2020 at the Horizon

Upcoming calls in Electronics

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Directorate: *"Digital Industry"*

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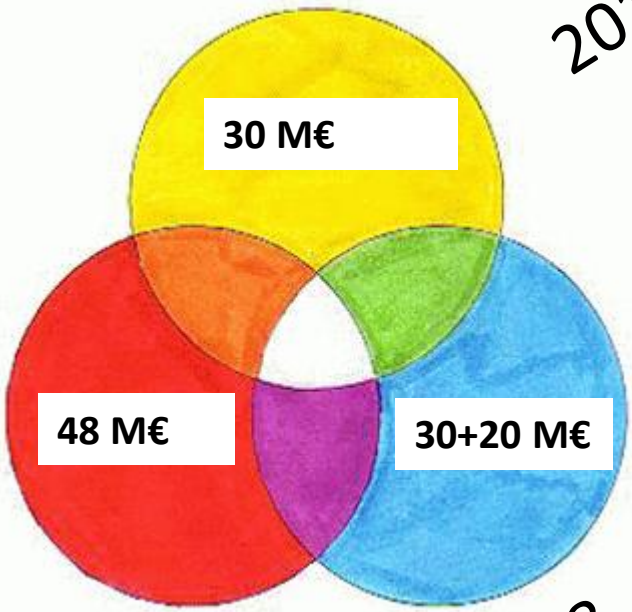
Reinforcing the Electronics sector in Europe

Unconventional Nanoelectronics

2019

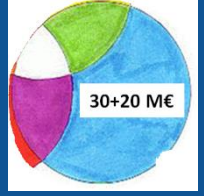


Electronic Smart Systems

2018

Flexible and wearable electronics

2018



Flexible and Wearable Electronics
ICT-02-2018

What are you looking for?

The Challenge

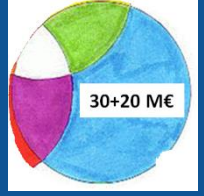
- **Materials & Large area processes →**
  - **lightweight, flexible, printed multi-functional electronic products**
- **Pushing technology barriers-demonstrate innovative use**
- **Open new opportunities in existing and emerging markets**

The Instruments and €

- Research and Innovation Actions (RIA) **30 M€ - 100% funding**

- Innovation Actions (IA) **20 M€ - 70% funding**

- under the DT-NMBP programme -



Flexible and Wearable Electronics
ICT-02-2018

The Scope (RIAs)

30 M€

TRL 4

- Enhancing manufacturability

Combine Organic/printed electronics and large area deposition technologies

→Multi-functional components

→ Equipment and processes for:
Large scale fabrication, Mass-customisation, Characterisation

- Integration technologies

TRL 4-5

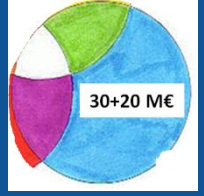
New concepts for the Integration of: Transducers, Energy storage, Data storage, Logic, Displays, Light sources, Interconnect

- Device demonstration

Prototype validation in specific applications

- Integration of electronic devices in wearables /portable setting (Textiles, flexible/streatchable substrates
- Compatibility with low-cost manufacturing, Efficient energy scavenging and storage
- Functional performance, Durability and reliability
- Privacy, Security, Liability and free flow of data, Recyclability, waste management

TRL 4-5



Flexible and Wearable Electronics ICT-02-2018

The Expected Impacts

Tech-R&D

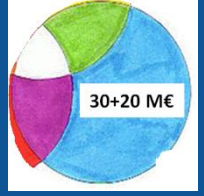
- Technology leaps in performance:
  - Functionalities, autonomy, reliability, manufacturability, cost
    - → European leadership in Large Area, flexible and wearable electronics
- Increased R&D cooperation in technology device development and related manufacturing process

New Opportunities (products-sectors)

- Emergence of new products (combining printed and large area processed electronics)
- New opportunities in new sectors, for new actors (eg designers, artists..)

Economy-Finances

- More manufacturing capabilities in Europe
- More industrial investments in flexible and wearable electronics



Flexible and Wearable Electronics
Other Opportunities

DT-NMBP 18-2019 Materials, manufacturing processes and devices for organic and large area electronics (IA)

20 M€
2 steps: 22/1/19; 5/9/19

Strengthen the value chain: materials → devices

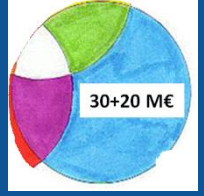
Joint funding from ICT + NMBP programmes (10+10)

- **Material & Process improvement:**
  - **Electrical performance,**
  - **Processibility and seamless integration**
  - **Stability, lifetime in operation**
- **OLAE Product prototyping and Demonstration**

Start TRL 3
Achieve TRL 5

Impacts

- New products based on the combination of printed and OLAE processed electronics in flexible and wearable electronics.
- Improvement in cost competitiveness, lifetime and processibility, manufacturing capability
- Improved environmental stability, water vapour transmission and oxygen transmission rates of organic electronic materials for products.
- Improved business opportunities and value creation in Europe



Flexible and Wearable Electronics
Other Opportunities

DT-ICT-01-2019: Smart Anything Everywhere

www.smartanythingeverywhere.eu

48 M€ (Up to 8M€)

Specific Challenge: next wave of products that integrate digital technology. Accelerate the design, development and uptake of advanced digital technologies by European industry - especially SMEs and mid-caps - in products that include innovative electronic components, software and systems, and especially in sectors where digital technologies are underexploited.

Scope

Area 3: Flexible and Wearable Electronics: the goal is to help businesses in further maturing, innovating and validating their products with thin, organic and large area electronics technologies, including wearable, portable and embedded objects. Focus is on i) access to design, technology and prototyping which are ready to use, and ii) application experiments driven by concrete user requirements and business cases

16/10/2018
2/4/2019

Impacts (All)

- *Attract a significant number of new users of advanced ICT in the manufacturing sector, and more innovative technology suppliers, in particular SMEs and mid-caps.*
- *Creation of a sustainable network of Digital Innovation Hubs, providing European added value to investments done at national and regional level in Digital Innovation Hubs.*
- *Availability of Digital Innovation Hub services across Europe and its regions with strong industrial capacities*

What we do NOT want?

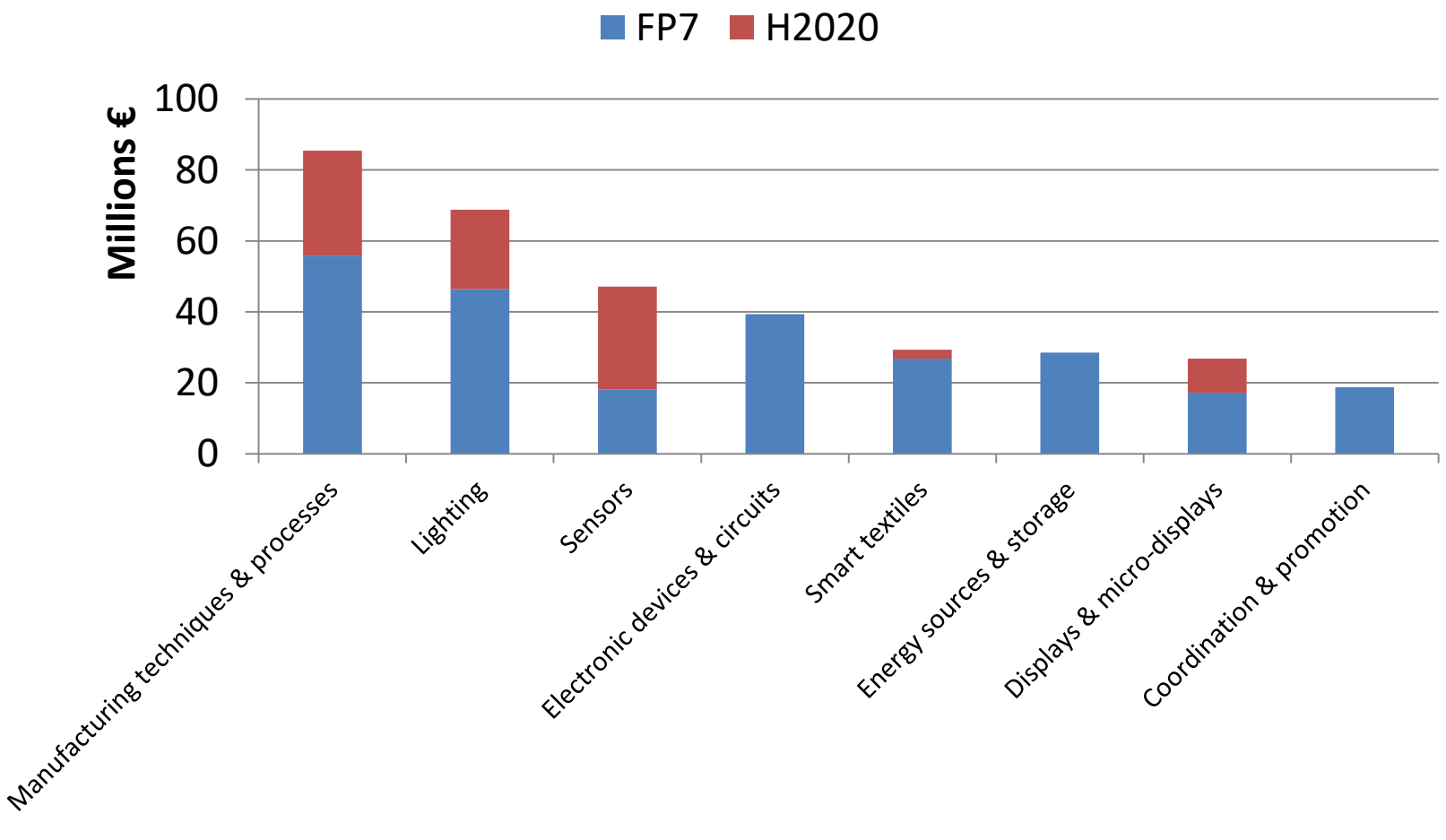
For example:

Wearables which, at the end, won't be worn !

More generally:

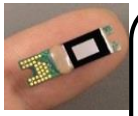
Technologies and integrated systems that do not bring competitive advantages and opportunities to the European Industry.

Topic Evolution and Current Portfolio



Large Area Electronics
– Application sectors -

Displays | Lighting | Sensors → Automotive | Medical | Entertainment | Smart home | manufacturing



LOMID - flexible OLED-CMOS large microdisplays
Wafer thinning – 200 mm wafers

Optintegral - LED displays for advertisement
In-mould hybrid integration

10 M€

PHEBE
Efficient blue emitters for white OLEDs

LEO
Low cost energy efficient OLEDs for lighting

LUMENTILE
Lighting and sensing tiles

66 M€

SOLEDLIGHT
Solution processed OLEDs for lighting

FLEXOLIGHTING
Flexible OLEDs for lighting

HAPPINESS
Haptic interface for automotive dashboards – with EAP – Electo Active Polymers - Printed

LORIX
Large area organic X-Ray Flat-Panel detectors
Printed Organic Photo Diode (OPD) + Thin Film Transistors active matrices (TFT),

PING
Flexible NFC techno embedded in paper
Game cards and Packaging

18,3 M€

TransFlexTeg
large area distributed sensors
transparent thin film thermoelectric devices and sensors
Smart windows

ALABO - Laser scribing OPV

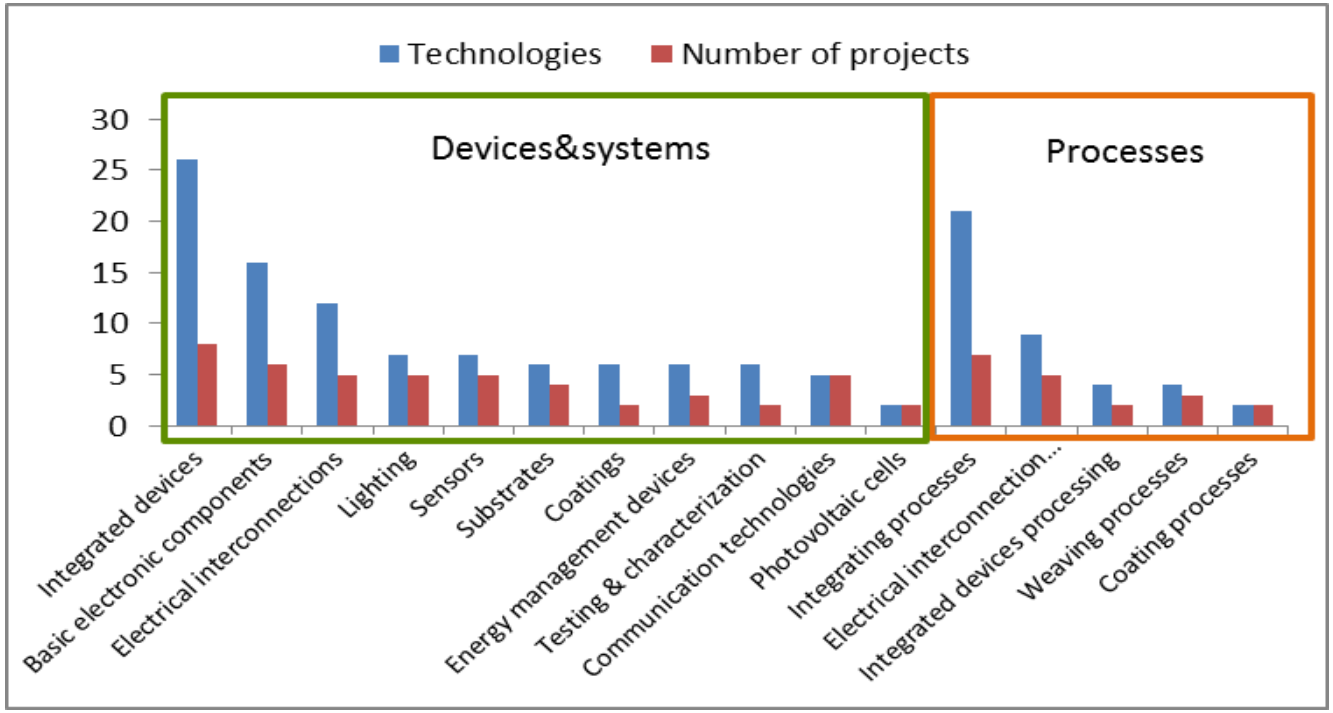
7.7 M€

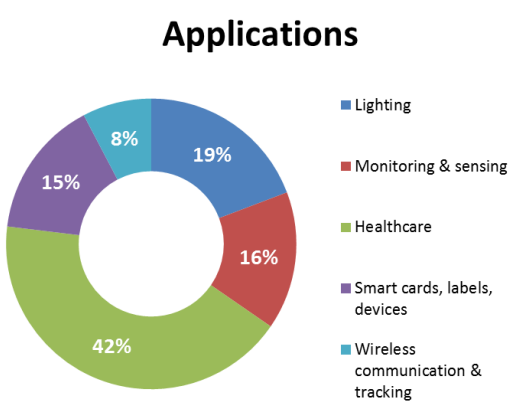
ROLL-OUT - Roll-to-Roll – automotive, packaging, textile

RIA
IA

Smart textiles, Flexible & Wearable Electronics

- *FP7 Cluster: 10 projects, 43,5 M€*
- *Wide variety of devices and systems developed*
- *Great effort related to fabrication processes*





Key actors

- ***Organic (and printed) Electronics***
- ***Wearable Electronics- Smart Textile***
- ***Materials-Electronics- Manufacturing- System Integrators, etc***

Additional / background documents

[Smart Wearables: Reflection and Orientation ... - European Commission](ec.europa.eu/newsroom/document.cfm?doc_id=40542)
ec.europa.eu/newsroom/document.cfm?doc_id=40542

https://ec.europa.eu/digital-single-market/news/information-and-stakeholders-day-smart-wearables

Future Outlook

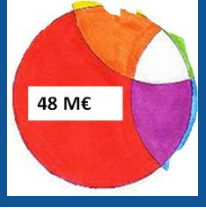
Emerging domain

Driven by low-cost manufacturing and consumer applications

Low cap investment (at least compared to Si Fab)

Smart wearables driver for new applications and markets

Electronic Smart Systems (ESS) ICT-07-2018



Electronic Smart Systems (ESS)
ICT-07-2018

What are you looking for?

The Challenge

- **Develop and validate a new generation of cost-effective ESS technologies**

  Hardware integration of Sensing, actuating, processing, wireless transmission

- **Access to technologies**

The Instruments and €

- Research and Innovation Actions (RIA)	**39 M€**
- Innovation Actions (IA)	**8 M€**
- Coordination and Support Actions (CSA)	**1 M€**

Electronic Smart Systems (ESS)
ICT-07-2018

48 M€

The Scope (RIA)

- **Research and Innovation Actions (RIA)**

TRL 4

a - Technological breakthroughs:
- miniaturisation
- new functionalities
- power consumption, autonomy
- reliability
- secure operation in real environments

Industrial exploitation
Application perspectives

b – Bio-electronics Smart Systems:

Cost effective miniaturisation, manufacturing and demonstration:

TRL 5

- Specificity/sensitivity
- Time to results
- Reliability
- manufacturability

Portability, wearability, biocompatibility, operation in remote & low resource setting.
User needs, markets and business cases

User needs
Market
business case

submission: 17 April 2018

39 M€

Electronic Smart Systems (ESS)
ICT-07-2018

48 M€

The Scope (IA and CSA)

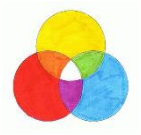
- **Innovation Actions (IA)**

  Access to Nanoelectronics and Electronic Smart Systems

  - Access to advance design and manufacturing (Academia, research institutes, SMEs)
  - Rapid prototyping production for SMEs and market deployment
  - Technical support and training

  8 M€

- **Coordination and Support Actions (CSA)**

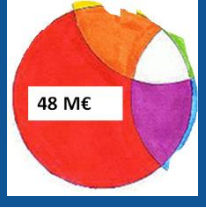


  - Collaboration between projects/experts in

    Nanoelectronics+ Electronic Smart Systems+ Flexible /wearable electronics
  - Increase outreach, International cooperation
  - Technology/development monitoring
  - Roadmapping

  1 M€

submission: 17 April 2018



Electronic Smart Systems (ESS)
ICT-07-2018

The Expected impacts

Tech-R&D

- Build a European Leadership for system performances
  Functionalities, size, reliability, manufacturability, cost…
- Increase cooperation – Promote multi-disciplinary initiatives
- Increased long-term industrial involvement in R&I

New Opportunities (products-sectors)

- New opportunities for digitising in traditional sectors
- New users in industry (SMEs, mid-caps) and academia

Economy-Finances

- Improved ESS manufacturing capabilities in Europe
- Increased market penetration for ESS and bio-electronics systems
- More industrial investments and open innovation marketplace

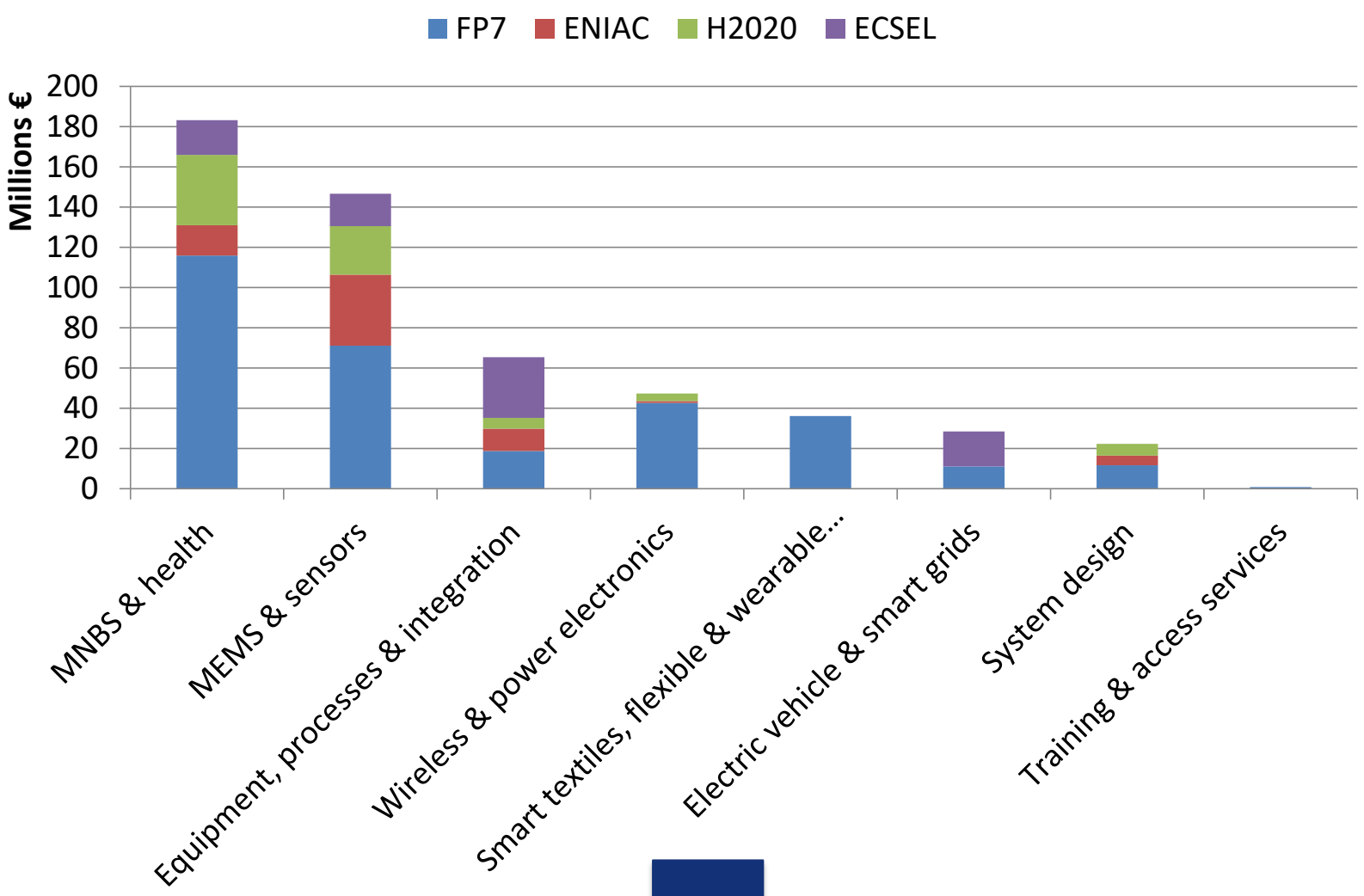
What do you NOT want?

Technologies and integrated systems that do not bring competitive advantages and opportunities to the European Industry.

Big smart systems

Software-only proposals

Topic Evolution and Current Portfolio



Smart Systems
– H2020 Application sectors -

Medical	Water	Food	Telecom	Thermic in SSI	Energy (management /harvesting)

Application specific SSI

PROTEUS
(Water quality monitoring)

SNIFFPHONE
(Health screening from exhaled breath)

MEDILIGHT
(Smart textile and wearable electronics)

SocketMaster
(Sockets for amputees)

BIOCDx
(Photonics diagnostic platfc for reliable cancer diagnosis)

LoveFood2Market
(pathogens in food – Ultra-fast detection

PhasmaFOOD
(photonic miniaturised on-the-spot food quality sensing

Liqbiopsens
biopsy-on-chip -colorectal cancer detection

SMARTDIAGNOS
(sepsis diagnosis)

MADIA
magneto-resistive sensors for diagnostic device)

TIPS
(Thermal management in photonic devices)

TOP HIT
(Micro-transfer printing)

smart-MEMPHIS
(MEMS energy harvester)

M3TERA
(Micromachined TeraHz systems)

Nanonets2Sense
(biosensors, functionalised

STREAMS
(µfluidic active cooling integration)

Key actors

Who are the leading players?

RTOs, Semiconductor Industry, System Integrators, Application developers (medical, food, etc), end-users (demand)

Is there a key group of actors driving this?

ECSEL JU (inc. EPoSS ETP)
MNBS –Wearables sector

additional / background documents

EPoSS SRA Presentation Kit: https://www.smart-systems-integration.org/public/documents/sra-presentation-kit

ECSEL http://www.ecsel-ju.eu/web/index.php

Report on the 10th Annual Concertation and Consultation Workshop on Micro-Nano-Bio-Systems: MNBS 2016, https://ec.europa.eu/digital-single-market/en/news/report-10th-annual-concertation-and-consultation-workshop-micro-nano-bio-systems-mnbs-2016

Future Outlook

Driven by Digital Single Market (DSM), Digitization or European Industry and Societal Challenges (demand side).

Evolution through further integration with core H/W, S/W and networking technologies(e.g. Electronics, Photonics, Low power computing, AI) to deliver fully integrated, miniaturised, multifunctional, connected, cost-efficient new generation of systems & services (IoT, Cloud, Big Data).

Upcoming events / information days

19-20-Oct-2017, Graz

9-10-Nov-2017, Budapest

5-7-Dec-2017, Brussels

https://efecs.eu/

MNBS, 12-13 Dec, Amsterdam
http://www.micronanoconference.org/

13-15-March-2018, München

17 April 2018, Brussels

call submission deadline

Funding decision: around August 2018

Thank you for your attention