Introducing Horizon 2020

Competenze trasferibili per i dottorandi

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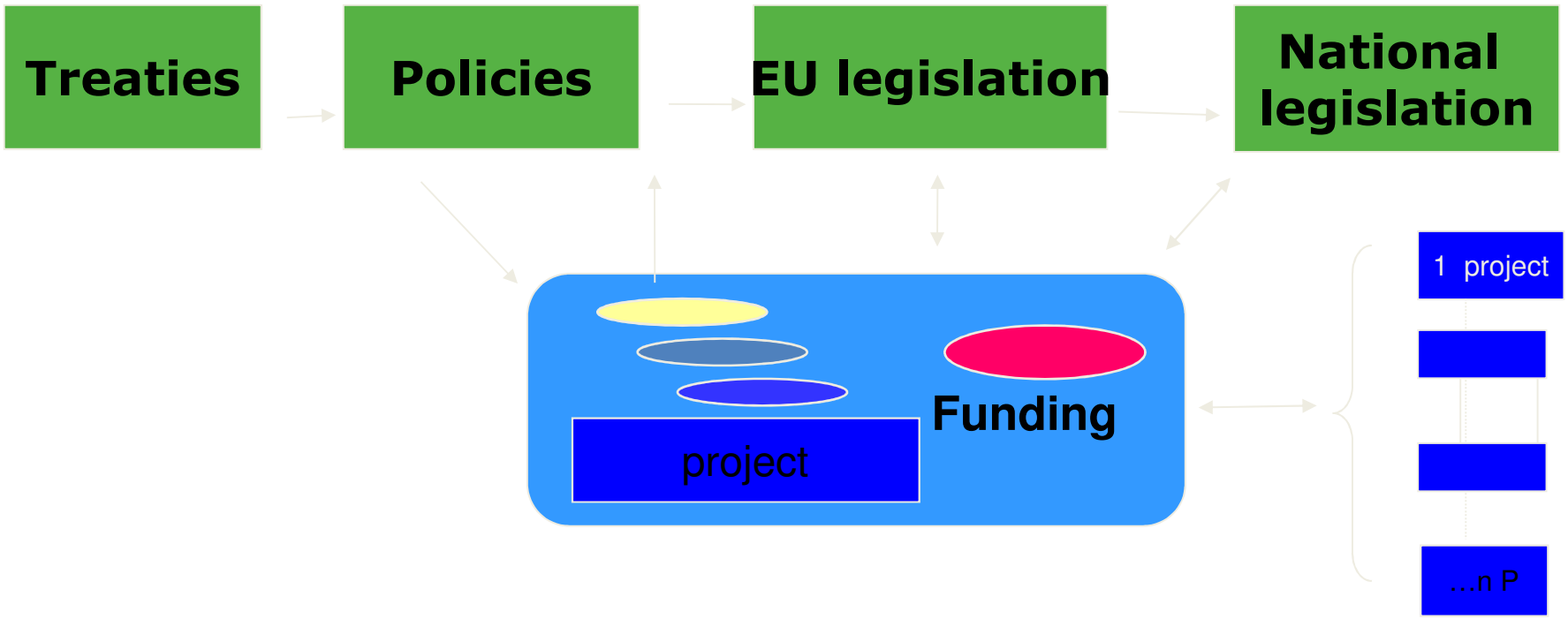
Modena 21 November 2013

The EU Policies

The European policies and their implementation process



To implement the policies the EU adopts mainly two tools

- Legislation
- Funding programmes

Researchers can contribute to the policy process using or making available scientific data or expert opinions, studies, databases, development of indicators, participation in committees, working groups, etc..

The State of the Union

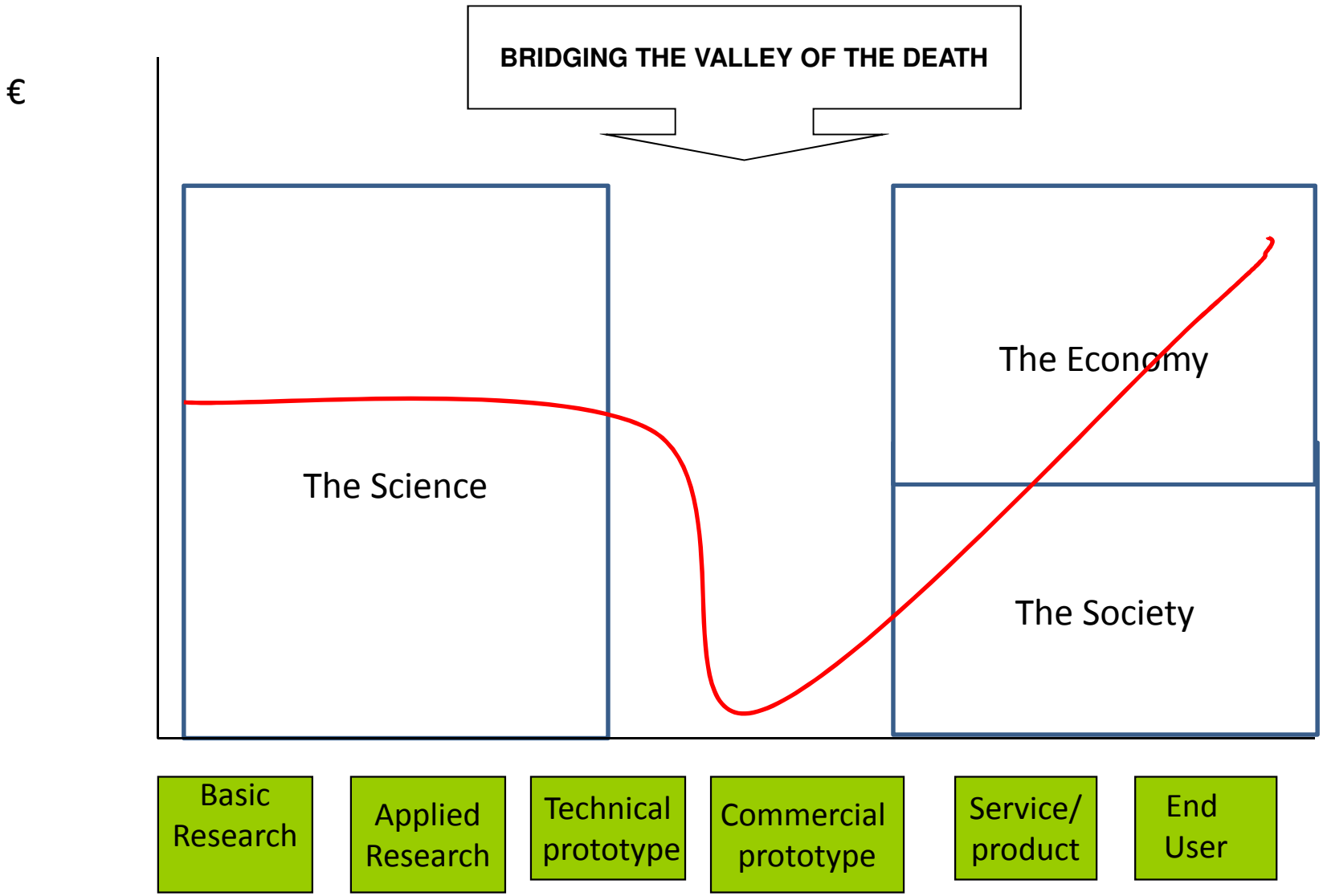
- European **economy is slowly emerging** from the deepest financial and economic crisis in decades
- Total EU public **R&D investments decreased** in 2011 – many national research systems still not working optimally
- Overall number of fast growing **innovative firms** is **stagnating - Europe lacks presence in many high-tech leading markets**
- Still **barriers for turning technological breakthroughs into Policy Research and Innovation commercial products and services** - linked to **shrinking liquidity** and lack of adequate financial instruments
- **Research and innovation divide** persists despite previous efforts - growing disparities on research and innovation spending
- Substantial **mismatches between skills supply and the market demand** - hefty unemployment figures.

R&D – European weaknesses

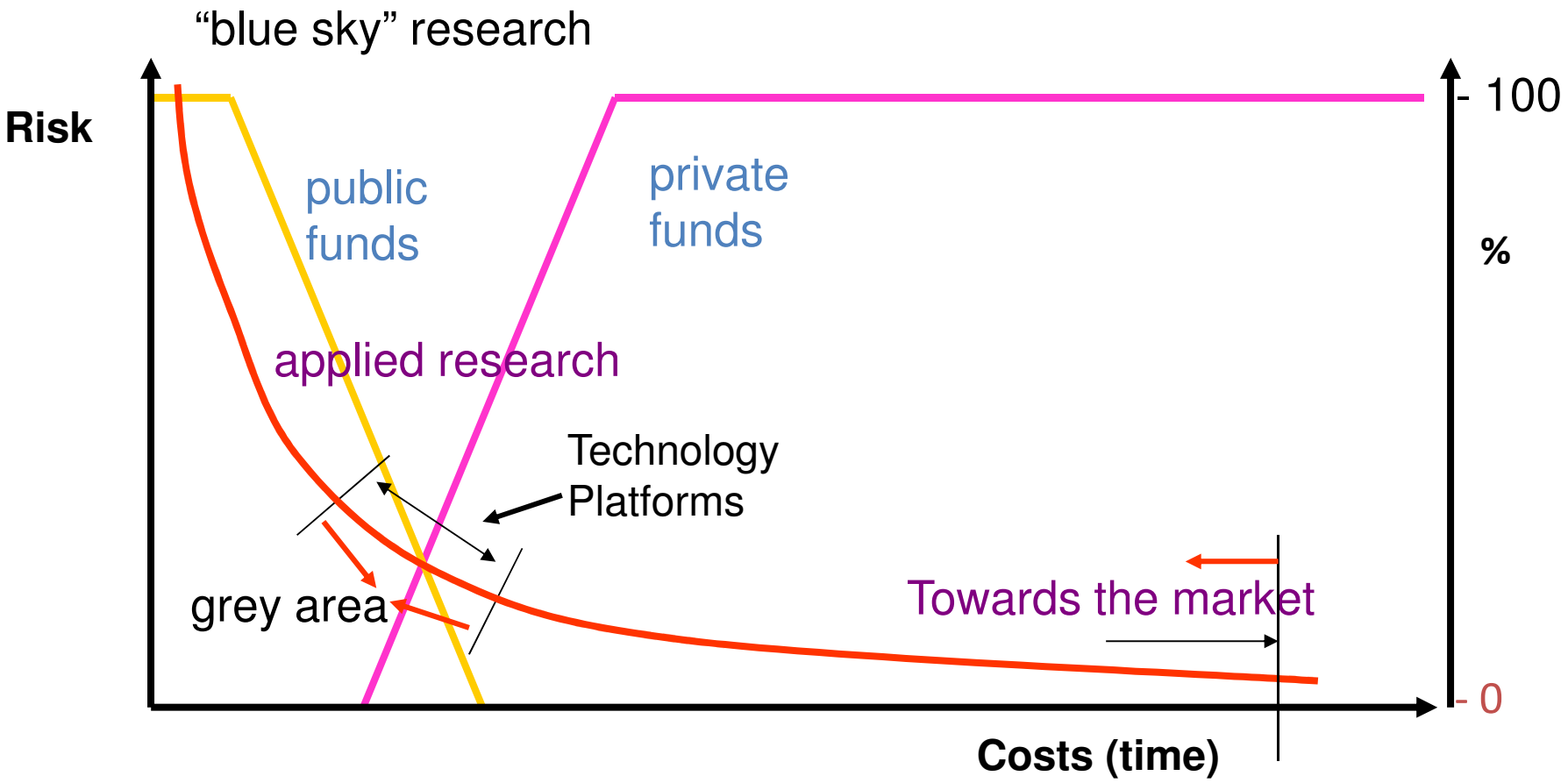
	EU-25	US	Japan
R&D intensity (% of GDP) [3]	1.97	2.59	3.12
Share of R&D financed by industry (%) [2]	55.9	63.1	73.9
Researchers per thousand labour force (FTE) [3]	5.5	9.0	9.7
Share of world scientific publications (%) [3]	38.3	31.1	9.6
Scientific publications per million population [3]	639	809	569
Share of world triadic patents (%) [1]	31.5	34.3	26.9
Triadic patents per million population [1]	30.5	53.1	92.6
High-tech exports as a share of total manufacturing exports (%) [3]	19.7	28.5	26.5
Share of world high-tech exports (%) [2]	16.7	20.0	10.6

Note: [1] 2000 data [2] 2002 data [3] 2003 data

EU Paradox: good science but poor exploitation



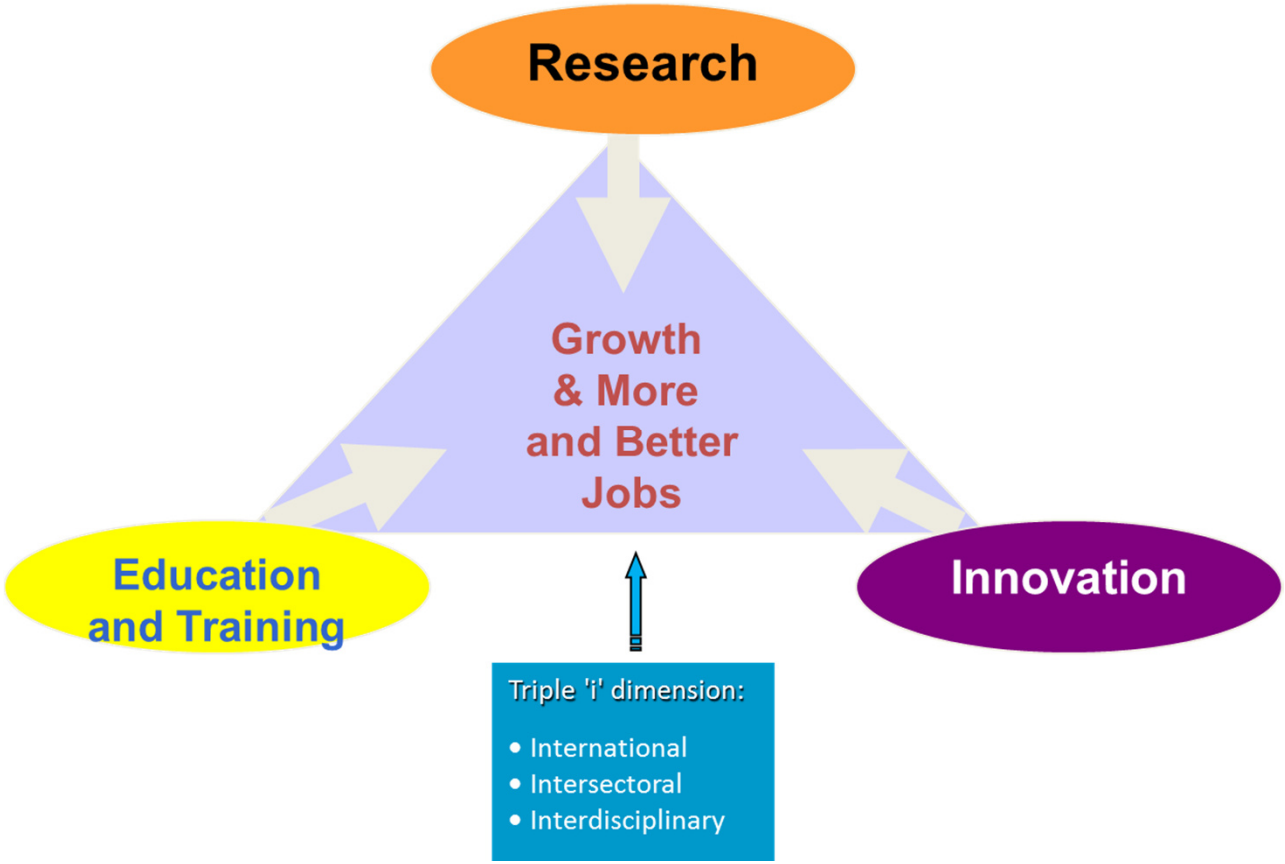
Bridging the gap



EUROPE 2020

A strategy for growth:

- **Intelligent:** developing an economy based on **knowledge** and **innovation**
- **Sustainable:** promoting a more **resource efficient, greener** and more **competitive** economy
- **Inclusive:** fostering a **high-employment economy** the **social and territorial cohesion**



EUROPE 2020 5 Targets

1. Employment: 75% of the 20-64 year-olds to be employed.

2. RTD/ Innovation

- 3% of the EU's GDP to be invested in R&D
- Elaborate a shared agenda tackling major societal challenges

3. Climate Change/ Energy

- greenhouse gas emissions 20% (or even 30%, if the conditions are right) lower than 1990
- 20% of energy from renewables
- 20% increase in energy efficiency.

4. Training/Education

- Reducing school drop-out rates below 10%
- at least 40% of 30-34–year-olds completing third level education

5. Poverty/ social exclusion at least **20 million fewer people in or at risk of poverty and social exclusion.**

This limited set of EU-level targets is **translated into national targets** in each EU country, reflecting different situations and circumstances.

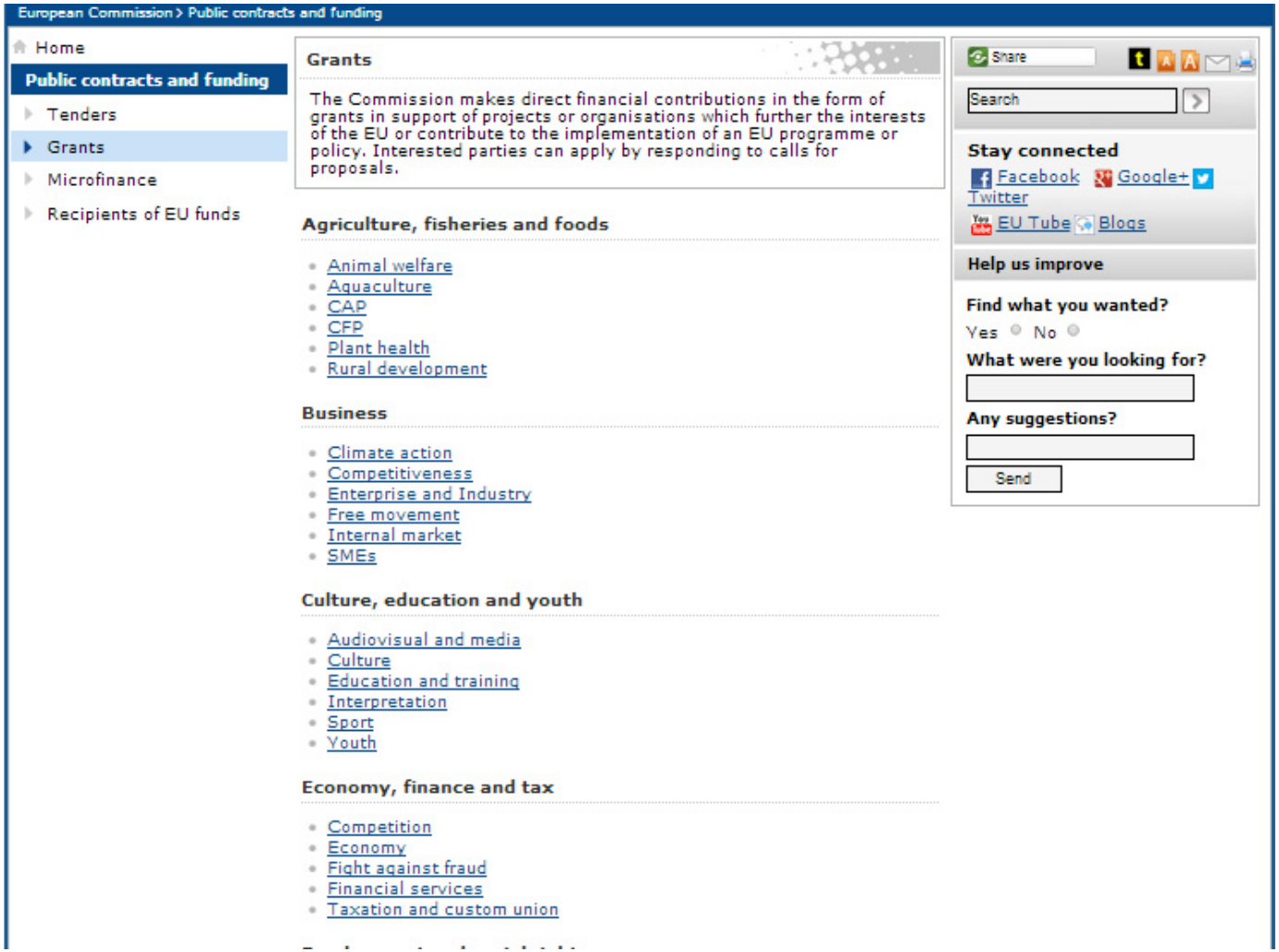
The European Programmes Funding

The European Commission (EC) grants contributions for the realization of projects or activities that contribute to the implementation of European Union policies.

These funds cover different fields and scopes e.g. for research, education, health, consumer protection and the environment, humanitarian aid, etc..

The beneficiaries of aid are mainly public or private organizations, only in exceptional cases individuals, chosen by the EC for their ability to implement the proposed projects.

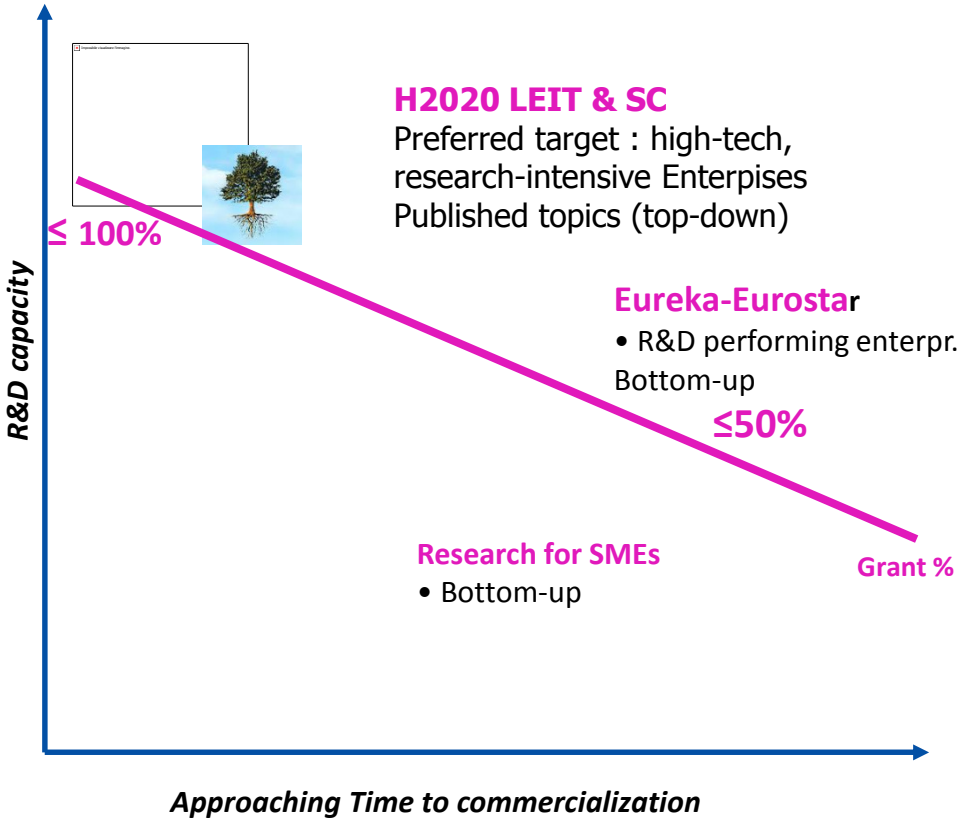
EU Grants & Loans

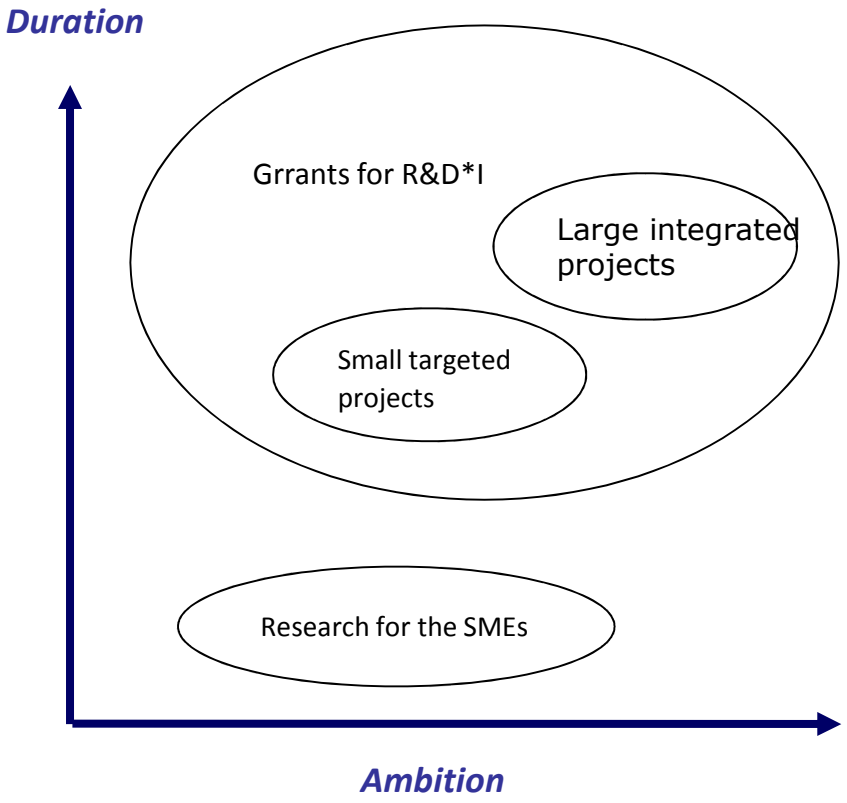


NB: listed by policy areas

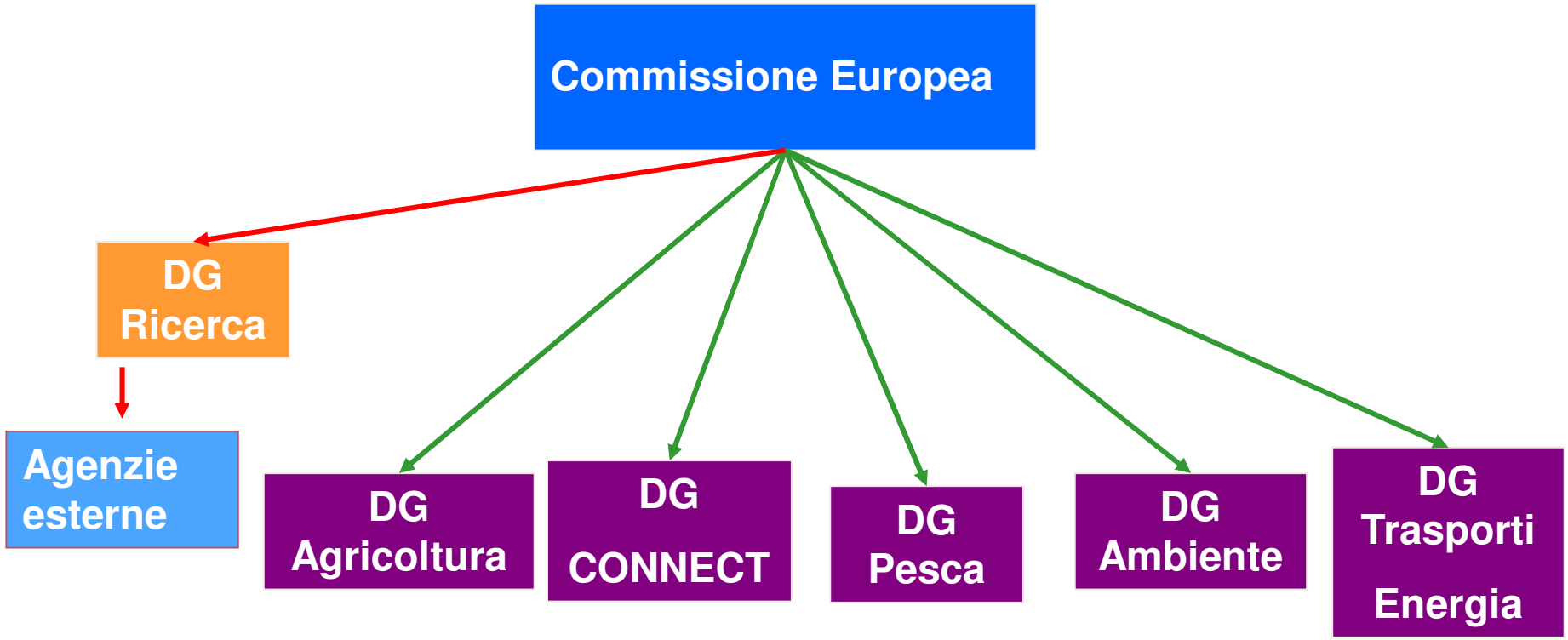
http://ec.europa.eu/contracts_grants/grants_en.htm

Understanding the financial instruments





Who manages the EU Programmes for RTD+I?



The implementation of the programs can be outsourced and delegated:

- Executive agencies (e.g EACI / EACEA)

- Project Management Unit eg ad hoc contracting Authority (eg Interreg)

- Joint EU undetakings (e.g CleanSky IMI JTI) and intergovernmental secretariats (Eurostars / COST)

The EU Budget

The scope of the EU Budget

"the EU budget translate in terms of resources the priorities and the orientations pursued by the EU, authorizing annually the funding of all activities and interventions of the EU"

Artt. 268-280 TCE: The EU Parliament and the Council decide upon the expenditure to be undertaken, the Commission takes care of the budget execution under its responsability.

Since 1988, the annual budget is established in accordance with a multiannual financial framework that defines the maximum annual expenditure

2002-2006, **2007-2013 e 2014-2020**

The EU Budget Revenues

The budget is financed using the following **RESOURCES**:

1. **Own resources** (Traditional)
   Duties on import from third countries (15% total revenues)

2. **VAT** (15% total revenues)

2. **Resources based on the Gross National Income (GNI)**
   A fixed percentage (0,73 %) applied to GNI of each Member State (69% of the total recvenues)

4. **Other incomes**

5. Tax applied to the EU staff, contribution paid by the third countries for association to certain EU programmes, penalities due by enterprises violating the single market rules etc… (1% of the total revenues)

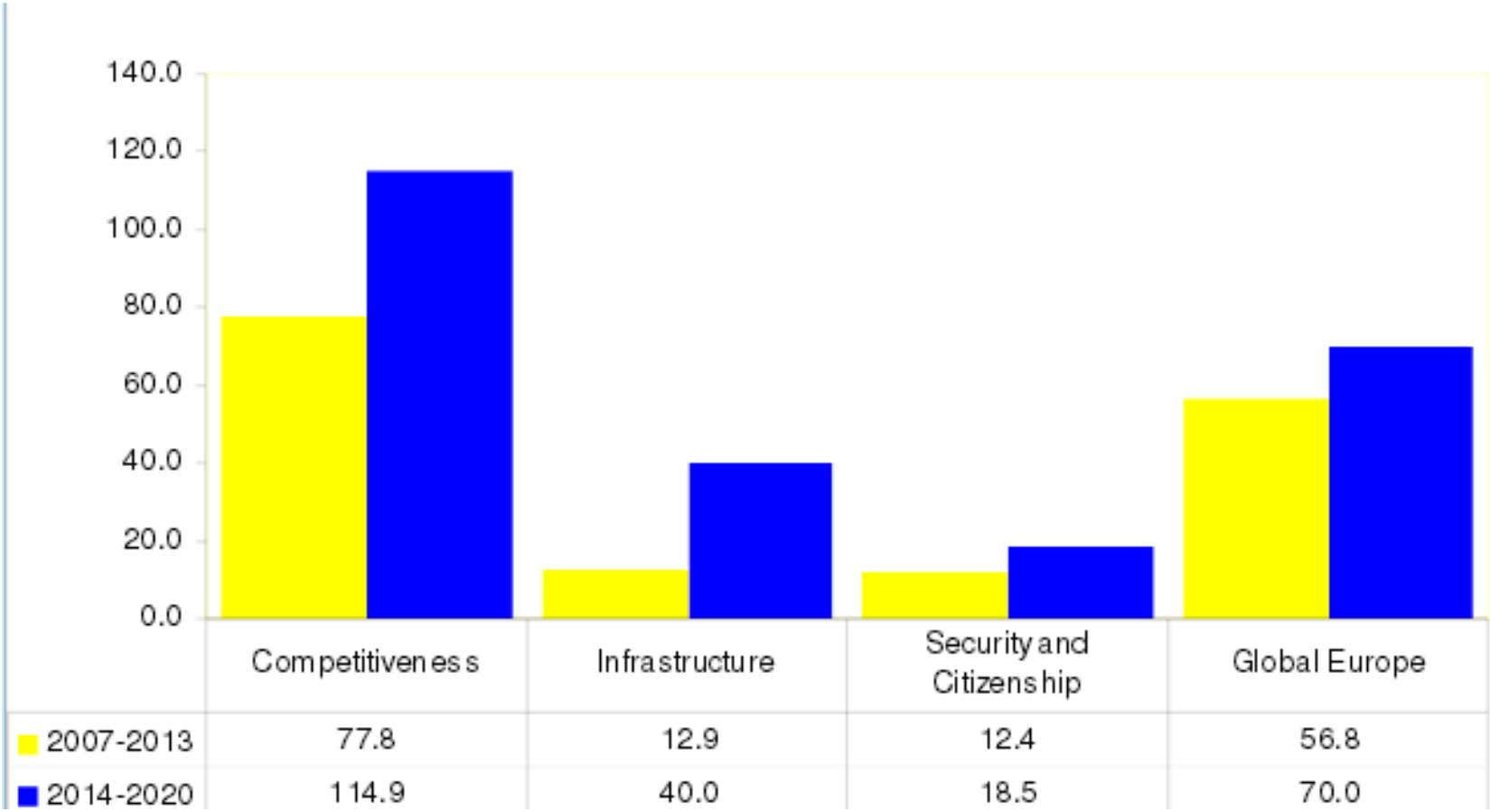
The EU MFF - Budget 2014-20

The EU budget is deployed to tackle the following overarching goals:

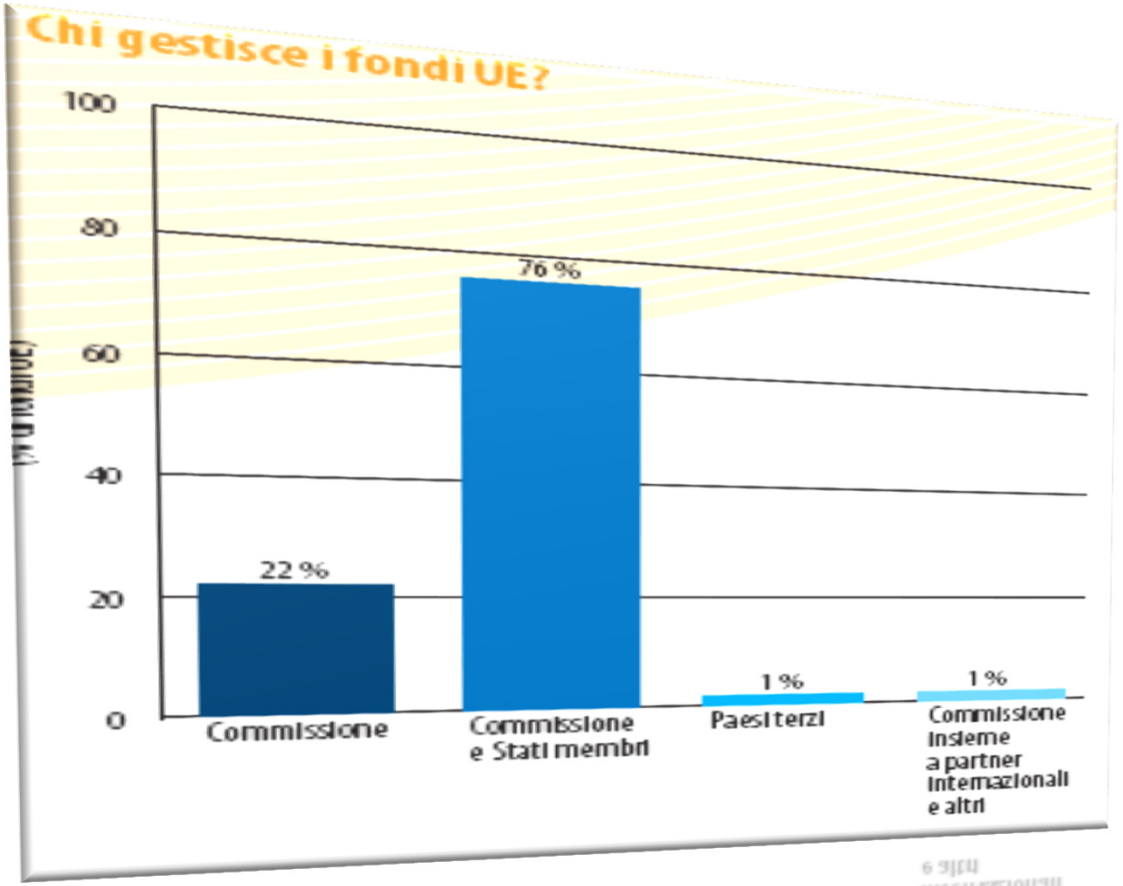
- **To promote growth and employment** to make the EU more competitive and to reduce the economic and social disparities
- To improve the **conservation and management of the natural resources**
- To improve the **quality of life** of the European citizens
- **To strengthen the EU's role** at world level by undertaking greater responsibility and challenges

COMPARISON MFF 2007-13/2014-20	Billion € in 2011 prices		Difference (in %)
	2007-2013	2014-2020	
1. Smart and Inclusive Growth	445,5	490,9	10,2%
Of which Competitiveness	*77,8*	*114,9*	*47,7%*
Of which infrastructure	*12,9*	*40,0*	*209,7%*
Of which cohesion policy	*354,8*	*336,0*	*-5,3%*
2. Sustainable Growth: natural resources	421,1	382,9	-9,1%
Of which Market related expenditure and direct payments	322,0	281,8	-12,5%
3. Security and Citizenship	12,4	18,5	49,9%
of which Freedom, Security and Justice	7,6	11,6	*53,0%*
of Citizenship	*4,8*	6,9	*44,9%*
4. Global Europe	56,8	70,0	23,2%
5. Administration (including pensions and European schools)	56,9	62,6	10,1%
Of which administrative expenditure of EU institutions	*48,4*	*50,5*	*4,2%*
6. Compensations	*0,9*		
Total appropriations	993,6	1.025,0	3,2%
In % of EU-27 GNI	1,12%	1,05%	

Despite the contraction - a significant redistribution in strategic sectors



	Competitiveness	Infrastructure	Security and Citizenship	Global Europe
2007-2013	77.8	12.9	12.4	56.8
2014-2020	114.9	40.0	18.5	70.0



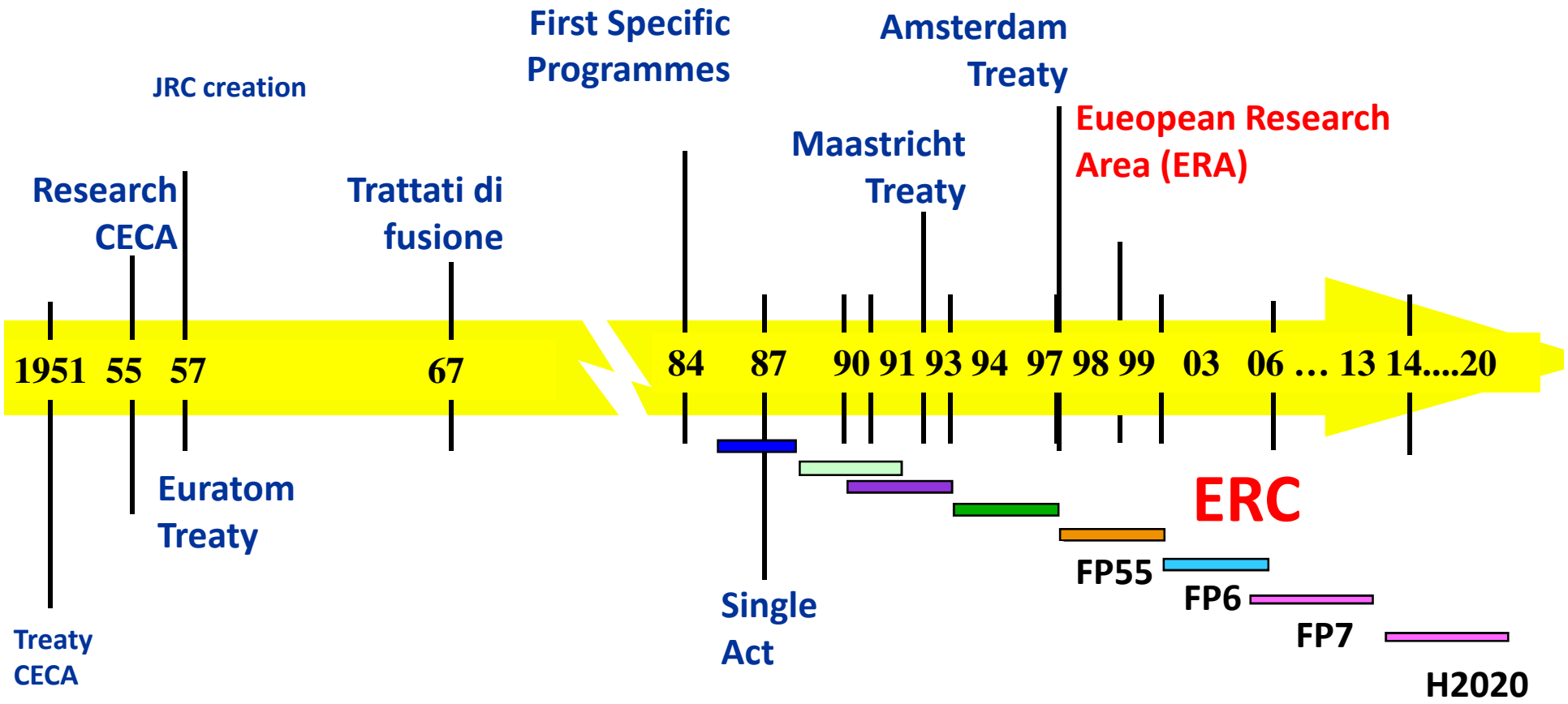
Atypical Budget: geographical and administrative dispersion

- Most of the budget is implemented in a very wide geographical and cultural context corresponding to the current 27 Member States, plus the third countries in which they implement EU-funded programs (External Action)

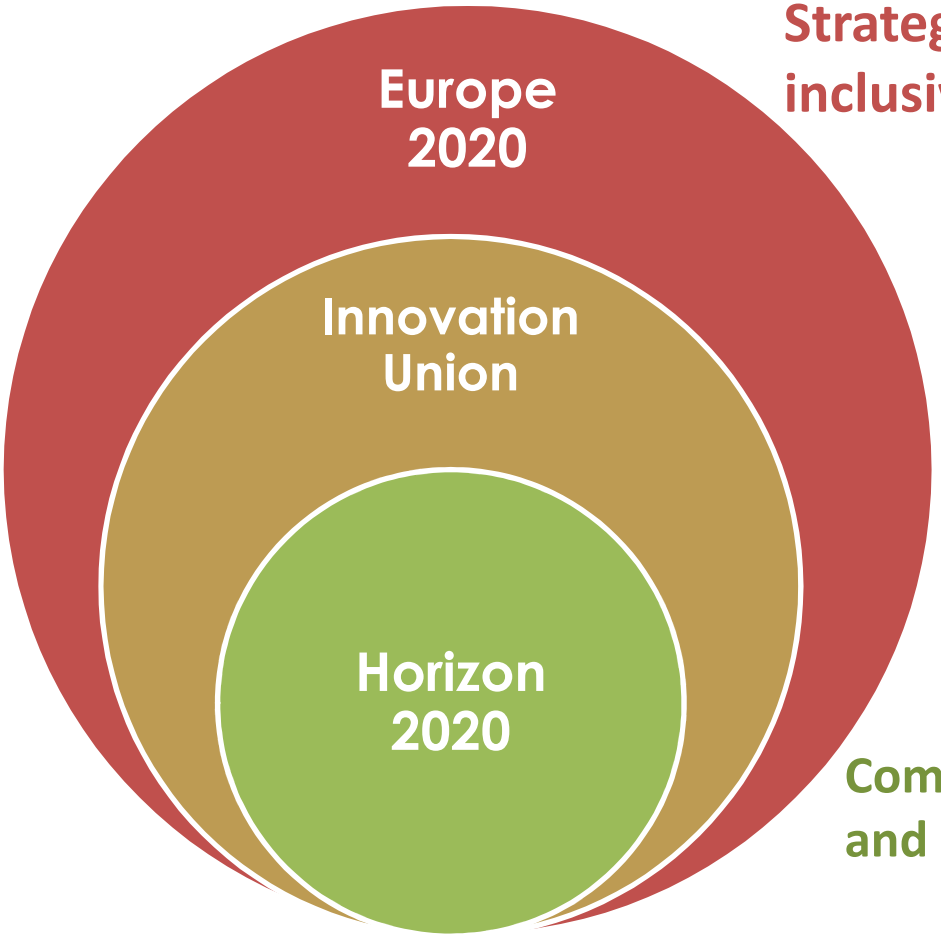
Budget consists mainly of transfers

- Ca. 80% directly managed by the Member States in a decentralized way (through national, regional, local) and 20% directly managed by the Commission

The Research and the EU integration Process



HORIZON 2020

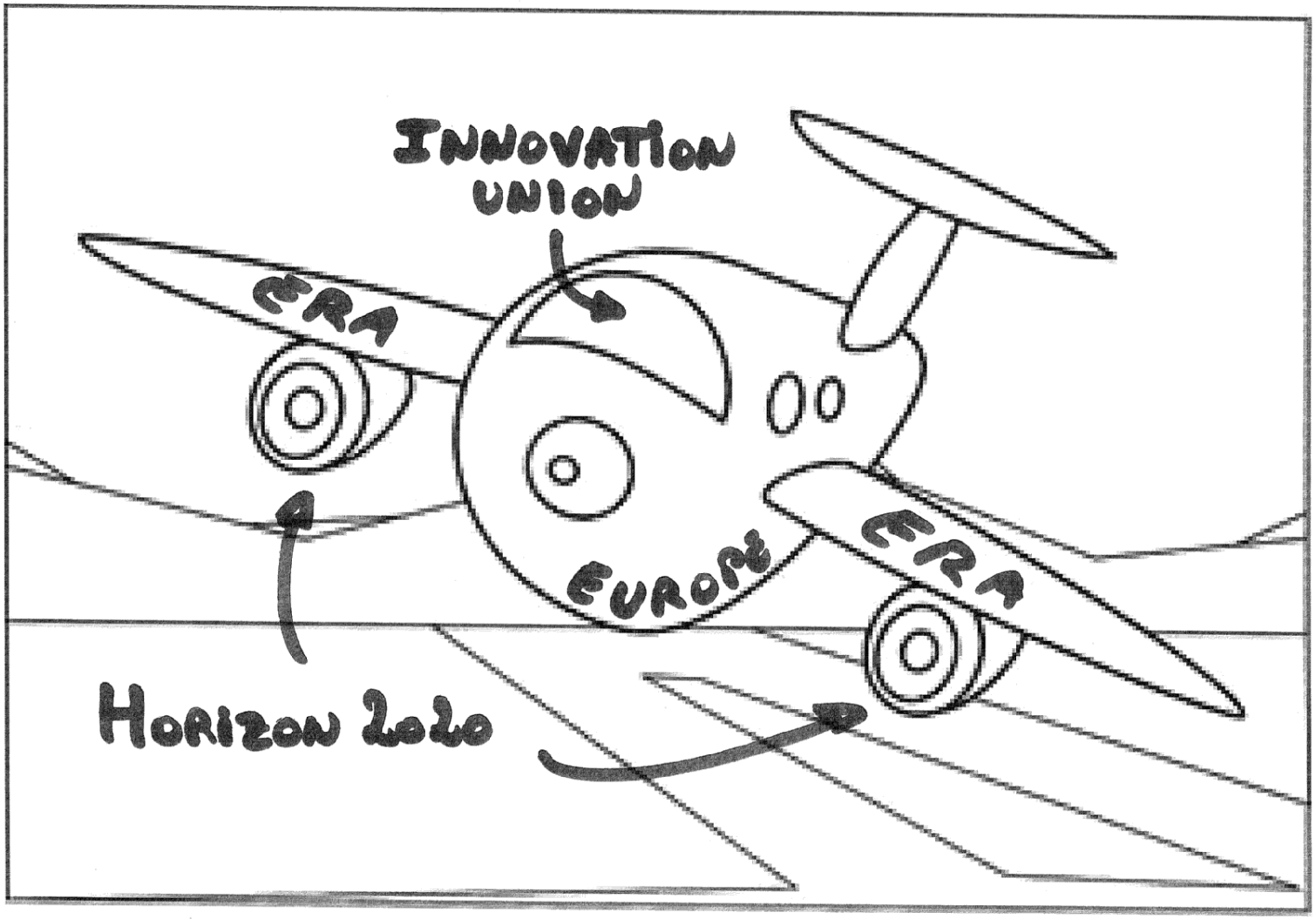


Strategy for smart, sustainable and inclusive growth

Flagship initiative to support research and innovation

Common Strategic Framework for research and innovation (2014 - 2020)

Innovation Union - ERA – Horizon 2020



What is Horizon 2020?

- Multiannual funding programme for RTD+I
- EC proposal of 80 billion Euros to fund research and innovation (2014-2020).
- Core part of Innovation Union & European Research Area initiative under Europe 2020:
  - **Responding to the economic crisis** (jobs and growth)
  - A**ddressing people's concerns** (livelihoods, safety, environment)
  - **Strengthening EU's global position** (research, innovation, technology)

H2020 Features

- Single program that brings together 3 separate initiatives up to now
- **Value chain ranging from frontier research, technological development, demonstration, innovation and exploitation of results**
- **Innovation,** in all its forms
- Focus on **societal challenges**
- **Simplified access for businesses, universities, etc. in all EU countries**
- Synergies with the Structural Funds

Which degree of Innovation in Horizon 2020?

Horizon 2020 aims to support all forms of innovation:

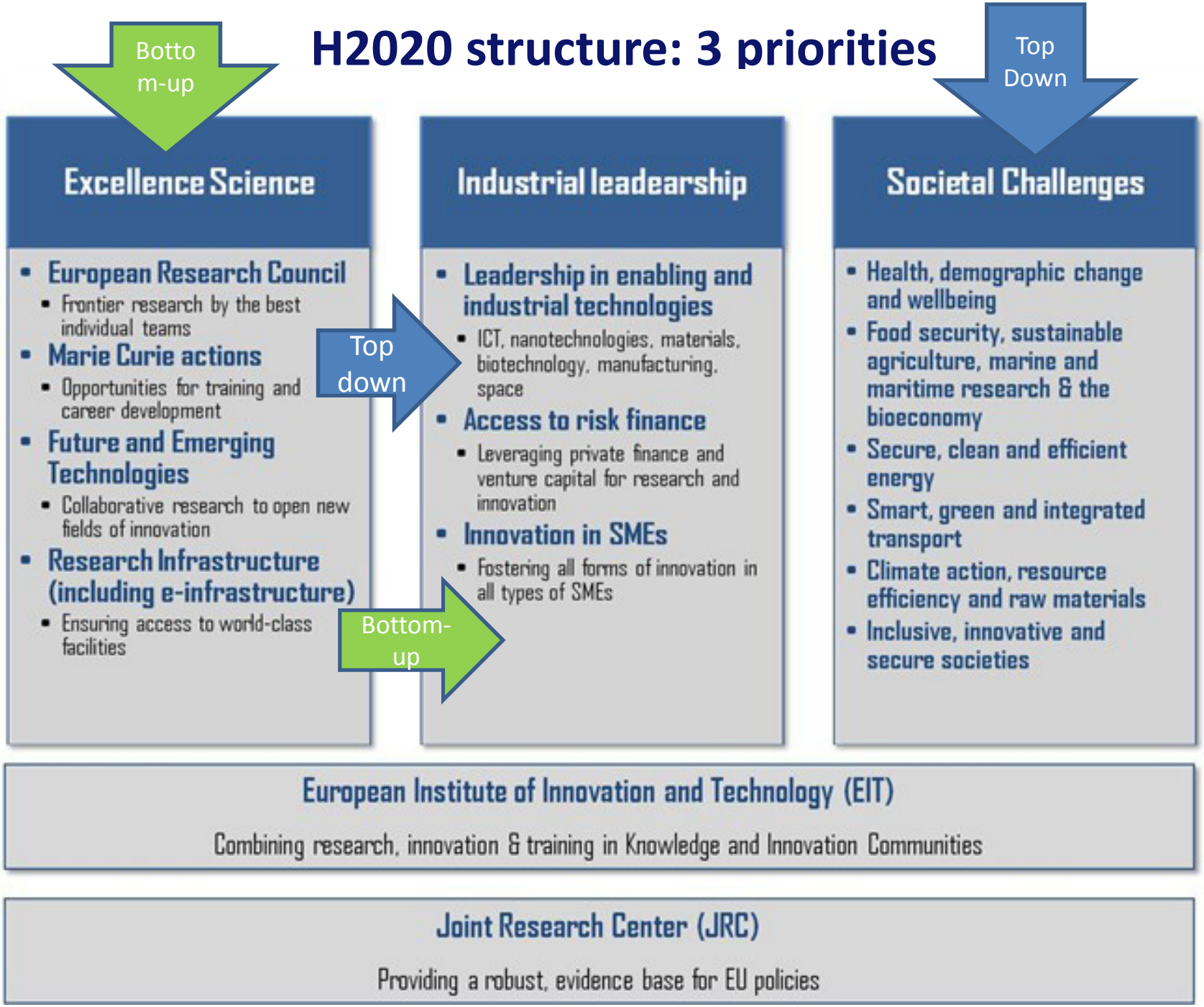
- From R&D;
- other assets, including systems or innovative combinations of existing technologies, development of new business models, etc.;
- for non-commercial applications, e.g.. to improve public services or to social issues ('social innovation').

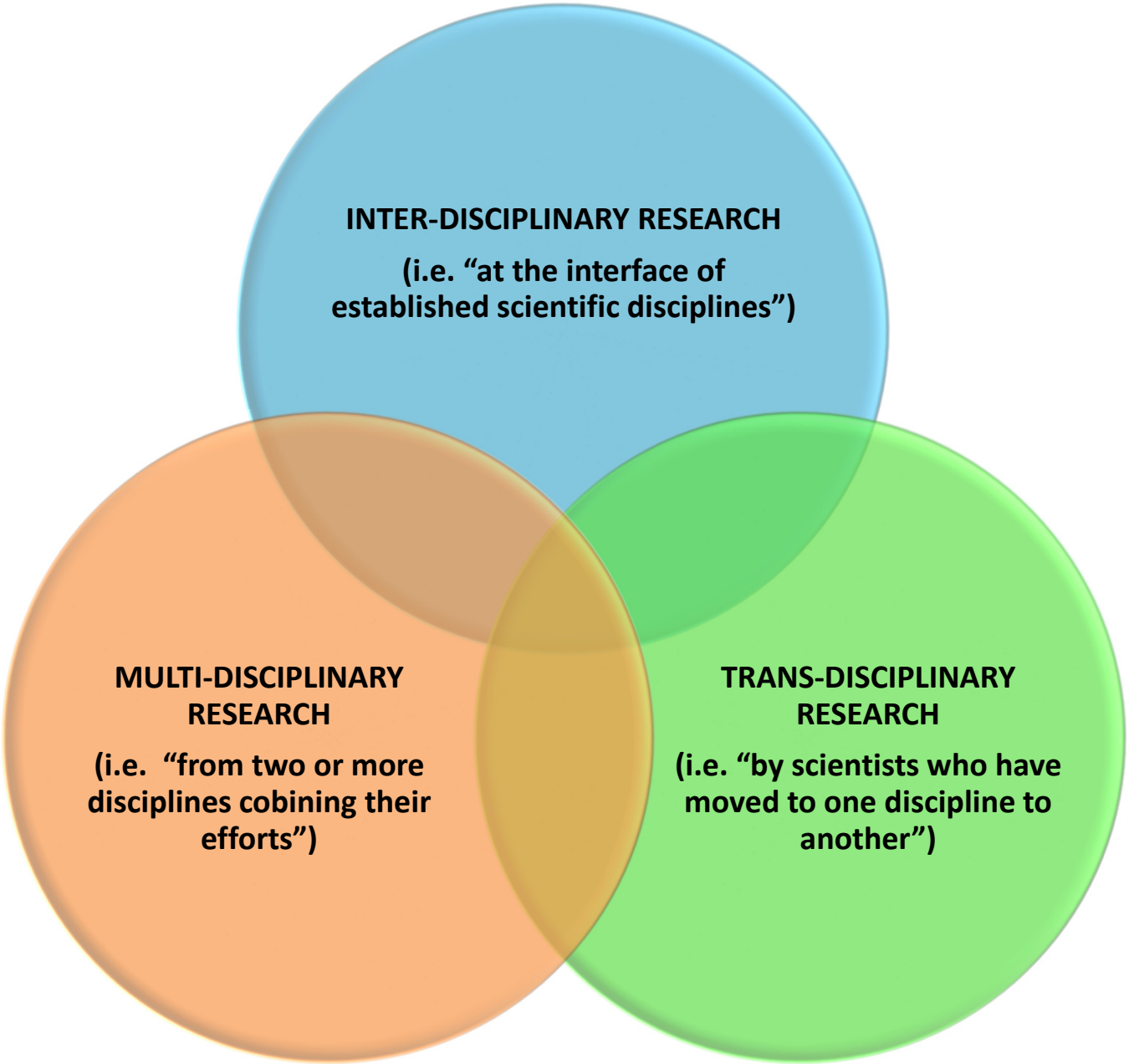
- Increased support to the implementation and dissemination of innovative processes (testing, piloting, demonstration of new technologies)

- Support for the "market demand" of innovation:
- - Standard;
- - Public procurement;
- - Inducement prizes;
- - Bottom-up activities (call for proposal more flexible);

Extensive use of financial instruments with leverage to favour technology penetration

H2020 structure: 3 priorities




INTER-DISCIPLINARY RESEARCH
(i.e. “at the interface of established scientific disciplines”)
MULTI-DISCIPLINARY RESEARCH
(i.e. “from two or more disciplines cobining their efforts”)
TRANS-DISCIPLINARY RESEARCH
(i.e. “by scientists who have moved to one discipline to another”)

Priority 1: Excellent science - €24,6 M ???

Why:

- World class science is the **foundation of tomorrow's** technologies, jobs and wellbeing
- Europe needs to **develop, attract and retain research talent**
- Researchers need **access to** the best **infrastructures**

European Research Council *Frontier research by the best individual teams*	13 268 M€
Future and Emerging Technologies *Collaborative research to open new fields of innovation*	3 100 M€
Marie Curie actions *Opportunities for training and career development*	5 752 M€
Research infrastructures (including e-infrastructure) *Ensuring access to world-class facilities*	2 478 M€

Priority 2: Industrial leadership - €17,9 M ???

Why?:

- Strategic investments in **key technologies** (e.g. advanced manufacturing, micro-electronics) underpin innovation across existing and emerging sectors
- Europe needs to attract **more private investment** in research and innovation Europe needs **more** innovative small and medium-sized enterprises (SMEs) to create growth and jobs

Leadership in enabling and industrial technologies (*ICT, nanotechnologies, materials, biotechnology, manufacturing, space)*	13 781 M€
Access to risk finance *Leveraging private finance and venture capital for research and innovation*	3 538 M€
Innovation in SMEs *Fostering all forms of innovation in all types of SMEs*	619 M€

Priority 3: Societal challenges - €31,7 M ???

Why?:

- Concerns of citizens and society/EU policy objectives (climate, environment, energy, transport, etc.) cannot be achieved without innovation
- Breakthrough solutions come from multi-disciplinary collaborations, including social sciences & humanities
- Promising solutions need to be tested, demonstrated and scaled up

Health, demographic change and wellbeing	8 029 M€
Food security, sustainable agriculture, marine and maritime research & the bioeconomy	4 152 M€
Secure, clean and efficient energy*	5 782 M€
Smart, green and integrated transport	6 802 M€
Climate action, resource efficiency and raw materials	3 160 M€
Inclusive, innovative and secure societies	3 819 M€

Who can participate in H2020?

H2020 Financial instruments

The Horizon2020 main Financial Instruments for implementing the projects via call for proposals are:

- **Grants for Research and Innovation**
- **Grants for Innovation Support and Coordination Actions**
- **Programme Co-funding Actions**
- **Pre-Commercial Procurement (PCP)**
- **Public Procurement of Innovative Solutions (PPI)**
- **SME-Instrument**
- **Prizes**

The funding instruments are defined at topic level in each work-programme.

Financial Instrument for RTD+I

Grants for Research and Innovation

- Funding of all activities and participants: 100%
- Defined in Work programme. Min 3 participants.
- Main activity type: Research and Development
- Can support the whole project range from large Integrated Projects to small Targeted

Grants for Innovation

- Funding of all activities and participants: 70% (except non-profit organisations:1 00%)
- Defined in Work Programme. Min.3 participants.
- Main activity type: Innovation activities – activities close to the market
- Can support the whole project range from large Integrated Projects to small Targeted actions.

Small-medium projects – STREP Projects

DURATION

2 -3 years

6-12 PARTNERS

"Players": Universities, research centes, enterprises and "end-users"

SHARPLY FOCUSED FIELD OF RESEARCH AND OBJECTIVES.

Specific Objective(s) addressed by a sharply focused appraoch

1-4M €

Usually ca. 2M €

ACTIVITIES

RTD	Demonstr*	Management	Diss./Exploit		Other

WORK PLAN

Results orinted (deliverables) – they should not change accross the project life

Large Project – Integrated Projects

DURATION

3 -5 years

10-20 PARTNERS

"Players": Universities, research centes, enterprises and "end-users"

BROAD; INTERDISCIPLINARY AND INTEGRATED RESEARCH SPECTRUM

Specific Objective(s) tackling "multiple issues"

4-25 M €

Usually ca. 10 M €

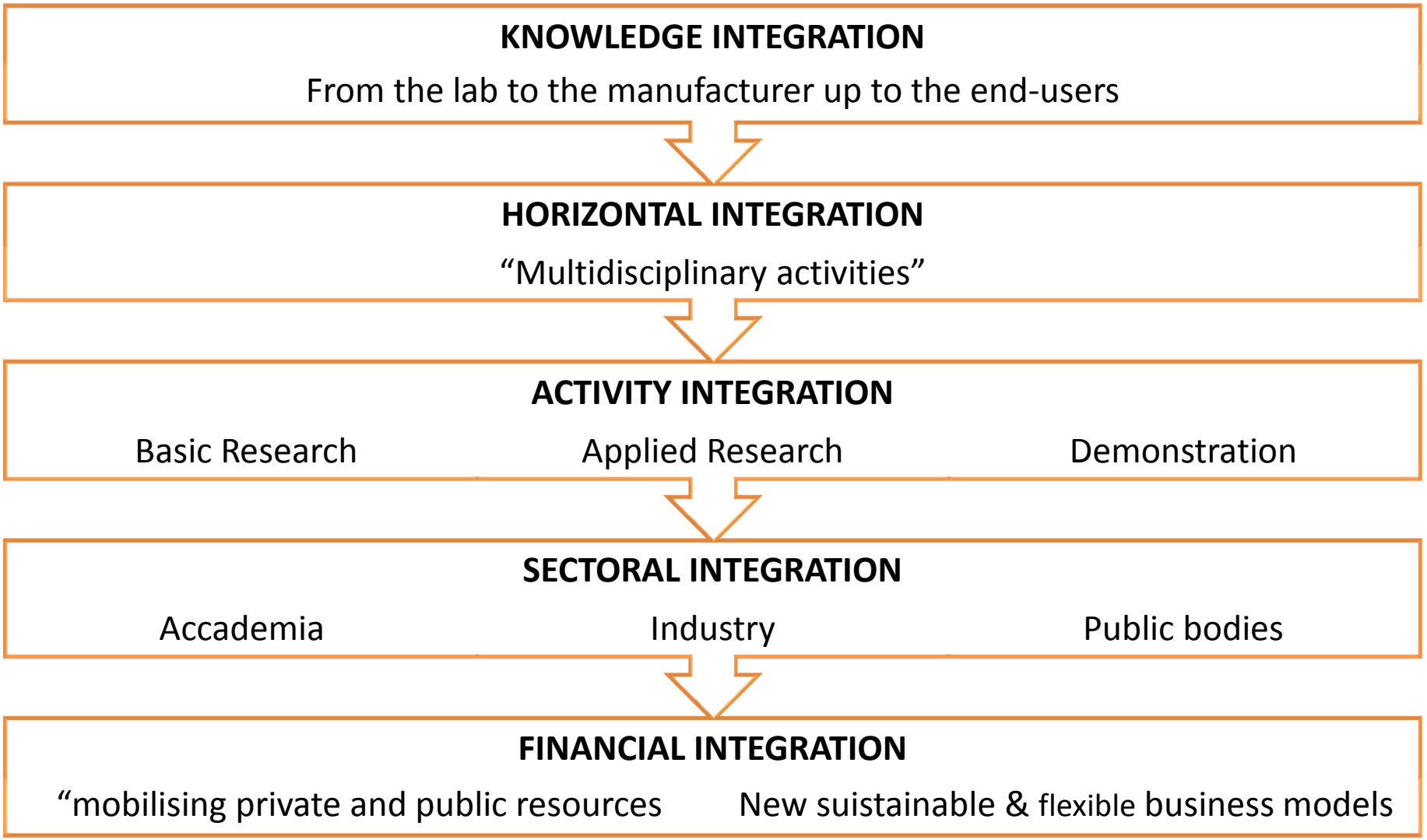
ACTIVITIES

RTD	Demonstr*	Management	Diss./Exploit	Training	Other

WORK PLAN

Large autonomy in defining and adapeting the workplan, the partnership and the results

Large Integrated Projects

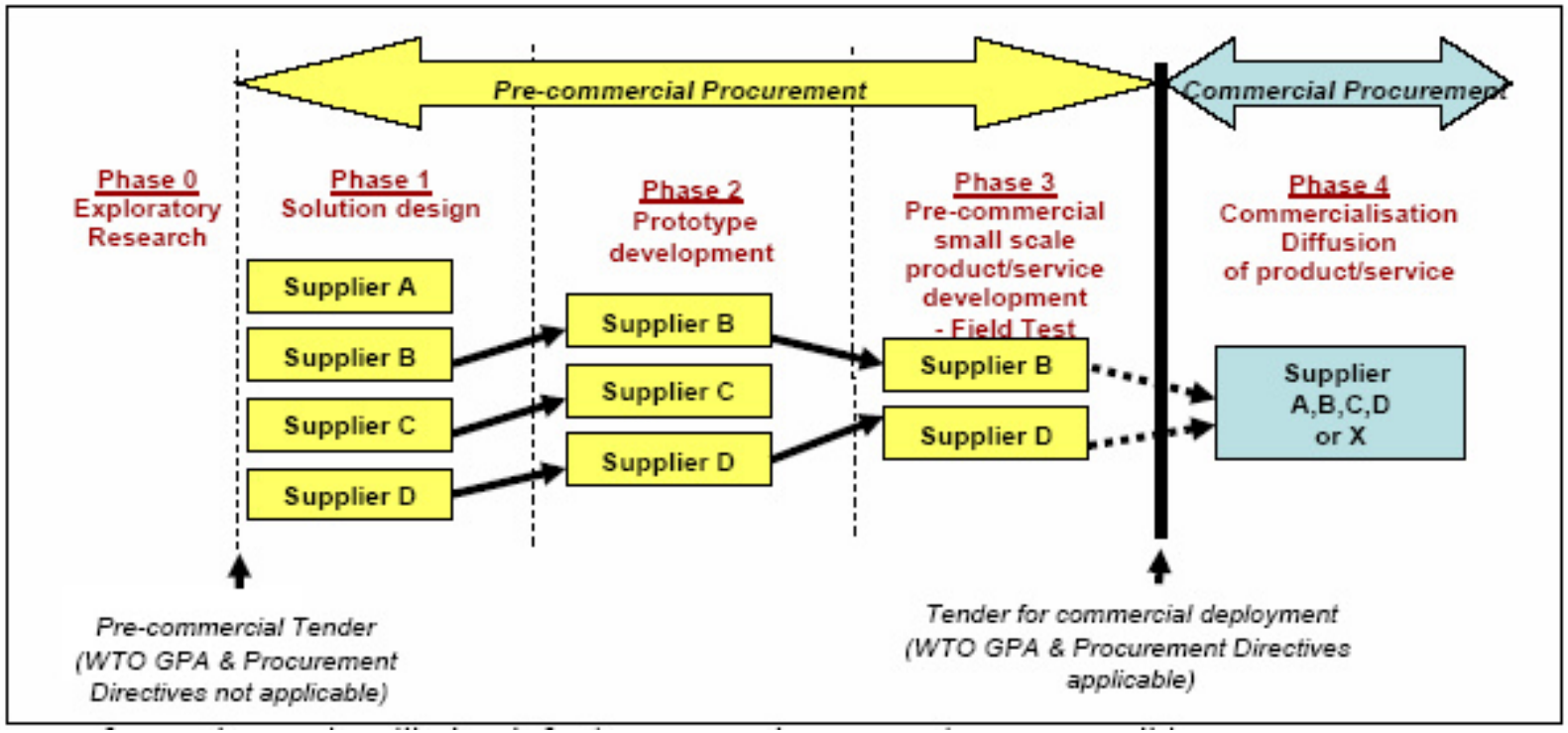


Pre-commercial procurement

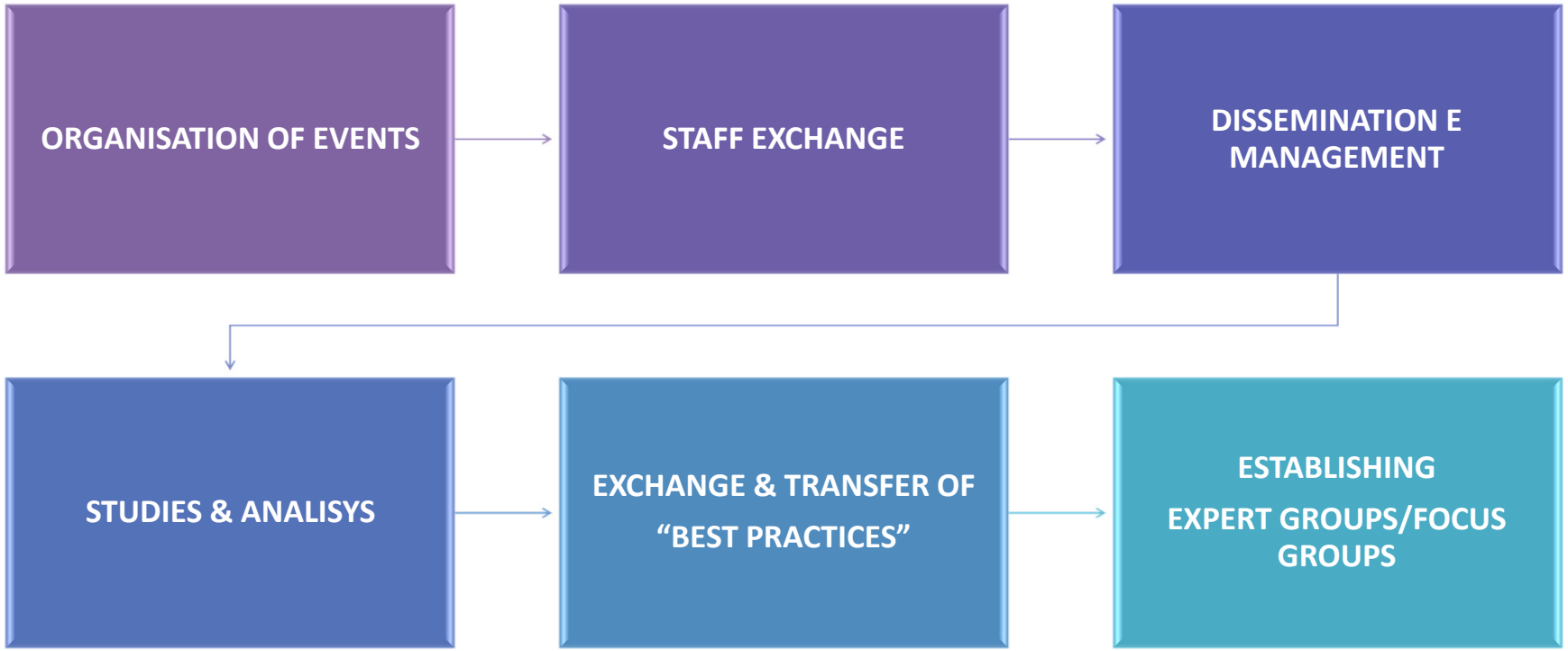
Bridging the innovation gap through public demand pull

- Specific approach for public sector to procure R&D services, enabling
  - Price/quality products that better fit public sector needs
  - Earlier customer feedback for companies developing solutions
  - Better take-up/Wider commercialisation of R&D results

(COM/2007/799 & SEC/2007/1668)



Coordination Action (CSA-CA) main activities



Support Action (CSA-SA) main activities

How H2020 calls will be implemented?

- Calls for proposal published in Participants Portal;
- Based on bi-annual workprogramme listing the relevant topics;
- 2 stage or single stage submission process;
- Proposal procedures are expected to be similar to FP7. Everything will be done electronically via a web-based.

Evaluation: Award Criteria (Art. 14)

Only 3 criteria

EXCELLENCE

Sole criterion for ERC frontier research

IMPACT

higher weighting for proposals for close-to-market actions.

IMPLEMENTATION

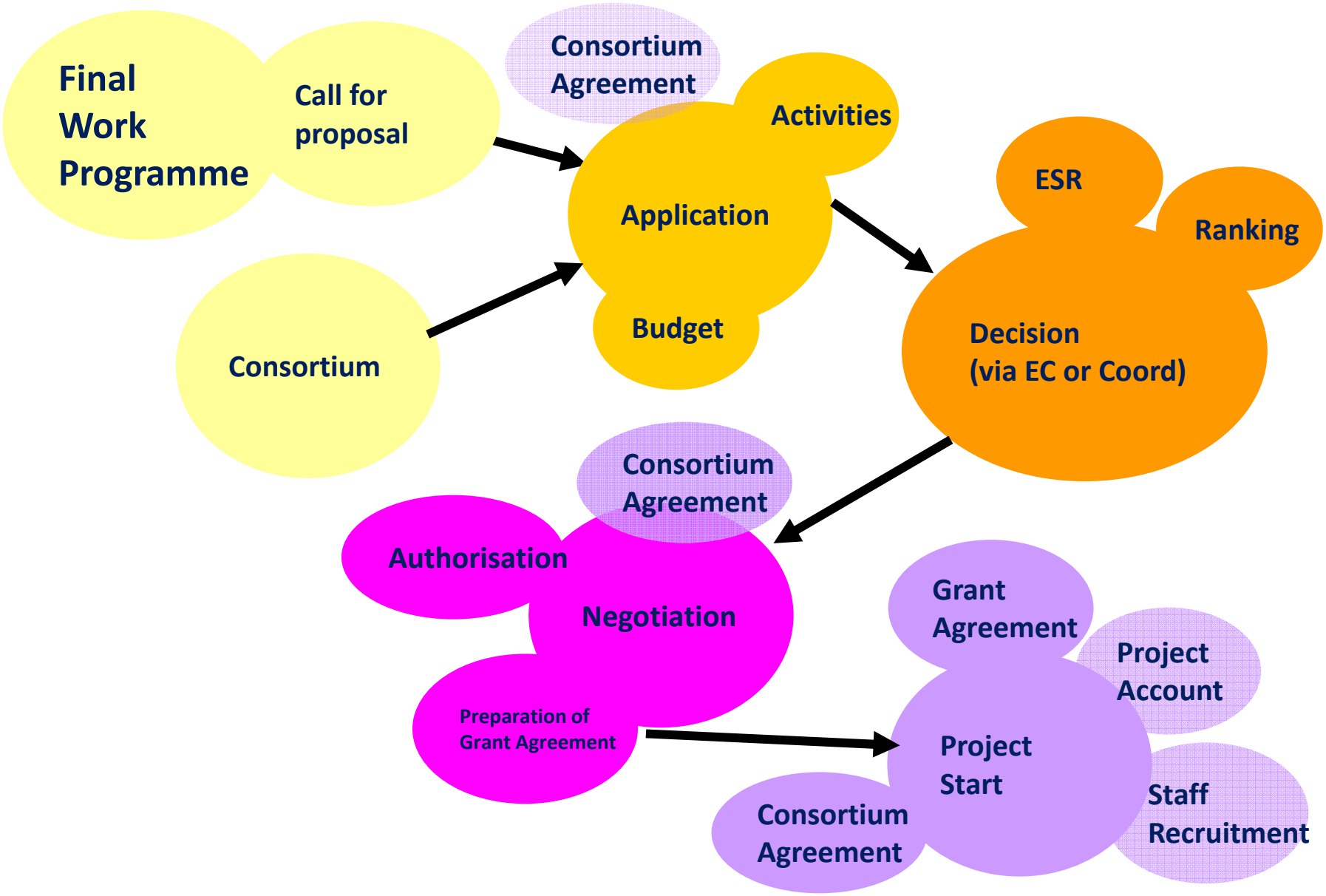
For evaluations of proposals the Commission / Agency picks experts from lists in a database. Everyone interested in being a evaluator is free to submit their CV and a description of their fields of expertise to the database

How to start?

You need to “master” the field of research where you are applying :

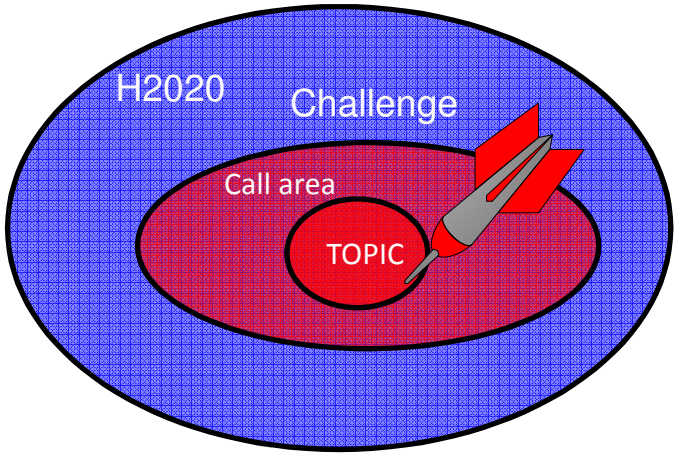
- Read the call and the related background documents: your idea must be targeted according to the objectives of the “call for proposals”;
- Clarify, and fully understand the policy context;
- Study the state of the art;
- Establish a general network to work with: identify the key players in the targeted research community;
- Be aware of the competitors and of strategic partners to involve;
- Establish cooperation with private enterprises and/or end-users;
- Consider how to include different disciplines, also disciplines outside one’s usual scope ;
- Consider the innovation potential of the project;
- Consider the societal or industrial impact of one’s project;
- Contact relevant advisers as early as possible to get advice.

Grant application work-flow



The H2020 work-programme

Work-programmes including calls are published on a biannual basis, but with annual deadlines for call for proposals. The actual call publication date and deadlines differ from one programme to the other



HORIZON 2020 – WORK PROGRAMME 2014-2015

Leadership in enabling and industrial technologies

Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing

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NMP12 - 2015: Biomaterials for treatment and prevention of Alzheimer's disease

Specific challenge: An estimated 7.3 million Europeans between 30 and 99 years of age suffered from different types of dementias in the EU27 in 2006 (14.6 per 1 000 inhabitants), most of these being of the Alzheimer's variety. Innovative approaches based on biomaterials can improve the treatment and prevention of neurodegenerative disorders such as Alzheimer's disease.

Scope: Projects should develop new multifunctional biomaterials, as part of eventual Medical Devices and Advanced Therapies, which aim to create, optimise, enhance, substitute or support therapeutic interventions in Alzheimer's disease. They can include: biocompatible and biodegradable biomaterials as part of minimally invasive treatments, theragnostic materials, and biocompatible materials that are easily degraded/cleared after completing their roles. The development of new drug candidates for Alzheimer's and clinical trials are excluded.

The development of new integrated experimental and computational approaches aimed to describe interface processes and their determinants should be considered as the key step for the design of safe and performing materials. Experimental protocols should be planned taking due account of current good laboratory practice (GLP) and ISO guidelines. Standardisation and manufacturing processes can be addressed, including upscaling, good manufacturing practice (GMP), process analytical technology (PAT), and regulatory work in respect of relevant regulations as appropriate.

Activities expected to be implemented at Technology Readiness Level 5.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact:

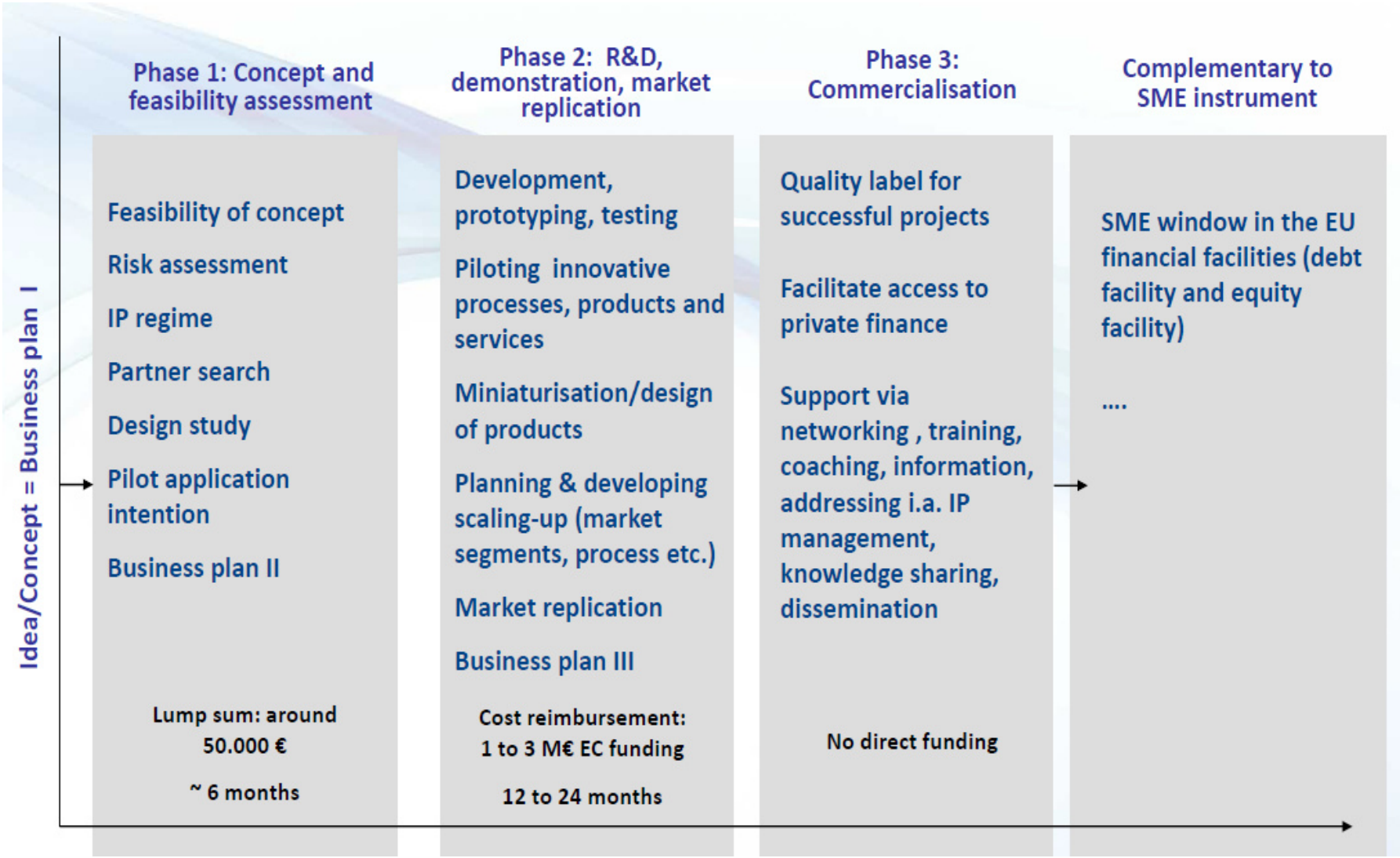
- Improved quality of life due to minimally invasive action;
- Reduced direct and indirect costs linked to the disease and its treatment;
- Implementation of relevant objectives of the European Innovation Partnership on Active and Healthy Ageing (COM (2012) 83).

Type of action: Research & Innovation Actions

Technology Readiness Levels (TRLs)?

TRL 0	**Unproven idea or concept where no peer reviewed analysis or testing has been performed.**
TRL 1	**Basic Research**: The initial scientific research has been completed. The basic principles of the idea have been qualitatively postulated and observed. The process outlines have been identified. No experimental proof and detailed analysis are yet available
TRL 2	**Technology formulation**: The technology concept, its application and its implementation have been formulated. The development roadmap is outlined. Studies and small experiments provide a "proof of concept" for the technology concepts.
TRL 3	**Applied Research:** The first laboratory experiments have been completed. The concept and the processes have been proven at laboratory scale, table-top experiments. Potential of materials and up scaling issues have been identified
TRL 4	**Small Scale Prototype Development Unit (PDU):** The components of the technology have been identified. A PDU has been built a laboratory and controlled environment. Operations have provided data to identify potential up scaling and operational issues. Measurements validate analytical predictions of the separate elements of the technology. Simulation of the processes has been validated. Preliminary LCA and economy assessment models have been developed.
TRL 5	**Large Scale Prototype Development Unit**: The technology has been qualified through testing in intended environment, simulated or actual. The new hardware is ready for first use. Process modelling (technical and economic) is refined. LCA and economy assessment models have been validated. Where it is relevant for further up scaling the following issues have been identified: Health & safety, environmental constraints, regulation, and resources availability.
TRL 6	**Prototype System** The components and the process have been up scaled to prove the industrial potential and its integration within the energy system. Hardware has been modified and up scaled. Most of the issues identified earlier have been resolved. Full commercial scale system has been identified and modelled. LCA and economic assessments have been refined.
TRL 7	**Demonstration System** The technology has been proven to work and operate a pre-commercial scale. Final operational and manufacturing issues have been identified. Minor technology issues have been solved. LCA and economic assessments have been refined.
TRL 8	**First of the kind commercial System**: The technology has been proven to work at a commercial level through a full scale application. All operational and manufacturing issues have been solved.
TRL 9	**Full commercial application**: The technology has been fully developed and is commercially available for any consumers.

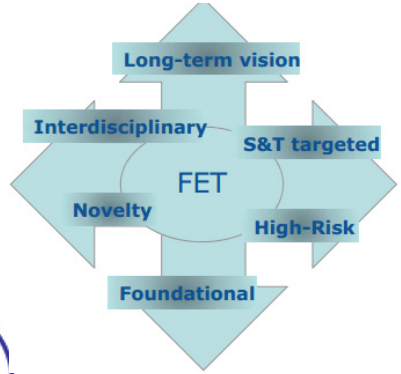
LEIT: The SME Instrument: 3 Phases



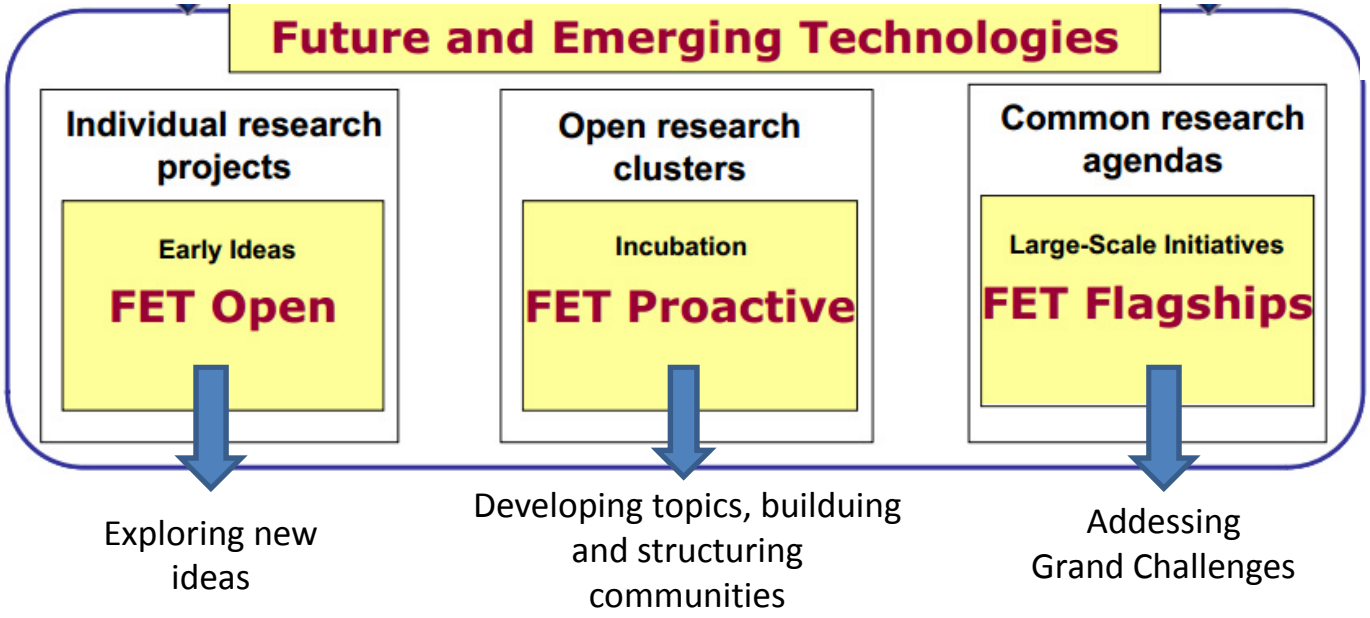
FET in Horizon 2020

Collaborative research to open new fields of innovation (3100 M€)

- **Pathfinding** Europe's technological future(s): **Long-term Vision & Fundational**
- **Venturing** into **uncharted territories** and nurturing **early proofs-of-concept**
- Fostering scientific collaboration across disciplines on **radically new, high-risk ideas** and accelerate development of the most promising emerging areas of science and technology



- **FET - Open and Xtrack - challenging current thinking**
- **FET-Proactive - drafting the new thematic initiatives**
- **FET-Flagships (Graphene, HBP)**

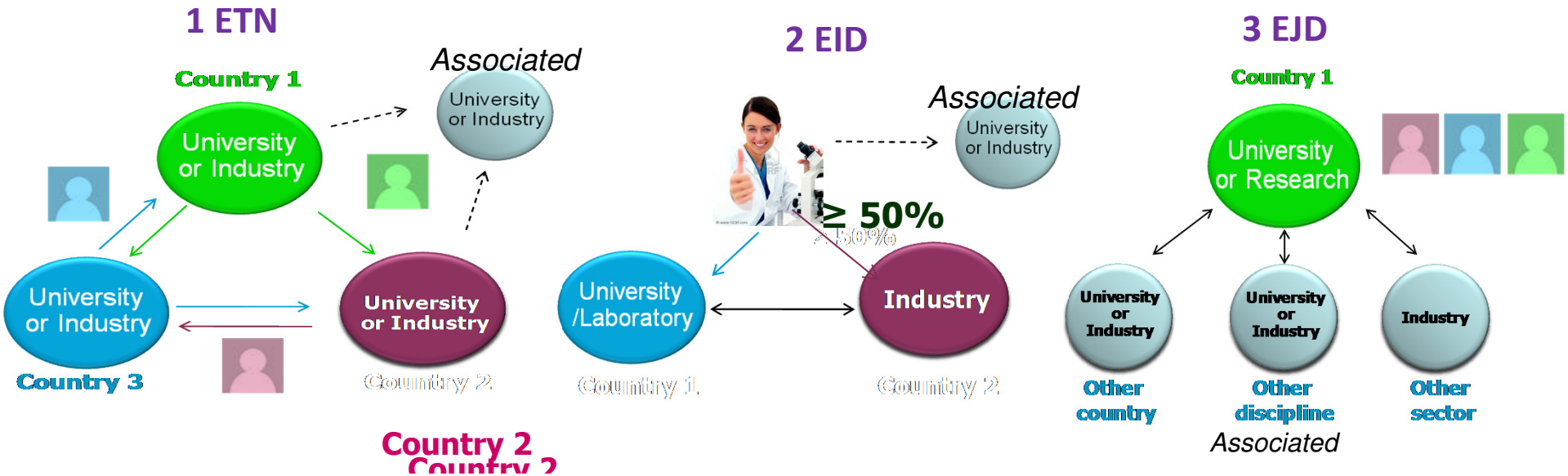


Marie Sklodowska-Curie Actions

Innovative Training Actions (€350 M - 8 Apr. 2014)

1. **European Training Network (ETN)** - encouraged joint supervision industry + academy [max. 540 p/m / min 3 partners]
2. **European Industrial Doctorate (EID)** €25.5 M – joint selection, supervision industry + academy sector [max. 180 p/m - ca 5 PhD – 2 partners]
3. **European Joint Doctorates (EJD)** €30 M - (max. 540 p/m / 1 + 2 Associated)

[100% funding - 4 yrs - single stage]



Marie Sklodowska-Curie Actions

Research and Innovation Staff Exchange (RISE) €80.3 M

- International and/or inter-sector staff exchange for joint research and transfer of knowledge activities.
- Involves academic and non-academic sectors in EU and beyond
- Secondments of ESR, ER, Tech & Managers (duration max. 12 months)

[Exchange in EU only inter-sector secondments - No secondment between institution located outside EU, No recruitment only secondments – Funding 100%]

Co-funding of regional, national and international programme (COFUND) €80 M

- Doctoral programmes € 30 M
- Fellowship programmes (career development) € 50 M

Transnational mobility and cros-sectoral mobility (secondments)

[New or existing mobility programme schemes - Funding up to 70% of the costs for max 36 months – recruitment min 3 months - single stage]

Innovation Investment Package

€22 billion Innovation Investment Package

Joint Technology Initiatives (under Article 187)

- Innovative Medicines Initiative
- Clean Sky (Aeronautics)
- Fuel Cell and Hydrogen
- Bio-based Industries
- Electronic components and systems

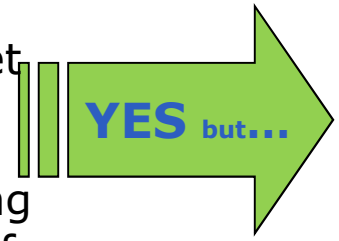
Joint programmes (under Article 185)

- European and Developing Countries Clinical Trials Partnership (EDCTP) 2
- European Metrology Research Programme
- Eurostars (for SMEs)
- Active and Assisted Living

H2020 A Single Funding rate (Art. 23)

One project = One rate

- Same rate for all beneficiaries and all activities in the grant fixed ex-ante in the WP.
- **Up to 100%** of the total eligible costs
- Limited to **max. 70**% for close to market actions (Art. 2)
  - activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication;



"For close-to-market actions, as an exception, the grant may reach a max. of 100% of the total eligible costs for non-profit legal entities, without prejudice to the co-financing principle."

H2020 Overheads

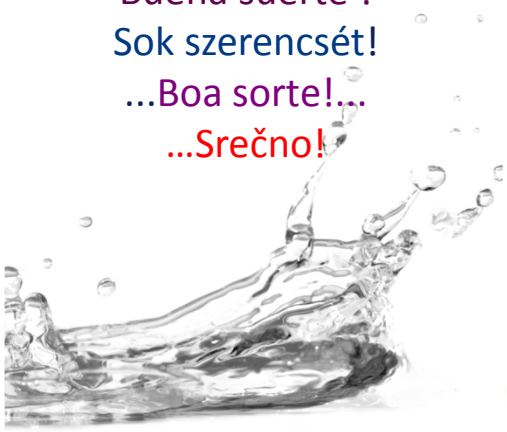
Art. 24:

1. Indirect eligible costs flat rate of 25% of the total direct eligible costs, excluding direct eligible costs for subcontracting and the costs of resources made available by third parties which are not used on the premises of the beneficiary, as well as financial support to third parties.
2. It may take form of a lump sum or scale of unit costs when provided for in the work programme or work plan (e.g. MCSA).

Thanks for your attention

Getting funding is only the beginnig....

In bocca al lupo!
Good luck!
Viel Glueck!
Onnea hakemukesellenne!
Bonne chance !
Buena suerte !
Sok szerencsét!
...Boa sorte!...
...Srečno!



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