

*MNBS'14 Workshop, LAAS CNRS
Toulouse 21 & 22 October, 2014*

Gaps and the Way Forward? Work Programme 2016-17

WHAT ARE THE OPTIONS FORWARD?

Andreas.lymberis@ec.europa.eu

*Directorate General for Communications Networks, Content and Technology- DG CONNECT,
Components & Systems, Components*

Learning from FP7

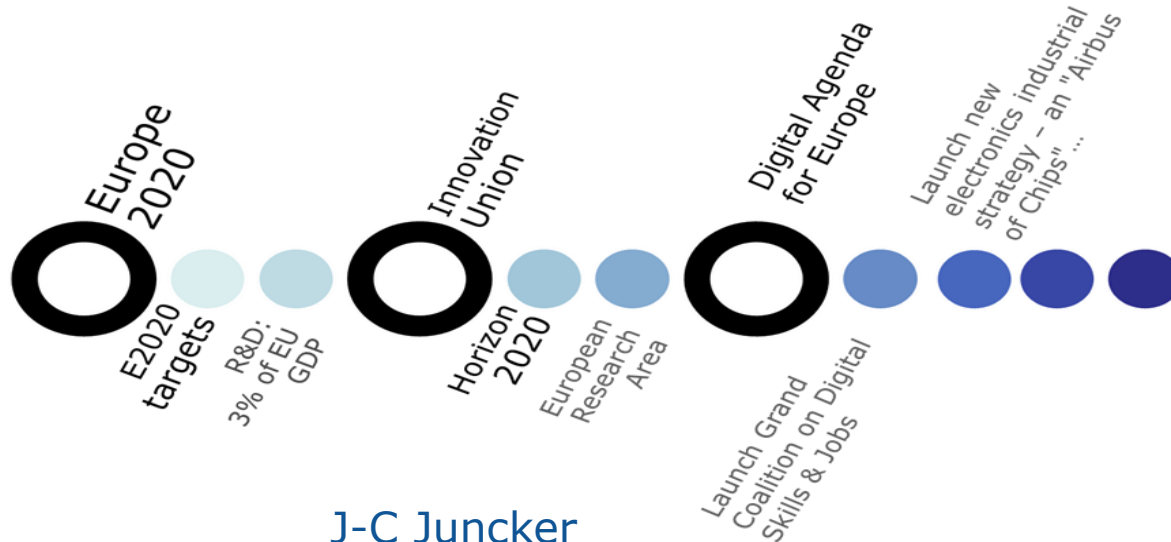
H2020-WP2014-15
Lessons & Opportunities



WP2016-17:
Challenges & Opportunities

Taking Home

The policy context



Neelie Kroes

J-C Juncker
2 out of 10 proposed priorities

Commissioners-designate



**ANDRUS
ANSIP**
VICE-PRESIDENT

Digital Single Market



**GÜNTHER
OETTINGER**

Digital Economy & Society



A New Boost for Jobs, Growth and Investment

My first priority as Commission President will be to strengthen Europe's competitiveness and to stimulate investment for the purpose of job creation. I intend to present, within the first three months of my mandate and in the context of the Europe 2020 review, an ambitious Jobs, Growth and Investment Package worth €300 billion.



A Connected Digital Single Market

I believe that we must make much better use of the great opportunities offered by digital technologies, which know no borders. To do so, we will need to have the courage to break down national silos in telecoms regulation, in copyright and data protection legislation, in the management of radio waves and in the application of competition law.

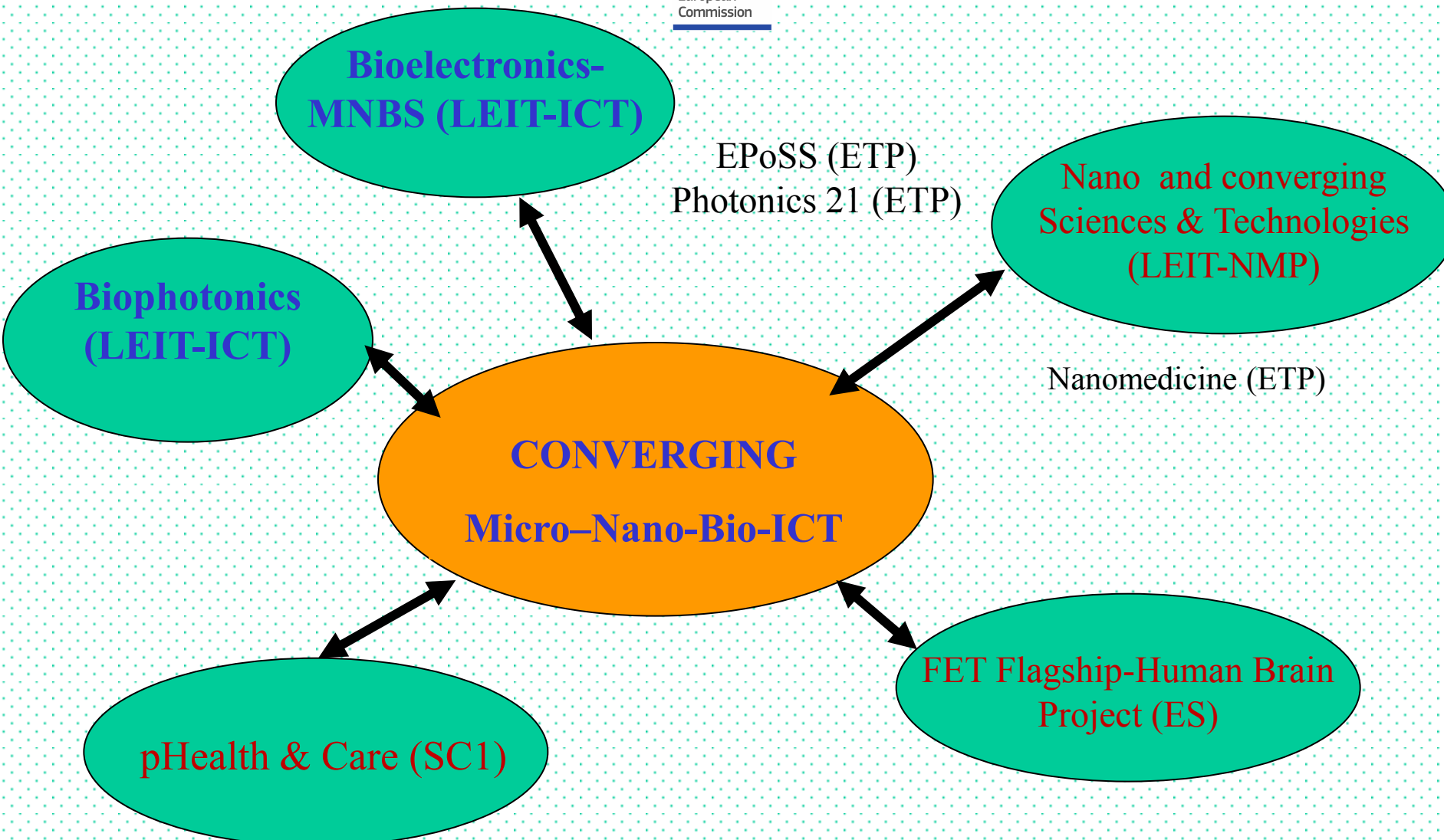
Serving the EU Policies: The renewed Lisbon agenda



- Markets & Competition: Europe - A more attractive place to invest & work
 - Extend & deepen the internal market
 - Improve European and national regulation
 - Ensure open & competitive markets inside & outside Europe
 - Expand & improve European infrastructure
- Knowledge & innovation for growth
 - Increase & improve investment in R&D
 - Facilitate innovation & uptake of ICT & the sustainable use of resources
 - Contribute to a strong European industrial base
- Employment & Skills: Creating more & better jobs
 - Attract more people into employment & modernise social protection systems
 - Improve the adaptability of workers & enterprises & the flexibility of labour markets
 - Invest more in human capital through better education & skills

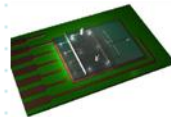
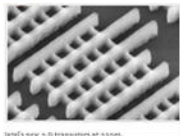
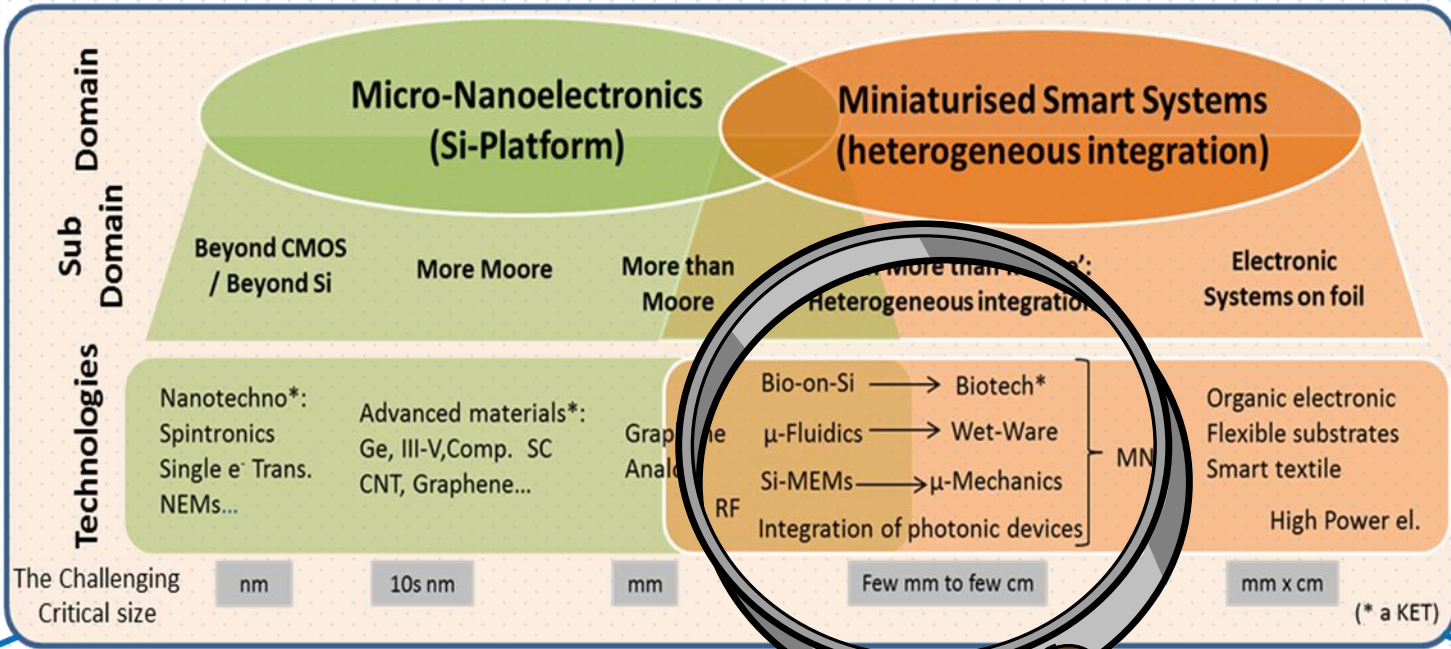
Learning from FP7

Cross – KET (Micro-nano-Photo-Bio-ICT) & PHC



Smaller . Smarter . Cheaper

Electronic Components - scope of R&I



3-D transistors

CMOS 22 nm

3-D stacking

Sub-THz telecom (iPHOS)

Lab-on-Chip (PYTHIA)

Many Miniaturised devices:
 Endoscopic capsule (iPHOS)
 Neural probes (NEURON)
 Implantable electrode (iWALK)

Plastic electronics (Place-it)

MNBS (25 FP7 projects)



European

Food/beverage contamination

Food pathogens detection & safety
Point-of-need detection
Miniaturised complete solution
Lab-on-chip

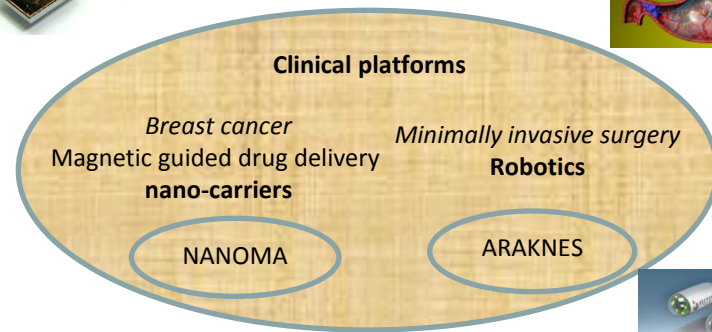
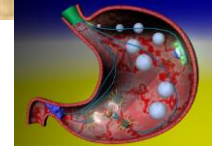
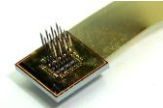
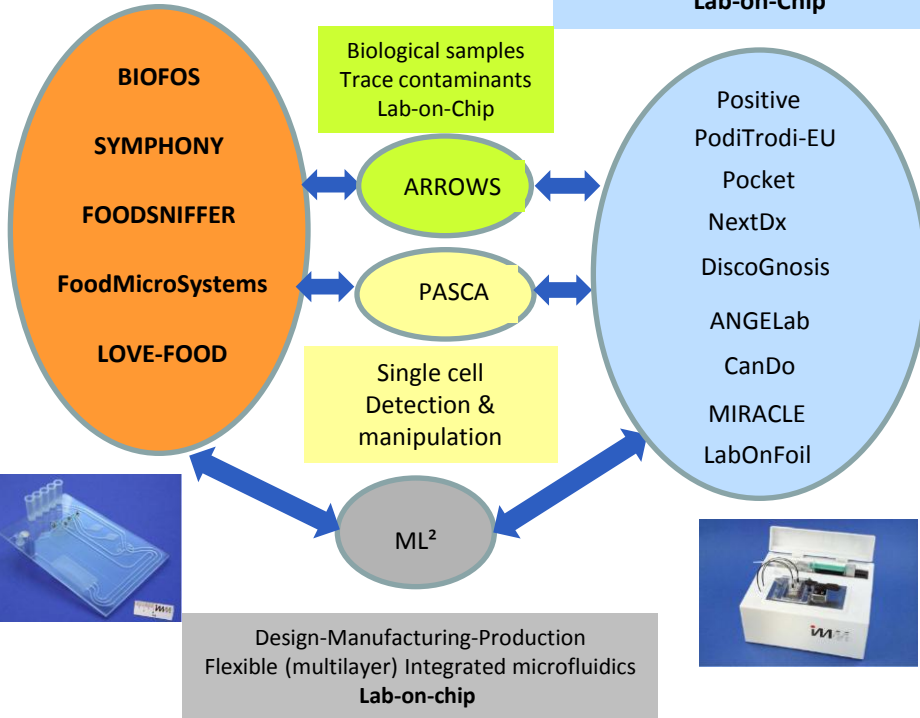


Point of care testing & IVD

Allergy detection
Tropical diseases detection
Tuberculosis detection
Chronic diseases monitoring
Malaria and fevers detection
Foetal mutation detection
Cancer early detection/diagnosis
Pathogen, drugs detection
Lab-on-Chip

Treatment of phantom limb pain
Neuro stimulation
Motricity restoration
Parkinson disease treatment
Hearing impairment treatment
Cochlear stimulation
Drug monitoring POC in transplanted patients
Cardiovascular repairing
Invasive MNBS
Smart Implants and stimulators
Actuators-EAP, Infrared Laser

TIME
NEUWalk
ACTION
NANODEM
Heart-e-Gel



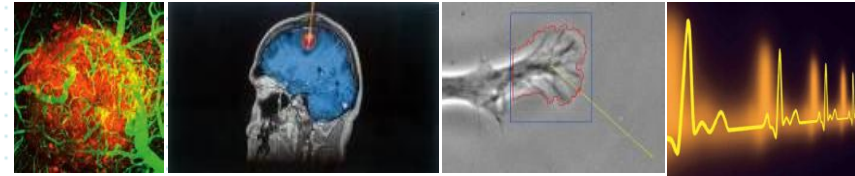
In vivo MNBS and Clinical Platforms

Biophotonics



19
projects
76 M€

4 IPs, 13 STREPs,
1 NoE,



10 M€

CIP pilot B actions: Biophotonics solutions for diagnosis, monitoring or treatment of disease

Outcome: solutions which have been evaluated by professional end-users and which demonstrated significant advantages with respect to current approaches, with the ultimate goal being their introduction into the market place.



ERANET+

15 M€

Co-funded by EC and DE, IL, IT (Toscana), UK, BE (Flanders), ES (Catalonia), LV
Line A. Translation into practical applications

➤ addresses end-user-oriented industrial research projects.

Line B. Investigation on new tools or methods

➤ smaller projects only (up to 1 M€ total costs);

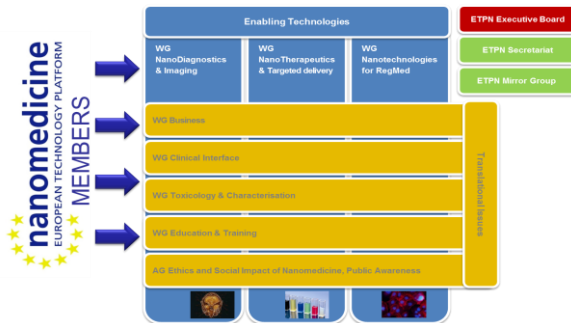
➤ addresses projects at an early stage of industrial research.

Personal Health System and Patient Guidance Services supported by ICT

- 90+ PHS, PGS projects funded under FP7 (2007-2013)
- EC contribution 348 M€ (FP7)

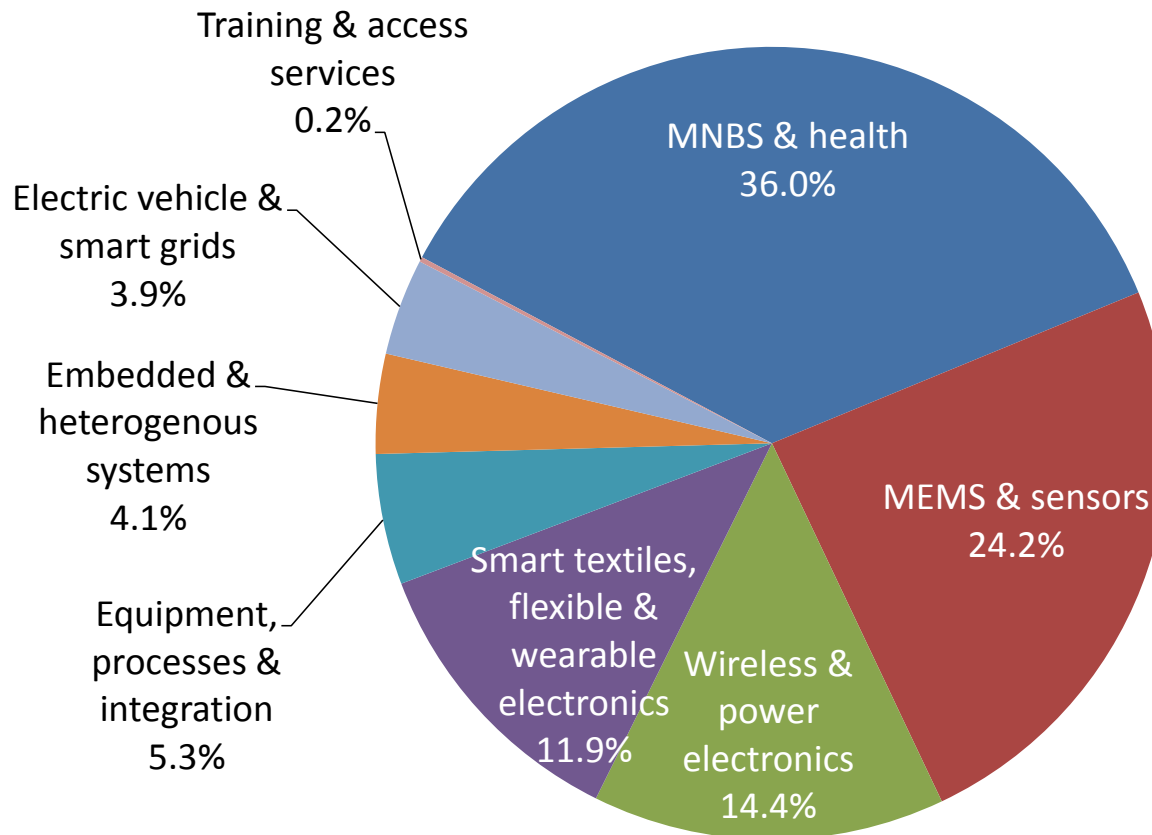
Nanomedicine

- 85 Projects in FP7 NMP, ~ 400 mio € funding
- 31 Projects in Health, ~ 150 mio €



Smart System Integration: Areas and Numbers in FP7

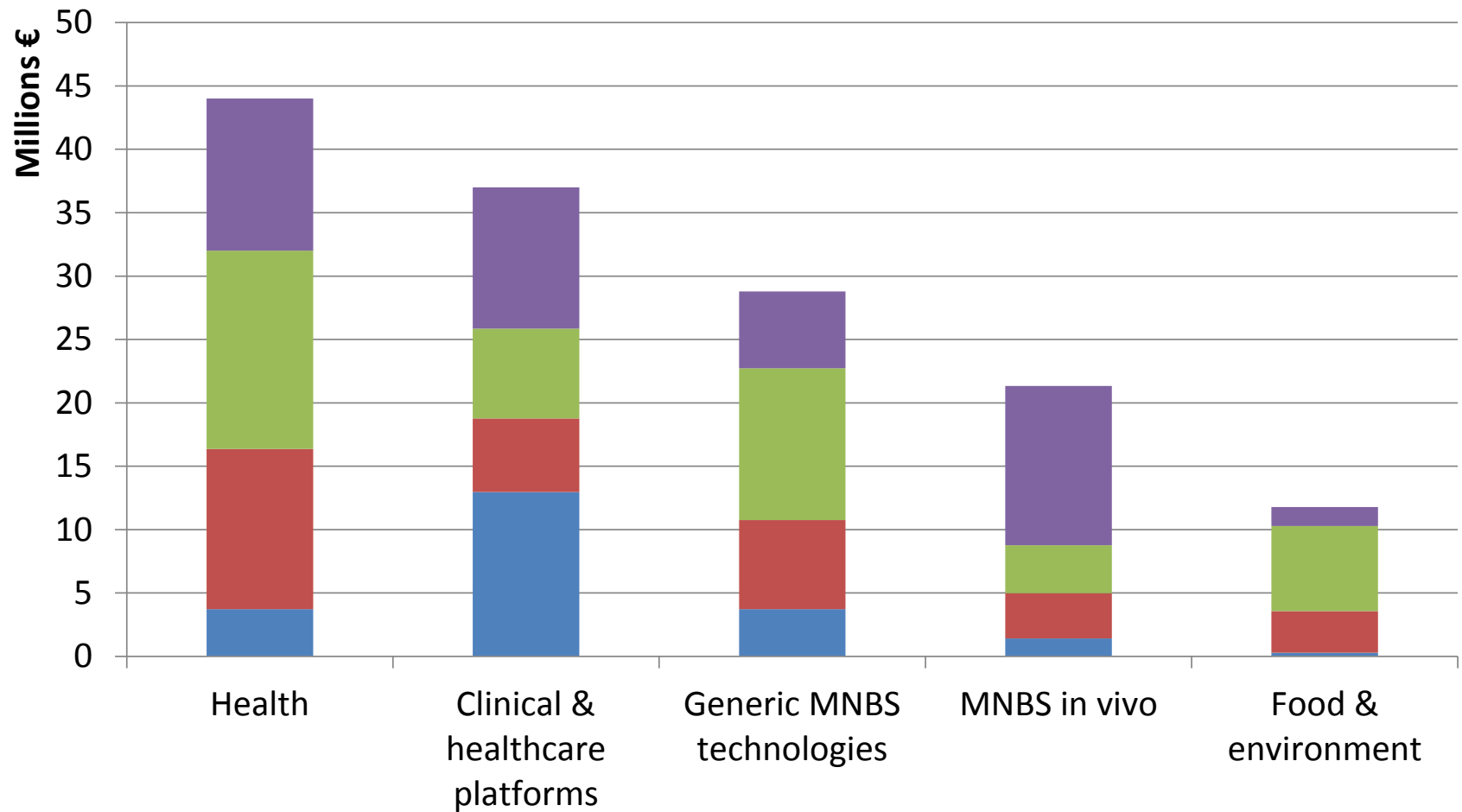
Total costs for Smart System Integration projects



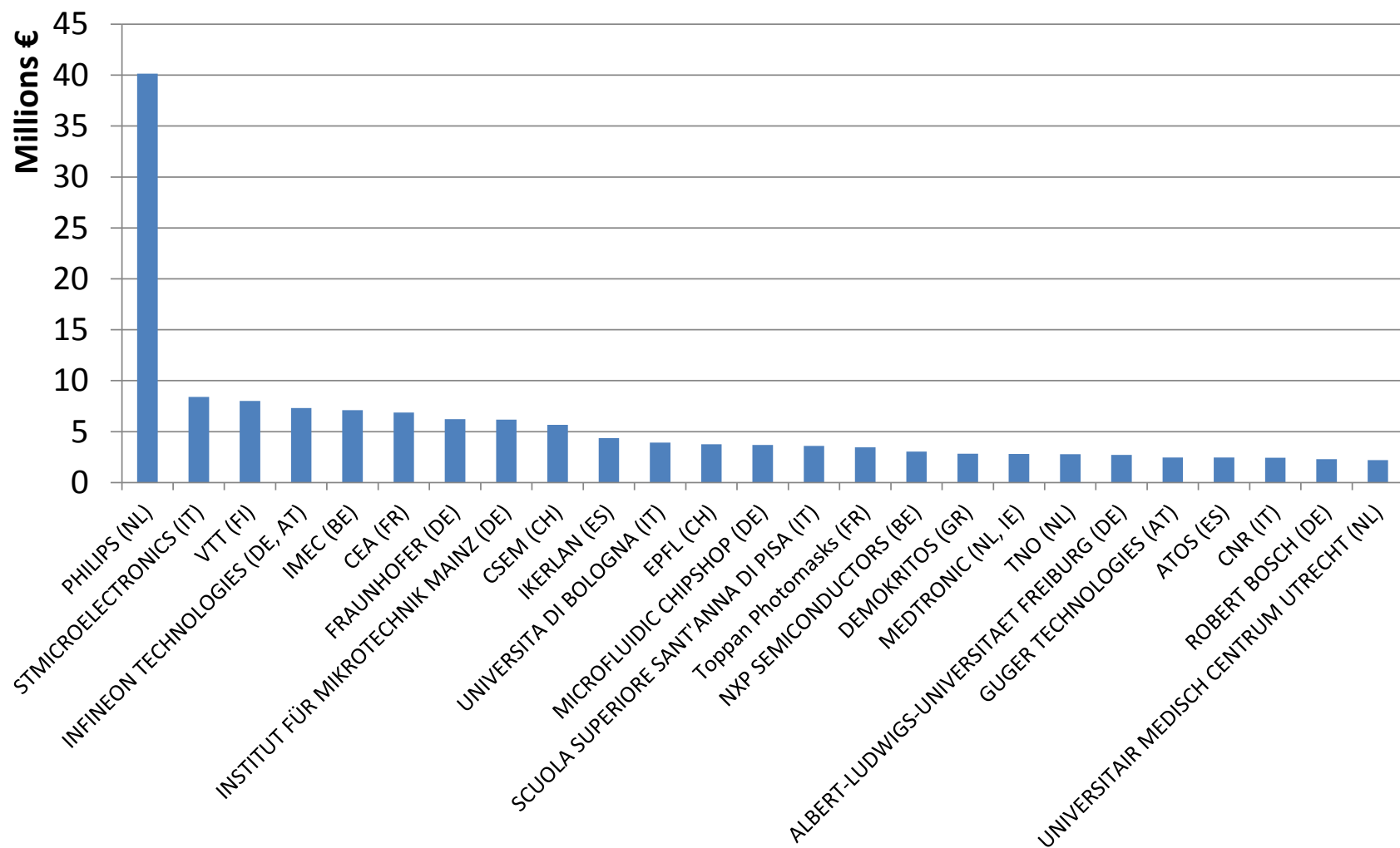
- 81 projects in FP7
- Total costs 441 M€
- EU funding 311 M€ (45% of the total from Components)
- 890 participants with 23% SMEs

EC funding to MNBS projects

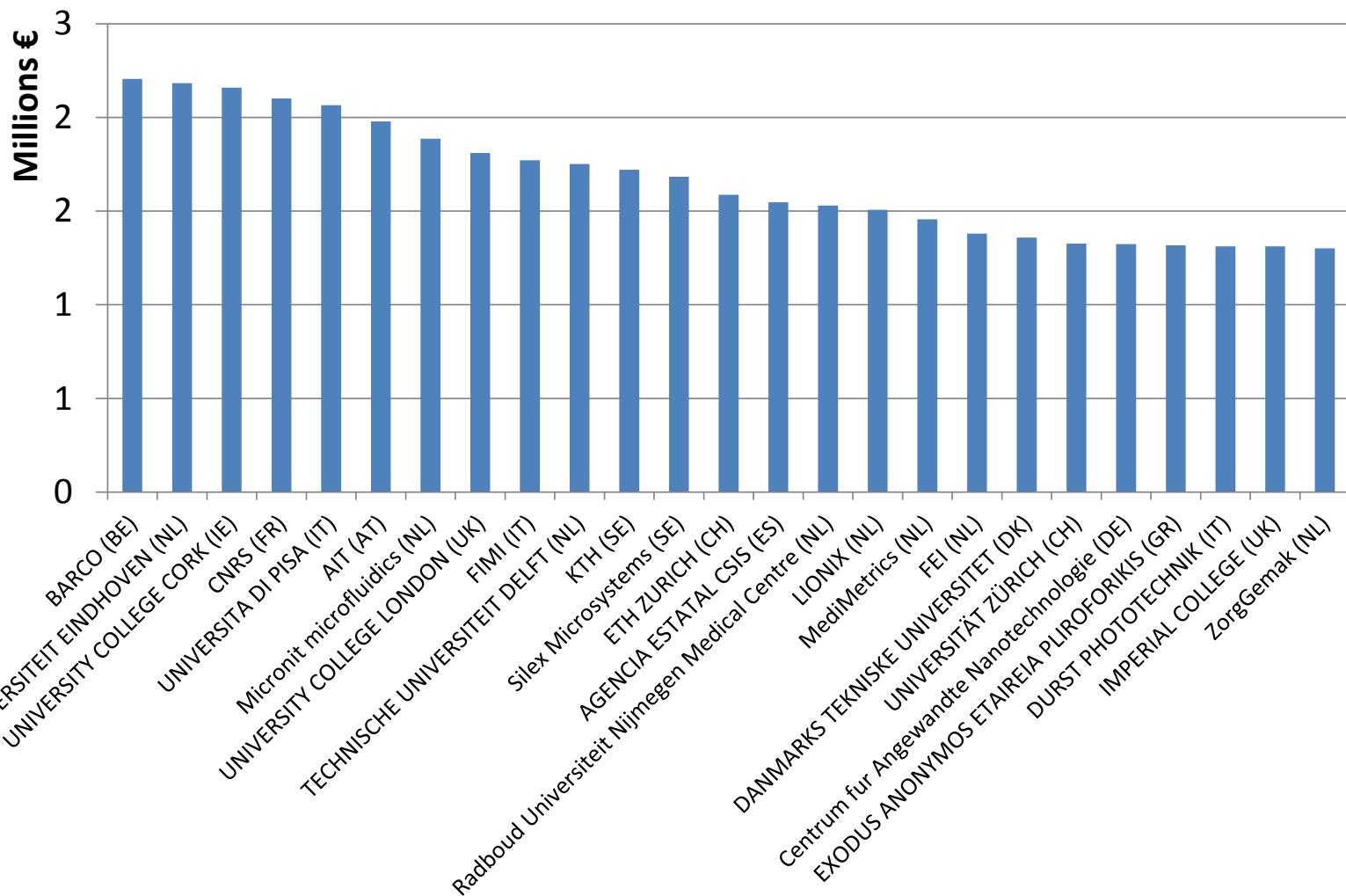
■ IND ■ SME ■ RES ■ HES

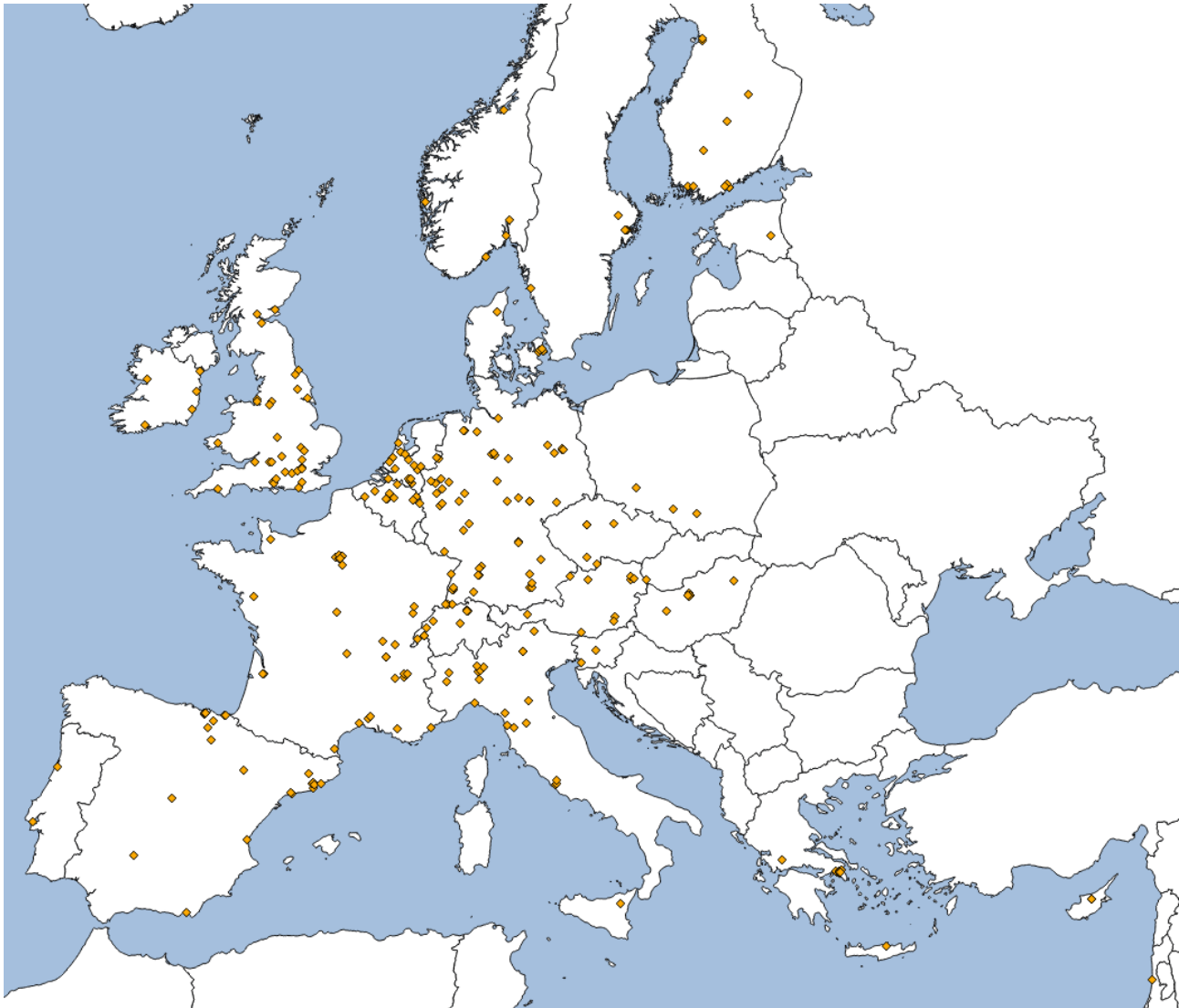


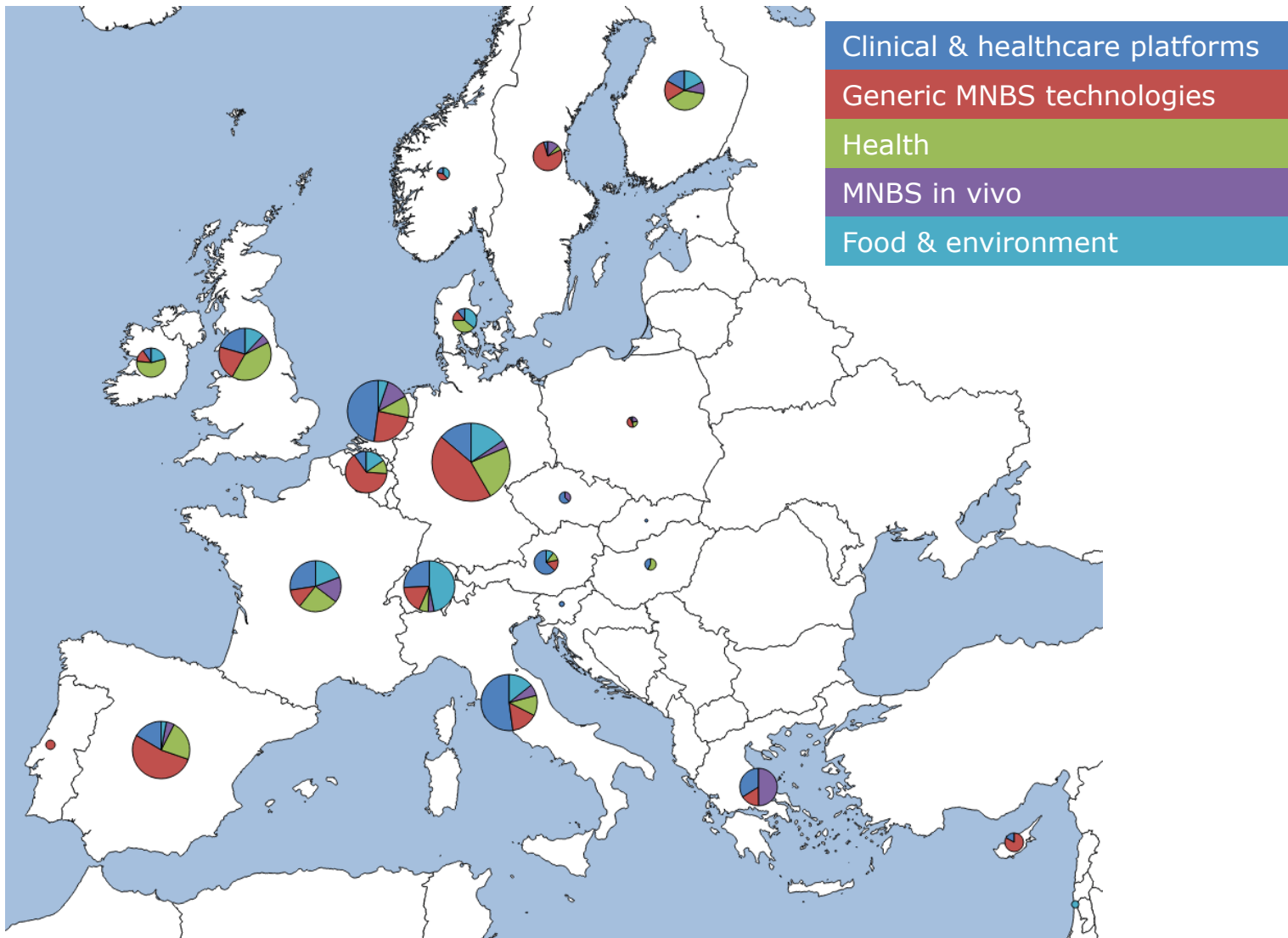
Total costs for the top 25 participants




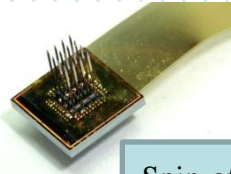
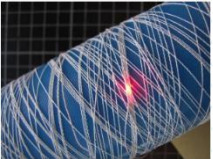



Total costs for the top 26 to 50 participants







...some technological breakthroughs, and industrial successes

ICT project	Technology	Application
<p>NEUROPROBES</p>	 <p>Smart Probes</p>	 <p><i>In Vivo extra-cellular neurons recording</i></p> <p>Spin-off: ATLAS Neuroengineering: www.atlasneuro.com/</p>
<p>PASTA</p>	 <p>Packaging of Electronic threats</p>	 <p><i>Smart Textile with integrated sensors, LED and RFID</i></p> <p>Incubator: Primo1D: www.grain-incubation.com/projets/prim0-1d/</p>
<p>LabonFoil</p>	 <p>Molecular Biology on Chip/foil</p>	 <p><i>In Vitro diagnostics portable solutions</i></p> <p>Spin-off: POC Microsolutions, www.pocmicrosolutions.com</p>



But... slow industrialisation, few patents, low SME and civil society participation, inexperience of regulatory...and remaining technical issues

Grand Challenge: Overcome current limitations and reach the market

- ***Innovation: translating technology and process in usable & commercial new service or goods***
- *R&I approaches that combine the supply push with the demand pull/drive for innovation and that aim at addressing Europe's socio-economic challenges.*
- *Opening to a wider stakeholder community and integration with the whole ecosystem*
- *Concentrating and pulling efforts to achieve breakthroughs*

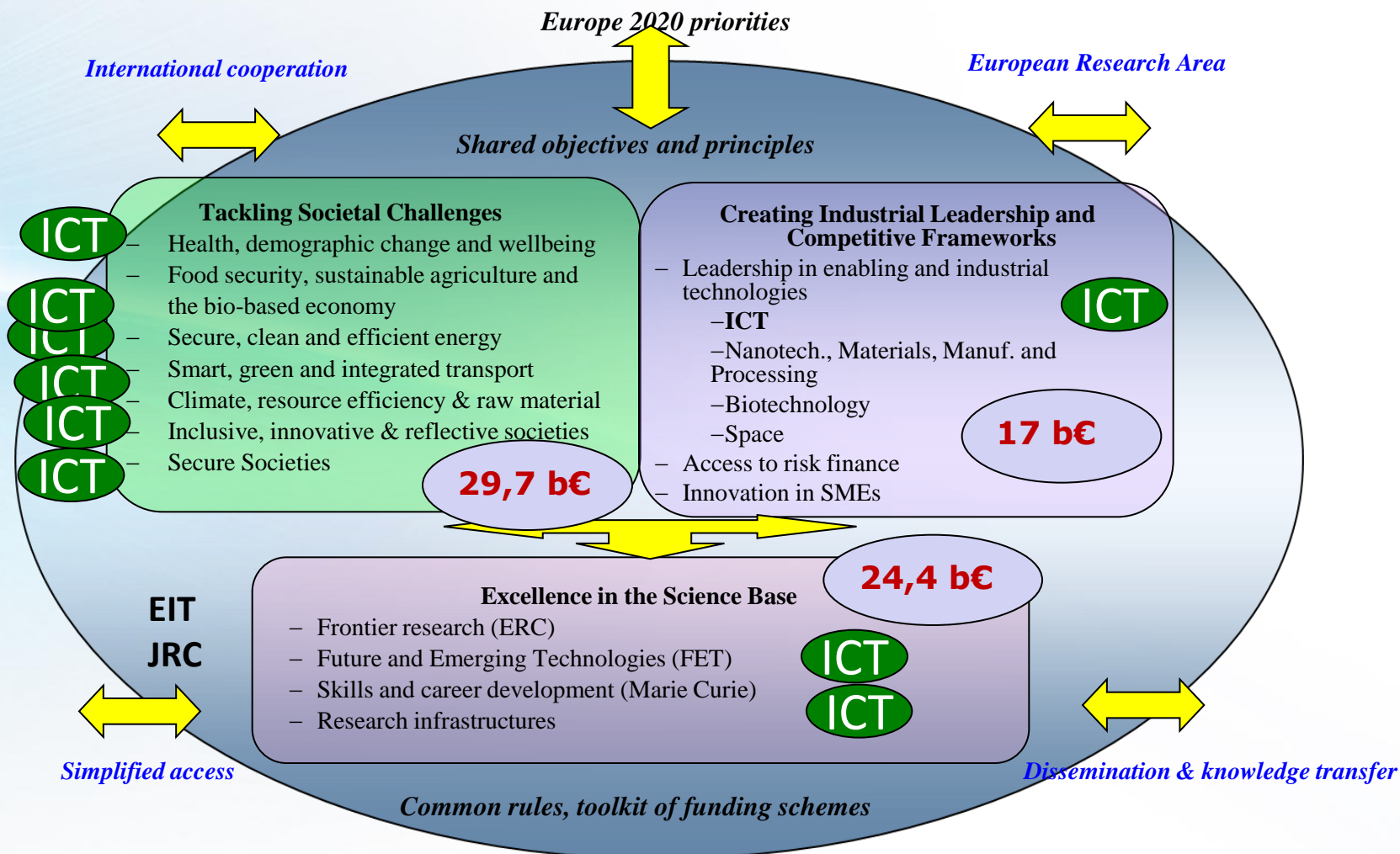
H2020*

WP 2014-15 Lessons & Opportunities

*** Other EU programmes on e.g. the Competitiveness of Enterprises and Small and Medium Sized Enterprises (covering access to finance and markets) or Structural Funds are very relevant but not covered in this presentation**

HORIZON 2020: 7 YEARS PROGRAMME

A STRONGER, CLEARER FOCUS

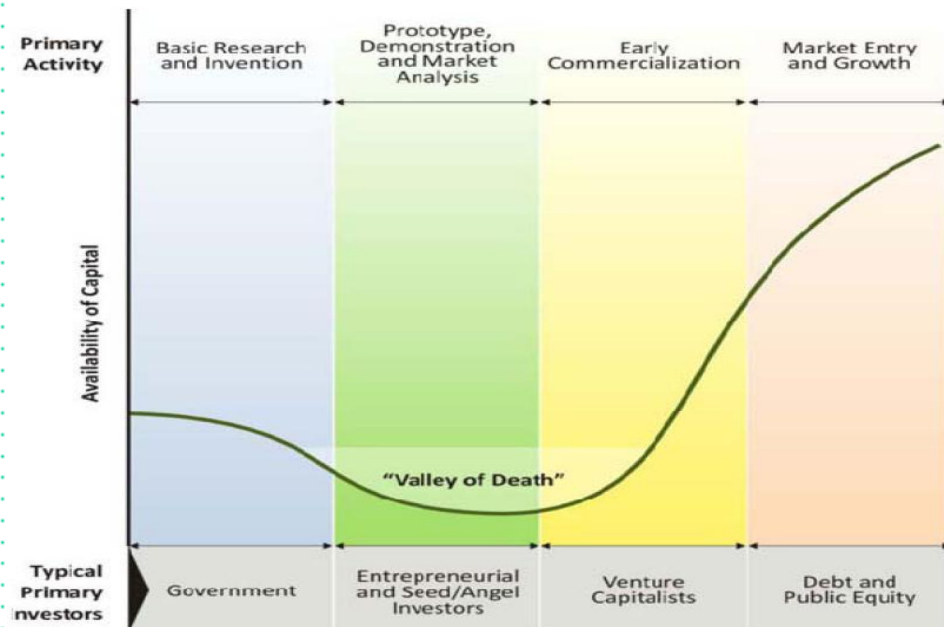


The budget is on the basis of 2011 "constant" prices

H2020: From basic research to innovation

In addition to collaborative projects for R&D

- Piloting, testing, demonstrations
- Access to finance (loans, guarantees, equity investments)
- Specific measures for SMEs
- Support to PPPs
- Pre-commercial procurement
- Support to infrastructures for R&I



- Work programme essentially is a short description of topics with details on expected impact
- More funding to Research and Innovation Actions
- Cover technology development, design and manufacturing
- Stress the importance of innovation – potential innovation for lower TRL. Innovation is a key differentiator.
- Involve actors along the value chain. High industrial participation.

- Technology drive vs. application pull – application pull proposals are somewhat more successful
- Innovation actions on access on design and manufacturing – however no projects on evaluation of equipment, process and building blocks for smart systems
- No proposals on pre-Commercial Procurement, no CSA

2015 Calls in ICT-LEIT and SC1

ICT28.a Innovation Actions ICT KET integrated platforms for the healthcare and food sectors **11 M€** ●

PHC 11– 2015 Development of new diagnostic tools and technologies: in vivo medical imaging technologies ●

45 M€

PHC 21 – 2015) Advancing active and healthy aging with ICT: Early risk detection and intervention **48 M€** ●

10 M€

PHC 29-2015) - Public procurement of innovative eHealth services

● Open (April-2015) ● Open (Oct-2014)

ICT 28 – Cross-cutting KETs

Innovation Actions

**ICT-KET integrated platforms for the
healthcare and food sectors**

**11 M€
70% funding**

Pilot lines for advanced KET products
Set-up and validation of pilot production for
advanced products

Pilot line for OLEDs on flexible substrates

Pilot line for analytical mid-infrared (MIR)
micro-sensors

Pilot line for PIC fabrication on III-V and/or
dielectric based platforms

**42 M€
70% funding**

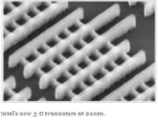

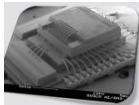

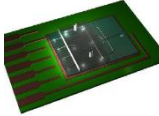

Coordination and Support actions
Cooperation and accelerating the sector

**1 M€
100% funding**

WP2016-17: Challenges & Opportunities

Electronic components and systems



Integration chain:	More Moore	Beyond CMOS / Beyond Si	More than Moore	Heterogeneous integration	Autonomous systems, Smart connection to local data networks, big data or internet		
- nm to cm-	→						
Technologies	Si Ge, III-V, Comp. SC nanotubes, Graphene...	Si Spintronics Single e ⁻ Trans. NEMs...	Bio-on-Si Si-MEMs RF	Bio-electronics, MNBS μ-Fluidics Thin electronics Photonics	μ-Mechanics Microrobots	Complex Systems, CPS <i>Platforms and Services</i>	
							
	ICT 25 (Generic micro-and nano-electronics technologies)	ICT 2 (Smart System integration)	ICT 26-27 (Photonics)	ICT 3 (TOLAE)	ICT 23-24 (Robotics)	ICT 1 (CPS)	+ ICT 30-7-14 (IoT., Cloud., 5G-Future Internet..)
	ICT 28 (Cross-cutting ICT KETs)						



- General
 - Maximising EU added value, need for collaborative projects involving several partners combining complementary skills
 - Areas addressing and anticipating key developments
 - Strong potential for uptake and impact, as well as leverage industry and SME participation
- Impact – linked to key performance indicators
 - Economic
 - Societal
- Boundary conditions
 - Limited budget, calls for focus
 - Unique Selling Proposition

- Which focus MNBS should put forward in the next 2-5 years? What would be an acceptable oversubscription rate?
 - By technology development? Miniaturisation and heterogeneous integration in Systems?
 - By application area?
 - By TRL?
 - By impact?
- Which instruments to use
 - Research and Innovation Actions – technology driven/application pull?
 - Innovation Actions – only access to design and prototyping? Testing zones? Other? In ECSEL?
 - Pre-commercial Procurement and/or Procurement of Innovation Solutions?
 - Any Coordination and Support Action?
 - Access to finance?

WP 2016- 2017 – Areas on which views are solicited

- Smart Systems Integration
 - Focus on miniaturisation and integration? Autonomous behaviour? Cover the full value chain from design to manufacturing?
 - Should MNBS be a cross-cutting topic with photonics?
- Internet of Things
 - If cross-cutting focus area including full value chain up to applications, which SSI topics should be developed/demonstrated (e.g. zero power, specific sensing/actuating, ...)?
- Cross-cutting KETs
 - In 2015 health and food. Any other specific application areas?
- Other?
 - -
 - -...

Next steps

17 Oct - start- Dec	Discussions with thematic configurations on scoping papers
December	Presentation of proposed strategic programming document to new Commissioner(s)
Jan-July 2015	Preparation of the detailed work programme 2016/17 content, prepared on the basis of the endorsed strategic programming document, including input from advisory groups and discussion with PC configurations
Summer 2015	Opinions of Programme Committee configurations
Third quarter 2015	Adoption by the Commission of the work programme 2016/17; publication of the calls for 2016

Taking Home

MNBS: *Doing the right things and doing things right*

- *Bold initiatives addressing demand and supply, addressing whole value and supply chains, linking research with innovation, combining resources*
- *Supporting innovation ecosystems and key regions – importance of clusters*
- *Focus, cooperate and invest!*



