of common interest, such as energy (including oil, renewables, wind, etc.), life sciences, earth sciences, climate change and air pollution, and natural disasters, among others.

FETHPC-02-2019: HPC PPP - Extreme scale computing technologies, methods and algorithms for key applications and support to the HPC ecosystem

Scope: a) Research and Innovation Actions

Proposals should address the development of extreme scale computing technologies, methods and algorithms through a **strong co-design approach driven by ambitious extreme computing and data applications** and in close cooperation with the scientific disciplines and stakeholders concerned.

The designs of the technology must respond to critical demands of performance, energy efficiency, scale, resilience, programmability, dynamic workflows etc. Proposals should describe clear metrics and targets when addressing these demands, quantify progress with respect to the state-of-the-art, and address the research challenges with a holistic view and their impact on the whole computational process including data movement and storage.

Proposals should clearly articulate how research will have a significant impact in enabling ambitious extreme-scale scientific and engineering applications.

Where relevant, proposals should also provide a path towards long-term standardisation of the technologies (e.g. system software architecture, programming models, APIs, etc).

Proposals should clearly identify and address at least one of the following topics:

a. System software and management, addressing adaptive and dynamic scheduling; heterogeneity of system components; efficient data access, transfers and communication, novel execution models for emerging HPC and High Performance Data Analytics (HPDA) usages, etc.

b. Programming environments, reducing programming complexity and increasing scalability through advancements throughout the programming model and system software stack, and addressing code maintainability and functional portability across existing and future architectures and systems. Interoperability throughout the programming environment should be addressed.

c. I/O and storage environment for data-centric extreme scale computing addressing overall system performance predictability, feature-rich and flexible data access and storage system API's, backup and retrieval of extreme volumes of data and systems operation in virtualised operating environment.

d. Data-intensive supercomputing and emerging HPC use modes addressing efficient implementation of established Big Data software frameworks and workloads on extreme-scale HPC systems, including the integration of Big Data and HPC programming models; algorithmic research addressing Machine Learning on HPC systems; interactive use of HPC resources for real time data analysis.

e. Mathematical methods and algorithms for extreme scalability of computing and data with impact in system energy reduction and resilience, and addressing the usability and the efficient implementation on different HPC architectures. Work should link to HPC and extreme scale data architectures and technologies as well as to relevant applications (e.g. challenges identified by the European Centres of Excellence on HPC).

b) Coordination and Support Action

To boost a sustainable European HPC ecosystem by providing activities to structure the community, to promote collaborations and synergies among Horizon 2020 HPC projects, Centres of Excellence on HPC (CoEs), Extreme scale Demonstrators (EsD), to create links with Big Data related activities, and to follow up and cooperate with other relevant international HPC activities. A specific focus will be given to the convergence of HPC and HPDA (High Performance Data Analytics). Activities should also address the following:

- coordinate the European HPC strategy, and monitor and measure its implementation,
- produce roadmaps for HPC technology and applications, covering also the post-exascale, and evaluate them through impact monitoring
- promote the European strategy and the results of the European HPC ecosystem (including at international level), engage with HPC users and foster industry take-up
- build and maintain relations with other relevant international HPC activities
- support the generation of young talent.

FETFLAG-01-2018: PREPARATORY ACTIONS FOR NEW FET FLAGSHIPS

Scope: Proposals should contain a description of a potential FET Flagship and how this is to be matured over the course of the preparatory action into a more complete blueprint.

Firstly, proposals should describe the FET Flagship initiative they propose to further develop through this preparatory action, by specifically addressing the following three key issues:

- **What makes this a FET Flagship:** what is the unifying goal, the grand S&T challenge and the underlying vision; why is this a grand challenge and what makes it a "gamechanger"; what are its main goals and objectives; and what are the technologies, including digital technologies, that it would advance.
- **Impact (why it is good for Europe):** will it bring major impact on economy and society as well as on science and technology; why and how is it relevant for the European industry; how does it build on existing scientific excellence in Europe; what is its innovation potential that would benefit Europe's economy and/or society; how would it uniquely position Europe with respect to relevant developments and initiatives existing in other regions in the world.
- **Integration and European added value:** is it well positioned to address its grand S&T challenge in terms of large-scale integration across disciplines and the involvement of relevant stakeholders from academia, industry and society at large; does critical mass in terms of research excellence and industrial capabilities exist in Europe needed to address the challenge; what is the estimated scale of the effort required to reach the objectives and how long will it take to do so; and, are there similar initiatives existing at regional, national or European level and what is the added value of such an effort.

Secondly, proposals should describe how the activities of the preparatory action will involve stakeholders over the course of up to 12 months (indicative), to arrive at a complete design and description of a candidate FET Flagship initiative. Specifically, they should describe the proposed activities for further developing the Flagship's unifying goal and its underlying S&T roadmap; attracting industry's endorsement and participation; further developing their consortium and its governance structure and attracting large public support.

Proposals should consider multidisciplinary aspects, including where relevant social sciences and humanities. They must also describe a clear strategy for dissemination and citizen engagement; and, in close cooperation with other proposals for preparatory actions that will be selected from this call, jointly organise and participate in an event addressing stakeholders including scientific communities, policy makers and the wider public and aiming at disseminating the main objectives and findings of the actions.

At the end of the action, the design and description of the candidate Flagship should include the following elements:

- **A consolidated vision** based on a well-defined unifying goal articulated in terms of S&T objectives and of its targeted impact on economy and society.
- **A strategic long-term research roadmap**, showing how the unifying goal can be realised and what the major milestones are, situating the Flagship in the global landscape and demonstrating a credible path towards societal impact, technology development, innovation and exploitation.
- **A blueprint for the Flagship's implementation** setting out the overall collaboration and S&T framework, the identification of necessary competencies and resources including infrastructure aspects, and openness of the initiative.
- **An effective scientific leadership and governance structure** based on lessons learned from the present Flagships, describing the coordination and decision-making structures of the Flagship, the role of industry and the relations with Member States, with the Commission and with the relevant funding agencies and national research initiatives.
- **Support from and involvement of industry**, giving a view on avenues for exploitation and further strengthening of European industry in the global landscape, including stimulating the emergence and growth of innovative value chains.
- **An approach to address responsible research and innovation**, in particular aspects such as education, gender aspects and societal, ethical and legal implications.

Proposals for candidate FET Flagship must address one of the following three main areas: **ICT and Connected Society**, **Health and Life Sciences**, or **Energy, Environment and Climate change**. Proposals should clearly specify which one of these three areas they target. In each of these areas at least one and at most two proposals for Flagship preparatory actions will be selected for funding.

(1) ICT and Connected Society

Proposals should address any of the following topics in part or in whole:

- **Smart Materials and Nanoscale Engineering:** Novel nano-engineered materials and systems with properties enabling the design and manufacturing of radically new ICT components and devices creating disruptive technologies and market opportunities, for example in energy efficiency, data processing, smart manufacturing, smart interfaces, nano-bio devices, etc.

(3) Energy, Environment and Climate change

Proposals should address any of the following topics in part or in whole:

- **Earth, Climate Change and Natural Resources:** New technologies and approaches for high precision modelling and simulation, including the necessary data integration, that enable an in depth understanding of the earth, natural hazards and climate change. Their exploitation and use should open up new opportunities for helping manage/mitigate their effects and impacts on human activity and natural resources in a sustainable way in specific areas such as: agriculture (ensuring food security and sustainable farming), forestry, fisheries, protecting/restoring natural ecosystems, energy supply and demand, etc.
- **Radically new Energy Production, Conversion and Storage devices and systems:** Disruptive technologies aiming at a paradigm shift in renewable energy by exploring and exploiting radically new principles and novel materials that can substantially reduce Europe's dependence on fossil fuels and open new industrial opportunities for their exploitation and sustainable development.

FETFLAG-02-2018: ERA-NET COFUND FOR FET FLAGSHIPS

Scope: One follow-up action to the FLAG-ERA II ERA-NET Cofund action (<http://www.flagera.eu/>) aiming to coordinate national and regional research programmes to fund PPs of the two Flagships by implementing a call jointly funded by the participating countries with EU co-funding in accordance with the provisions of the General Annexes, possibly followed by further calls for proposals without EU co-funding. The action may also organise additional joint activities between the participating funding agencies in support of the two Flagships.