Micro and nanosystems in H2020 and FP9
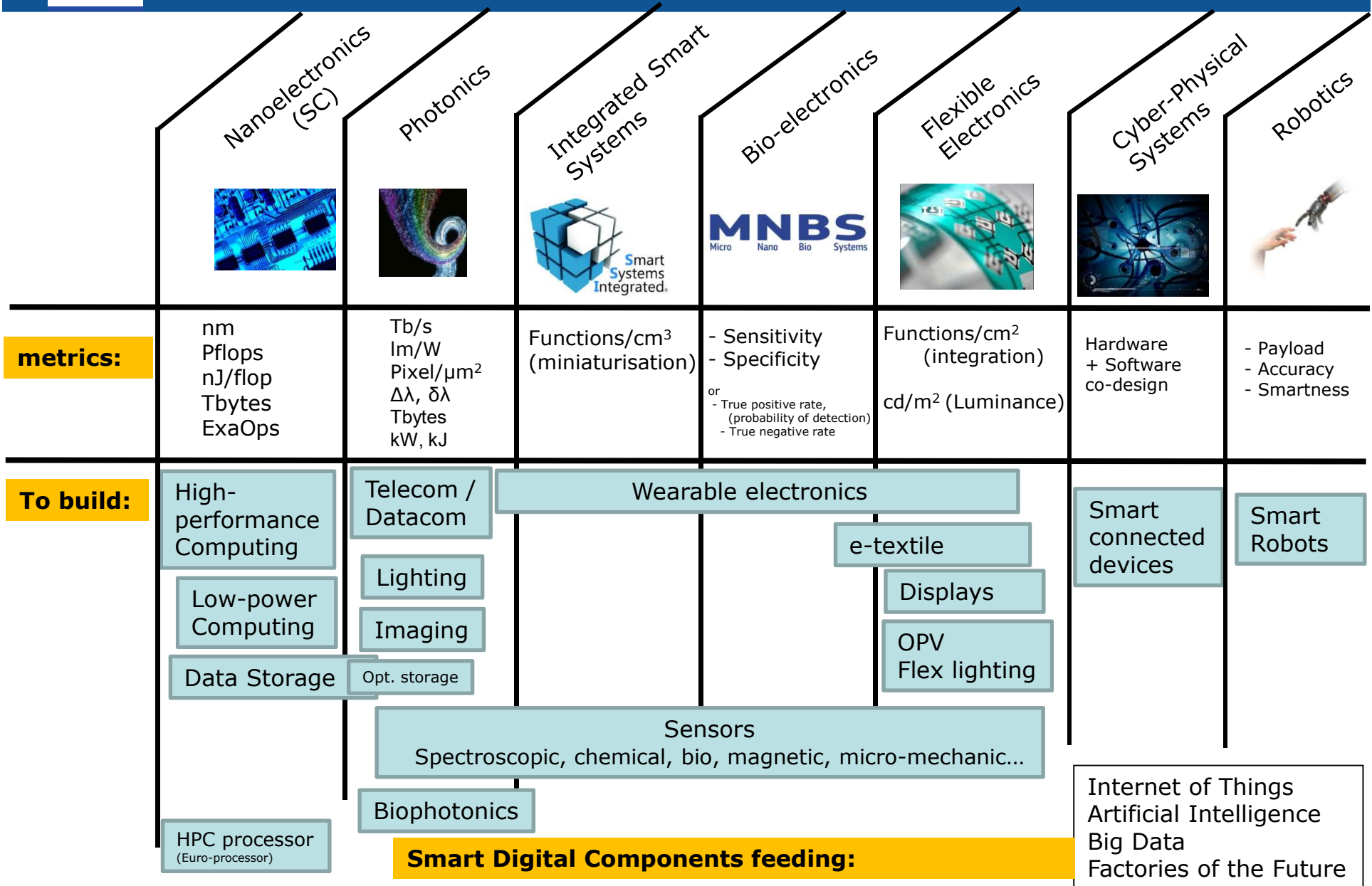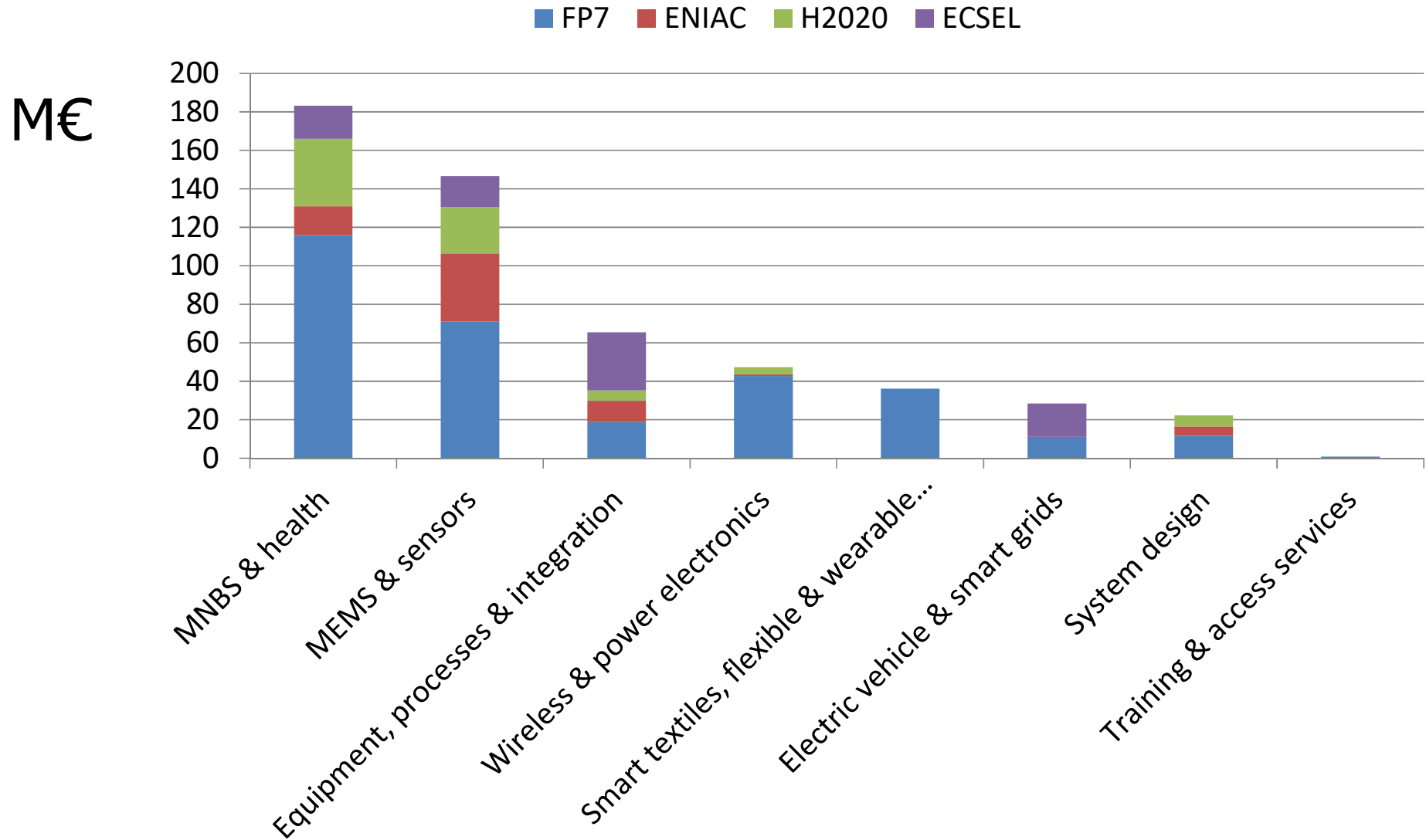
Colette Maloney
Head of Unit DG CONNECT
European Commission

Heterogeneous integration

	Nanoelectronics (SC)	Photonics	Integrated Smart Systems	Bio-electronics	Flexible Electronics	Cyber-Physical Systems	Robotics
metrics:	nm Pflops nJ/flop Tbytes ExaOps	Tb/s lm/W Pixel/μm^2 $\Delta\lambda$, $\delta\lambda$ Tbytes kW, kJ	Functions/cm^3 (miniaturisation)	- Sensitivity - Specificity or - True positive rate, (probability of detection) - True negative rate	Functions/cm^2 (integration) cd/m^2 (Luminance)	Hardware + Software co-design	- Payload - Accuracy - Smartness

To build:

Nanoelectronics	Photonics			Flexible Electronics	Cyber-Physical	Robotics
High-performance Computing	Telecom / Datacom	Wearable electronics			Smart connected devices	Smart Robots
Low-power Computing	Lighting		e-textile			
Data Storage	Imaging			Displays		
	Opt. storage			OPV Flex lighting		

Sensors
Spectroscopic, chemical, bio, magnetic, micro-mechanic...

Biophotonics

HPC processor
(Euro-processor)

Smart Digital Components feeding:

Internet of Things
Artificial Intelligence
Big Data
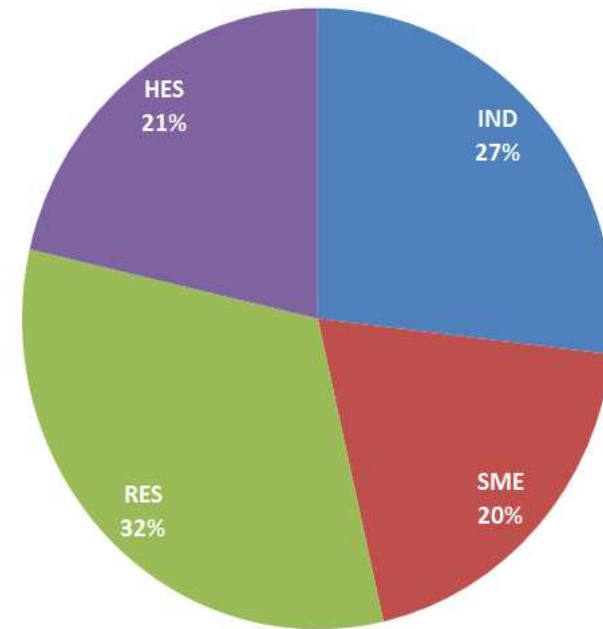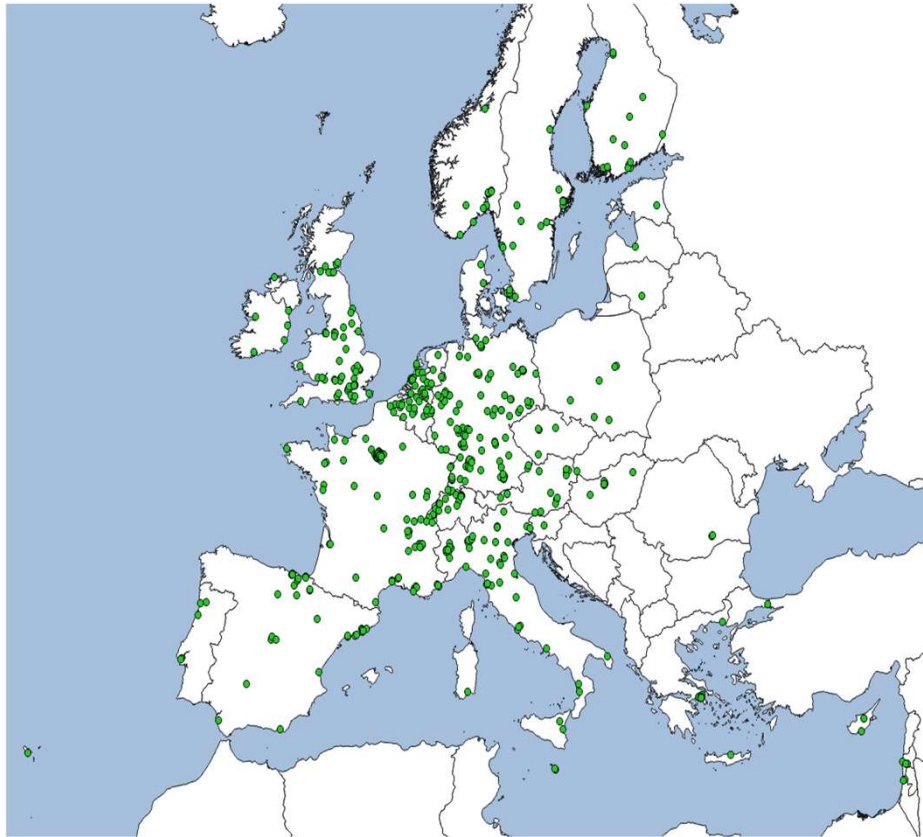Factories of the Future

Smart System Integration
- Significant and long-standing EU support -

Electronic Smart Systems

- Who and where -

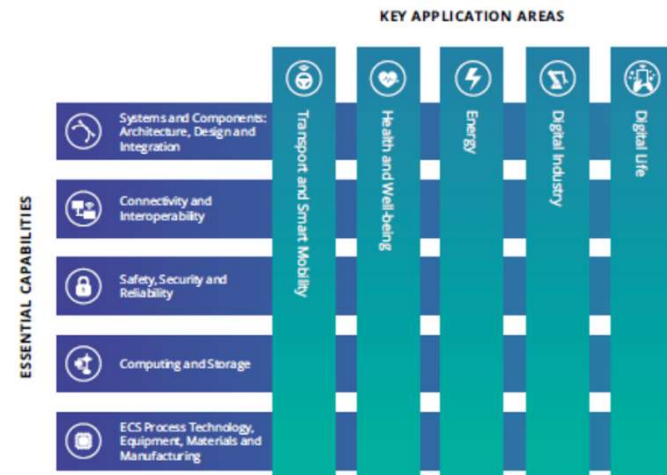ECS: An integral approach
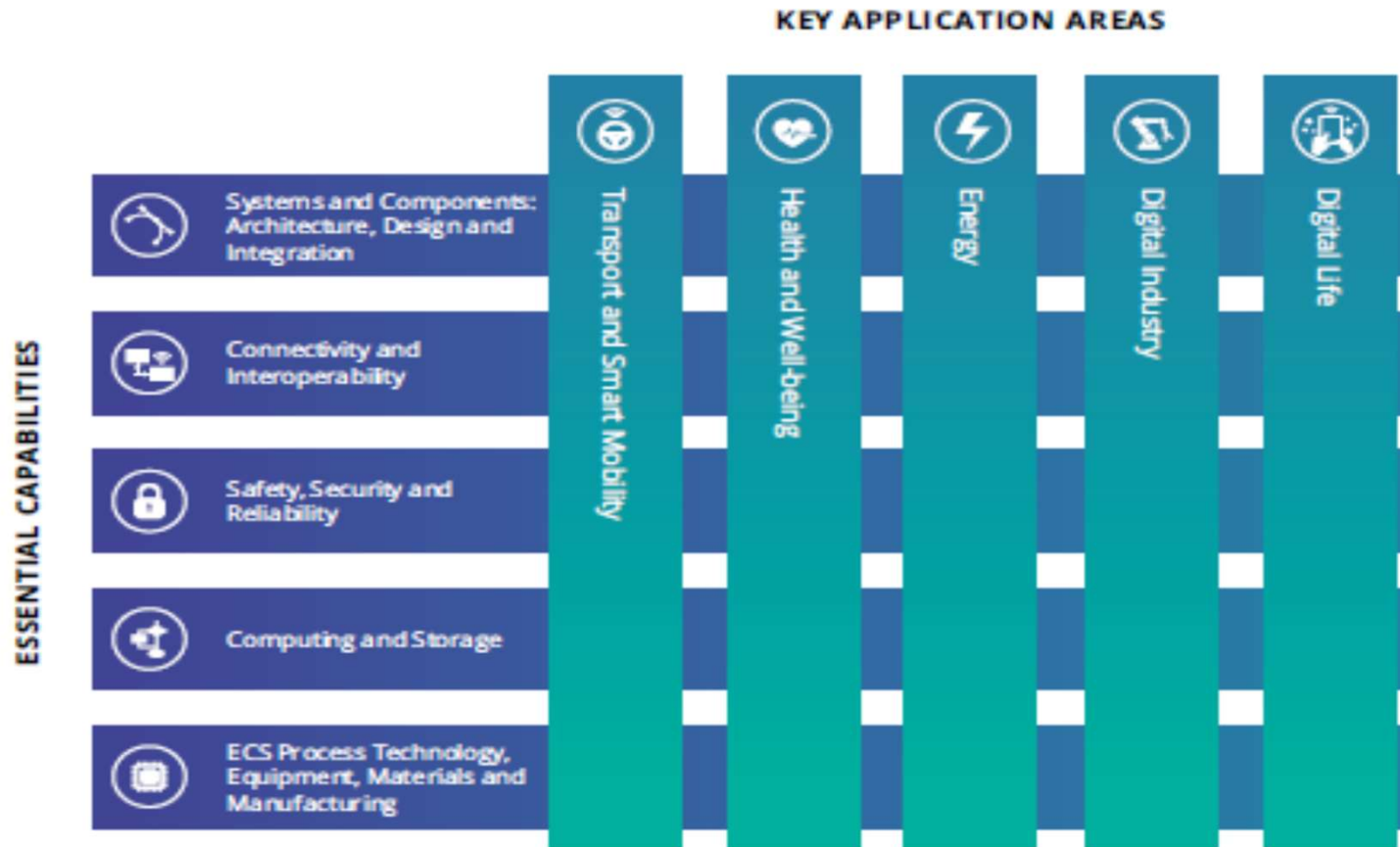
A renewed strategy for ECS in Europe

- Strategy for electronics
  - Objective: Reverse the decline of EU's share of world's supply
  - Focus on Europe's strengths, build on and reinforce Europe's leading clusters
  - Seize opportunities arising in non-conventional fields and support SMEs growth

- Actions
  - Towards a European Strategic Roadmap for investment in the field -> Electronics Leaders Group roadmap & implementation plan
  - The Joint Technology Initiative: A tri-partite model for large scale projects -> ECSEL Joint Undertaking
  - Building on, and supporting horizontal competitiveness measures -> Communication on IPCEI and stimulating the building up of the IPCEI in microelectronics

R&I after 2020. Main inputs

- **LAB - FAB – APP** (July 2017). Lamy report

- **EC Communication on H2020 interim evaluation** (Jan 2018)

- **Mission-Oriented R&I in the EU** (Feb 2018)

- **EC Communication on post-2020 MFF** (Feb 2018)

- **Open public consultation** (10 Jan – 8 March 2018)

Lessons learnt for future framework programmes:

- **Invest more in R&I**
- **Continue simplification**
- **Support breakthrough innovation**
- **Mission-orientation and citizen involvement**
- **Increase synergies with other EU funding programmes and EU policies**
- **Strengthen international cooperation**
- **Reinforce openness**
- **Rationalise the funding landscape**

Five key criteria for selecting missions proposed by Prof. Mazzucato:

1. **Bold, inspirational with wide societal relevance**

2. **A clear direction: targeted, measurable and time-bound**

3. **Ambitious but realistic R&I actions**

4. **Cross-disciplinary, cross-sectoral and cross-actor innovation**

5. **Multiple, bottom-up solutions**

Communication on next MFF

Towards our priorities for the future

- **Management of external borders**
- **European Defence Union**
- **Mobility of young people**
- **Europe's digital transformation**
- **Boosting competitiveness through R&I**
- **Economic and monetary Union**
- **Efficient cohesion policy**
- **Efficient Common Agricultural Policy**
- **Project our interests abroad**

EU**BUDGET**
MFF POST 2020

Where should the money go?

"An important element will be the budgetary plans the Commission will present in May 2018. Here again we have a choice: either we pursue the European Union's ambitions in the strict framework of the existing budget, or we increase the European Union's budgetary capacity so that it might better reach its ambitions. I am for the second option."
Jean-Claude Juncker
President of the European Commission
State of the Union Speech 2017

In the <u>context</u> of

- IoT/Big data
- autonomous systems
- edge computing
- Energy efficiency
- Smart connectivity
- Portability/wearability
- Artificial intelligence

Nano and microsystems or '*multisensing systems with integrated functionalities*' will be an essential technology for Europe to master