

Horizon 2020 NMP

Nanotecnologie – Materiali - Produzione

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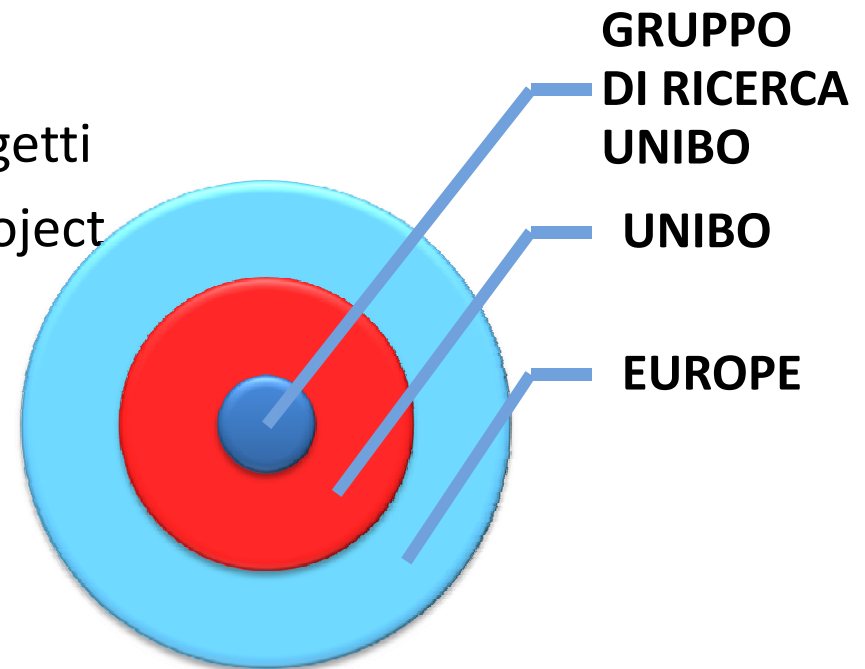
CNA, 22 gennaio 2014



Università di Bologna - European Research & Innovation Office EuRO

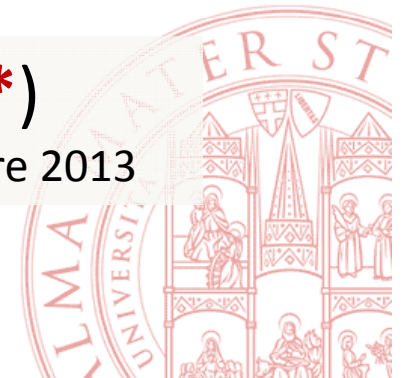
Servizi forniti ai docenti UNIBO:

- Networking & informazioni
- Supporto nella preparazione dei progetti
- Supporto per implementazione & project management



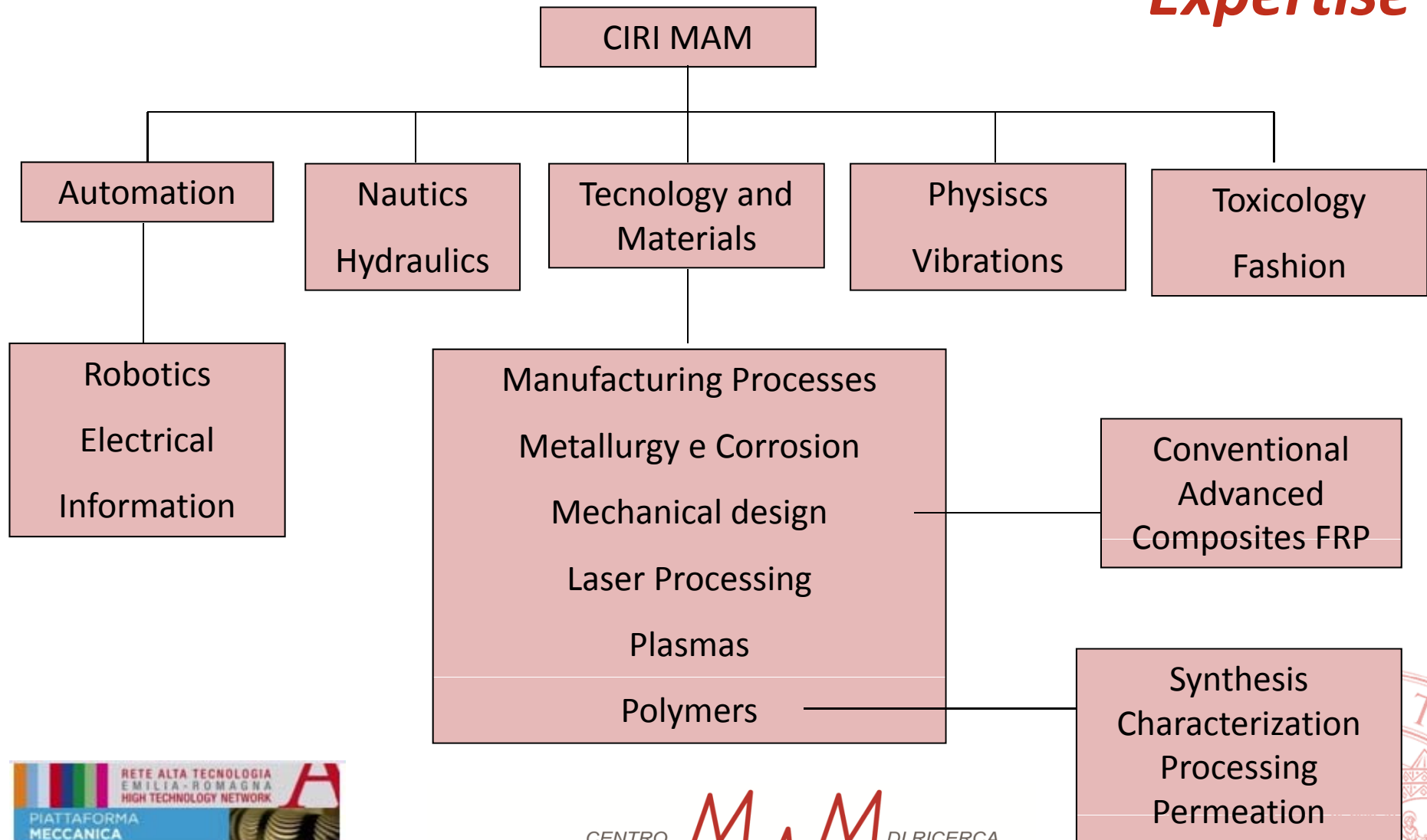
Circa **264** progetti finanziati in FP7 (**86 M €***)

*Dicembre 2013



CIRI MAM-Mechanics&AdvancedMaterials@ *unibo*

Expertise



CENTRO
INTERDIPARTIMENTALE **MAM** DI RICERCA
INDUSTRIALE
MECCANICA AVANZATA E MATERIALI



Alma HeritageScience @ unibo

Expertise

✓ **Cultural Heritage: Environment and Territory**

- Environment and Energy
- Territorial Aspects

✓ **Cultural Heritage: Management and Promotion**

- History and Ethics of Conservation
- Documentation and Cataloguing (ICT based)
- Management and Promotion

✓ **Cultural Heritage, Image, Structure and Materials: Conservation and Restoration**

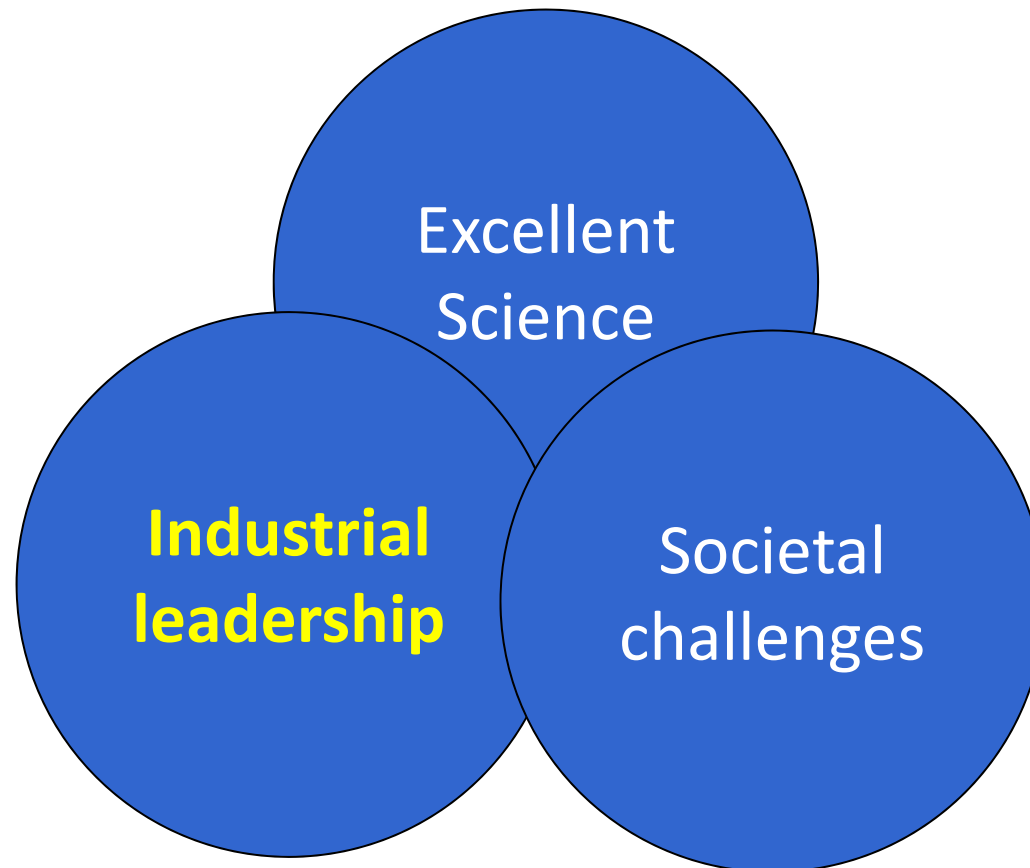
- Surveying and Monitoring of Cultural Heritage
- Structural Assessment and Surface Diagnostic
- Constituents Materials, Microstructure and Inner Structure
- Bioarchaeology
- Development of new Equipments and Diagnostic Methodologies



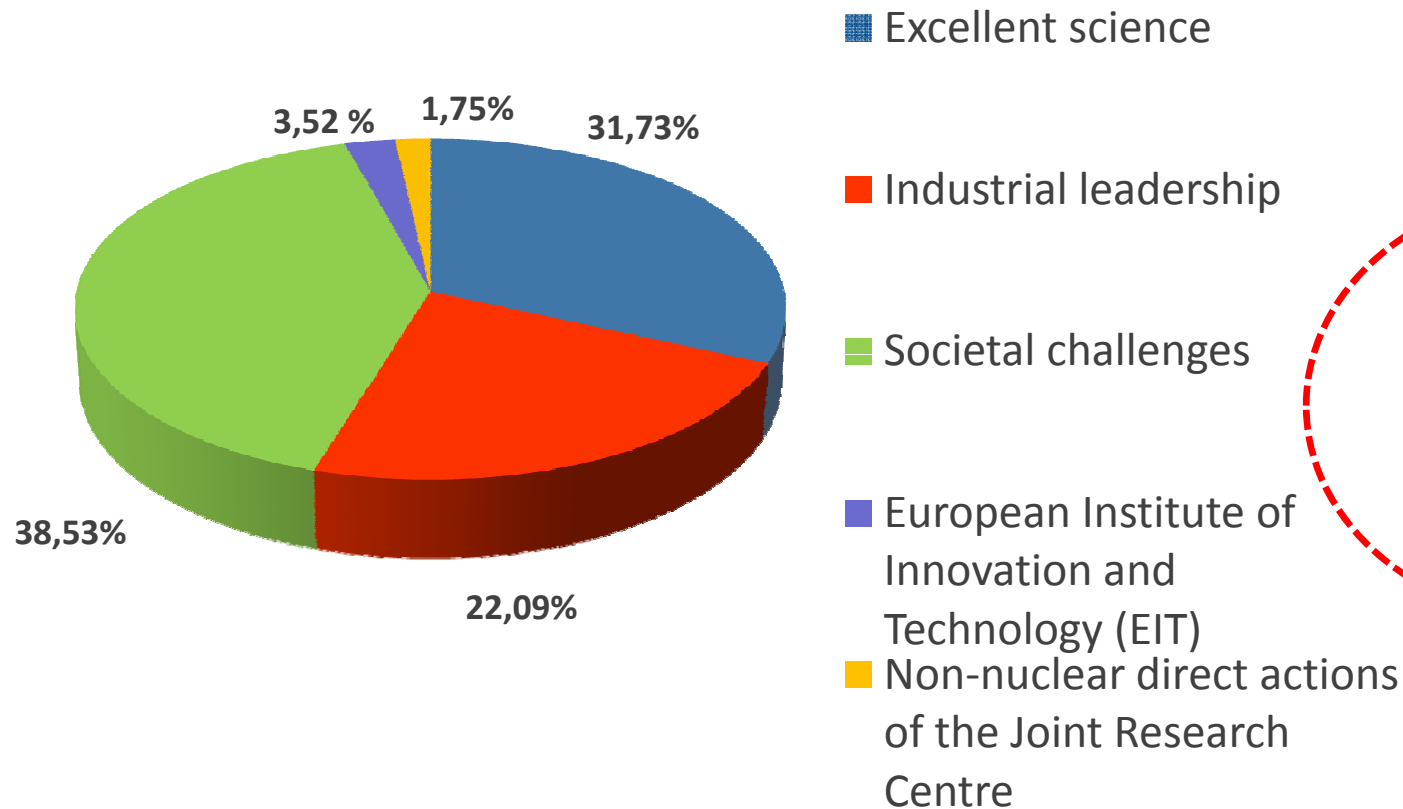
HORIZON 2020



UNIBO e HORIZON 2020



BUDGET HORIZON 2020



secondo l'accordo
PE e Consiglio:
Budget H2020:
80 miliardi Euro
circa



Industrial Leadership



Industrial leadership - programmi

- **Leadership in enabling and industrial technologies** – LEIT (Key Enabling Technologies KETs)
- **Access to finance** per aziende innovative, strumenti finanziari in partenariato con l'European Investment Bank;
- **Innovation in SMEs**



Leadership in enabling and industrial technologies LEIT



Le Key Enabling Technologies - KETs

- Il Programma **Leadership in Enabling and Industrial technologies – LEIT** contiene linee di finanziamento dedicate alle **tecnologie abilitanti**, ovvero alle **Key Enabling Technologies** che la Commissione Europea (EC ha identificato come tecnologie chiave su cui basare la leadership industriale dell'Europa fino al 2020.
- Let KETs sono tecnologie:

"ad alta intensità di conoscenza e associate ad elevata intensità di R&S, a cicli d'innovazione rapidi, a consistenti spese di investimento e a posti di lavoro altamente qualificati. Rendono possibile l'innovazione nei processi, nei beni e nei servizi in tutti i settori economici e hanno quindi rilevanza sistemica. Sono multidisciplinari, interessano tecnologie di diversi settori e tendono a convergere e a integrarsi. Possono aiutare i leader nelle tecnologie di altri settori a trarre il massimo vantaggio dalle loro attività di ricerca"

Fonte: Current situation of key enabling technologies in Europe, SEC (2009) 1257



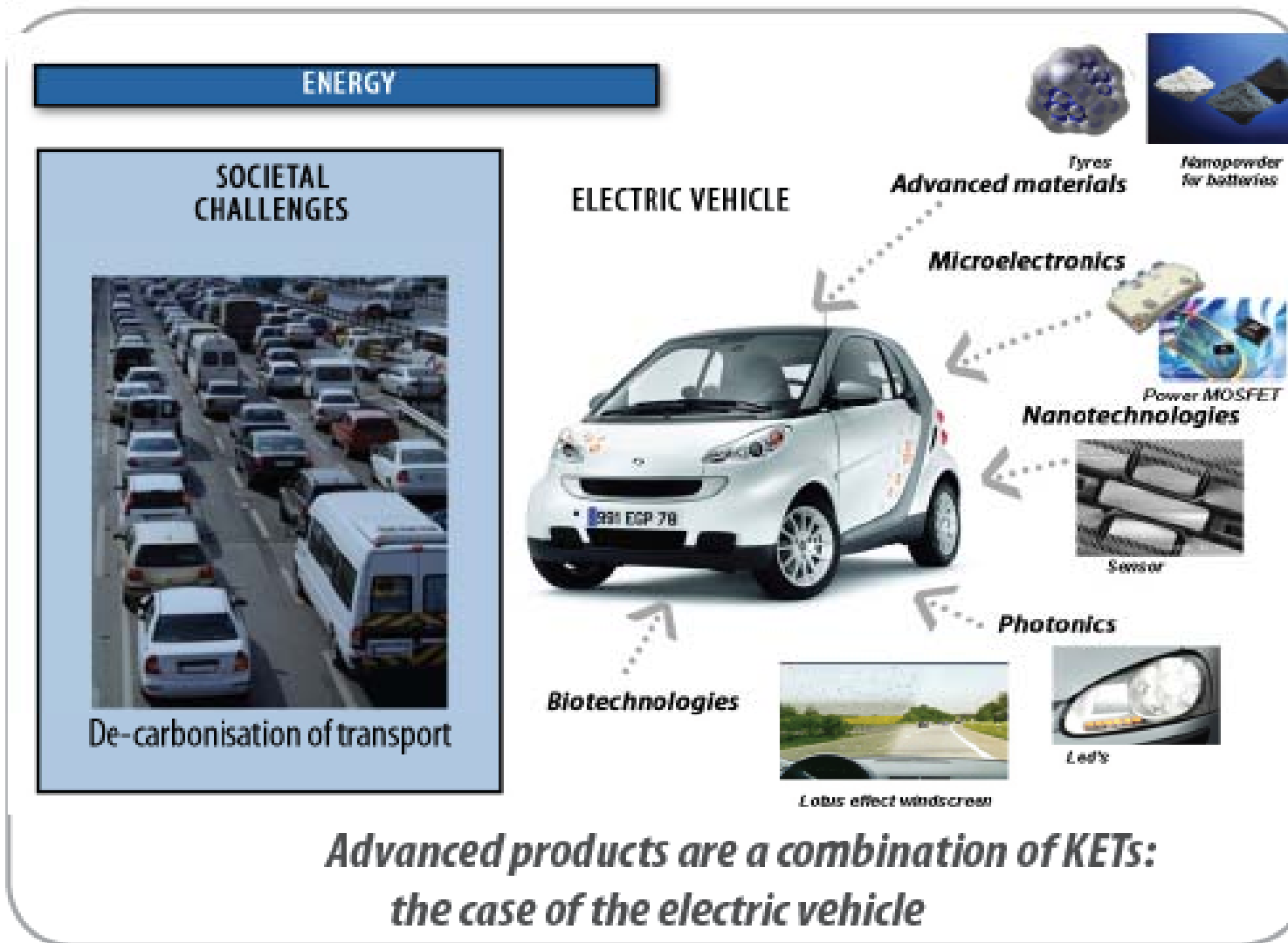
Quali sono le KET?

6 tecnologie strategiche che permettono la realizzazione di **prodotti e servizi** ad alto contenuto di **innovazione**, contribuendo alle sfide sociali e alla competitività dell'EU:

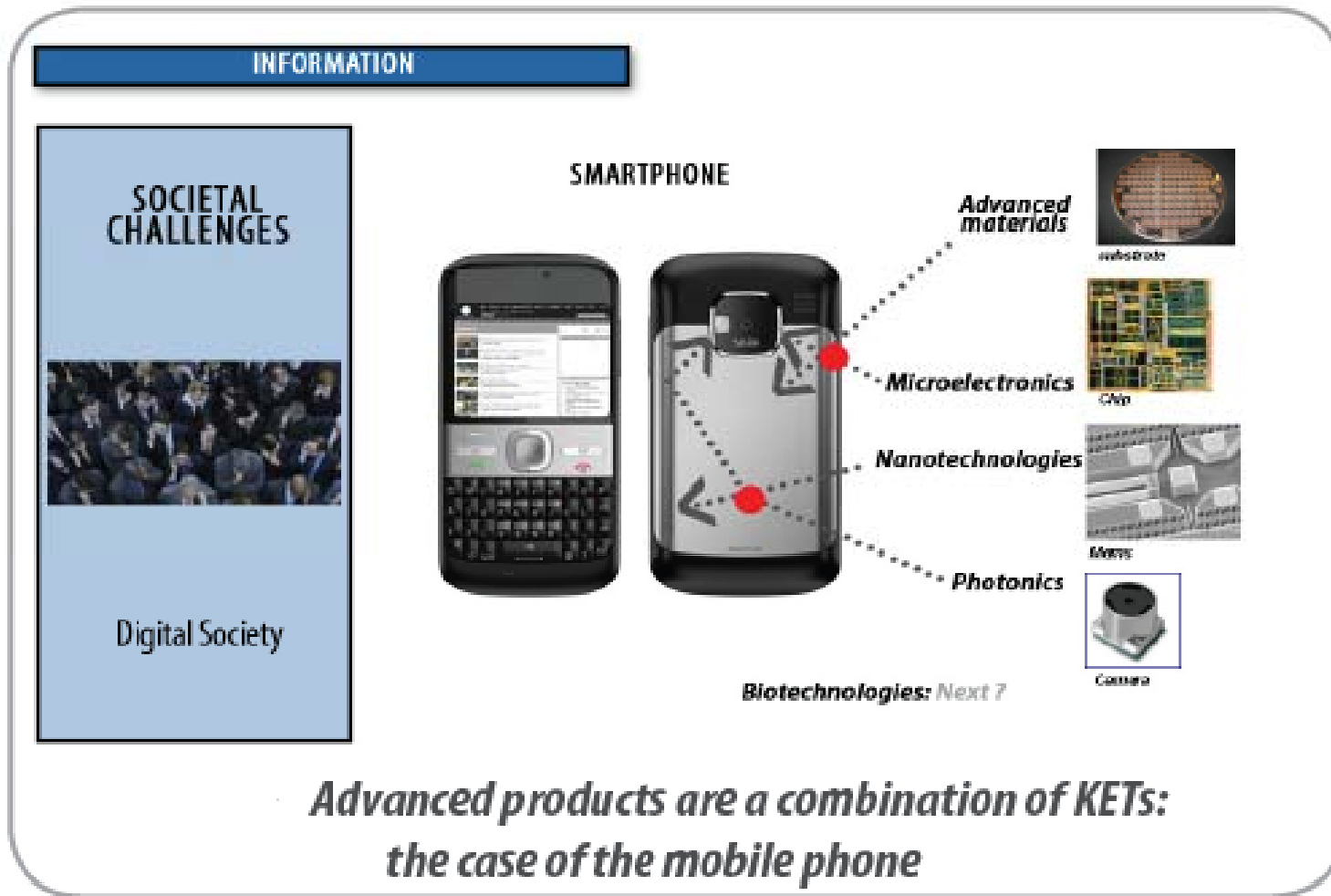
- nanotechnology
- micro- e nanoelectronics
- advanced materials
- Advanced manufacturing
- biotechnology
- photonics



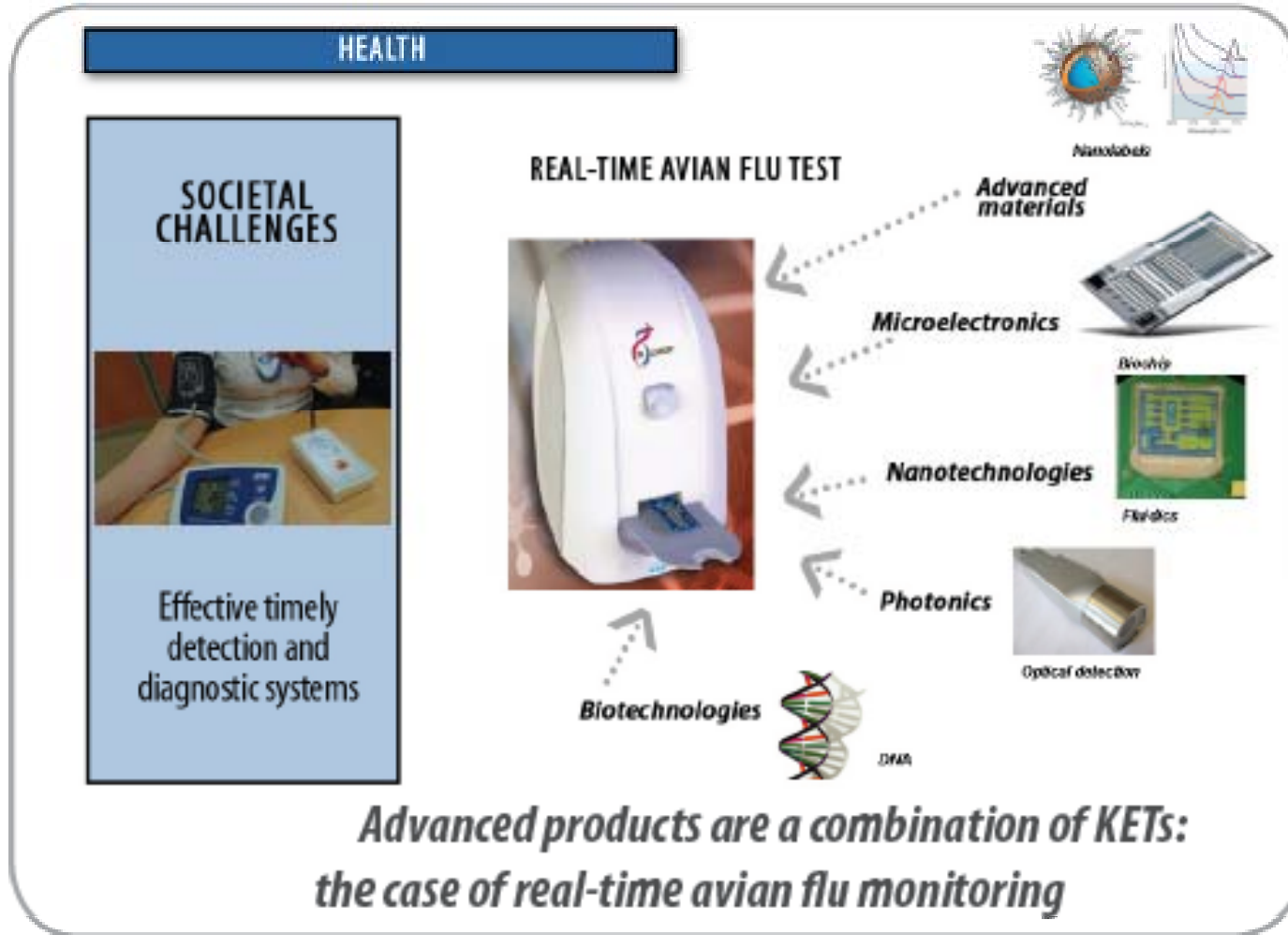
Le combinazioni di KET nei prodotti avanzati: il **veicolo elettrico**..



..lo smartphone..



..il test per l'influenza aviaria..



KET e innovazione

- L'EU è forte nella ricerca e nella brevettazione
- EU è ai vertici dei ranking per la brevettazione nelle KET
- Ma c'è ancora un divario tra tecnologia e capacità produttive

Dobbiamo aggiungere alla tecnologia

- Lo sviluppo del prodotto (e.g. demonstrators)
- Produzione competitiva



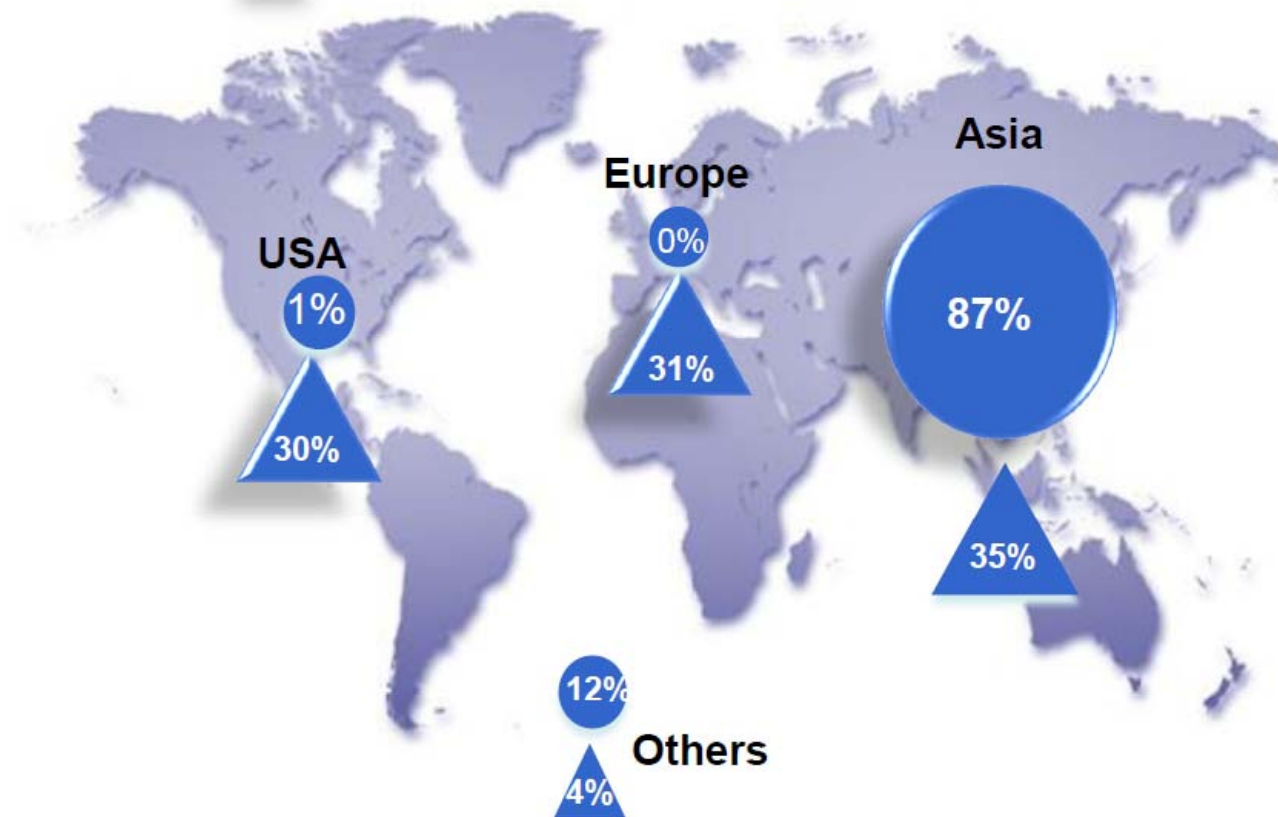


Disconnection between patents share and manufacturing share

Case Study: Li-ion battery production

Li-ion battery cell production share in 2008

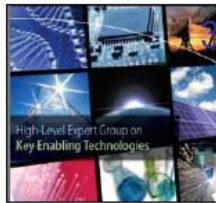
Advanced Material Patent Share



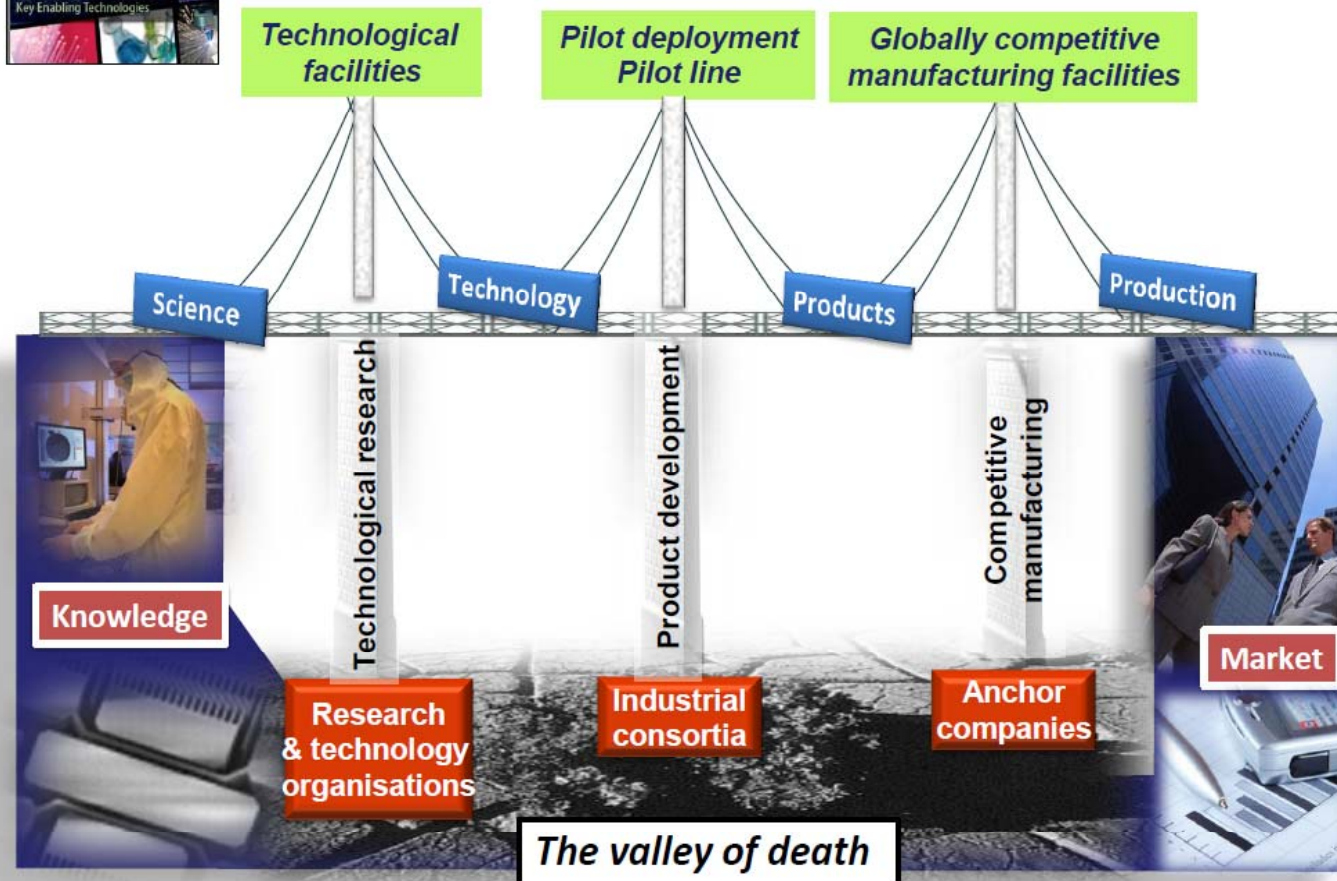
Source: European Competitiveness Report 2010, European Competitiveness in Key Enabling Technologies (TNO/ZEW), CGGC, Lithium-ion Batteries for Electric Vehicles : THE U.S. VALUE CHAIN, October 2010



Superare la “valley of death”

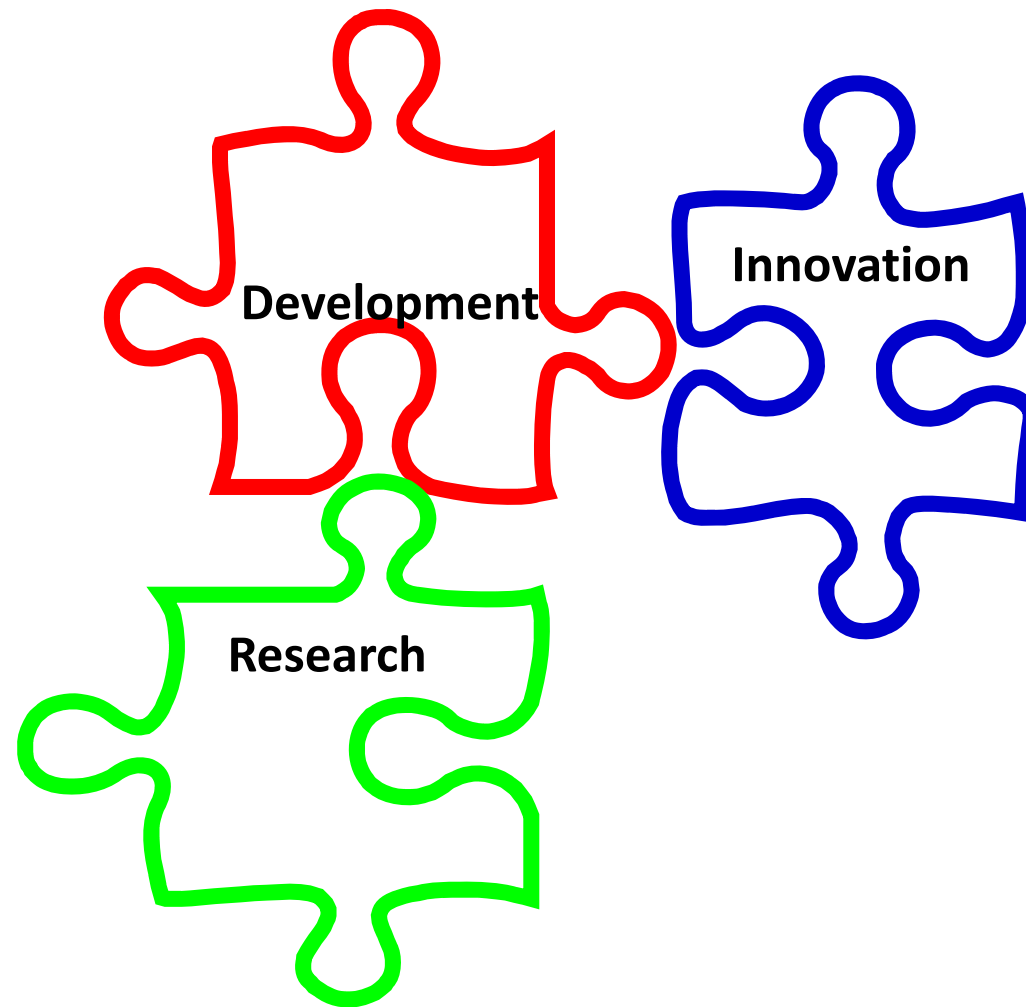


- The “three pillars bridge” to pass across the “valley of death”



HORIZON 2020

KEYWORDS



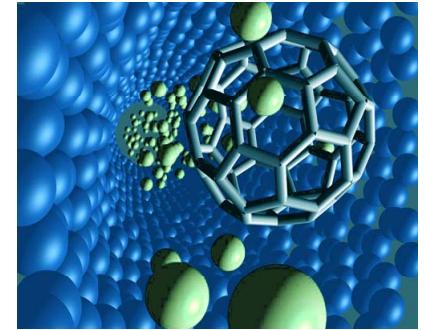
Technology readiness levels TRL

NEW!

- Ricerca fondamentale
 - TRL 1 – Principi di base osservati
- Ricerca tecnologica
 - TRL 2 – concetto della tecnologia formulato
 - **TRL 3 – prova sperimentale del concetto**
 - **TRL 4 – validazione in laboratorio del concetto**
- Dimostrazione dei prodotti e linee pilota
 - **TRL 5 – validazione della tecnologia nell'ambiente rilevante**
 - **TRL 6 – dimostrazione nell'ambiente rilevante**
 - **TRL 7 – dimostrazione nell'ambiente operativo**
 - **TRL 8 – sistema completo e qualificato**
- Produzione competitiva
 - TRL 9 – sistema completo provato in ambiente operativo

NMP





Il bando LEIT NMP 2014-2015



LEIT WP: Struttura

❑ Introduzione generale

❑ LEIT ICT

- Contenuto call ICT, viene pubblicato separatamente

❑ LEIT NMP

- Informazioni di background e obiettivi specifici di NMP
- Call NMP: contenuto tecnico dettagliato per ciascun **topic**
- Dettagli sulle azioni (type of action) e budget

❑ LEIT Biotechnology

- Contenuto call Biotech (non presentata in questa sede)

❑ Public-Private Partnership

- FoF – Factories of the Future
- EeB – Energy-efficient Buildings
- Challenge SPIRE (non presentato in questa sede)

<http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/index.html>



“Type of actions”: ad ogni topic una struttura di progetto ad hoc

- **RESEARCH AND INNOVATION ACTION (RIA)**

- Finanziamento: 100%

- **INNOVATION ACTION (IA)**

- Finanziamento: 70% (100% per enti no profit)

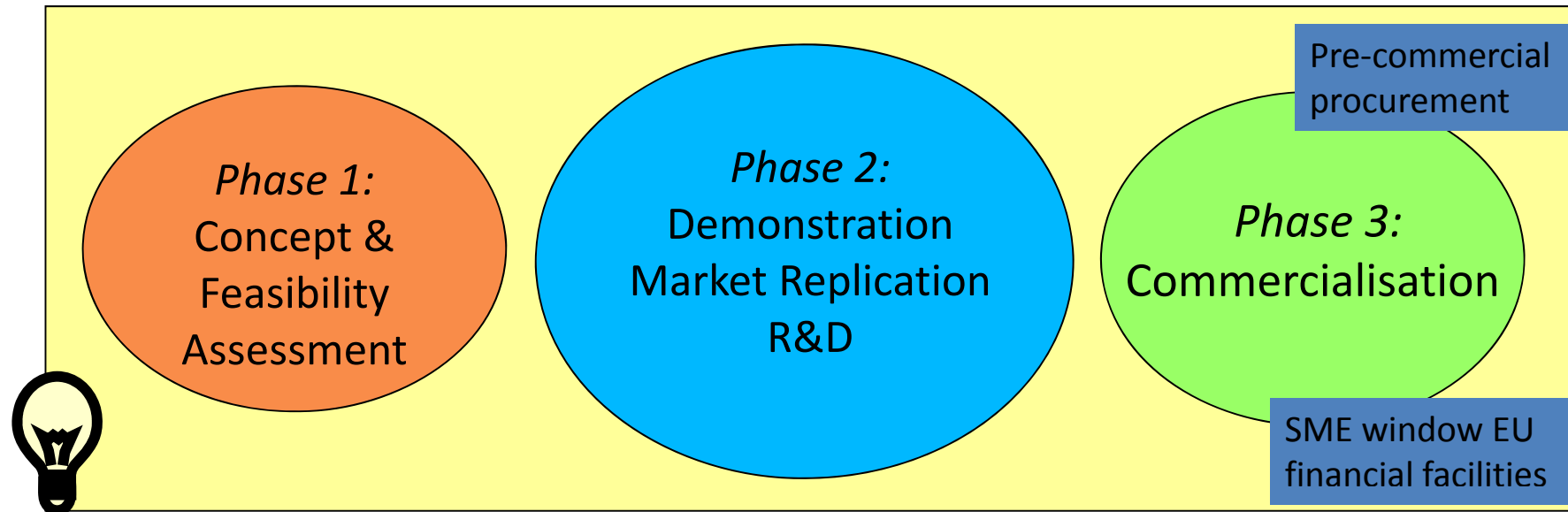
- **COORDINATION AND SUPPORT ACTION (CSA)**

- Finanziamento: 100%

- **SME-INSTRUMENT (SME)**: solo per le piccole medie imprese



SME instrument



Idea to concept,
risk assessment,
technological &
commercial feasibility

Demonstration,
prototyping, testing ,
market replication, scaling
up, miniaturisation,
research

Quality label for
successful projects,
access to risk
finance, indirect
support

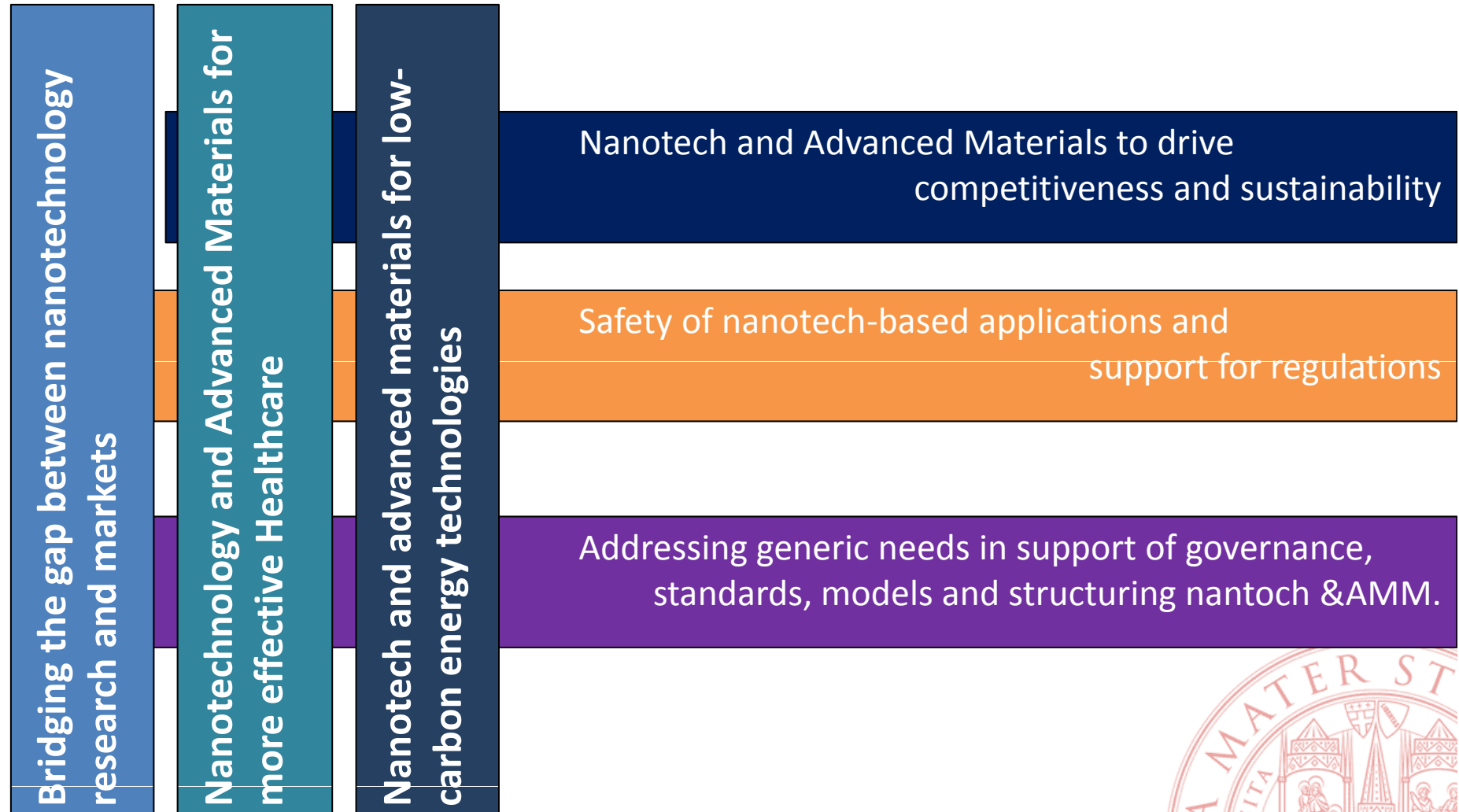
IDEA

continued support throughout the project

MARKET



I challenge



Call for Nanotechnology, Advanced Materials and Production

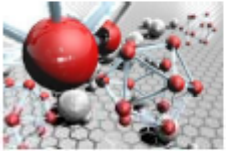
Bridging the gap between nanotechnology research and markets

Single-stage evaluation: 06/05/2014

Topic code	Topic title	Type of Action
NMP 1 - 2014	Open access pilot lines for cost-effective nanocomposites	RIA
NMP 2 - 2015	Integration of novel nano materials into existing production	IA
NMP 3 - 2015	Manufacturing and control of nanoporous materials	IA
NMP 4 - 2014	High-definition printing of multifunctional materials	IA
NMP 5 - 2014	Industrial-scale production of nanomaterials for printing applications	IA
NMP 6 - 2015	Novel nanomatrices and nanocapsules	RIA
NMP 7 - 2015	Additive manufacturing for table-top nanofactories	RIA



Call for Nanotechnology, Advanced Materials and Production



Bridging the gap between nanotechnology research and markets

- Addresses 3 of key European nano-enabled industrial value chains :
 - Lightweight multifunctional materials and sustainable composites
 - Structures surfaces
 - Functional fluids
- SMEs invited to participate
- Expected activities :

Deployment and market introduction by scaling up lab experience to industrial scale and by demonstrating viability of variety of manufacturing technologies

UNIBO:

- Scale-up nella produzione di nanocompositi e materiali avanzati per diverse applicazioni
- Test meccanici per biomateriali
- Sviluppo di nanocompositi per applicazioni in ambito biomedico (dentale)

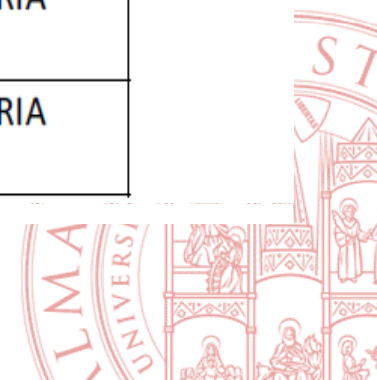


Call for Nanotechnology, Advanced Materials and Production

Nanotechnology and Advanced Materials for more effective Healthcare

Two-stage evaluation: 06/05/2014 & 07/10/2014;
Single-stage for NMP 8, 9: 06/05/2014

Topic code	Topic title	Type of Action
NMP 8 - 2014	Scale-up of nanopharmaceuticals production	RIA
NMP 9 - 2014	Networking of SMEs in the nano-biomedical sector	CSA (max 1)
NMP 10 - 2014	Biomaterials for the treatment of Diabetes Mellitus	RIA
NMP 11 - 2015	Nanomedicine therapy for cancer	RIA
NMP 12 - 2015	Biomaterials for treatment and prevention of Alzheimer's disease	RIA



Call for Nanotechnology, Advanced Materials and Production



Nanotechnology and Advanced Materials for more effective Healthcare

- Support **more effective therapies** in health care for important diseases.
- Required development : reach point where they can be considered **fit for purpose** in preparation of, but not including, clinical trial stages.
- Gender issues important : technologies and innovations should suit both women and men.

UNIBO:

- Sviluppo di biomateriali per applicazioni in campo medico (protesi, scaffold, ortopedia ecc.)
- Produzione di nanoparticelle funzionalizzate
- Sviluppo di nanomedicine per il “drug delivery” (applicazione: cancro)
- Test in vivo e in vitro di nuovi materiali (certificazione GLP)

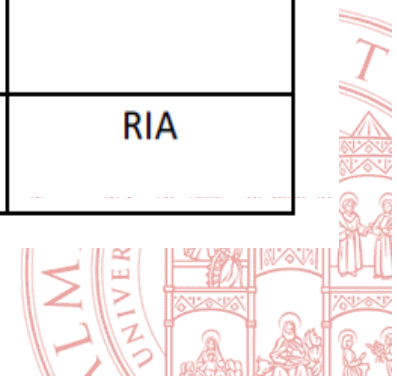


Call for Nanotechnology, Advanced Materials and Production

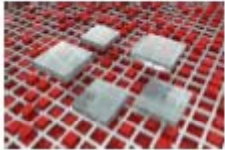
Nanotechnology and Advanced Materials for low carbon energy technologies and Energy Efficiency

Two-stage evaluation: 06/05/2014 & 07/10/2014
Single-stage for NMP 17: 06/05/2014

Topic code	Topic title	Type of Action
NMP 13 - 2014	Storage of energy produced by decentralised sources	RIA
NMP 14 - 2015	ERA-NET on Materials (including Materials for Energy)	Era-Net (Cofund)
NMP 15 - 2015	Materials innovations for optimisation of cooling in power plants	IA
NMP 16 - 2015	Extended in-service service of advanced functional materials in energy technologies (capture, conversion, storage and/or transmission of energy)	IA
NMP 17 - 2014 *	Post-lithium ion batteries for electric automotive applications	RIA



Call for Nanotechnology, Advanced Materials and Production



Nanotechnology and Advanced Materials for low-carbon energy technologies and Energy Efficiency

- Support EU objectives to increase use of **renewable energy sources** and improve **energy efficiency**
- Demonstrate **technology readiness** for further take-up by societal challenge
- Contributions to Materials Roadmap Enabling Low Carbon Energy Technologies
- Time to market should be assessed with view of contributing to **EU2020 targets**

UNIBO:

- Sviluppo di materiali avanzati e nanoparticelle per applicazioni in campo energetico (storage, batterie LI-ion)
- Progettazione e sviluppo di membrane per la separazione di gas e CO₂ capture
- Batterie post-litium innovative



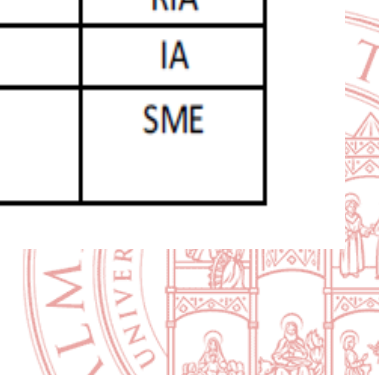
Call for Nanotechnology, Advanced Materials and Production

Exploiting the cross-sector potential of Nanotechnologies and Advanced materials to drive competitiveness and sustainability

Two-stage evaluation, 06/05/2014 & 07/10/2014

*SME Instrument: Phase 1 – 18/06, 24/09, 17/12/2014;
Phase 2 – 09/10, 17/12/2014*

Topic code	Topic title	Project type
NMP 18 - 2014	Materials solutions for use in the creative industry sector	IA
NMP 19 - 2015	Materials for severe operating conditions, including added-value functionalities	RIA
NMP 20 - 2014	Widening materials models	RIA
NMP 21 - 2014	Materials-based solutions for protection or preservation of European cultural	IA
NMP 22 - 2015	Fibre-based materials for non-clothing applications	IA
NMP 23 - 2015	Novel materials by design by substituting critical elements	RIA
NMP 24 - 2015	Low-energy solutions for drinking water production	IA
NMP 25 - 2014/2015	Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs	SME



Call for Nanotechnology, Advanced Materials and Production



Exploiting the cross-sector potential of Nanotechnologies and Advanced materials to drive competitiveness and sustainability

- Boosting European **industry competitiveness** and contributing to a **sustainable economy**
- Enabling **multi-sectorial potential**, by developing and advancing technological readiness of solutions with break-through potential.
- **International cooperation** particularly appropriate.

UNIBO:

- Materiali avanzati, dispositivi e tecnologie per il restauro e la conservazione di beni culturali
- Materiali e prodotti innovative per l'industria creativa (moda, lusso, beni culturali, design, architettura ecc)
- Sviluppo di tool per la modellazione di materiali
- Collaborazione con CIRI sul topic NMP 25



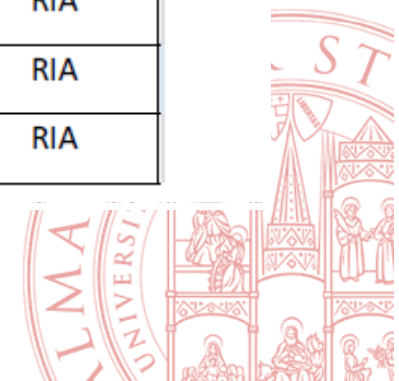
Call for Nanotechnology, Advanced Materials and Production

Safety of nanotechnology-based applications and support for the development of regulation

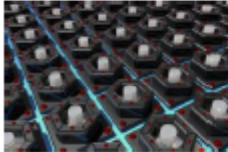
Two-stage evaluation: 06/05/2014 & 07/10/2014

Single-stage for NMP 27: 06/05/2014

Topic code	Topic title	Type of Action
NMP 26 - 2014	Joint EU & MS activity on the next phase of research in support of regulation "NANOREG II"	RIA
NMP 27 – 2014	Coordination of EU and international efforts in safety of nanotechnology	CSA
NMP 28 – 2014	Assessment of environmental fate of nanomaterials	RIA
NMP 29 – 2015	Increasing the capacity to perform nano-safety assessment	RIA
NMP 30 – 2015	Next generation tools for risk governance of nanomaterials	RIA



Call for Nanotechnology, Advanced Materials and Production



Safety of nanotechnology-based applications and support for the development of regulation

- **Risk management** to become integral part of supply chain
- All projects should align with the **EU Nanosafety Cluster** and other international activities
- **International cooperation** encouraged, in particular with leading nanotechnology developing Nations (US, Canada, Australia, Korea, Japan, China, Brazil)
- **Responsible governance** determining for future impact of nanotechnologies on society and economy (KET-support)

UNIBO:

- Test su biomateriali (GLP STANDARD)
- Test sulla safety dei nanomateriali/nanoparticelle per diverse applicazioni



Call for Nanotechnology, Advanced Materials and Production

Addressing generic needs in support of governance, standards, models, and structuring

Two-stage evaluation for NMP 35: 06/05/2014 & 07/10/2014

Single-stage for CSAs: 06/05/2014

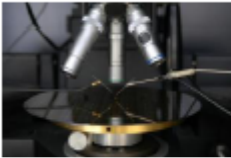
Topic code	Topic title	Type of Action
NMP 31- 2014	Novel visualisation tools for enhanced nanotechnology awareness	CSA
NMP 32 - 2015	Societal engagement on responsible nanotechnology	CSA
NMP 33- 2014	The materials "common house"	CSA
NMP 34- 2014	Networking and sharing of best practises in management of new advanced materials via eco-design of products , eco-innovation, and product life cycle management	CSA
NMP 35- 2014	Business models with new supply chains for sustainable customer-driven small series production	IA
NMP 36 - 2014	Facilitating knowledge management, networking and coordination in NMP	CSA
NMP 37- 2014	Practical experience and facilitating combined funding for large-scale RDI initiatives	CSA
NMP 38 - 2014/2015	Presidency events	CSA
NMP 39- 2014	Support for NCPs	CSA

Call for Factories of the Future (FoF)

Single-stage evaluation: 20/03/2014 (09/12/2014 for 2015 topics)

Topic code	Topic title	Type of Action
FoF 1 - 2014	Process optimisation of manufacturing assets	RIA & CSA (SA)
FoF 2 - 2014	Manufacturing processes for complex structures and geometries with efficient use of material	RIA
FoF 3 - 2014	Global energy and other resources efficiency in manufacturing enterprises	RIA
FoF 4 - 2014	Developing smart factories that are attractive to workers	IA
FoF 5 - 2014	Innovative product-service design using manufacturing intelligence	RIA
FoF 6 - 2014	Symbiotic human-robot collaborations for safe and dynamic multimodal manufacturing systems	IA
FoF 7 - 2014	Support for the enhancement of the impact of FoF PPP projects	CSA (CA)
FoF 8 - 2015	ICT-enabled modelling, simulation, analytics and forecasting technologies	RIA & CSA (SA)
FoF 9 - 2015	ICT Innovation for Manufacturing SMEs (I4MS)	IA & CSA (SA)
FoF 10 - 2015	Manufacturing of custom made parts for personalised products	RIA
FoF 11 - 2015	Flexible production systems based on integrated tools for rapid reconfiguration of machinery and robots	IA
FoF 12 - 2015	Industrial technologies for advanced joining and assembly processes of multi-materials	IA
FoF 13 - 2015	Re-use and re-manufacturing technologies and equipment for sustainable product life cycle management	RIA
FoF 14 - 2015	Integrated design and management of production machinery and processes	RIA





Call for Factories of the Future (FoF PPP)

- **Aim:** help EU manufacturers (incl. SMEs) to adapt to global competitive pressures
- **How:** developing necessary key enabling technologies across broad range of sectors
- Meet increasing **global consumer demand** for greener, more customised and higher quality products
- Transition to **demand-driven industry** with lower waste and energy consumption
- Activities :
 - Industry-led R&D projects (incl. Demo activities)
 - Cross-sectoral, addressing needs of SMEs
- Contribution from ICT part (one topic in 2014)

UNIBO:

- Diverse ipotesi di collaborazione sul tema dei processi di fabbricazione, in collaborazione col CIRI-MAM



Call for Energy-efficient Buildings (EeB)

Single-stage evaluation: 20/03/2014 (09/12/2014 for 2015 topics)

Topic code	Topic title	Type of Action
EeB 1 - 2014	Materials for building envelope	IA
EeB 2 - 2014	Adaptable envelopes integrated in building refurbishment projects	RIA
EeB 3 - 2014	Development of new self-inspection techniques and quality check measures for efficient construction processes	RIA
EeB 4 - 2014	Support for the enhancement of the impact of EeB PPP projects	CSA (CA)
EeB 5 - 2015	Innovative design tools for refurbishment at building and district level	IA
EeB 6 - 2015	Integrated solutions of thermal energy storage for building applications	RIA
EeB 7 - 2015	New tools and methodologies to reduce the gap between predicted and actual energy performances at the level of buildings and blocks of buildings	IA
EeB 8 - 2015	Integrated approach to retrofitting of residential buildings	IA





Call for Energy-efficient Buildings (EeB PPP)

- Drive creation of **high-tech building industry** - Turning **energy efficiency** into **sustainable business** - Fostering EU **competitiveness in construction sector** on global level
- Reduce energy consumption & CO₂ emissions in existing and new buildings.
- Effective integration of key technologies into construction operations for sustainable, long-term competitiveness.
- Contributes to EU industrial leadership and grand societal challenges
- Participation of public authorities, asset for some projects as owners of large part of EU building stock.

UNIBO:

- Diverse ipotesi di collaborazione col CIRI Edilizia e Costruzioni
- Sviluppo di materiali ceramici per applicazioni in edilizia (in collaborazione col Centro Ceramico CENCERBO)
- Recupero energetico di edifici storici e esistenti
- Impianti per l'efficientamento energetico di nuove costruzioni



Find out more about Horizon 2020

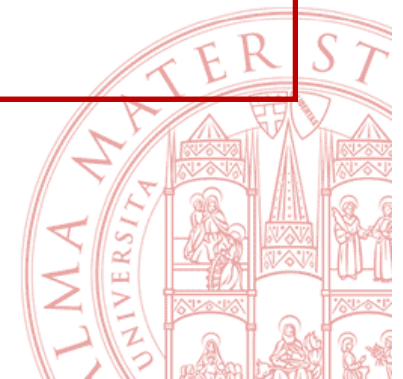
- <http://www.ec.europa.eu/research/horizon2020>

Participant Portal

- <https://ec.europa.eu/research/participants/portal/page/home>

Work Programmes

- http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents



Grazie per l'attenzione!

HEALTH & AMM Unit

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