Introducing Europe's *Horizon 2020*

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This presentation will

- give a short history of the European Union
- explore the rationale for the European Research Funding
- and introduce Horizon 2020

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A short history of the European Union

18 April 1951
Based on the Schuman plan, six countries sign a treaty to run their heavy industries – coal and steel – under a common management (CST). In this way, none can on its own make the weapons of war to turn against the other, as in the past.

25 March 1957
Building on the success of the **Coal and Steel Treaty**, the six countries expand cooperation to other economic sectors. They sign the Treaty of Rome, creating the **European Economic Community** (EEC), or ‘ common market ’. The idea is for people, goods and services to move freely across borders. Striving for a common energy supply the **EURATOM** treaty is signed.

30 July 1962
The EU starts its ‘ common agricultural policy ’ giving the countries joint control over food production. Farmers are paid the same price for their produce. The EU grows enough food for its needs and farmers earn well. The unwanted side-effect is overproduction with mountains of surplus produce.

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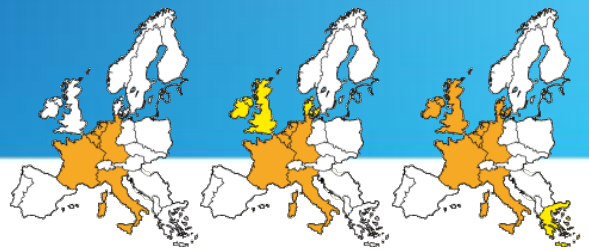

A short history of the European Union

1 January 1973

The six become nine when **Denmark**, **Ireland** and the **United Kingdom** formally enter the EU.

10 June 1979

EU citizens directly elect the members of the European Parliament for the first time. Previously they were delegated by national parliaments.

1 January 1981

Membership of the EU reaches double figures when **Greece** joins. It has been eligible to join since its military regime was overthrown and democracy restored in 1974.

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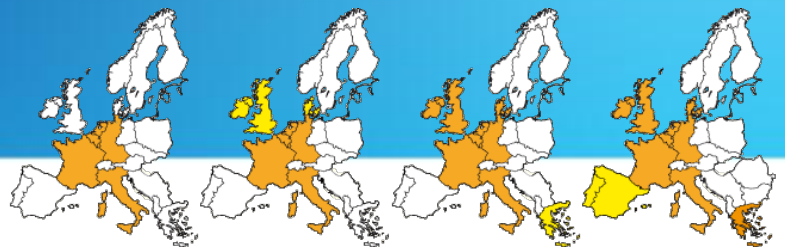

A short history of the European Union

28 February 1984
Computers and automation are changing the way we live and work. To stay in the forefront of innovation, the EU adopts the 'Esprit' programme in 1984 as the first of many research and development programmes it has since funded.

1 January 1986
Spain and **Portugal** enter the EU, bringing membership to 12.

17 February 1986
Although customs duties disappeared in 1968, trade is not flowing freely across EU borders. The main obstacles are differences in national regulations. The **Single European Act** defines a deadline to overcome these obstacles and introduces a research funding competence to the European Commission.

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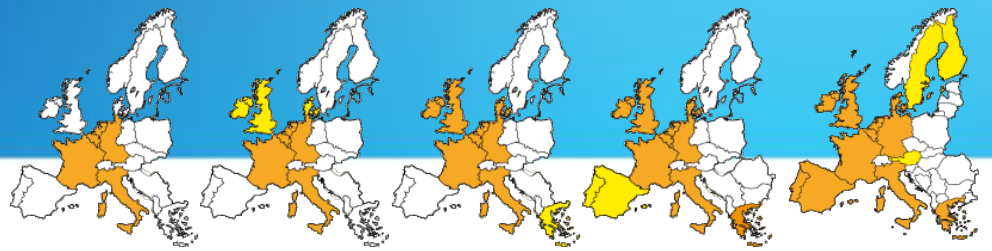

A short history of the European Union

7 February 1992
The Treaty on European Union is signed in Maastricht. It is a major EU milestone, setting clear rules for the future single currency as well as for foreign and security policy and closer cooperation in justice and home affairs. Under the treaty, the name ‘European Union’ officially replaces ‘European Community’.

1 January 1993
The single market and its four freedoms are established: the free movement of goods, services, people and money is now reality. More than 200 laws have been agreed since 1986 covering tax policy, business regulations, professional qualifications and other barriers to open frontiers. The free movement of some services is delayed.

1 January 1995
Austria, **Finland** and **Sweden** join the EU. The 15 members now cover almost the whole of western Europe. In October 1990, Germany was unified and therefore former East Germany became part of the EU.

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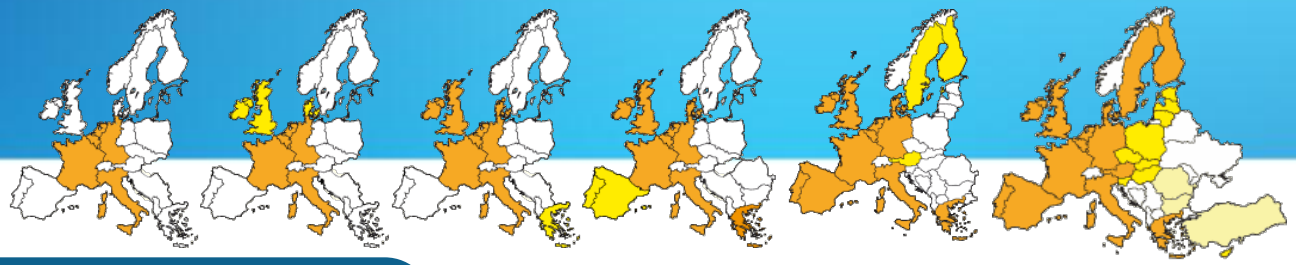

A short history of the European Union

1 January 2002
Euro notes and coins arrive. Notes are the same for all countries. Coins have one common face, giving the value, while the other carries a national emblem. All circulate freely. Using Finnish (or any other) euro coin to buy a Madrid metro ticket is something we take for granted.

31 March 2003
As part of its foreign and security policy, the EU takes on peace-keeping operations in the Balkans, firstly in the Former Yugoslav Republic of Macedonia, and then in Bosnia and Herzegovina. In both cases, EU-led forces replace NATO units. Internally, the EU agrees to create an area of freedom, security and justice for all citizens by 2010.

1 May 2004
Eight countries of central and eastern Europe — the **Czech Republic**, **Estonia**, **Latvia**, **Lithuania**, **Hungary**, **Poland**, **Slovenia** and **Slovakia** — join the EU, finally ending the division of Europe decided by the Great Powers 60 years earlier at Yalta. **Cyprus** and **Malta** also become members.

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A short history of the European Union

1 January 2007
Two more countries, **Bulgaria** and **Romania**, now join the EU, brining the number of member states to 27 countries.

13 December 2007
The 27 EU countries sign the Treaty of Lisbon, which amends the previous Treaties. It is designed to make the EU more democratic, efficient and transparent, and thereby able to tackle global challenges such as climate change, security and sustainable development. **The Treaty of Lisbon** is ratified by all EU countries before entering into force on 1 December 2009.

1 July 2013
Croatia join the European Union as their 28th member state.

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A short history of the EC Framework Programmes

- It all started with a book – 'Le Défi Américain' ('The American Challenge', 1967) by Jean-Jacques Servan-Schreiber…
- In the early 1980s, the Germans had some experience with their concept of "Verbundforschung". This concept was taken up by the Research Commissioner at the time, Etienne Davignon, who 'converted' this concept into a policy plan, together with a number of other ideas, such as that of the first grant programme for researchers, or the first major European programme in IT technology, ESPRIT.
- All this with a view to putting a little order into an increasing profusion of activities by placing them, as the name suggests, in a single 'framework' to counteract the perceived American dominance. This was done while putting in place, as the name also suggests, a medium-term 'programme', with a budget covering several years, rather than just one. This was a 'French policy style' approach to planning, combined with 'German engineering'.

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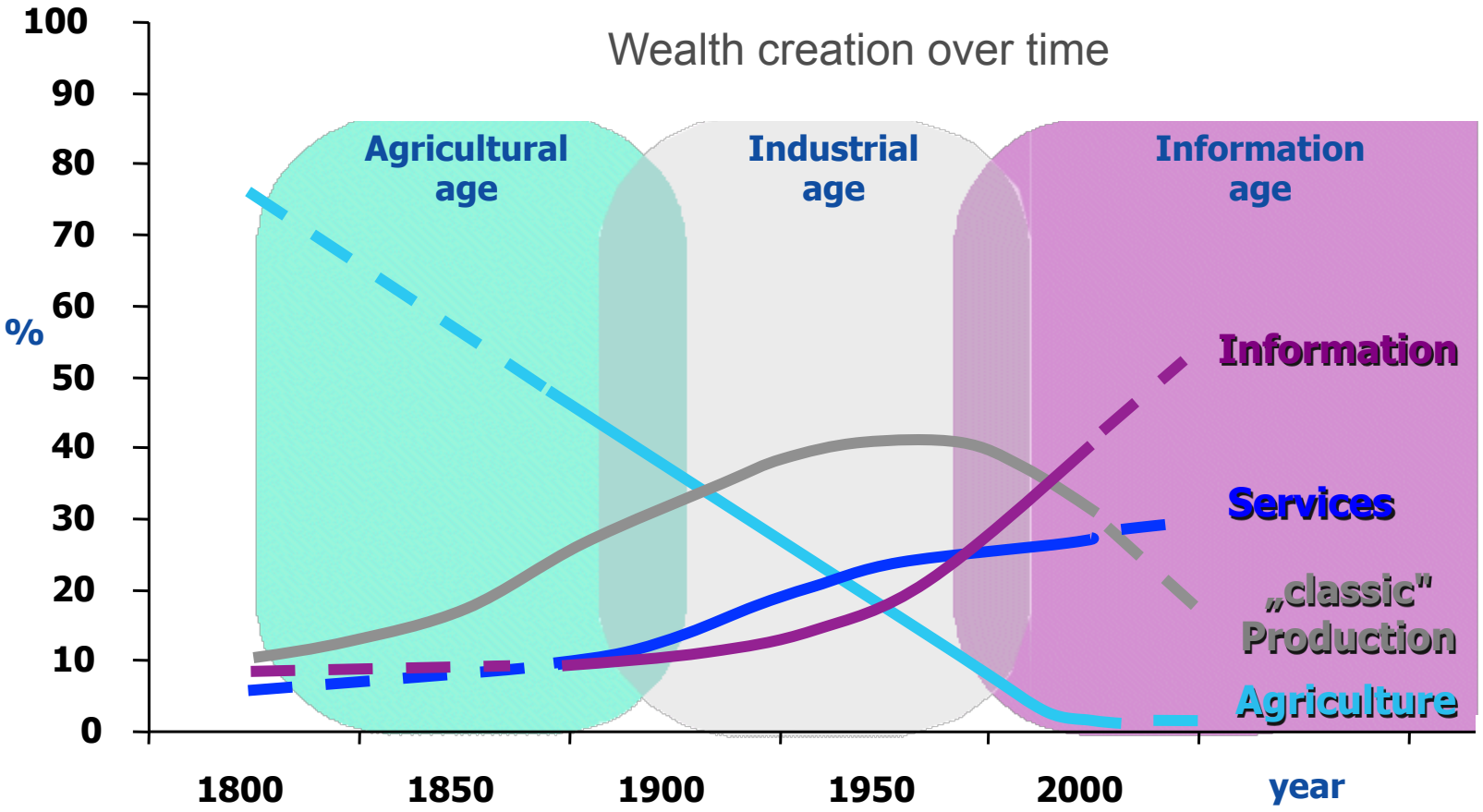
Motivation for EC Framework Programmes



Source: http://www.wk.or.at/aws/pdf/kapitel1.pdf

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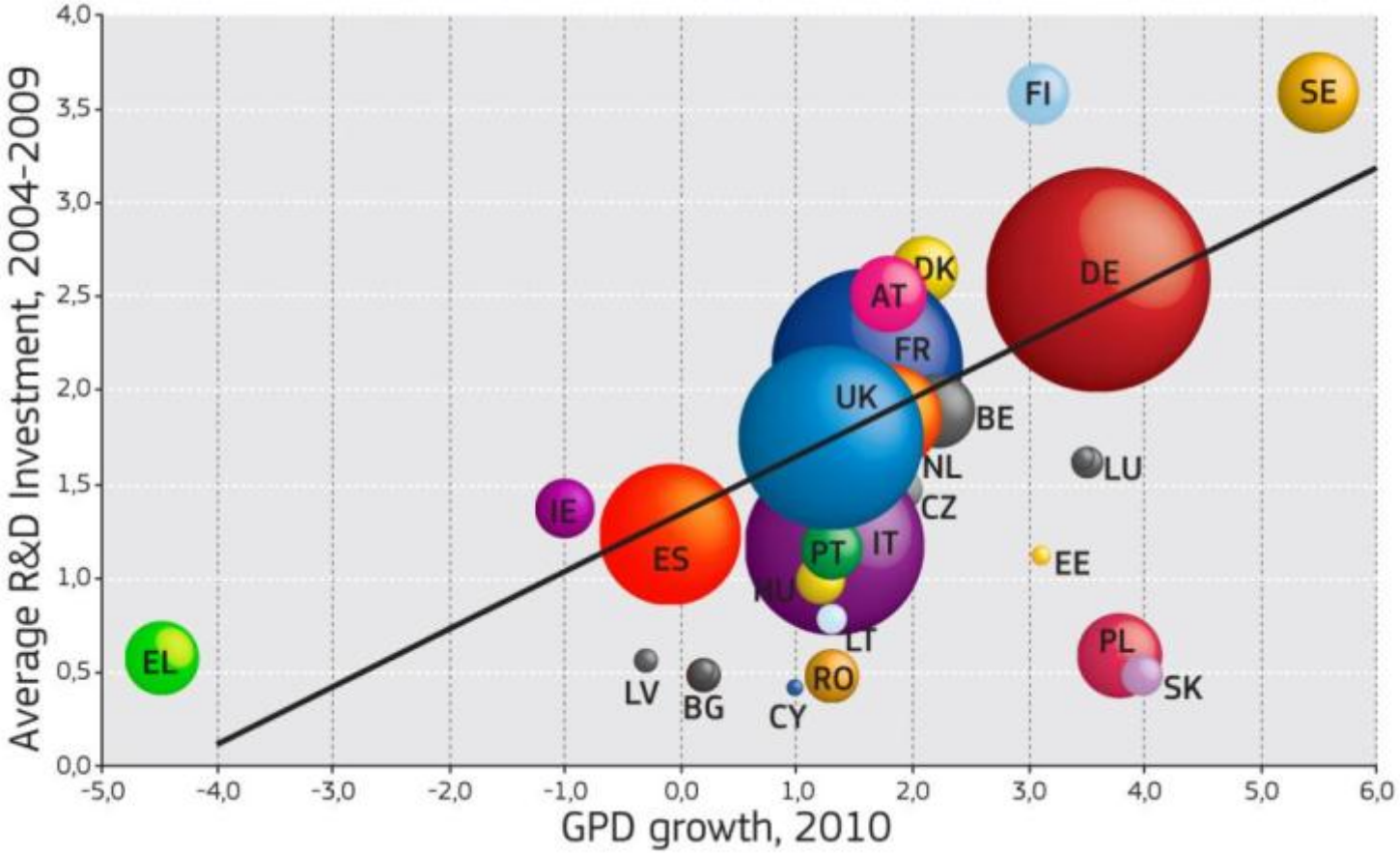
Motivation for EC Framework Programmes



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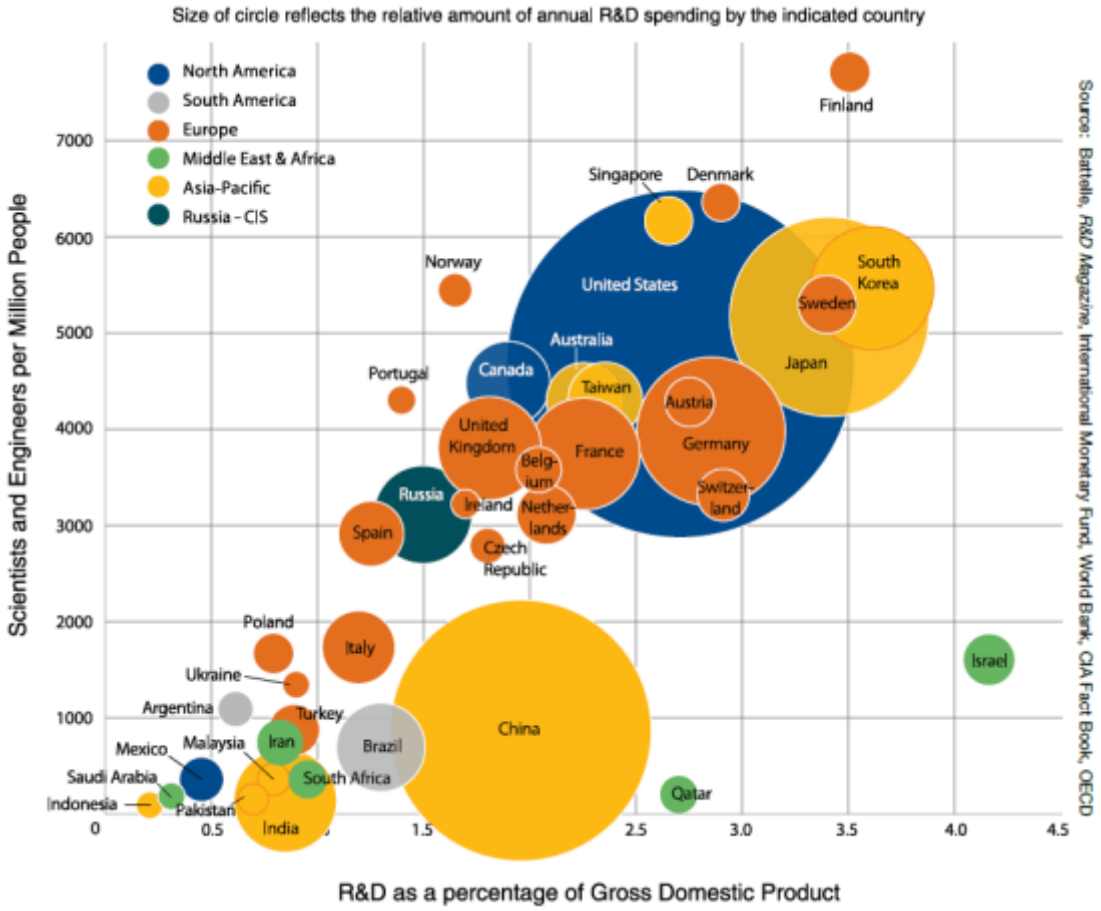
Global comparison 2013



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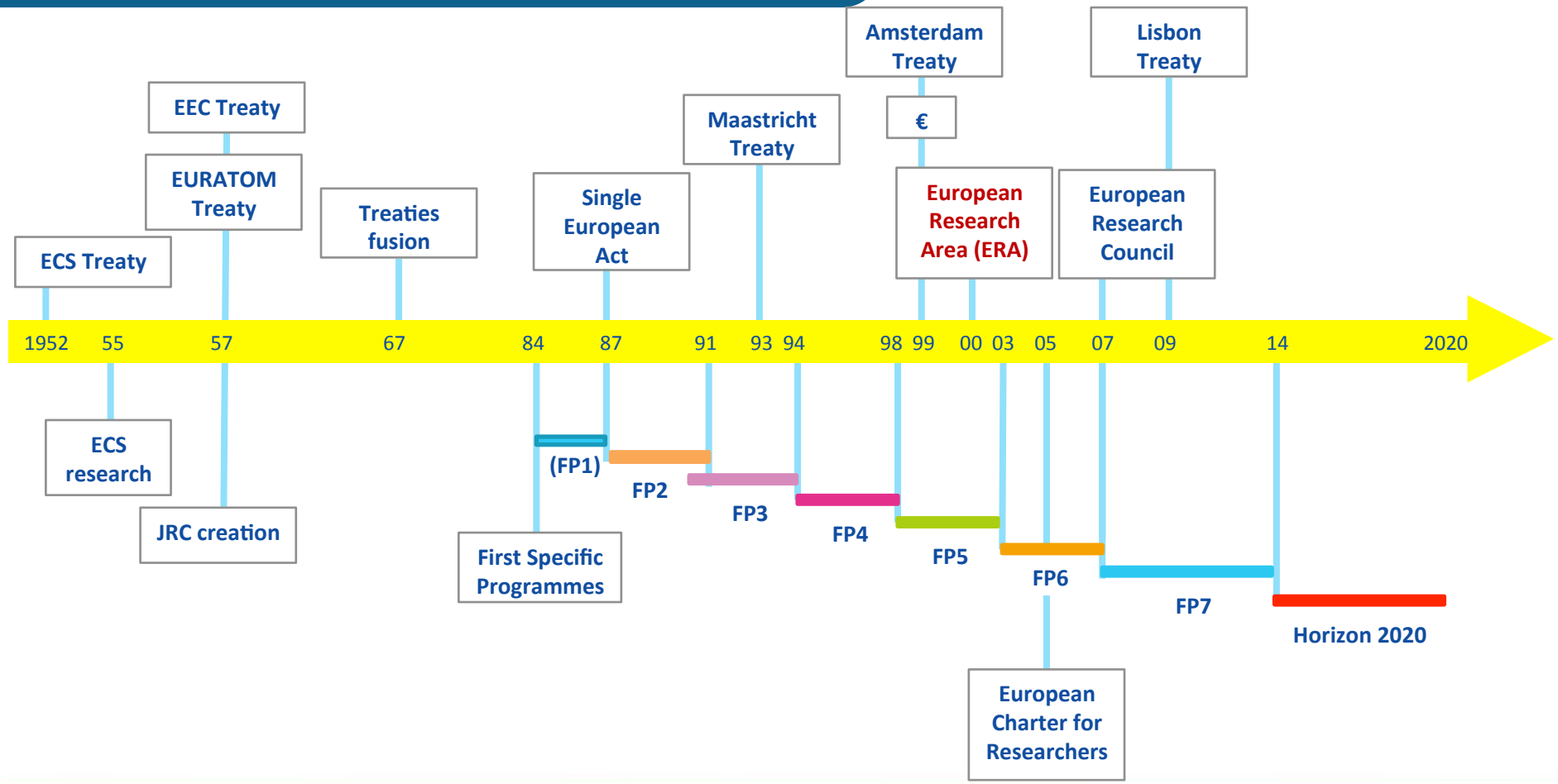
History of EU Framework Programmes



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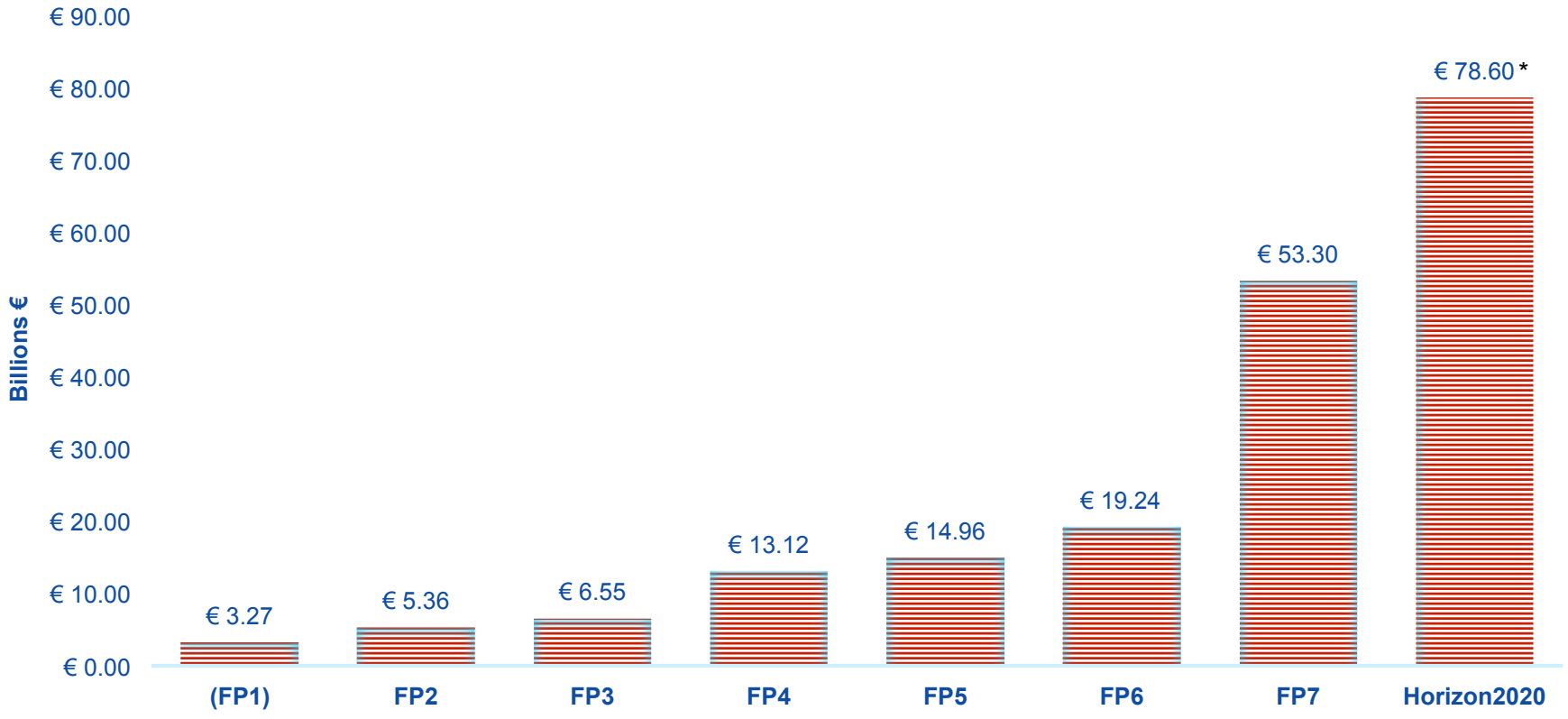
History of EU FP's Budgets



* current prices

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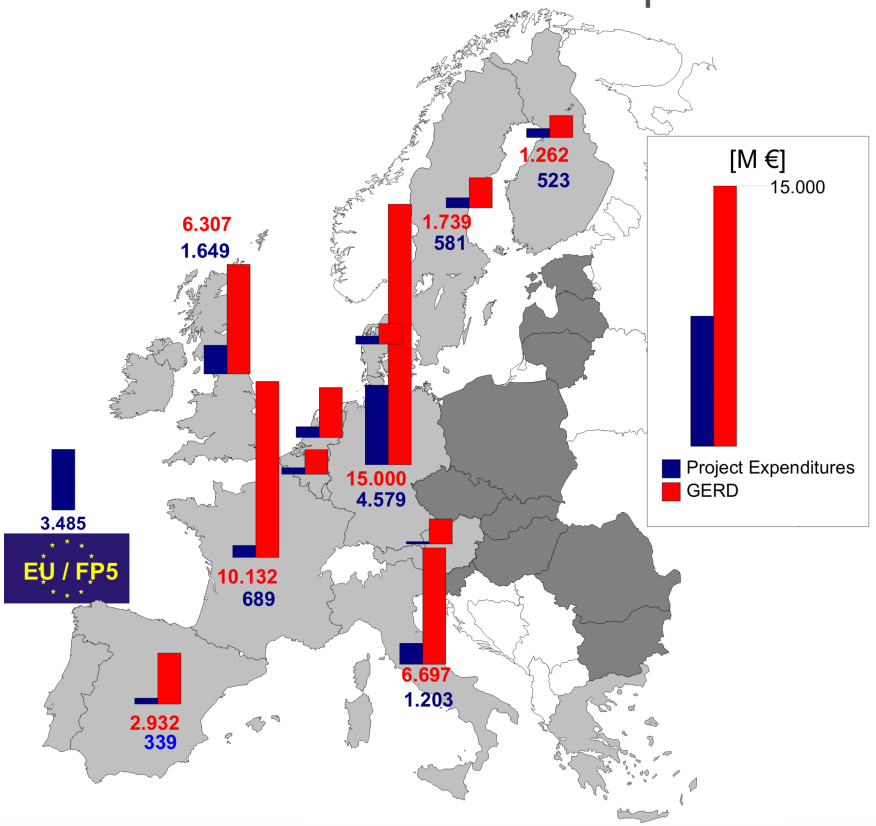
History of EC Framework Programmes

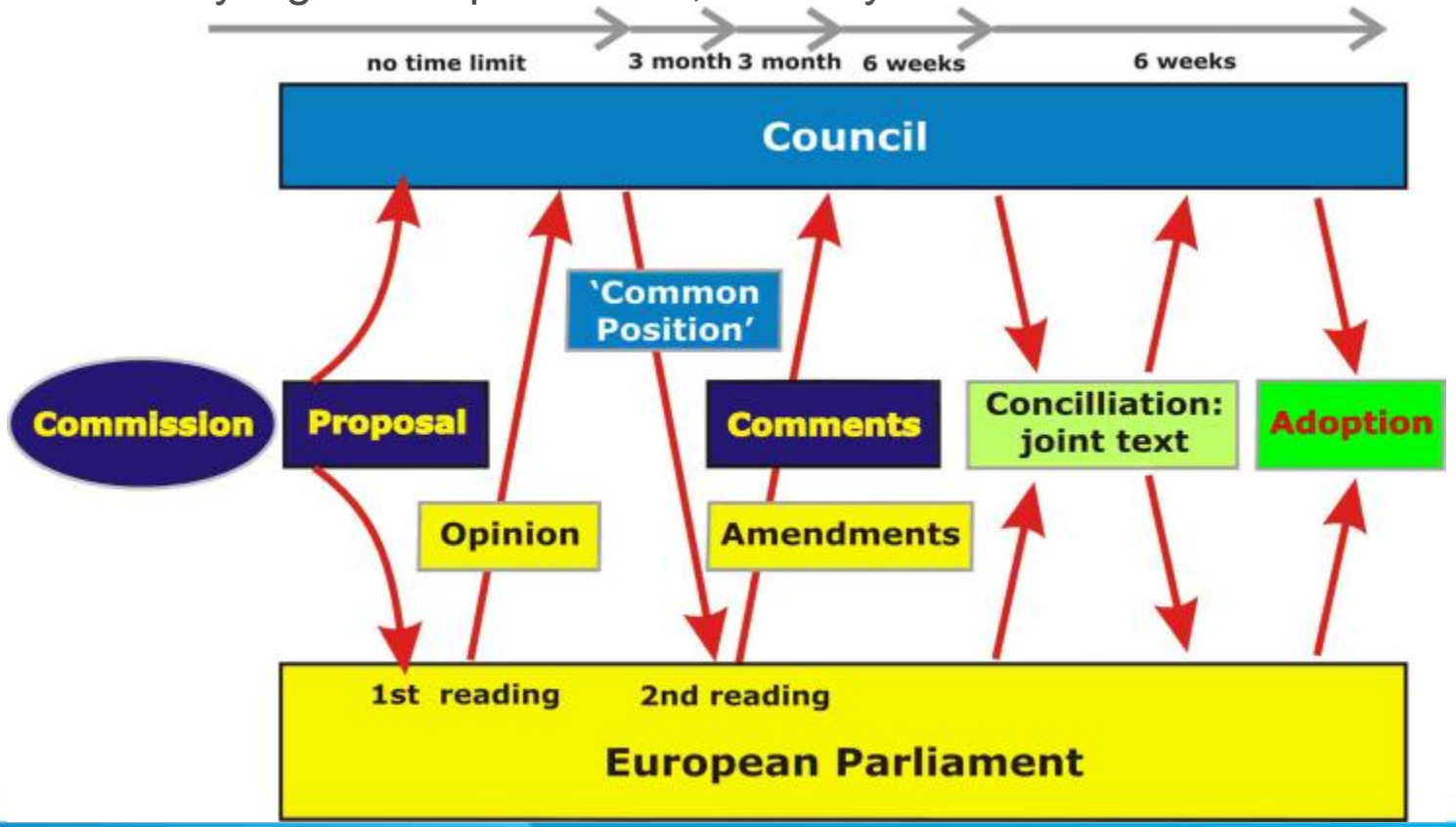
A study Stefanie Schellhove conducted for KoWi in 2002 compared national **project funding** and FP5.

	Civil GERD [M €]	project funding [M €]	Relative project funding
Austria	1 445	141	10 %
Belgium	1 418	373	26 %
Denmark	1 182	467	40 %
Finland	1 262	523	41 %
France	10 132	689	7 %
Germany	15 000	4 579	31 %
Italy	6 697	1 203	18 %
Netherlands	2 875	628	22 %
Spain	2 932	339	12 %
Sweden	1 739	581	33 %
UK	6 307	1 649	26 %
EU / FP5		**3485**	**31 %**



Decision making on EC Framework Programmes

The ‘ordinary legislative procedure’; formerly known as ‘co-decision’.



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H2020 as part of the European policy framework

H2020 is a core part of Europe 2020, integrating the political concepts of the Innovation Union & the European Research Area:

- Responding to the economic crisis to invest in future jobs and growth
- Addressing peoples' concerns about their livelihoods, safety and environment.
- Strengthening the **EU's global position in research, innovation and technology**

Through promotion of intensive innovation, from research to retail, in all forms.

With a focus on societal challenges facing EU societies, e.g. jobs, health, environment, food and energy security and efficient transport.

Offering simplified access, for all companies, universities, institutes in all EU countries and beyond.

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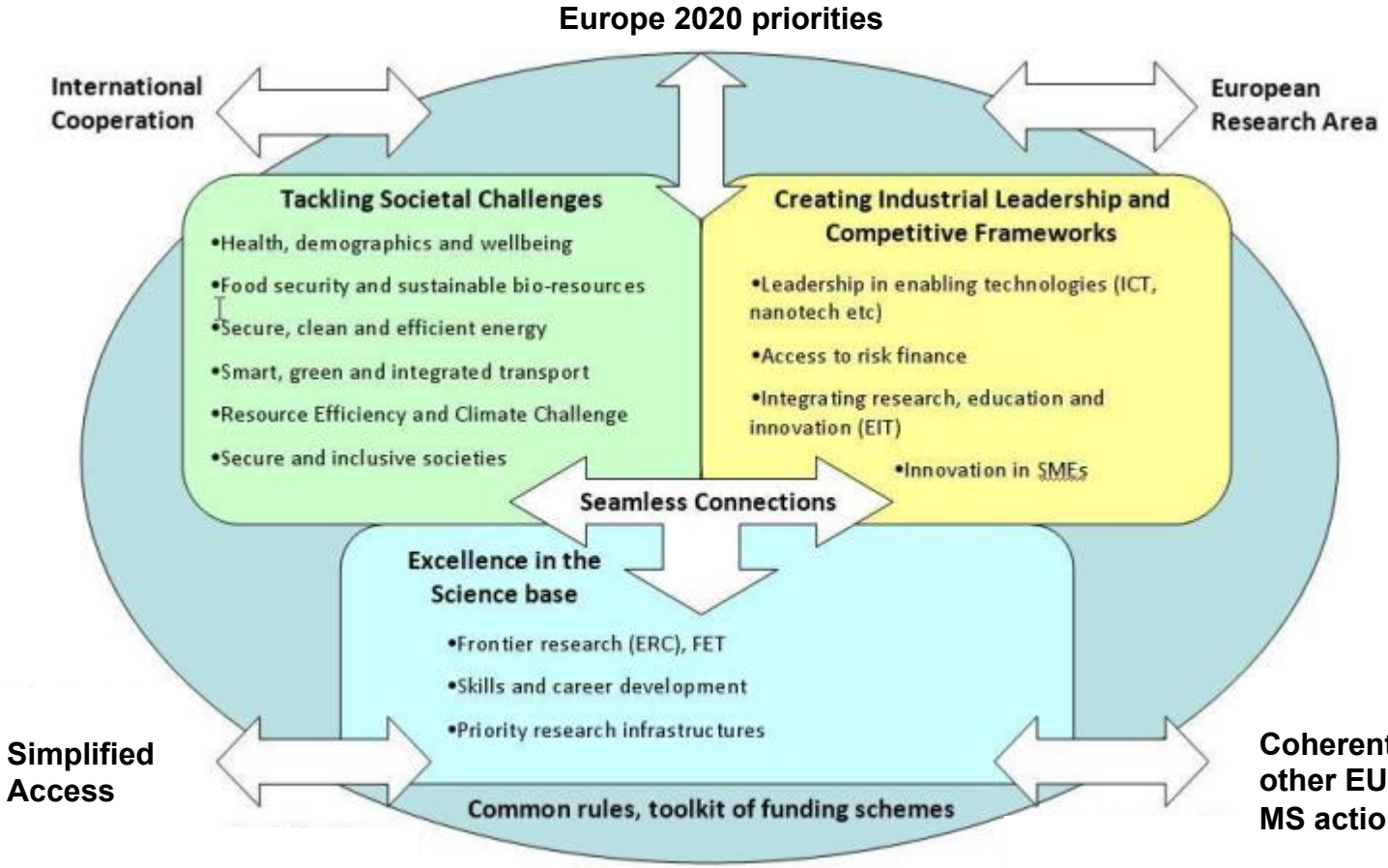
H2020 structure



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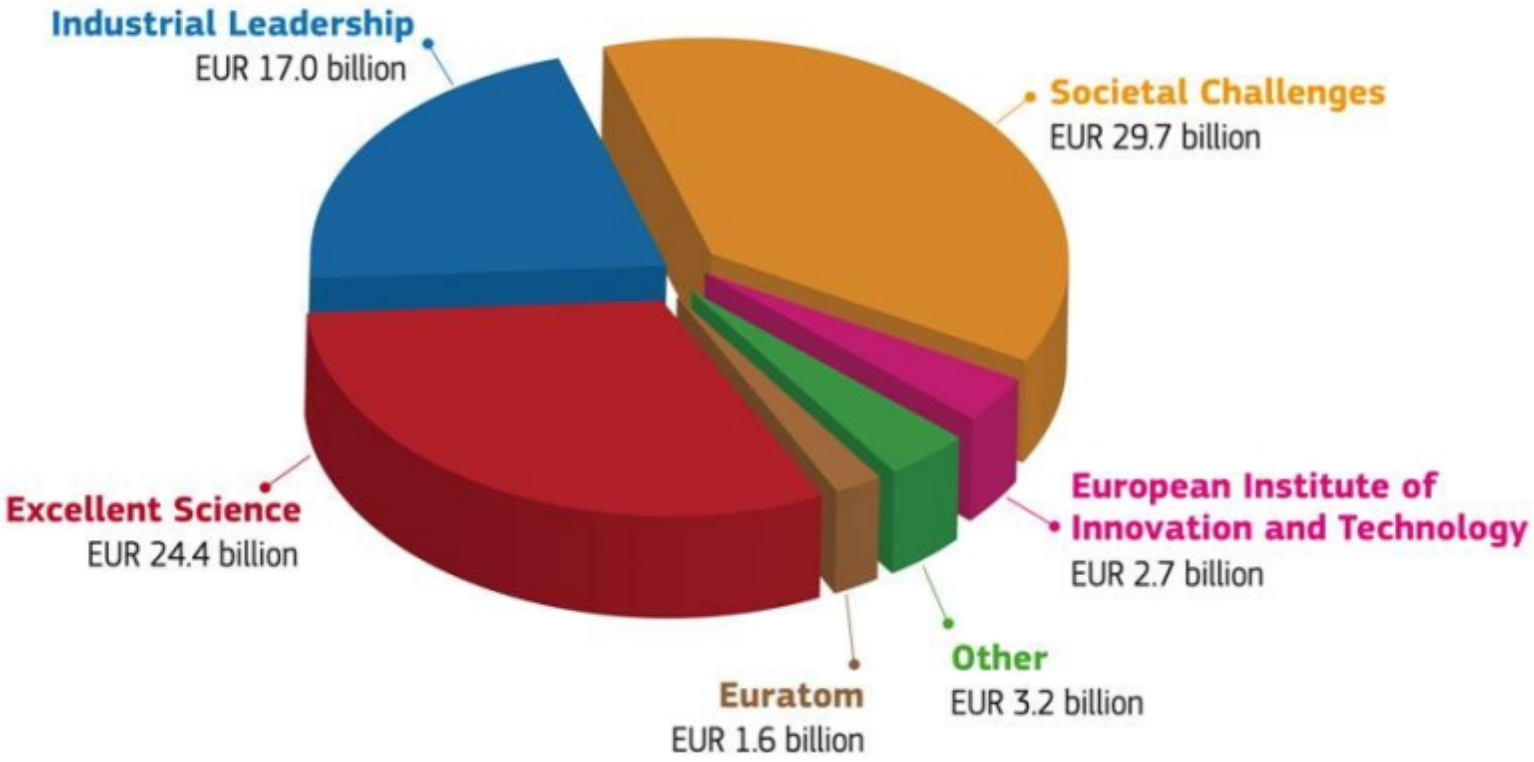
H2020 budget

2014-2020: € 70,200,000,000 (current prices) ~ AU$105,3bn



H2020 excellent science = €22.3bn

- 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 (ERC) Frontier research by the best individual teams	**€11,900m**
Future and Emerging Technologies Collaborative research to open new fields of innovation	**€2,500m**
Marie Skłodowska-Curie actions (MSCA) Opportunities for training and career development	**€5,600m**
Research infrastructures (including e-infrastructure) Ensuring access to world-class facilities	**€2,300m**

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H2020 industrial leadership = €15.5bn

- 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 (LEITs) (ICT, nanotechnologies, materials, biotechnology, manufacturing, space)	**€12,400m**
Access to risk finance Leveraging private finance and venture capital for research and innovation	**€2,600m**
Innovation in SMEs Fostering all forms of innovation in all types of SMEs	**€615m** + complemented by expected 20% of budget of societal challenges + LEITs and **'Access to risk finance'** with strong SME focus

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H2020 industrial leadership – what are LEITs?

From the Lab to Industry to Markets

- Use of Technology Readiness Levels (TRLs from 3-4 to 8)
- Ground prepared in last two years of FP7 ('bridging')
- Contractual PPPs and JTIs (Electronic components and systems, Bio-based Industries)
- Cross-cutting Key Enabling Technologies (or a combinations of KETs)
- Pre-commercial procurement and prizes (to be developed further after 2015)
- e.g. nano-pharmaceutical production by SMEs = prerequisite for clinical testing
- Developing new technologies to solve societal problems
- Reducing dependence on critical resources and energy; customising healthcare; critical components of energy technologies; clean water; waste avoidance and recovery; towards the circular economy (environment)
- Creating high-quality jobs: combine research and skills development, commit to job creation e.g. in machine tool, chemical and biotechnology industries

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H2020 industrial leadership - LEIT example

ICT 29 – 2014 Development of novel materials and systems for OLED lighting

Specific Challenge: In the last 10 years, European industry (both SMEs and large companies) has made significant investments in OLED technologies, i.e., materials, devices and manufacturing processes. However, major S&T progress and research and innovation (R&I) investments are required in OLEDs, in particular for the realisation of flexible, high brightness light sources over large areas. The further technological development of OLEDs is expected to give Europe a leading position on the world general lighting market and create new manufacturing jobs for novel consumer products. Moreover, the move to OLEDs would help in reducing the amount of electricity consumed by lighting and limiting carbon dioxide emissions.

Scope:

Research & Innovation Actions should focus on materials, process and device technology for OLED lighting. The aim is to realise OLED devices over larger surfaces, with higher brightness, larger uniformity and longer lifetimes. A demonstrator should be provided at the end of every project. A specific target for OLED lighting is energy efficacy of above 100 lm/W, considering also improved out-coupling efficiency. The materials have to allow for a competitive lifetime for all colours and white light (lifetime of several hundred hours at 97% of the original intensity). Attention should be paid to recyclability issues and the environmental impact of the materials and systems as appropriate. Proposals should involve material suppliers, OLED manufacturers or suppliers and OLED system integrators.

Expected impact:

- Cost performance breakthroughs - lighting systems with production costs of 1€/100 lm.
- Secured and reinforced industrial technology leadership and substantially increased market presence in lighting.
- Improved business opportunities and value creation in Europe in lighting by reinforced cooperation along the value chain.

Type of Action:

Research & Innovation Actions – Proposals requesting a small contribution are expected

H2020 societal challenges = €27.0bn

- 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	**€6,800m**
Food security, sustainable agriculture, marine and maritime research & the Bioeconomy	**€3,500m**
Secure, clean and efficient energy	**€5,400m**
Smart, green and integrated transport	**€5,800m**
Climate action, resource efficiency and raw materials	**€2,800m**
Europe in a changing world - inclusive and reflective societies	**€1,200m**
Secure societies – protecting freedom and security of Europe and its citizen	**€1,500m**
Science with and for society	*€400m*
Spreading excellence and widening participation	*€700m*

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H2020 societal challenges – examples

'Secure, clean and efficient Energy'

Objective: to make the transition to a reliable, sustainable and competitive energy system, in the face of increasingly scarce resources, increasing energy needs and climate change.

Broad lines of activities: (1) Reducing energy consumption and carbon footprint by smart and sustainable use; (2) Low-cost, low-carbon electricity supply; (3) alternative fuels and mobile energy sources; (4) A single, smart European electricity grid; (5) New knowledge and technologies; (6) Robust decision making and public engagement; (7) Market uptake of energy innovation. Solutions need to be tested, demonstrated and scaled up.

Support the implementation of the European Strategic Energy Technology Plan:

- SET-Plan roadmaps, implementation plans and governance structure
- Improve coordination of relevant Union Programmes, initiatives and policies (e.g. Cohesion policy and the ETS mechanisms)

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H2020 Rules for Participation

1. **A single set of rules**
   - Adapted for the whole research and innovation cycle
   - Covering all research programmes and funding bodies
   - Aligned to the Financial Regulation, coherent with other EU Programme
2. **One project – one funding rate**
   - Maximum of 100% of direct costs (except for actions close to market, where a 70% maximum will apply)
   - Indirect eligible costs: a flat rate of 25% of direct eligible costs
3. **Simple evaluation criteria**
   - Excellence – Impact - Implementation (ERC: Excellence only!)
4. **New forms of funding**: aimed at innovation: pre-commercial procurement, inducement prizes, dedicated loan and equity instruments
5. **International participation**: facilitated but stronger emphasis on EU's interests

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H2020 international collaboration

International cooperation is crucial to address many Horizon2020 objectives

- Principle of general openness: the programme will remain to be the most open funding programme in the world
- Horizon 2020 shall be open to the association of: acceding countries, candidate countries and potential candidates and selected international partner countries that fulfil the relevant criteria (capacity, track record, close economic and geographical links to the Union, etc.)
- Targeted actions to be implemented taking a strategic approach to international cooperation (dedicated measures in the 'Inclusive, innovative and secure societies' challenge)

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H2020 international collaboration contd

Enhancing and focusing EU international cooperation in research and innovation: a strategic approach [COM(2012)497]

International cooperation activities developed under Horizon 2020 should contribute to the objectives of:

- Strengthening the Union's excellence and attractiveness in research and innovation and its economic and industrial competitiveness;
- Tackling global societal challenges; and,
- Supporting the EU's external policies.

The new international cooperation strategy focuses on research in areas of common interest and mutual benefit in order to achieve these objectives. To strengthen implementation, the strategy also differentiates between three country groupings:

- Industrialised and emerging economies (which will only receive funding under specific conditions);
- Enlargement and neighbourhood countries (eligible for automatic funding); and
- Developing countries (eligible for automatic funding).

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H2020 and COST

COST (Cooperation in Science and Technology) was established in 1970 to:

- Enhance research progress through creation of international networks
- Connect scientists with policy-makers, governmental & regulatory bodies
- Foster innovation through technology transfer (academia, spin-offs, industry)
- Build capacity through inclusive participation (trans-disciplinary)

Under H2020 COST will strengthen its core business:
The *COST Action* as an efficient research networking instrument, based on the principles of "bottom-up"; "openness"; "inclusiveness" and "excellence"

COST has now established its own legal entity to conclude a contract with the European Commission.

The COST budget of €300m will come from two H2020 sources:

- *"Europe in a changing world – inclusive, innovative and reflective Societies"*
- *"Spreading Excellence and Widening Participation"*

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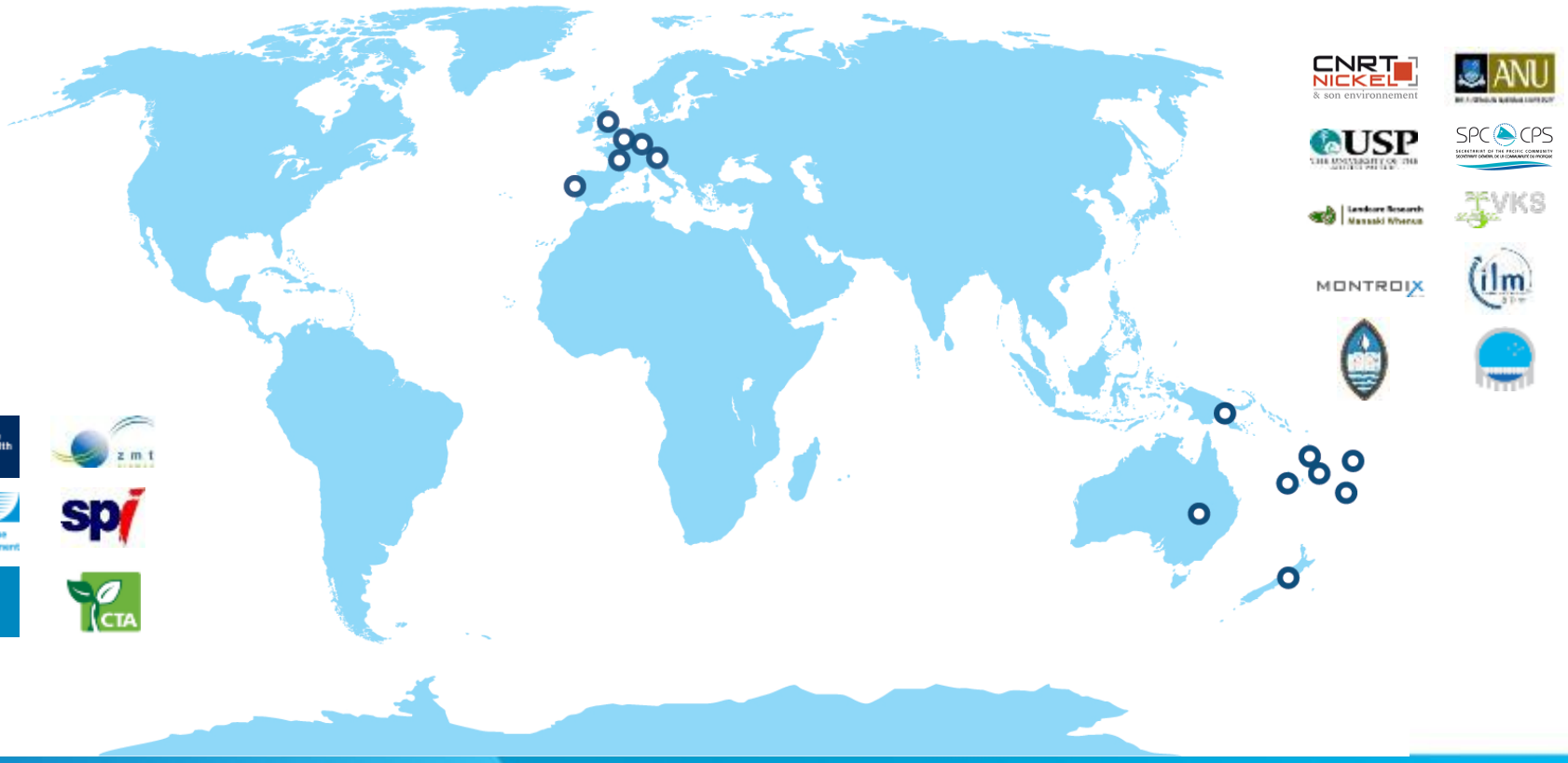
Thank you



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