The European Research Council

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The ERC Scientific Strategy

Barbara Ensoli

Member of the ERC Scientific Council

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Rome, September 14, 2016

The European Research Council (ERC)

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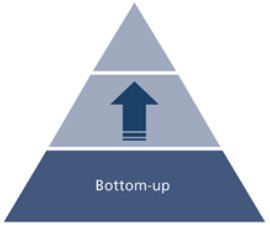

ERC supports excellence in frontier research through a bottom-up, individual-based, pan-European competition

- **Scientific governance**: independent **Scientific Council** with 22 members including the ERC President; ***full authority over funding strategy***
- Supported by the **ERC Executive Agency** (autonomous)
- **Excellence** as the only criterion

Budget: € 13 billion (2014-2020) - 1.9 billion €/year
€ 7.5 billion (2007-2013) - 1.1 billion €/year

ERC Structure

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The ERC Scientific Council

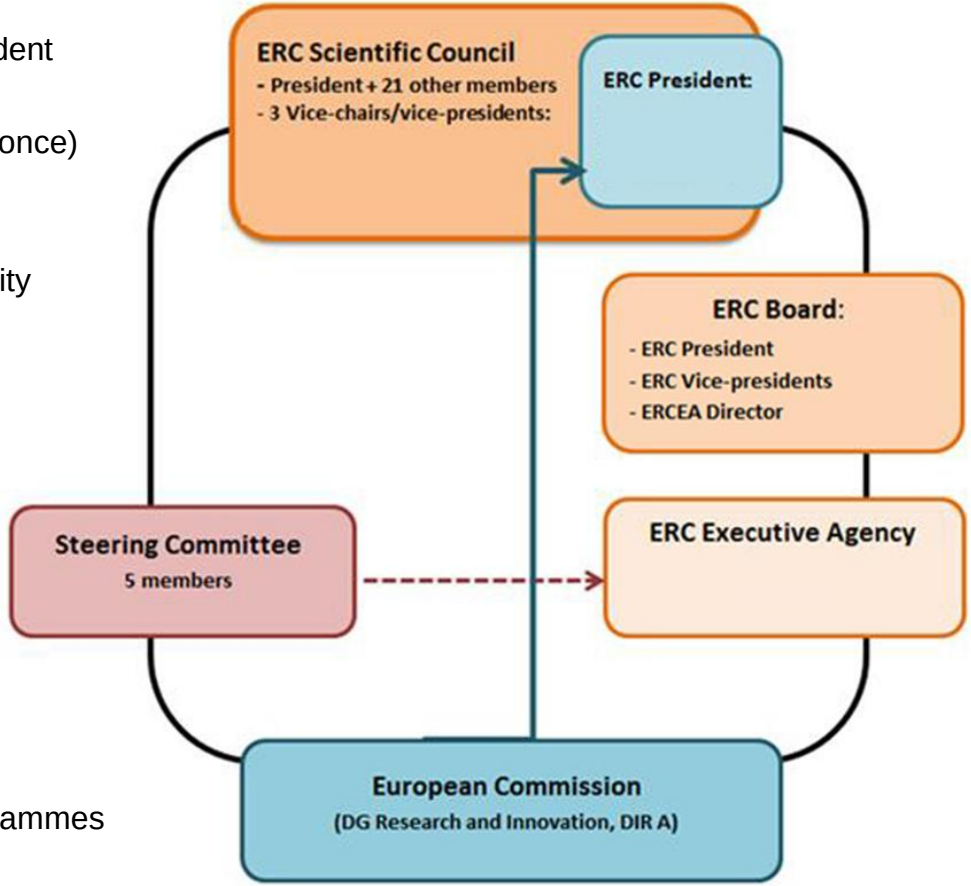
- 22 prominent researchers proposed by an independent identification committee
- Appointed by the Commission (4 years, renewable once)
- Establishes overall scientific strategy;
- Controls quality of operations and management
- Ensures communication with the scientific community

The ERC Executive Agency

- Executes annual work programme
- Implements calls for proposals
- Organises peer review evaluation
- Establishes and manages grant agreements
- Administers scientific and financial aspects
- Carries out communications activities

The European Commission

- Provides financing through the EU framework programmes
- Guarantees autonomy of the ERC
- Assures the integrity and accountability of the ERC
- Adopts annual work programmes



ERC Scientific Governance

Horizon 2020 SP
Article 7
Scientific Council

2. The Scientific Council shall establish:

(a) the overall strategy for the ERC;
(b) work programmes;
(c) the methods and procedures for peer review and proposal evaluation;
(d) its position on any matter which may enhance achievements and impact of the ERC;
(e) a code of conduct addressing, inter alia, the avoidance of conflict of interests.

What is special about the ERC?

Standing Committees and Working Groups support the development of the ERC strategy

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- **Support for the individual scientist – no networks!**
  - ✓ Irrespective of nationality, gender or age
  - ✓ Host organisation located in EU or in Associated Countries
- **Global peer-review**
  - ✓ High-level scientists evaluators (Panel Members)
- **Scientific Quality is the only criterion**
  - ✓ Individual team + research project
- **All fields of science and scholarship are eligible**
  - ✓ Investigator-driven, no predetermined subjects (bottom-up)
  - ✓ Support of frontier research in all fields of science and humanities
- **Attractive grants**
  - ✓ Significant, flexible grants, up to five years
  - ✓ Under full control of the Principal Investigator

Creative Freedom to Individual Grantees

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ERC offers independence, recognition & visibility

- to work on a research topic of **own choice**, with a team of **own choice**
- to gain true **financial autonomy** for 5 years
- to negotiate with the host institution the **best conditions** of work
- to attract **top team members** (EU and non-EU) **and collaborators**
- to move with the grant to any place in Europe if necessary (**portability of grants**)
- **to attract additional funding and gain recognition;** ERC is a quality label

ERC H2020 Budget

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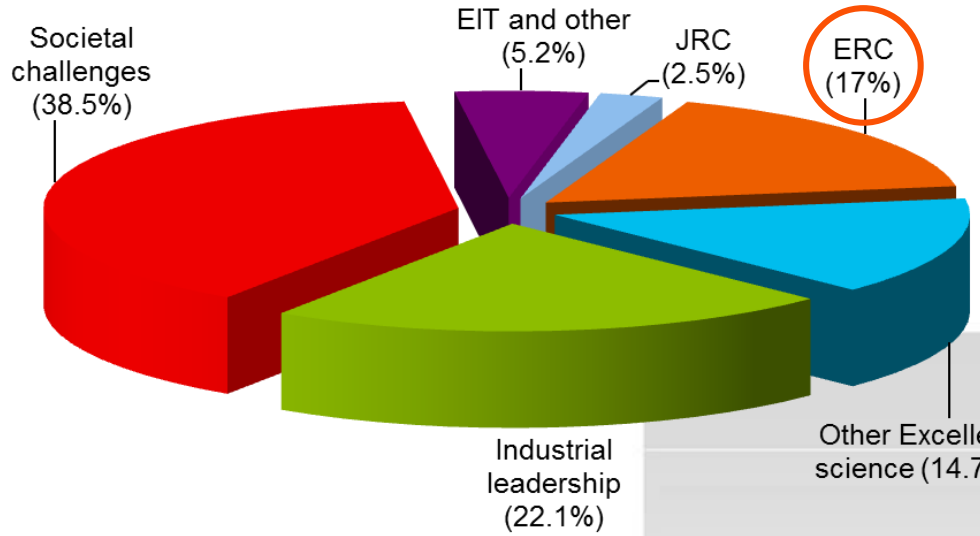
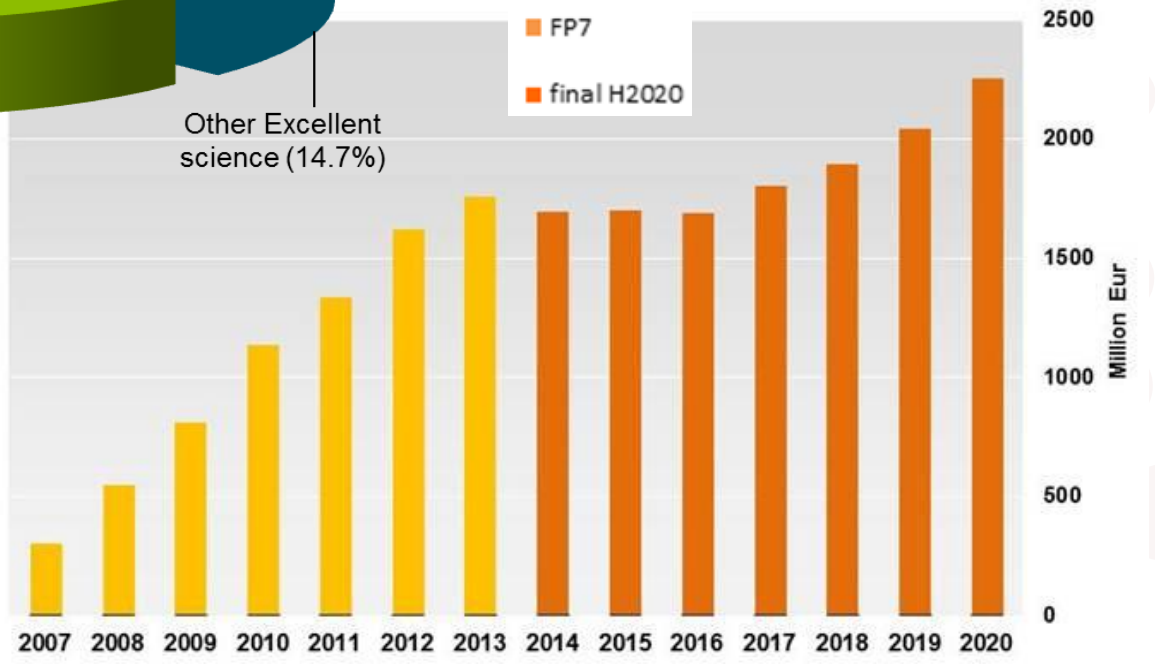


ERC Budget
€ 13 billion



ERC Grant Schemes

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Starting Grants

starters
(2-7 years after PhD)
up to € 1.5 Mio
for 5 years

Consolidator Grants

consolidators
(7-12 years after PhD)
up to € 2 Mio
for 5 years

Advanced Grants

track-record of significant research achievements in the last 10 years
up to € 2.5 Mio
for 5 years

Proof-of-Concept

bridging gap between research - earliest stage of marketable innovation
up to €150,000 for ERC grant holders

Evaluation Criteria

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Scientific Quality aiming for Excellence, as sole criterion, to apply to:

Research Project

- ➔ Frontier Research
- ➔ Scientific Approach

Principal Investigator (PI)

- ➔ Skills
- ➔ Experience
- ➔ Creativity

Who Evaluates the Proposals?

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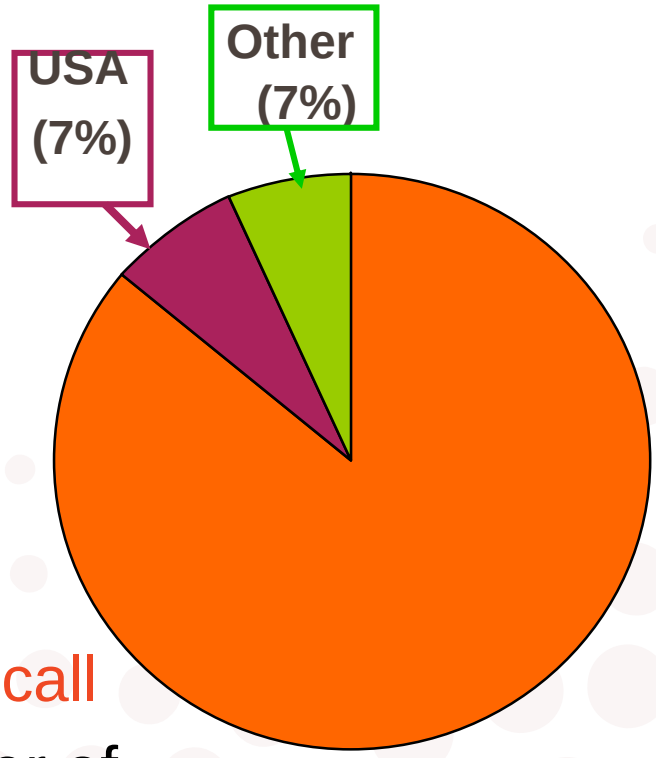
- **Panel members**:

  typically 600 PMs involved per call

  - ➔ High-level scientists
  - ➔ Recruited by ScC from all over the world
  - ➔ About 10-15 members plus chair person



- **Remote Referees**: typically 2000 per call
  - ➔ Each evaluates only a small number of proposals

Evaluation Panel Structure (WP2016)

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Life Sciences

- LS1 Molecular and Structural Biology and Biochemistry
- LS2 Genetics, Genomics, Bioinformatics and Systems Biology
- LS3 Cellular and Developmental Biology
- LS4 Physiology, Pathophysiology and Endocrinology
- LS5 Neurosciences and Neural Disorders
- LS6 Immunity and Infection
- LS7 Diagnostic Tools, Therapies and Public Health
- LS8 Evolutionary, Population and Environmental Biology
- LS9 Applied Life Sciences and Non-Medical Biotechnology

Physical Sciences & Engineering

- PE1 Mathematics
- PE2 Fundamental Constituents of Matter
- PE3 Condensed Matter Physics
- PE4 Physical and Analytical Chemical Sciences
- PE5 Synthetic Chemistry and Materials
- PE6 Computer Science and Informatics
- PE7 Systems and Communication Engineering
- PE8 Products and Process Engineering
- PE9 Universe Sciences
- PE10 Earth System Science

Social Sciences and Humanities

- SH1 Individuals, Markets and Organisations
- SH2 Institutions, Values, Environment and Space
- SH3 The Social World, Diversity, Population
- SH4 The Human Mind and Its Complexity
- SH5 Cultures and Cultural Production
- SH6 The Study of the Human Past

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ERC Evaluation process : Submission of proposals

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Single submission

- one deadline per Call
- to a targeted panel of your choice
- electronically only
- proposals have two parts:
- Part A: administrative forms
- Part B: scientific proposal itself (pdf)
  - Step 1: Look at only Part B1
  - Step 2: Look at Part B1 + B2

Evaluation of proposals

Evaluation procedure

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STEP 1

Remote assessment by Panel members of **section 1 – Synopsis and PI**

Panel meeting

Proposals retained for step 2

STEP 2

Remote assessment by Panel members and reviewers of **full proposals**

Panel meeting + interview (StG+ CoG)

Ranked list of proposals

Feedback to applicants

Redress

Panel meeting – Step 1 Scoring

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Result of **Step 1**:

A. Proposal is of sufficient quality to pass to Step 2 of the evaluation

B. Proposal is of high quality but not sufficient to pass to Step 2 of the evaluation

C. Proposal is not of sufficient quality to pass to Step 2 of the evaluation

Feedback to applicants
Step 2 results

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Result of **Step 2**:

A. Proposal fully meets the ERC's excellence criterion and is recommended for funding <u>if sufficient funds are available</u>

B. Proposal meets some but not all elements of the ERC's excellence criterion and will not be funded

*At the end of both steps, applicants will be informed about the **ranking range** of their proposal out of all proposals evaluated by the panel*

Resubmission restrictions

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- Ever increasing number of applications causes low success rates and high panel workload
  - those who receive a B at Step 1 have to wait out one year
  - those who receive a B at Step 2 can apply next year
  - those who receive a C will have to wait out two years

ERC Funded Projects by Country of HI

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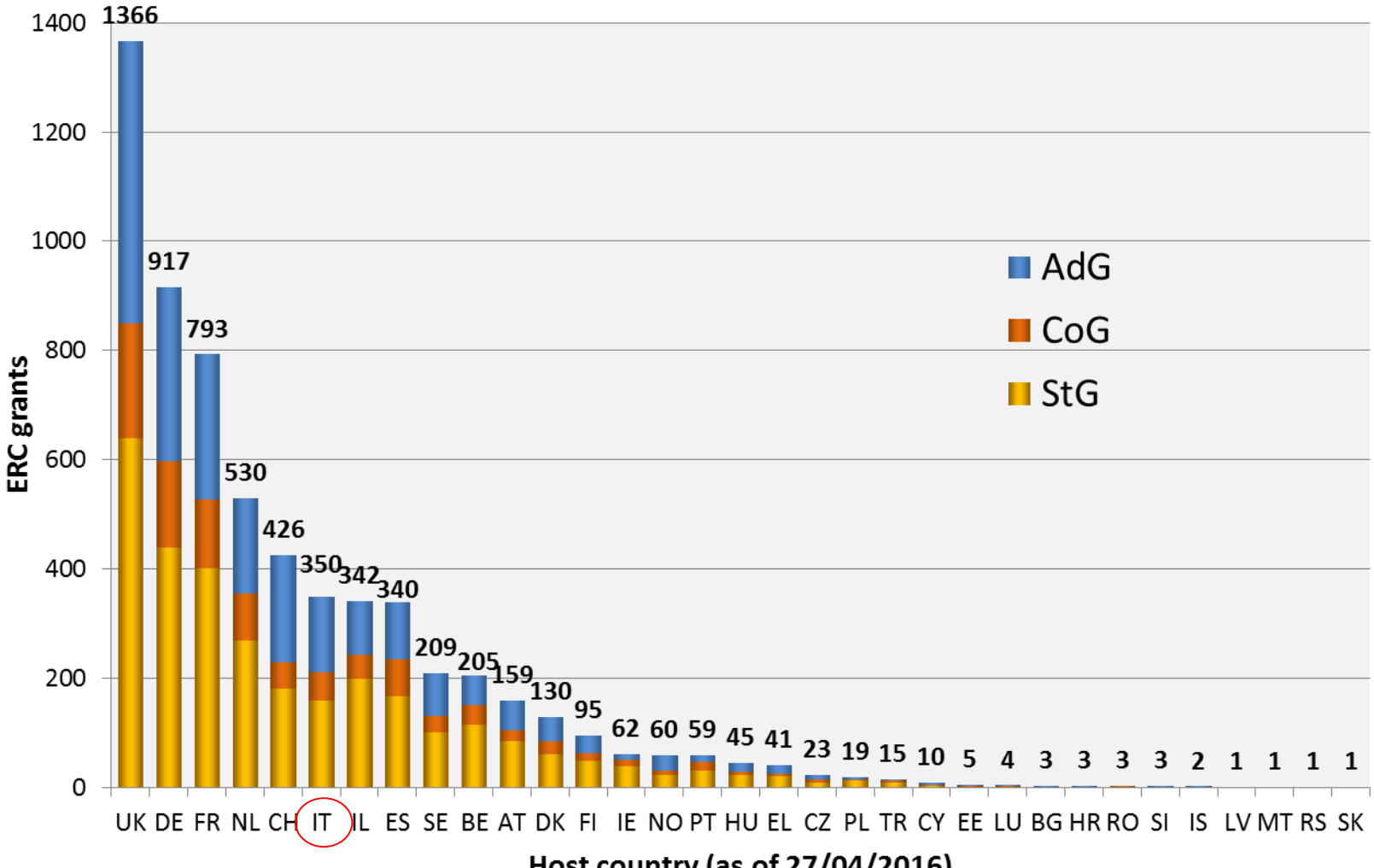

Priority to Young Scientists

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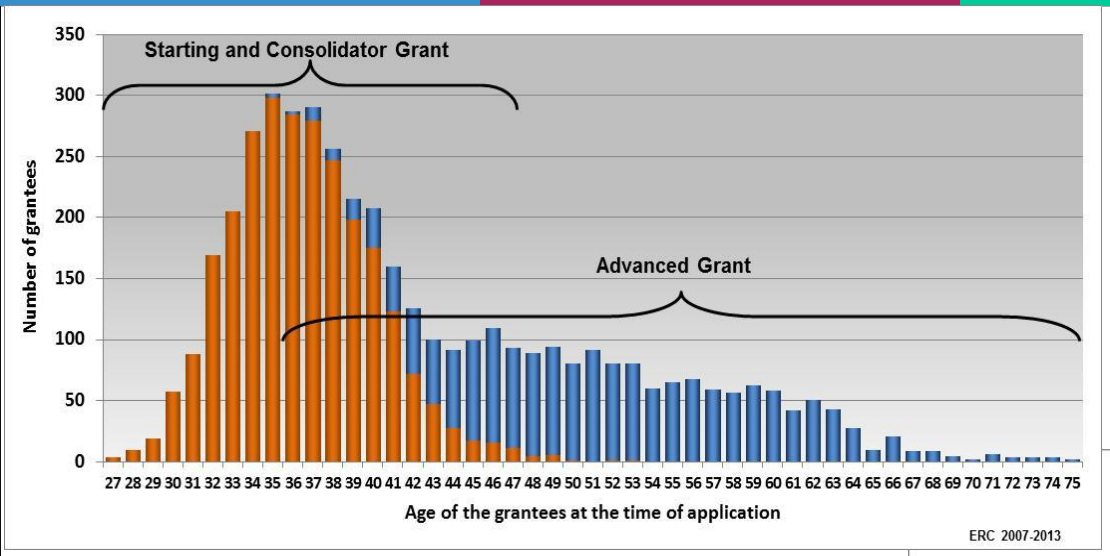
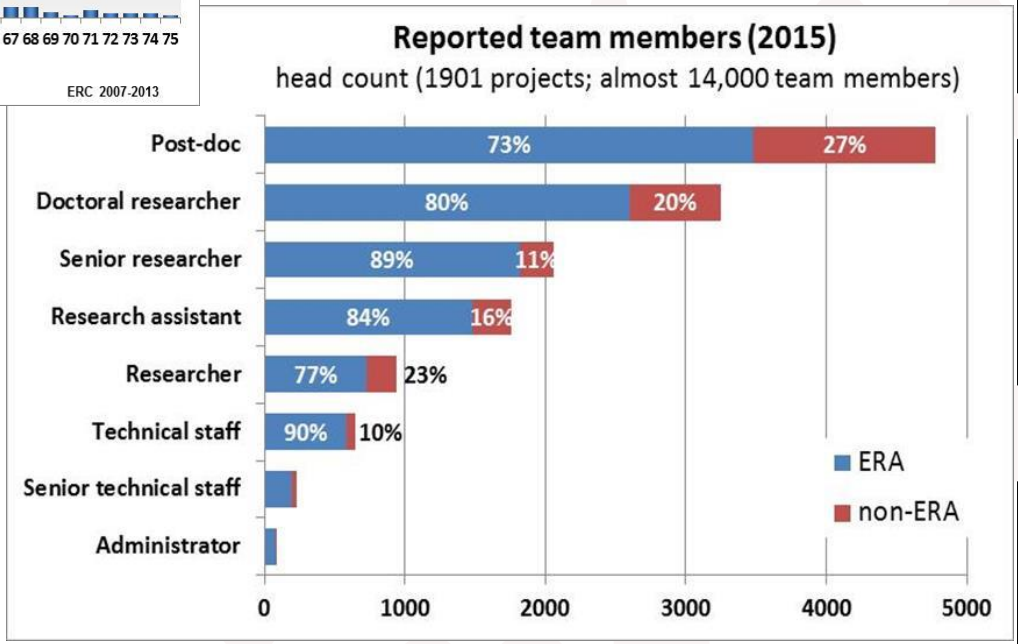


+ 30 000 PhD and post-doc researchers working in ERC teams.

Two-thirds of ERC grants to early-stage Principal Investigators.



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Researchers career development and complementary funding schemes

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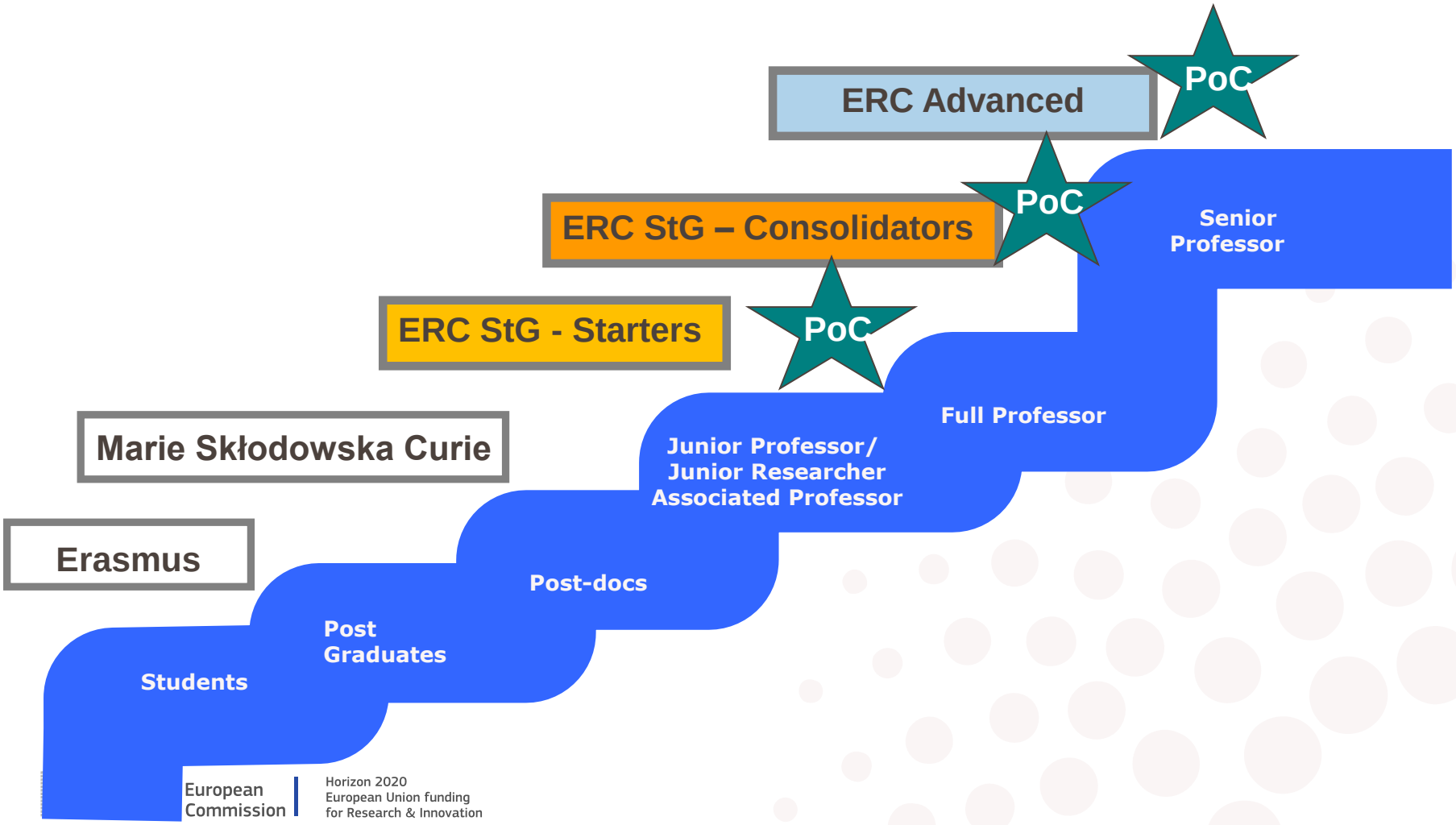

Standing Committees & Working groups support the development of the ERC strategy

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- **Standing committees:** two subcommittees to deal with **conflict of interest issues** and to steer and control the **selection of reviewers and panellists**.

- **Working groups:** non-permanent structures created ad-hoc to address specific **tasks of strategic importance**

Both **Standing committees** and **Working groups** report to the Scientific Council plenary meetings

ERC Scientific Council
Standing Committees & Working groups

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CoIME (Conflict of Interest & Research integrity)

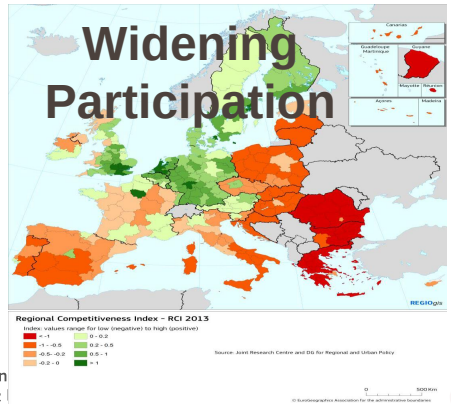
CoP (Committee on Panels)

Gender balance

Open Access

Strengtening Internationalisation

Widening Participation



Innovation and relations with industry

Key Performance Indicators

ERC Standing Committee on Conflict of interest & Research integrity (CoIME)

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- ✓ **Formulates guidelines on conflict of interest, fraud and ethical issues**
- ✓ Clarifies criteria to manage ethical concerns
- ✓ Consultative role in cases of scientific misconduct within ERC
- ✓ Promotes culture of research integrity

❖ ERC Strategy on Scientific Misconduct (October 2012)

- **HIs have primary responsibility for:**
  - ➔ detection of scientific misconduct
  - ➔ investigation
  - ➔ adjudication
- **ERC Recommendation**: all ERC HIs should have structures in place to:
  - ➔ uphold scientific integrity
  - ➔ deal with all cases coming to ERC attention
  - ➔ report to the ERC on actions taken

ERC Standing Committee on Committee on Panels (CoP)

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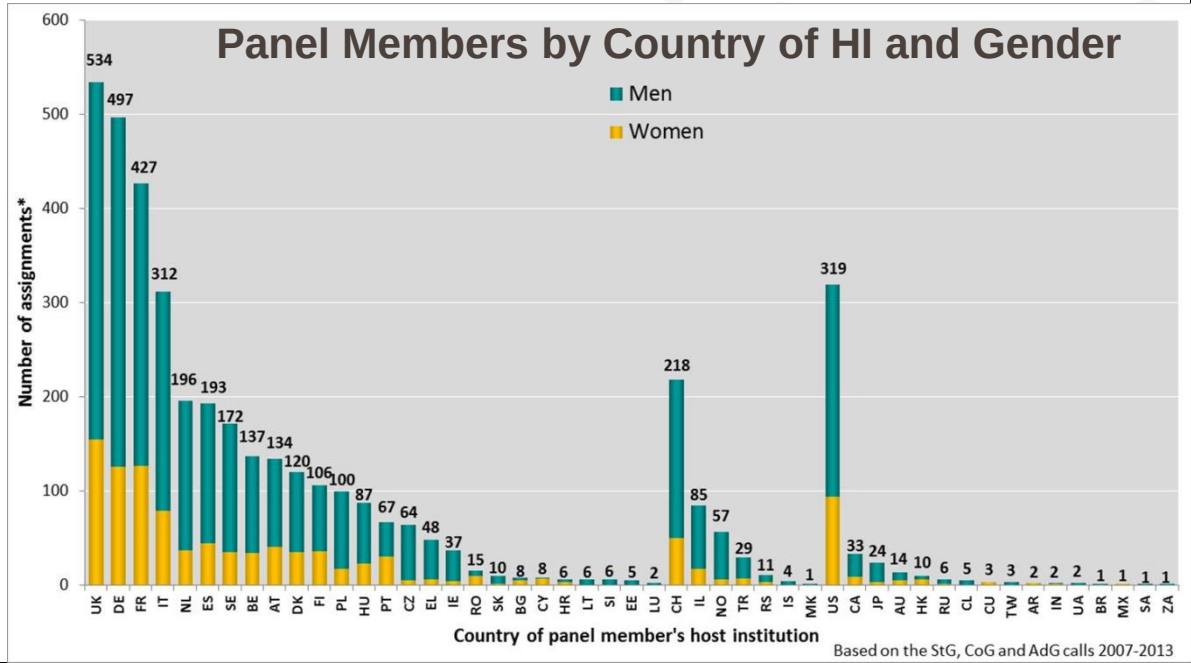
- **Formulates policies & procedures for selecting evaluators**
- Develops norms for the functioning of the **peer evaluation system and panels**
- Guides the setting up and monitoring of a **data base of experts**
- Makes proposals for the **composition of panels**



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Gender Balance Working Group

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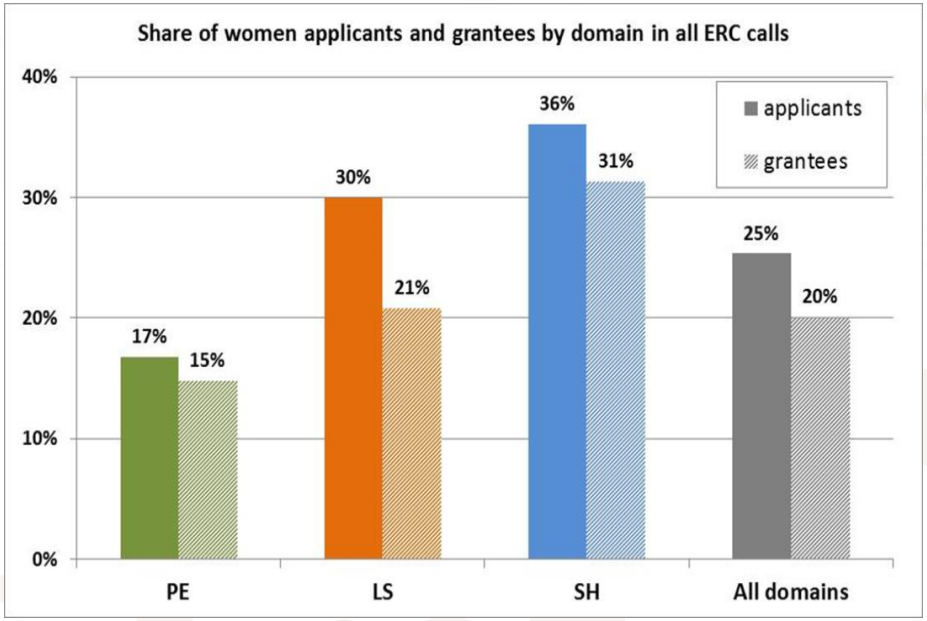
- **Ensures that male and female researchers are aware of what ERC grants offer and promotes gender equality by:**

  - ✓ raising awareness among both male and female researchers of the opportunities of ERC grants;
  - ✓ giving equal opportunities and treatment to men and women;
  - ✓ monitoring gender distribution within the ERC's peer review system;
  - ✓ taking into account the gender dimension in all ERC grants;
  - ✓ Identifying and removing potential gender bias.

- **Gender Equality Plan 2007–2013**
- **Gender Equality Plan 2014-2020**



Gender Balance Working Group
Extensions of Eligibility Window

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Extensions of eligibility window possible for StG and CoG for documented situations of:

- Maternity leave – 18 months per child
- Paternity leave – effective time taken off
- Military service
- Medical speciality training
- Caring for seriously ill family members

- **No limit to the total extension**

Open Access Working Group

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- **Supports the implementation of open access policy to the results from ERC funded research** *(publications and research data)*

- ✓ Workshops with stakeholders to identify gaps (SH domain, Research data management and sharing, OA to monographs, …)

- ✓ Supporting mechanisms for OA infrastructures (Europe PubMed Central, OAPEN, arXiv)

- **ERC Open Access Guidelines (latest revision: February 2016)**

The ERC considers that the most effective way of valorizing the results of ERC-funded grants for future research is to provide free online access to them.

Widening European Participation Working Group

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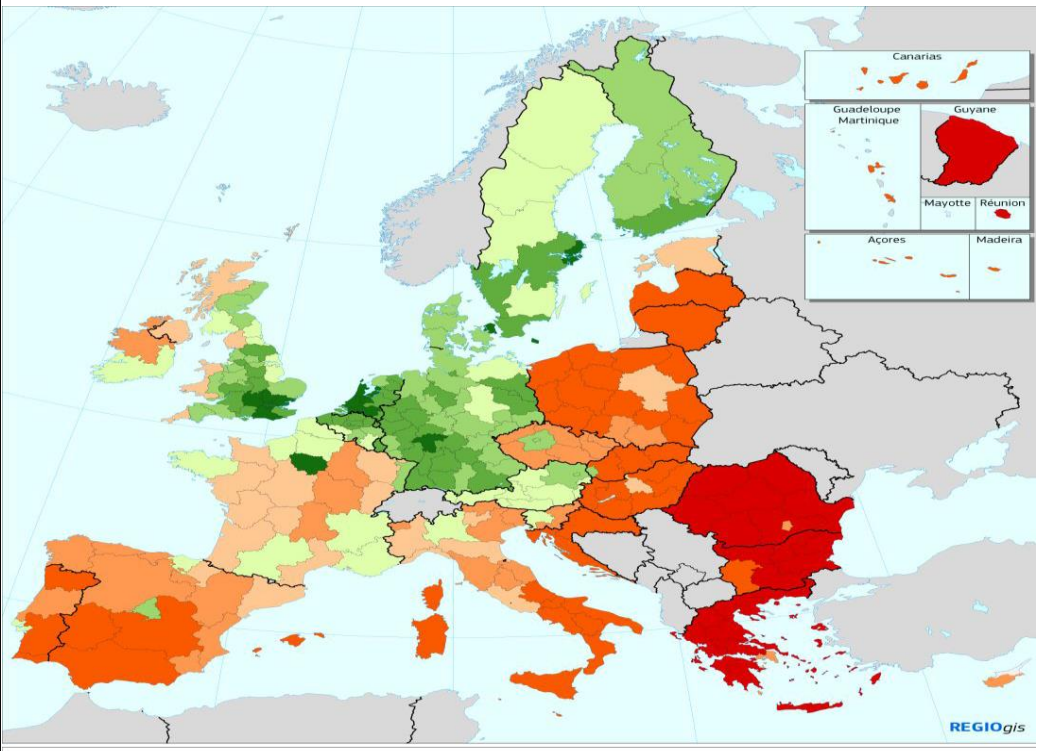

Regional Competitiveness Index – RCI 2013

Index: values range for low (negative) to high (positive)

< -1	0 - 0.2
-1 - -0.5	0.2 - 0.5
-0.5- -0.2	0.5 - 1
-0.2 - 0	> 1

Source: Joint Research Centre and DG for Regional and Urban Policy

0 500 Km

© EuroGeographics Association for the administrative boundaries

- ✓ **Contributes to an inclusive European culture of competitiveness in science:**
  - ✓ Increases participation in ERC calls from less research-performing regions
  - ✓ Facilitates scientific networking and good practices in supporting the very best researchers to successfully apply to the ERC.
- ✓ **Fellowship programmes (<u>NEW</u>)**
  - ✓ For potential applicants in visiting the teams of existing ERC-funded Principal Investigators (funded by the country of the applicant)

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Strengthening Internationalisation Working Group

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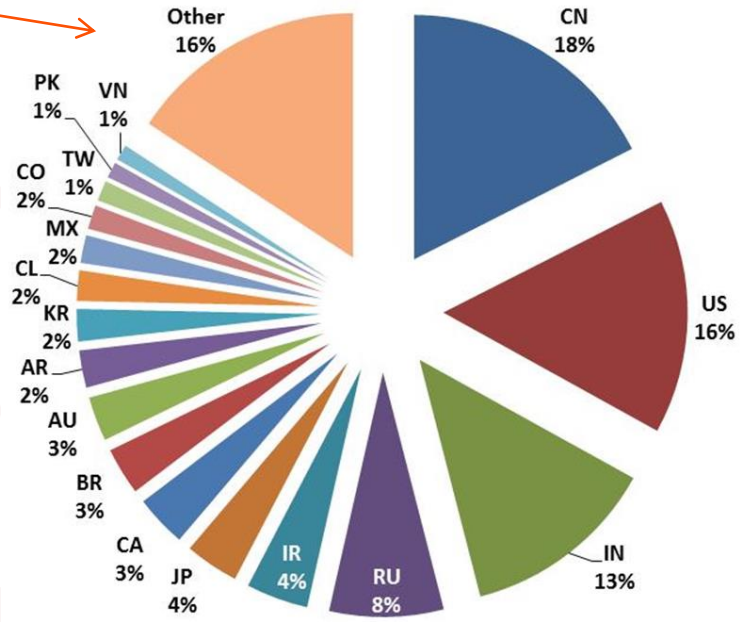
- **Increases the participation in ERC calls of researchers from countries outside of the EU by:**
  - ✓ Monitors the number of applications from third country nationals
  - ✓ Monitors ERC teams compositions

Non-ERA Principal Investigators	Starting and Consolidator grants	Advanced grants	Total grants
USA	121	78	199
Canada	43	9	52
Russia	29	8	37
Australia	29	4	33
India	31	2	33
Japan	18	1	19
China	16	0	16
New Zealand	9	4	13
Argentina	9	0	9
Other	42	7	49
Total	347	113	460

- ERC Implementing Arrangements with third countries
- ERC goes global campaign (2012-2015)
- ERC - Open to the World (started in 2016)



Key performance indicators (KPIs) Working Group

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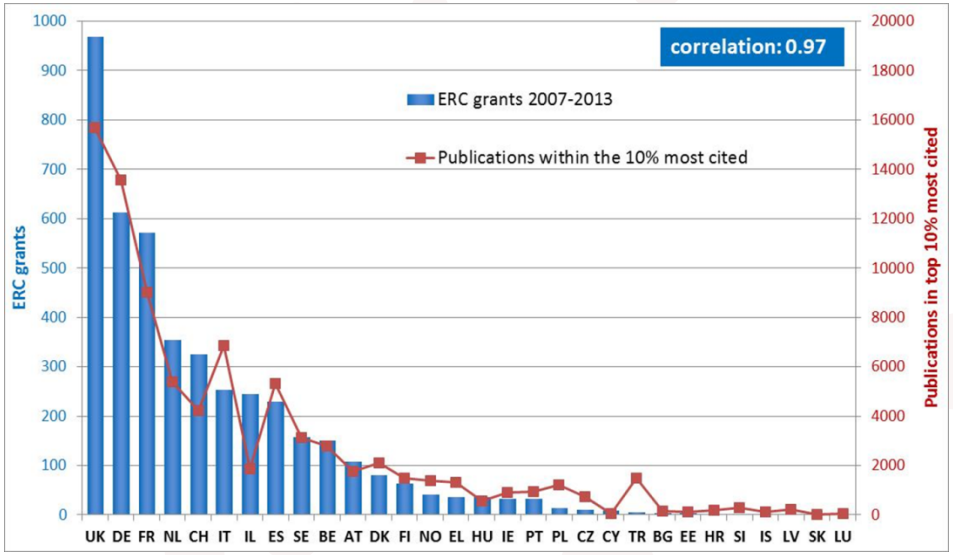
- **Develops indicators for monitoring and evaluating ERCs accomplishment of its mission and supports short-, medium- and long-term policies of ERC:**

- ✓ Defines a methodology for the ERC main indicator "top-1% highly cited publications"
- ✓ Develops other headline indicators to assess frontier research
- ✓ Designs a methodology for the ex-post assessment
- ✓ Improves the ex-ante selection of frontier research

- **ERC Monitoring and Evaluation Strategy** endorsed by the Scientific Council in June 2009 and focusing on:
  - direct impact
  - structural impact
  - socio-economic impact
  - operational performance



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Innovation & relations with industry Working group

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- **Supports the ERC in its relationship with the business sectors:**
  - ✓ Evaluation of ERC's contribution to innovation and socio-economic growth in EU
  - ✓ Fostering of frontier research in collaboration with business sectors
  - ✓ Establishing relations with industry
  - ✓ Design, development, implementation and follow-up of the Proof-of-Concept (PoC) scheme

- **ERC Proof of Concept**

call scheme launched in 2011

- ➢ Helping ERC grant-holder to bridge the gap between research and earliest stage of innovation
- ➢ Supporting grant-holders during the pre-demonstration phase
- ➢ Up to 150.000 Euro per grant

ERC-funded ideas should not miss future industrial opportunities and societal benefits

	2011	2012	2013	TOTAL in FP7
Submitted	151	143	292	586
Evaluated*	139	120	279	538
Funded	51	60	67	178

	2014	2015
Submitted	442	339
Evaluated*	426	323
Funded	121	135

* withdrawn and ineligible proposals not taken into account

* withdrawn and ineligible proposals not taken into account

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ERC Proof of Concept Scheme (PoC)

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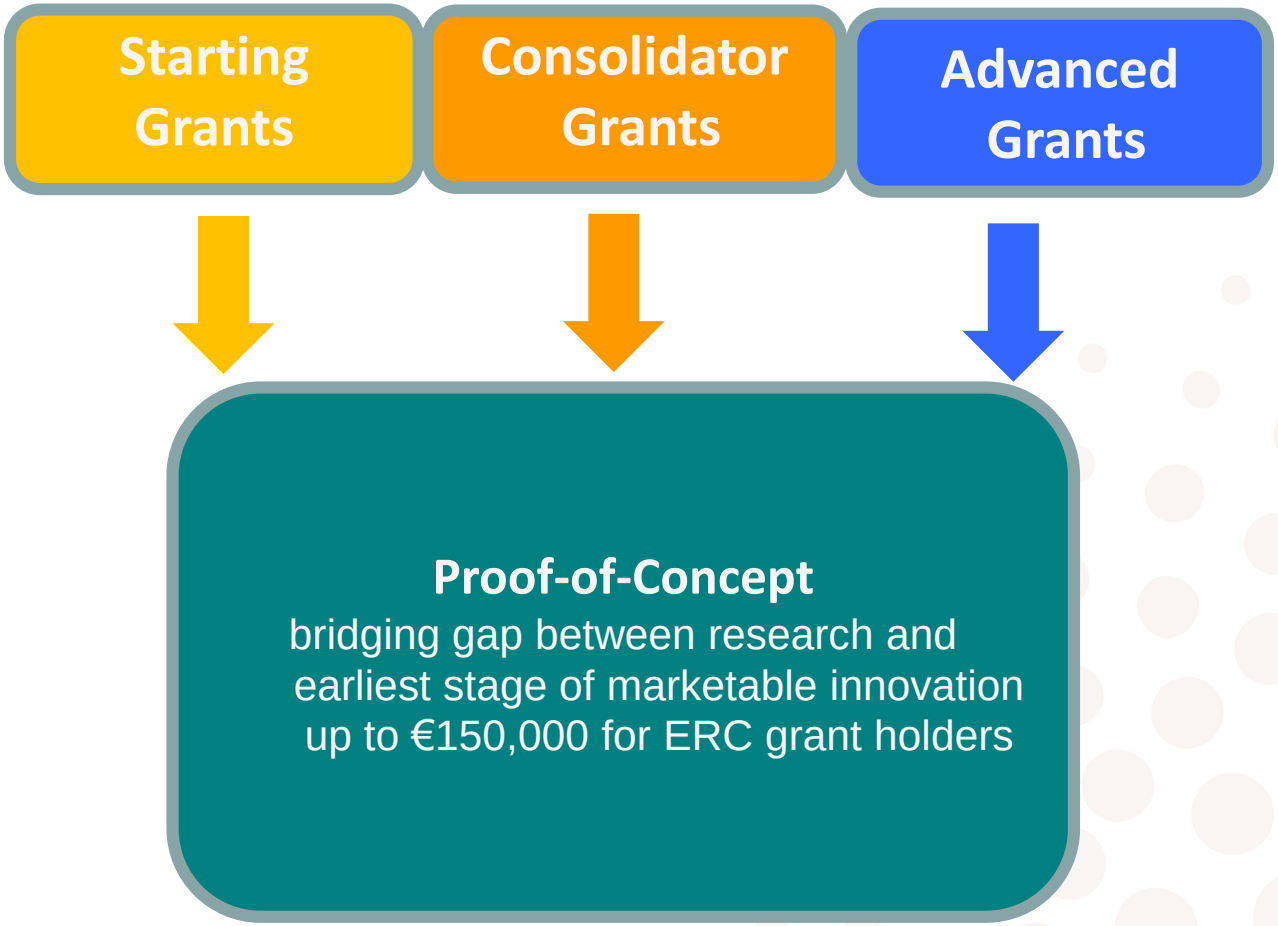

PoC – what is it?

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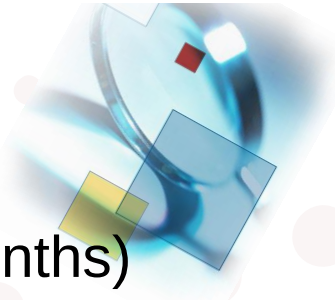
Who can apply: **Holders of an ERC grant**

What for: technical validation, market research, IP strategy, seeking business opportunities



Amount: up to **€150,000** per grant (**18** months)
Total budget for 2015: € 20 million

Evaluation: Experts in technology transfer evaluate the **innovation potential** and the **business plan**

The role of ERC PoC funding in the valorisation process

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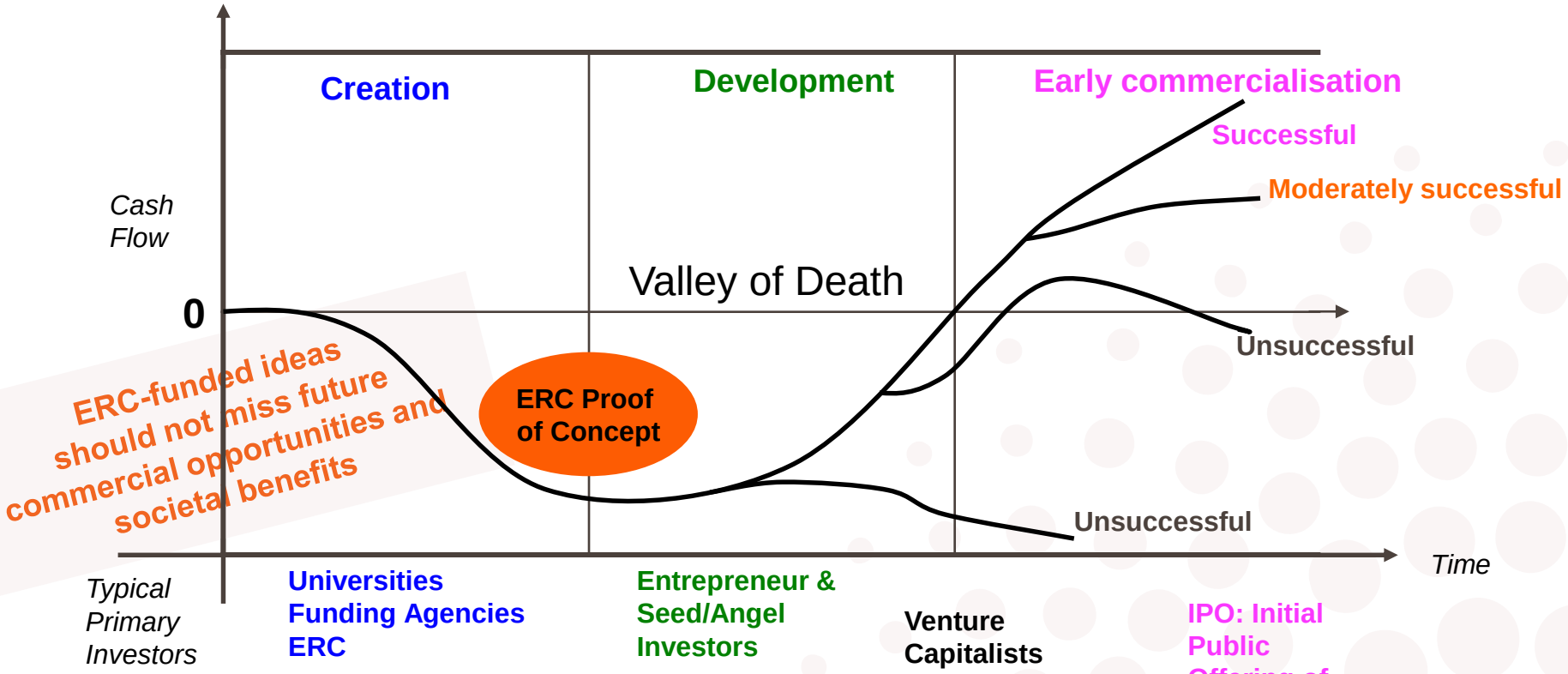

ERC grantees are rising stars in innovation (some successful PoCs)

- High-Resolution 3D Copying and Printing of Objects
- A new Cancer Diagnostic
- Innovative Solutions for Encapsulation
- Portable blood testing technology
- Mitigation of damage to historic buildings
- Therapeutic Applications of Light-Regulated Drugs
- Graphics and 3D visualization
- Gene-therapy for Parkinson
- Novel solution to Haematopoietic Stem Cell regeneration
- Tool assisting search for a parking place in cities
- Virtual Environments in Interior Design
- Fiber-top sensing technology

Recently created Working Groups

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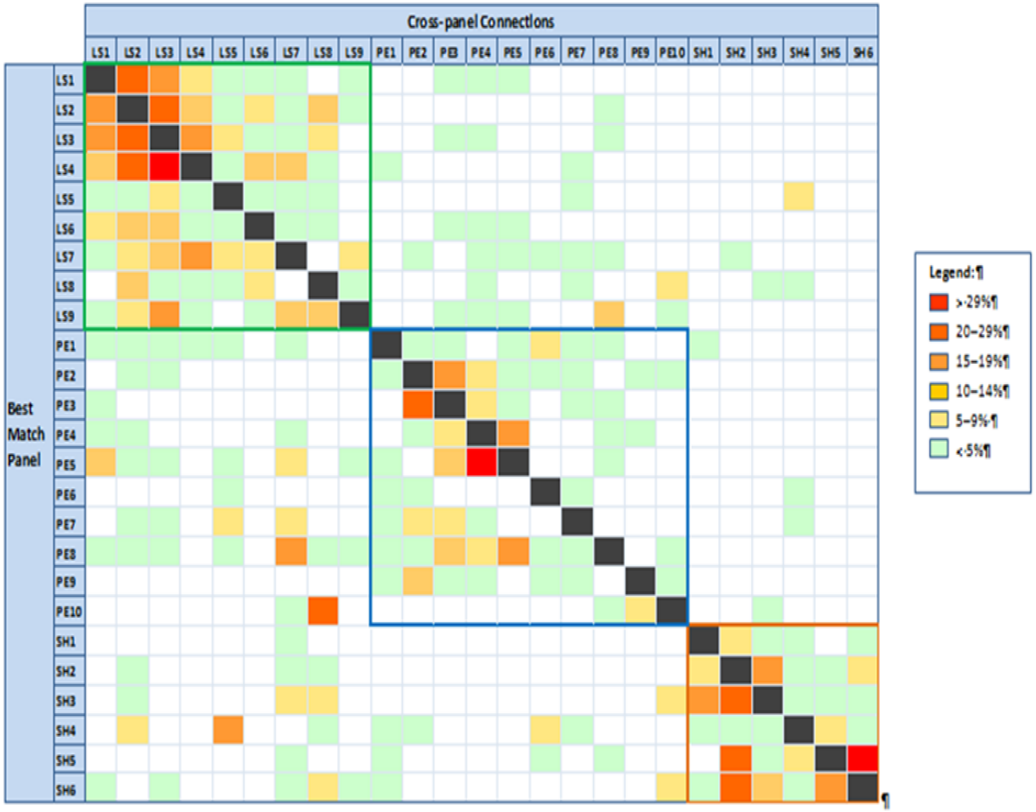
The Scientific Council may set up new Working Groups and discontinue existing ones in response to changing requirements

Recently created WGs

- **Science behind the projects Working Group**
- **Taskforce on Synergy Grants**
- **Taskforce on interdisciplinary grants**



European Commission

After 9 years a success story

Key figures

6,000
projects funded

40,000
researchers and experts employed in ERC teams

€10 billion

Scientific breakthroughs

21% | **50%**
of completed projects led to
Scientific breakthroughs | Major advances

Scientific impact

> 7%
articles among 1% most cited scientific journals

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Funding top talent from anywhere in the world

Supporting young talent

64%
of grants for early-career researchers

ERC as a model in Member States

15
EU countries set up ERC-like structures/funding schemes

Prestigious prizes including

5 Nobel Prizes

5 Wolf Prizes

3 Fields Medals

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ERC KEY MILESTONES

March 2004 – The European Council agrees on the need for an EU funding scheme for excellent basic research

October 2005 – The ERC Scientific Council meets for the first time

February 2007 – The ERC is formally established and launched in Berlin

June 2010 - The ERC has funded 1,000 top researchers

2004 2005 2007 2009 2010

April 2005 – The Commission proposes the creation of the ERC, funded through the EU's Seventh Framework Programme

April 2007 - First ERC call for proposals

July 2009 – The ERC is reviewed by an independent expert panel.

October 2010 – First time an ERC grantee wins Nobel Prize (Physics)

July 2011 – A dedicated task force reflects on the ERC's future

2012 - The ERC celebrates 5 years of existence. For the second time, an ERC grantee wins a Nobel Prize (Physics)

January 2013 - The ERC participates, for the first time, in the World Economic Forum in Davos, Switzerland

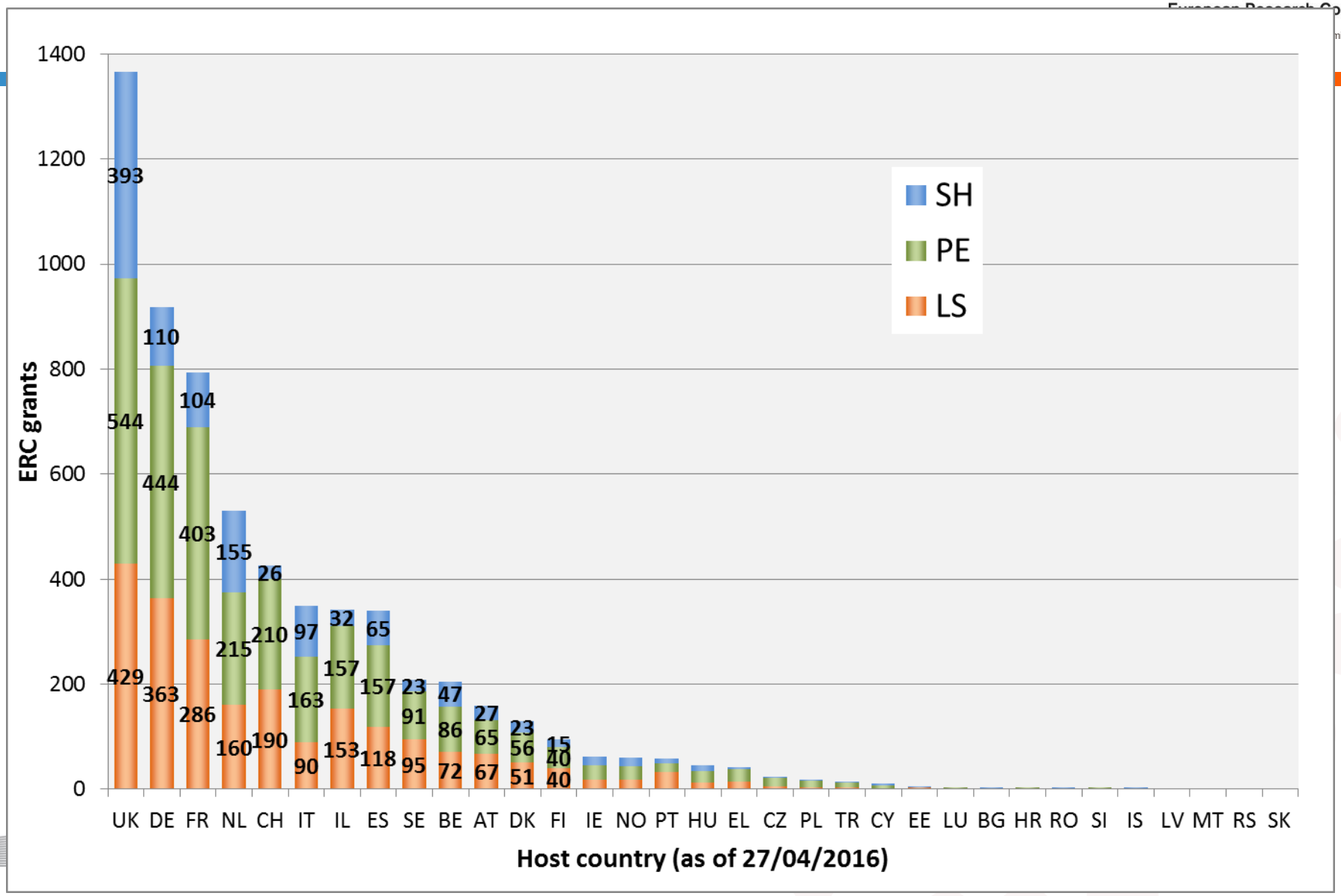
2015 - The ERC celebrates its 5000th grantee funded

2011 2012 2013 2014 2015

July 2012 - The ERC and US National Science Foundation (NSF) conclude a pioneering agreement, encouraging early-career NSF researchers to join ERC grantees' teams in Europe. Similar agreements with other countries follow in the coming years.

2014 - Three ERC grantees win Nobel Prizes in Physiology/ Medicine and in Economic Sciences

ERC Funded Projects by Domain



ERC Starting Grants 2016
Grantees by Country of Host Institution & domain

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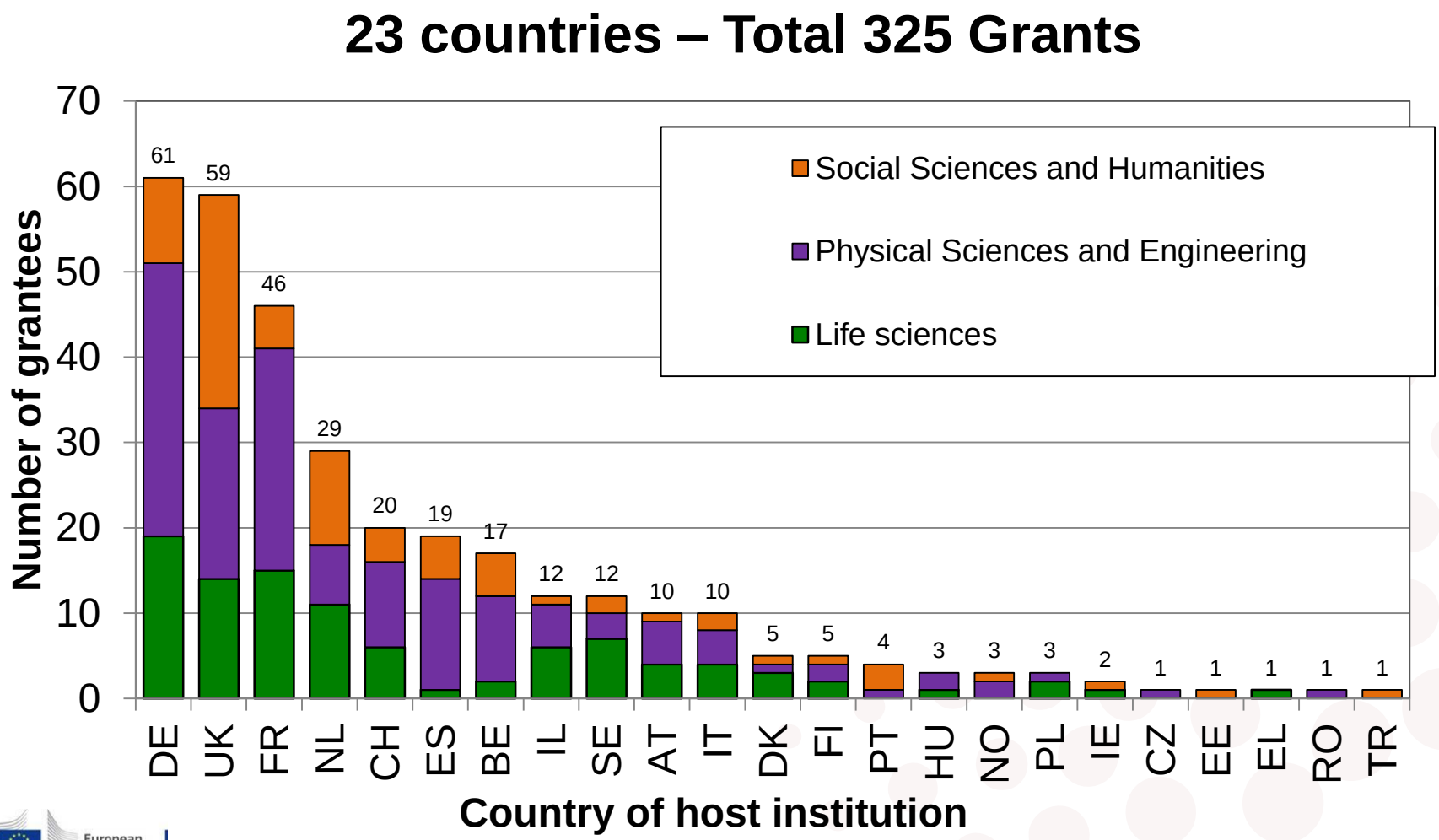

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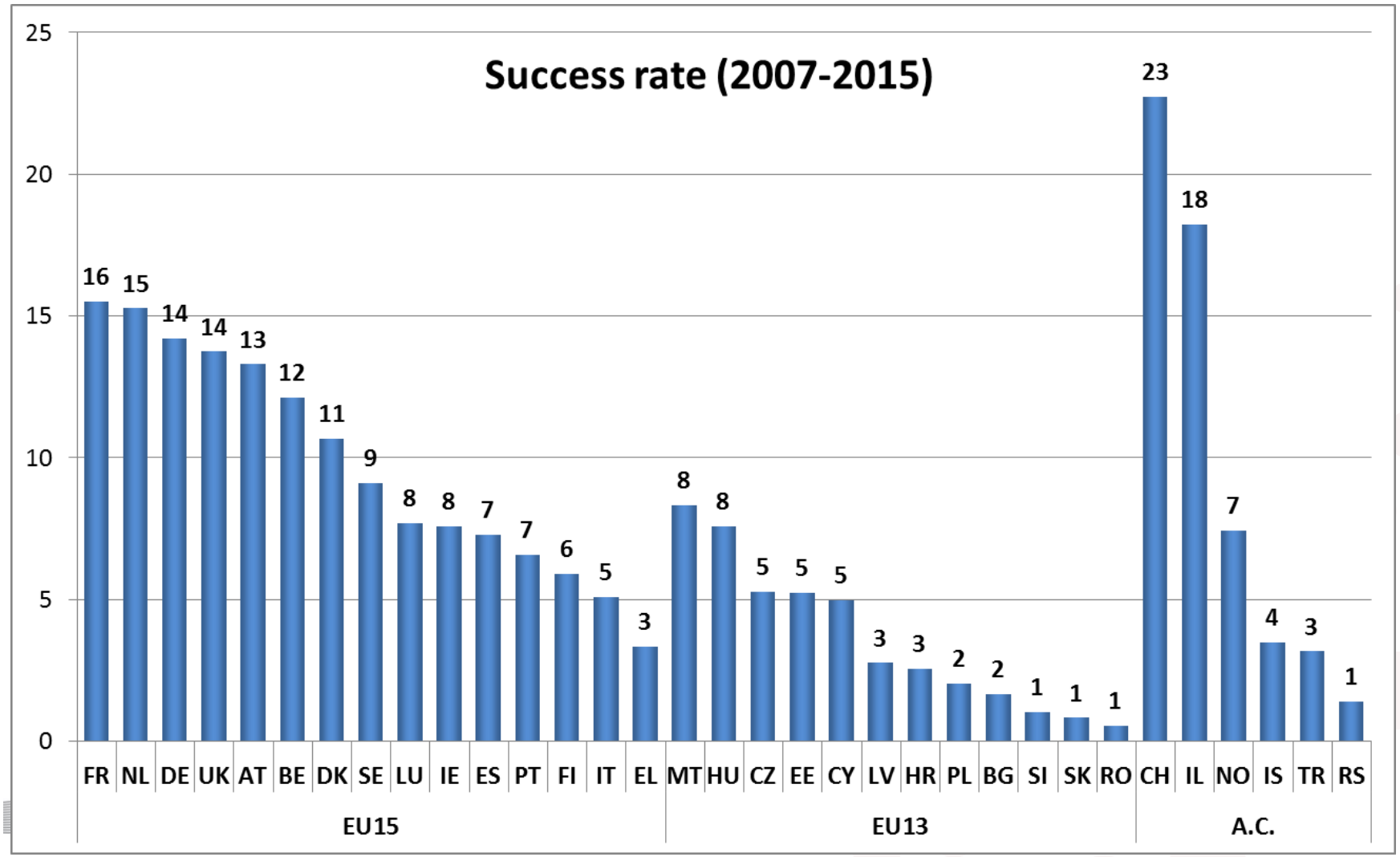
Success Rate by Country of HI

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