



HORIZON 2020 - Future & Emerging Technologies (FET)

Work Programme 2018-2020 & FET Flagships

Athens, 26 September 2017

Preparatory Actions for FET Flagships

Wide Hogenhout

Flagships Unit

DG Connect, European Commission

FET Flagships

What are they?

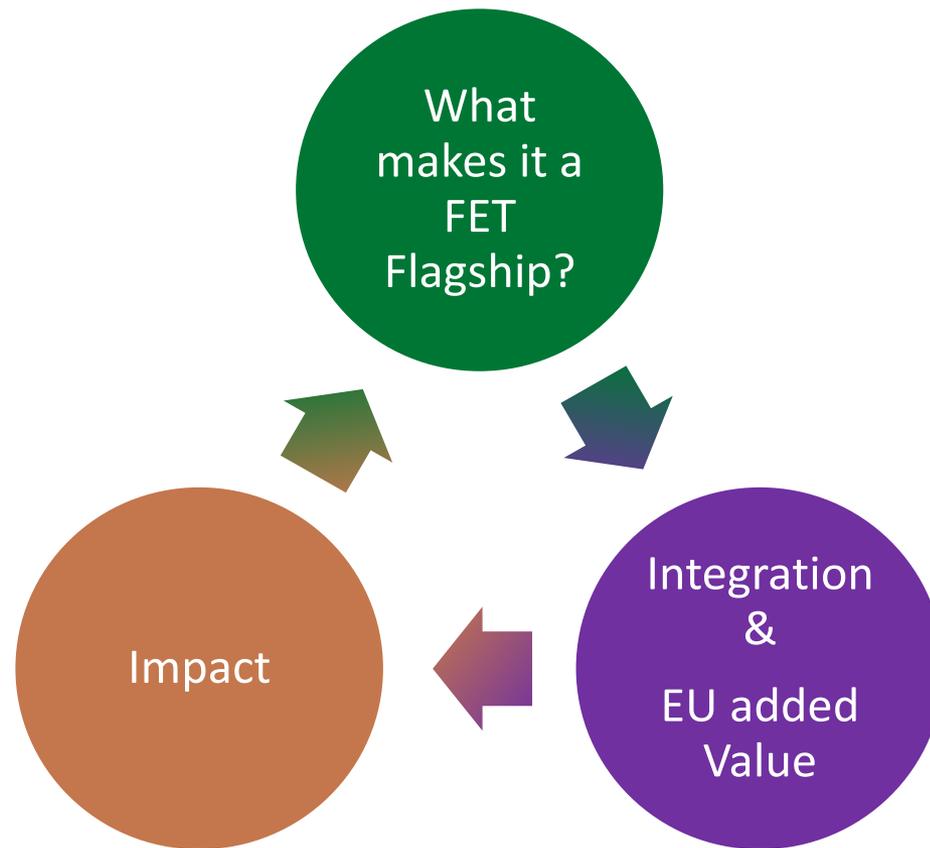
- Science-driven, large-scale research initiatives built around an ambitious unifying vision
- grand S&T challenges requiring interdisciplinary cooperation and involving academia and industry
- convert scientific advances into technology developments: from lab to the market place

~ 1 Billion Euro

~ 10 year duration

Flagships are implemented in close cooperation between the European Commission and the Member States

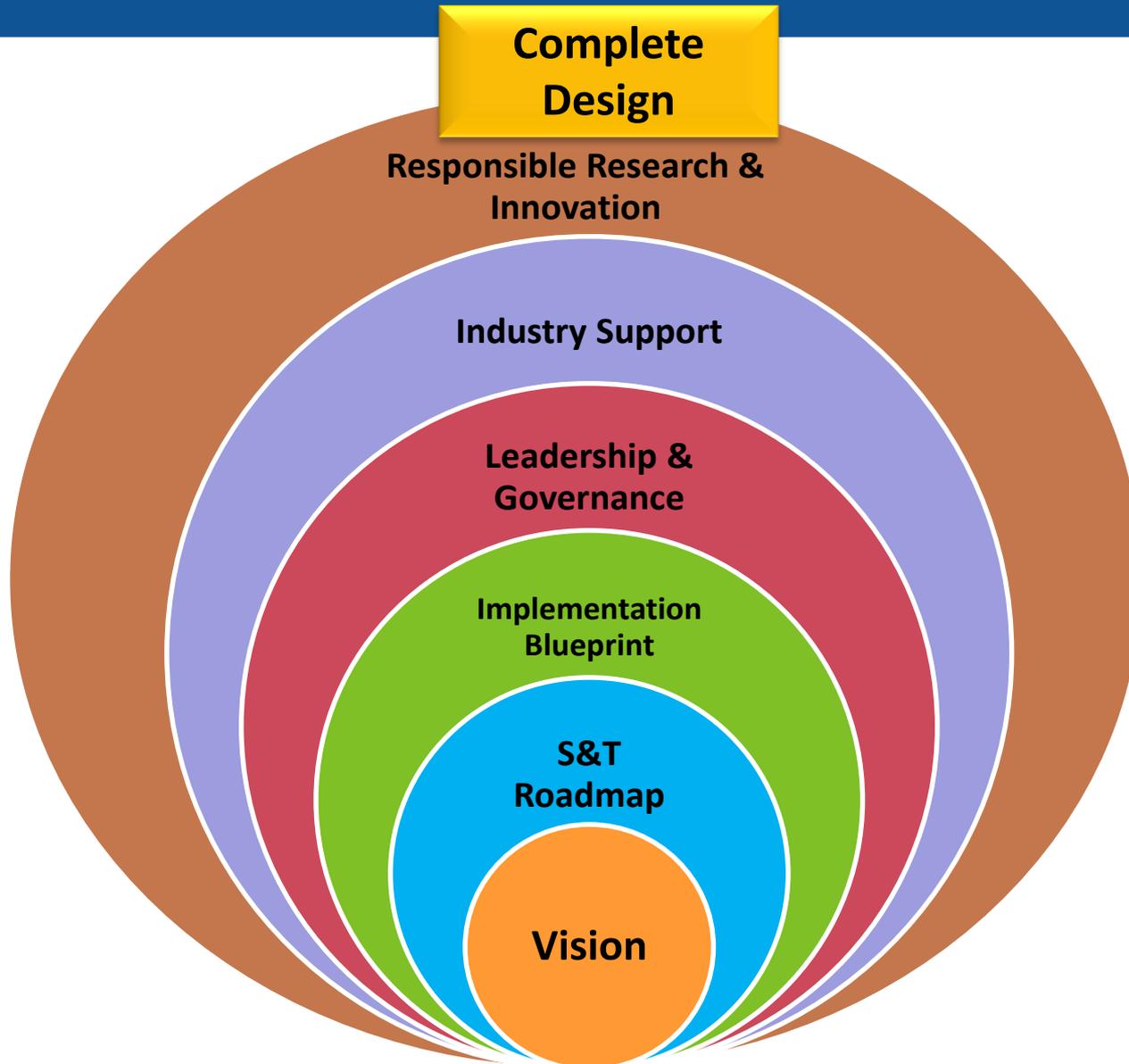
Where to start from?



Preparatory Action – indicative actions



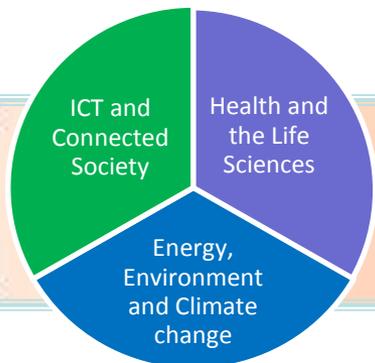
What should Preparatory Action Deliver?



Areas & Sub-Areas

How were they chosen?

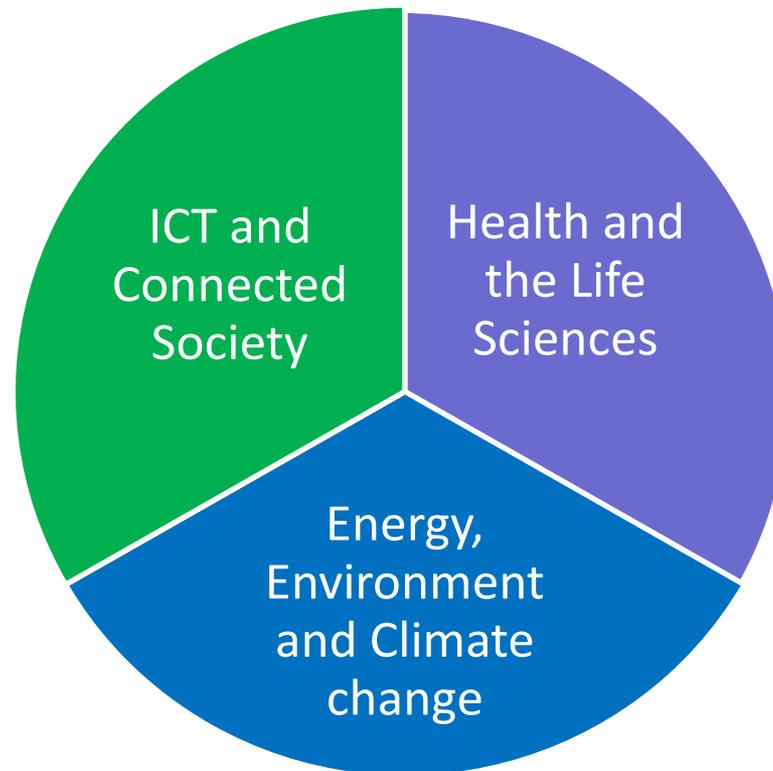
- Wide public consultation early 2016
- Roundtable with Member States and Associated countries end of 2016 to confirm national support
- After this continued interaction with country representatives to develop areas and sub-areas



Three main areas

Several sub-areas in each of these

Areas



Proposals must target a visionary goal in one area

In each area at most two CSAs

Two-stage evaluation

Areas & Sub-Areas

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ICT and Connected Society

- Smart Materials and Nanoscale Engineering
- Robotics, Interfaces and Artificial Intelligence
- ICT for Social Interaction and Culture

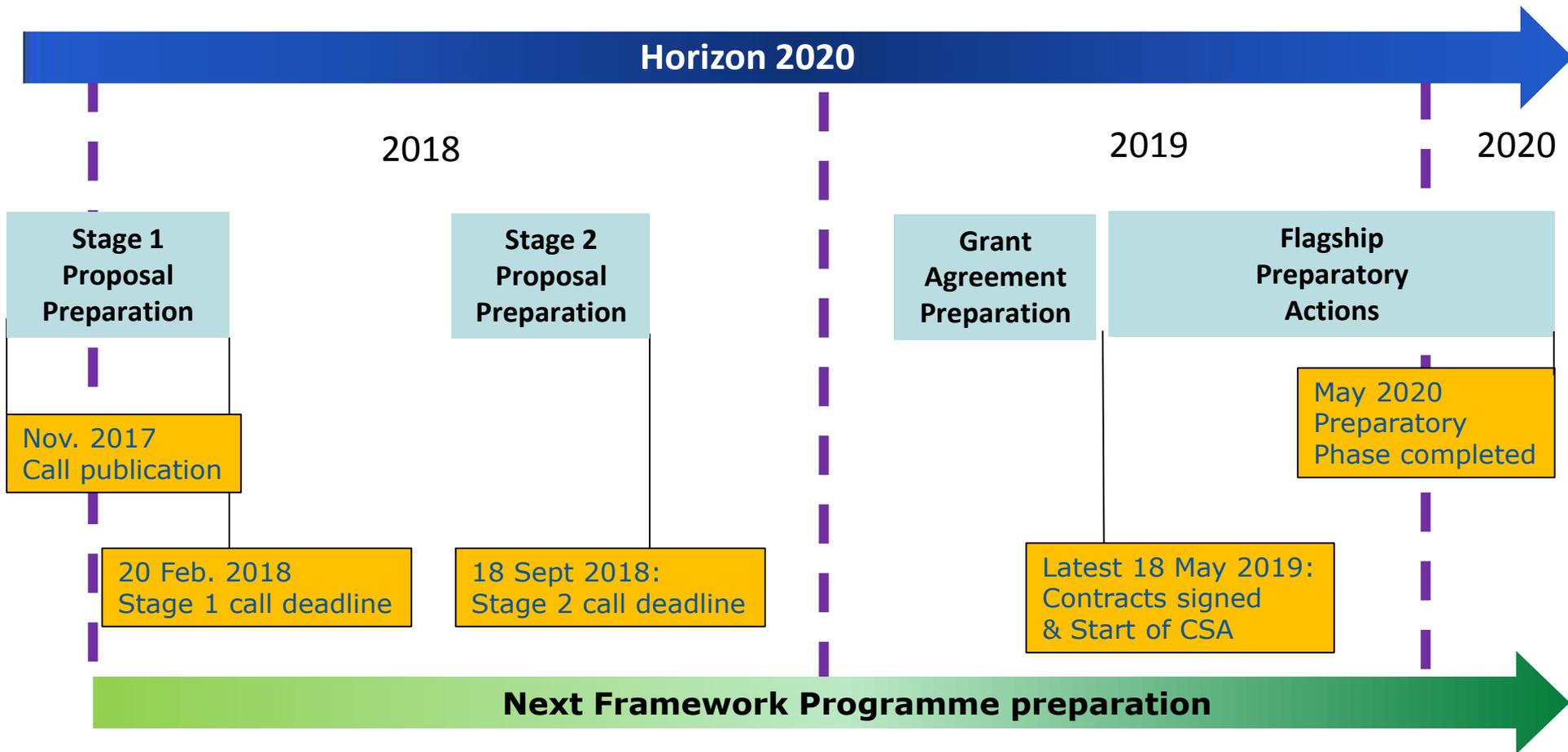
Health and the Life Sciences

- Disruptive technologies to Revolutionise Healthcare
- Understanding Life by Exploring the Genome and the Cell

Energy, Environment and Climate change

- Earth, Climate Change and Natural Resources
- Radically new Energy Production, Conversion and Storage devices and systems

Tentative timeline for new FET-Flagships call



Evaluation

- 1 or 2 Preparatory Actions (CSA) to be selected per area
 - Competition within the 3 areas , no competition across areas
 - Duration of actions: 12 months; Indicative budget: 1M€ per action
- Specific evaluation criteria assessing both the flagship idea and the implementation of the preparatory action
- Two stage evaluation by S&T experts
 - Stage1: short proposal : the Flagship idea scientific excellence and expected impact
 - Stage2: full proposal: full evaluation including implementation of the coordination action
- Thresholds : S&T 4/5; Impact 4/5; Implementation 3/5

Evaluation criteria – Stage 1

Excellence

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Excellence

Threshold: 4/5

- Degree of adherence to the FET Flagship concept as specified in the work programme
- Soundness of the proposed Flagship's vision, scientific concept, quality and pertinence of the objectives and of its targeted technologies and progress beyond the state-of-the-art
- Existence of excellence and critical mass in Europe to reach the Flagship goals in the long term and extent to which these are considered in the proposed Flagship

Evaluation criteria – Stage 1

Impact

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Impact

Threshold: 4/5

- Key benefits for economy and society based on significant advances on science and technology. This should be demonstrated by e.g. potential for S&T breakthroughs, industrial support, added value for Europe, potential for increasing European competitiveness, potential for societal benefits, etc.
- Long-lasting structuring effect on research efforts in Europe, anchor point for international cooperation and the nurturing of talent through the training of a new generation of researchers.
- Extent to which proposed Flagship creates EU added value by making use of complementarities and exploiting synergies, and enhances the overall outcome of regional, national, European and international research programmes.

ICT Proposer's Day:



Things to keep in mind

Level of ambition

Industrial Perspective

Openness

Interdisciplinarity

Maturity of community

*A preparatory action does not
imply any commitment for FP9*

Pre-publication at:

<https://ec.europa.eu/programmes/horizon2020/en/what-work-programme>

ICT and Connected Society

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- **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.
- **Robotics, Interfaces and Artificial Intelligence:** a new generation of robotics technologies including soft and flexible robotics, bio-inspired robotics, new approaches to human-machine interaction and cooperation, cognition and artificial intelligence, giving rise to much smarter systems performing sophisticated functions opening radically new opportunities to address societal and economic challenges.
- **ICT for Social Interaction and Culture:** new ICT technologies and approaches for empowering deep social interactions across diverse cultures, languages, goals, values, etc.; for understanding large-scale complex socio-technical systems and their interactions, interdependencies and evolutions and avenues for exploiting this understanding; and/or for collecting, preserving, studying and promoting Europe's unique cultural heritage and exploiting these to achieve major societal or economic benefits.

Health and Life Sciences

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- **Disruptive technologies to Revolutionise Healthcare:** New technologies and approaches aiming at a paradigm shift in the field of individualised prevention, prediction and treatment of diseases. This includes among others bioinformatics and modelling approaches to use patients' genetic expression patterns, metabolism and derived systems; novel and innovative nano-medicine approaches (e.g. technologies for novel sensors and imaging, organ-on-a-chip and bio-electronic medicine, drug delivery, ...); network medicine; neuro-prosthetic technologies; regenerative medicine and biofabrication techniques to reprogram or replace human cells, tissues and whole organs and to integrate these in functioning body systems.
- **Understanding Life by Exploring the Genome and the Cell:** Novel technologies and approaches that enable a paradigm shift in studying and understanding the foundational building blocks of life, for example the functioning of the cell, and of cells within organisms, including structure and dynamics, and the full multi-omics (genome/epigenome/proteome/metabolome/connectome etc.) and their interactions. This will open up radically new opportunities such as developing novel nano-bio devices and technologies, advanced screening methods and analytical and morphological technologies, advanced therapies and contribute to the understanding of biological processes and pathological mechanisms.

Energy, Environment and Climate change

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- **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 to 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.