



## **Horizon 2020 Themes and Topics**

### **Future and Emerging Technologies (FET)**

The mission of FET (Future and Emerging Technologies) is to turn Europe's excellent science base into a competitive advantage by uncovering radically new technological possibilities.

- Challenging Current Thinking
- Future technologies for social experience
- Measuring the unmeasurable — Sub-nanoscale science for Nanometrology
- Digital twins for the life-sciences
- Environmental Intelligence
- Neuromorphic computing technologies
- High Performance Computing
- Complementary call on Quantum Computing
- International Cooperation on Quantum Technologies
- Training and Education on Quantum Technologies

### **Information and Communication Technologies**

Europe should step up its research activities in the areas building on the promising digital technologies which offer a significant competitive boost for our economies and respond to key societal challenges. For the 2020 Work Programme, the areas of Artificial Intelligence (AI), key technologies for digital transformation from photonics to software, advanced and smart connectivity with the emerging 5G, and Next Generation Internet including distributed ledger technologies and Blockchain are prioritised

- Artificial Intelligence and Technologies for Digitising European Industry and Economy
- European Data Infrastructure: HPC, Big Data and Cloud technologies
- 5G
- Next Generation Internet (NGI)
- Robotics
- Cyber Security

### **Health, demographic change and wellbeing**

Includes 3 main calls: Personalized medicine, digital transformation in Health and Care and trusted digital solutions and Cybersecurity in Health and Care.

#### **Personalized medicine:**

- Innovative health and care industry
- Infectious diseases and improving global health



- Innovative health and care systems - Integration of care
- Decoding the role of the environment, including climate change, for health and well-being
- Supporting the digital transformation in health and care

#### Digital transformation in Health and Care

##### Trusted digital solutions and Cybersecurity in Health and Care:

- Digitizing and transforming European industry and services

### Space

Space is important for Europe. It is both a strategic asset and enormous opportunity for our society and economy. Space technologies, infrastructure, services and data provide the EU with the tools needed to address societal challenges and big global concerns, such as climate change, migration, mobility, energy security and many others.

- Earth observation/ Copernicus
- Artificial Intelligence and Space
- Space business, entrepreneurship, outreach and education
- Space technologies, science and exploration
- Secure and safe space environment
- EGNSS market uptake (The European Global Navigation Satellite System)

### Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy

The program aims at making the best of our biological resources in a sustainable way. The objective is to contribute to securing sufficient supplies of safe, healthy and high-quality food and other bio-based products, by developing productive, sustainable and resource-efficient primary production systems, fostering related ecosystem services and the recovery of biological diversity, alongside competitive and low carbon supply chains.

- From functional ecosystems to healthy food
- Environment and climate-smart food production and consumption
- Building capacities
- Targeted international cooperation (Africa/ China)
- Blue Growth
- From farm to society: understanding dynamics and modernising policies
- Organising sustainable food and non-food value chains under changing conditions
- Boosting innovation and enhancing the human and social capital in rural areas
- Food and Natural Resources



### **Europe in a changing world – Inclusive, innovative and reflective societies**

Europe in a changing world - Inclusive, innovative and reflective societies” aims at fostering a greater understanding of Europe, by providing solutions and support inclusive, innovative and reflective European societies with an innovative public sector in a context of unprecedented transformations and growing global interdependencies. Pressure from increased migration flows, socio-economic and cultural transformations from new forms of human-technology interaction under the fourth industrial revolution, and new developments in European, national and global governance have the potential to significantly impact Europe's future at many levels.

- MIGRATION
- SOCIOECONOMIC AND CULTURAL TRANSFORMATIONS IN THE CONTEXT OF THE FOURTH INDUSTRIAL REVOLUTION
- GOVERNANCE FOR THE FUTURE

### **Secure societies - Protecting freedom and security of Europe and its citizens**

Foster secure European societies in a context of unprecedented transformations and growing global interdependencies and threats, while strengthening the European culture of freedom and justice.

- Protecting the infrastructure of Europe and the people in the European smart cities
- Artificial Intelligence and security: providing a balanced assessment of opportunities and challenges for Law Enforcement in Europe
- Disaster-Resilient Societies
- Technologies for first responders
- Chemical, biological, radiological and nuclear (CBRN)
- Fight against Crime and Terrorism
- Border and External Security
- Cybersecurity, Digital Privacy and data protection



### **Secure, clean and efficient energy**

Covers the full innovation cycle – from 'proof of concept' to applied research, pre-commercial demonstration and market uptake measures. It also exploits synergies with other relevant areas, e.g. information and communication technologies. In addition, the Energy Challenge contributes to the 'Blue Growth' focus area as well as to the Public Private Partnerships Energy-efficient Buildings and Sustainable Process Industries

#### **BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE: SECURE, CLEAN AND EFFICIENT ENERGY**

- Energy efficiency
- Buildings in energy transition (B4E)
- Global leadership in renewables
- Smart and clean energy for consumers
- Smart citizen-centred energy system
- Smart Cities and Communities
- Smart Airports
- Enabling near-zero CO<sub>2</sub> emissions from fossil fuel power plants and carbon intensive industries
- Social Sciences and Humanities (SSH) aspects of the Clean-Energy Transition

### **Climate action, environment, resource efficiency and raw materials**

Focuses on moving to a greener, more resource efficient and climate-resilient economy in sync with the natural environment.

#### **Building a low-carbon, climate resilient future: climate action in support of the Paris Agreement**

- Decarbonisation
- Climate adaptation, impacts and services
- Inter-relations between climate change, biodiversity and ecosystem services
- The Cryosphere
- Knowledge gaps
- Earth Observation

#### **Greening the economy in line with the Sustainable Development Goals (SDGs)**

- Connecting economic and environmental gains - the circular economy
- Raw materials
- Innovating cities for sustainability and resilience
- Protecting and leveraging the value of our natural and cultural assets: Nature-based solutions, disaster risk reduction and natural capital accounting



## **Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing**

The next generation of industrial products will require further advances in state-of-the-art materials characterization tools as well as materials computational modelling. Furthermore, managing the risks of every emerging technology is of key importance for its societal acceptance and consequent possible success. The overall challenge is to establish a suitable form of nanotechnology risk governance and to ensure that new technologies are accepted by the civil society, the industry and regulators.

### **FOUNDATIONS FOR TOMORROW'S INDUSTRY**

- OPEN INNOVATION TEST BEDS
- MATERIALS CHARACTERISATION and COMPUTATIONAL MODELLING
- GOVERNANCE, SCIENCE-BASED RISK ASSESSMENT AND REGULATORY ASPECTS
- INDUSTRY COMMONS

### **TRANSFORMING EUROPEAN INDUSTRY**

- FACTORIES OF THE FUTURE (FOF)
- BIOTECHNOLOGY
- MEDICAL TECHNOLOGY INNOVATIONS

### **INDUSTRIAL SUSTAINABILITY**

- SUSTAINABLE PROCESS INDUSTRY (SPIRE)
- CLEAN ENERGY THROUGH INNOVATIVE MATERIALS

## **Smart, green and integrated transport**

The Smart, green and integrated transport program overall objectives are to achieving a European transport system that is resilient, resource-efficient, climate- and environmentally-friendly, safe and seamless for the benefit of all citizens, the economy and society.

- Mobility for Growth
- BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE: LOW-CARBON AND SUSTAINABLE TRANSPORT
- SAFE, INTEGRATED AND RESILIENT TRANSPORT SYSTEMS
- GLOBAL LEADERSHIP AND COMPETITIVENESS
- ACCOUNTING FOR THE PEOPLE
- BLUE GROWTH
- Digitising and Transforming European Industry and Services: Automated Road Transport
- Building a low-carbon, climate resilient future: Green Vehicles