

# An Introduction to Horizon 2020

**Thies Wittig**

Deputy Team Leader  
Project "Turkey in Horizon 2020"

## Dr. Thies Wittig

- PhD in Computer Science
- 12 years in industrial research department (signal processing, artificial intelligence)
- In 1995 creation of own company IT Consult GmbH, Germany
- Since 1986 involved in international collaborative research projects, as researcher, manager, coordinator ...
- Long experience as EC proposal evaluator and project reviewer
- Until today involved in around 25 projects in Europe, Middle East, Far East and Balkan countries
- Since Sept 2015 deputy team-leader in "Turkey in H2020"

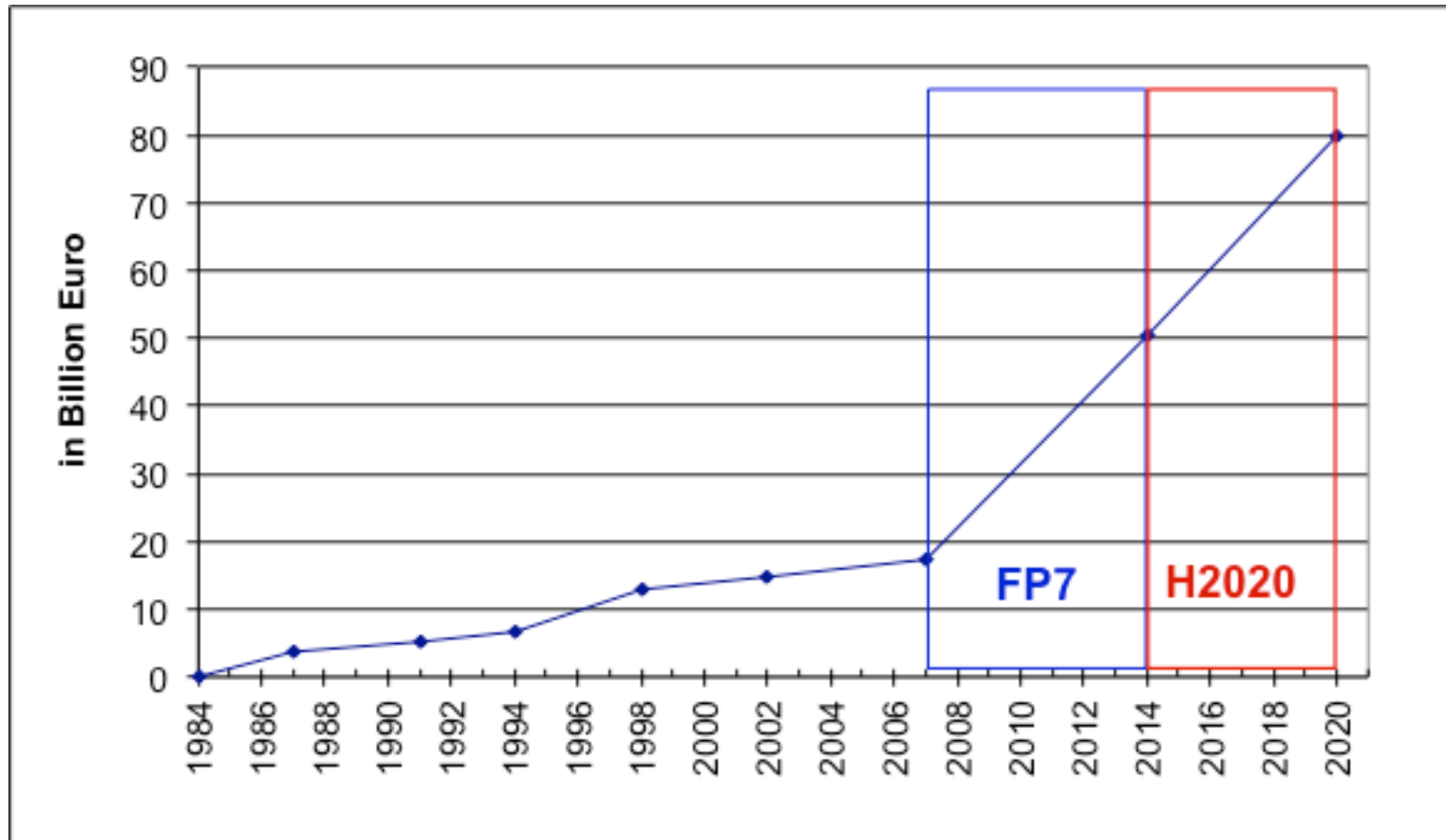
# Framework Programmes - Overview

EC funding for research, development, innovation:

- It started in the 80ies with a small funding programme
- Strong European economies had their large national funding programmes for R&D – smaller countries did not
- Gradual move for national funding to European funding:
  - Avoiding overlaps in R&D
  - Tying in smaller countries

# FP Budget Development

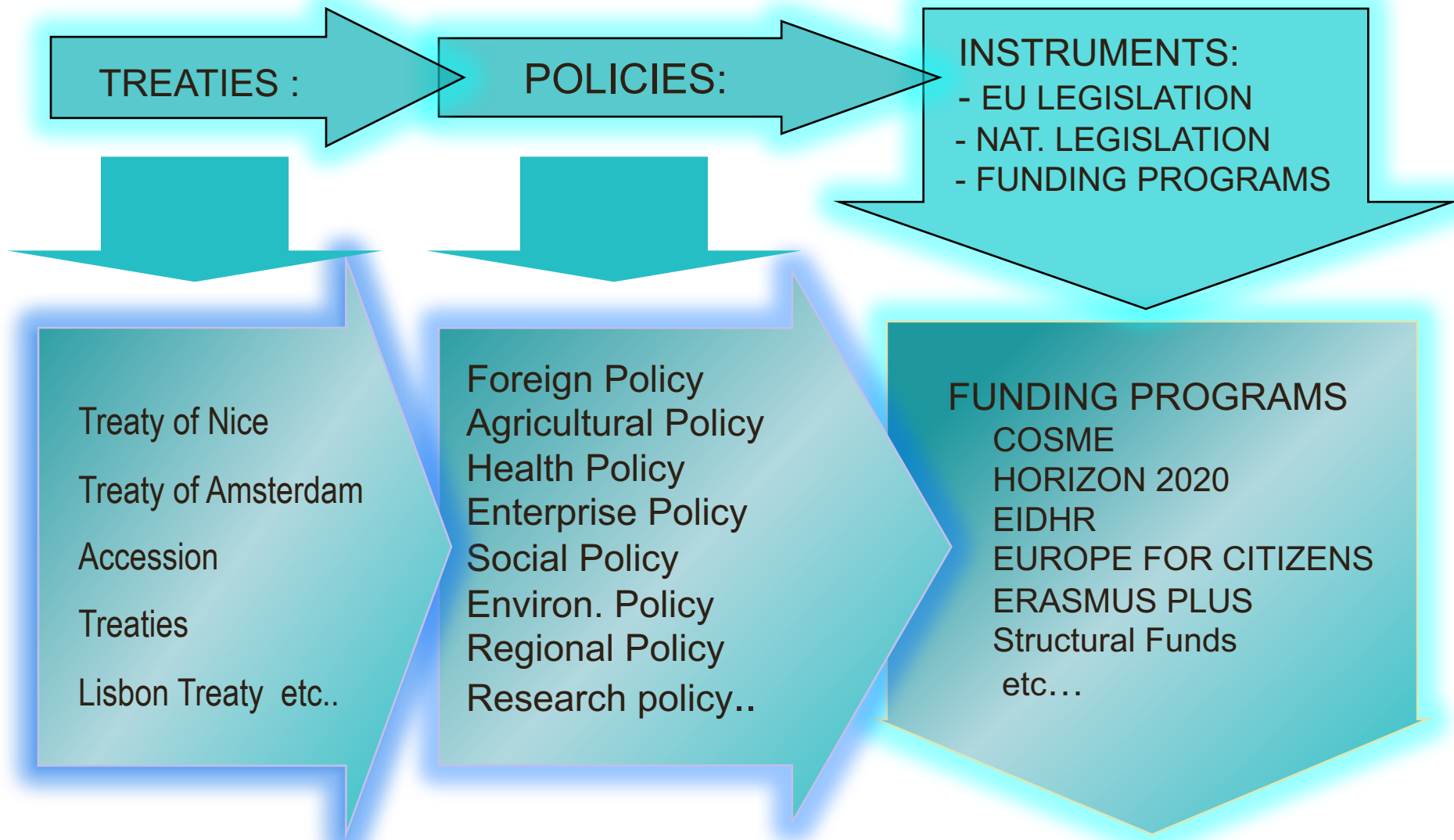
- Horizon 2020 has nearly €80 billion Euro of funding available over 7 years (2014 to 2020).



# Principles of EU R&D&I Activities

- Transnational collaboration (min. 3 partners/3 countries)
- Open to all: Industry, SMEs, Universities,...)
- Consortia selected via Calls for Proposals and evaluation procedures involving a set of multiple criteria and independent experts
- Strategic objectives - programme oriented
- Innovative, based on science & technology excellence
- Competitive - competition of the best teams in EU
- RTD results are the property of the participants

# How EU funding programmes work



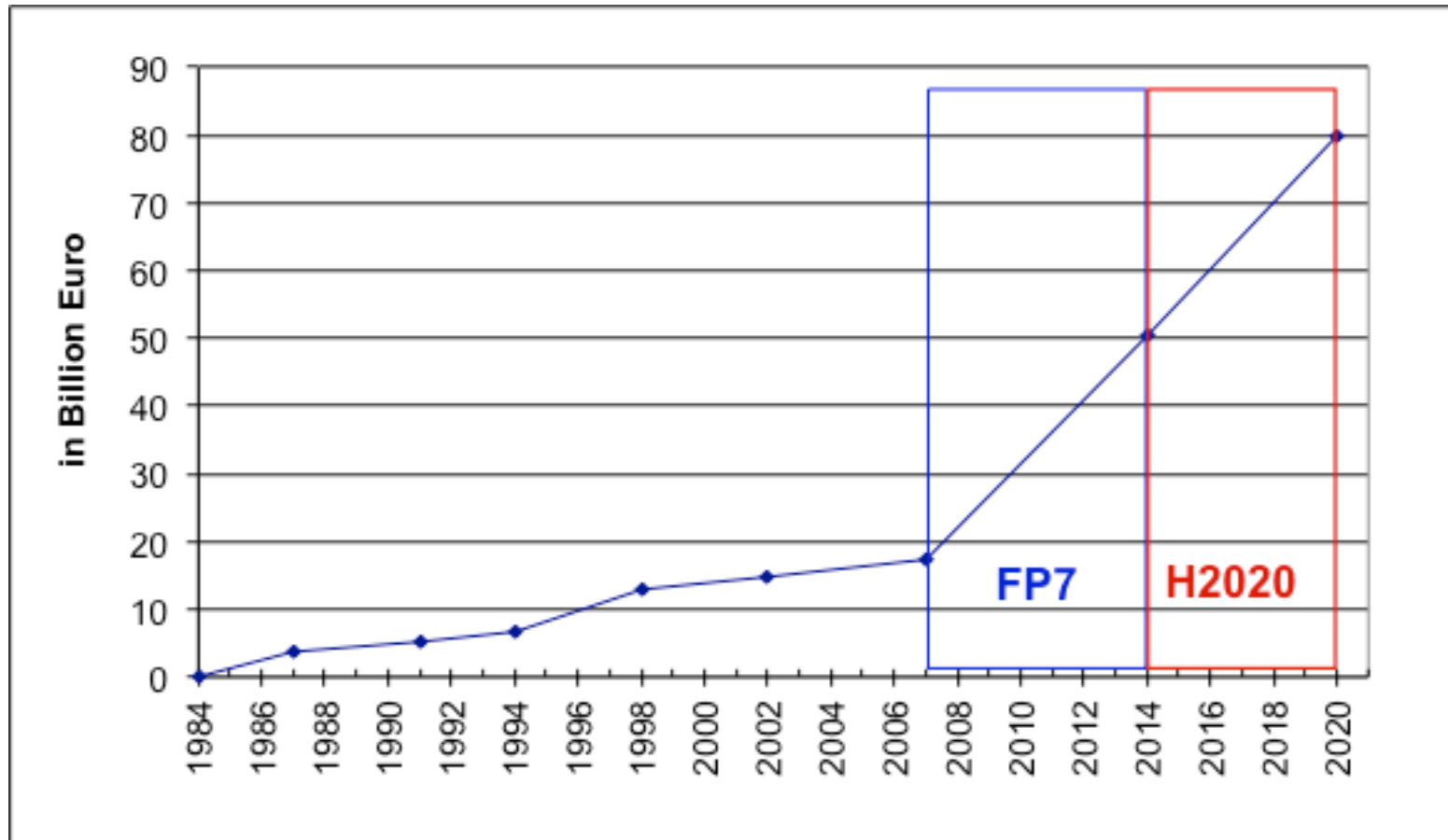
THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

# HORIZON 2020

The background of the image is a deep blue gradient. A bright, glowing horizon line curves across the middle of the frame. Above the horizon, a small, detailed globe of the Earth is positioned, appearing to sit on the horizon. From behind the globe and the horizon, numerous bright, white light rays radiate outwards in all directions, creating a sense of energy and innovation. The overall aesthetic is futuristic and high-tech.

# HORIZON 2020

- Horizon 2020 has nearly €80 billion Euro of funding available over 7 years (2014 to 2020).





# HORIZON 2020

- It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.
- As compared with FP 7 there are relatively fewer calls and topics that are generally broader and encompass a range of possible approaches. In most cases more than one possible action is envisaged for a particular topic.
- The Work Programme reflects the strong challenge-based approach of Horizon 2020, allowing applicants to have considerable freedom to come up with innovative solutions.

# Funding of projects

- The majority of the funding in H2020 is for transnational collaborative projects (min. 3 partners/3 countries).
- But also there is funding for individual researchers in specific sub-programmes (ERC, MSCA)
- Open to all: Industry, SMEs, Universities,...)

## One reimbursement rate by action

The same rate for all beneficiaries and all activities:

- Up to 100% for "Research and Innovation Actions"
- Up to 70% for "Innovation Actions" (non-profit entities up to 100%)

# The H2020 Structure – 3 Pillars

## Leadership in Enabling and Industrial Technologies - LEIT 24%

### Enabling Technologies

ICT

Nanotech

Adv.  
Materials

Biotech

Manufac-  
turing

Space

Access to Risk Finance

Innovation in SMEs

## Excellent Science 33%

- European Research Council
- FET
- Marie Curie
- Research Infrastructures

## Societal Challenges 43%

HEALTH

FOOD ...

Efficient  
Energy

Smart  
Transport

Climate

Inclusive  
Societies

Secure  
Societies

# Horizon 2020 - Excellent Science

## European Research Council:

- Frontier research,
- Cross disciplinary proposals and pioneering ideas in new and emerging fields, which introduce unconventional and innovative approaches
- Across all fields of research

## ERC principles:

1 researcher; 1 host institution;  
1 project; 1 selection criterion: scientific excellence  
No consortia, no networks, no co-financing

# Horizon 2020 - Excellent Science

## European Research Council:

### Starting Grants

support up-and-coming research leaders who are about to establish a proper research team and to start conducting independent research in Europe.

### Consolidator Grants

support researchers at the stage at which they are consolidating their own independent research team or programme.

### Advanced Grants

allow exceptional established research leaders of any nationality and any age to pursue ground-breaking, high-risk projects that open new directions in their respective research fields or other domains.

# Horizon 2020 - Excellent Science

## Future and Emerging Technologies:

- Frontier research: alternative ideas, concepts or paradigms of *highly risky, non-conventional* but *life-changing* and *long-term* research
- Funding schemes:
- FET Open: fostering novel ideas
- FET Pro-Active: nurturing emerging themes and communities
- FET Flagships: tackling grand interdisciplinary science and technology challenges

# Horizon 2020 - Excellent Science

## Marie Skłodowska-Curie Actions (MSCA)

### • Main objective

- Ensure the optimum development and dynamic use of Europe's **intellectual capital** in order to generate new skills and innovation

### • Rationale

- Encourage new, creative types of **training**
- Identify **excellent talents** in research and innovation in **international competition**
- Make **best researchers** in Europe and the world work together across countries, sectors and disciplines
- Create a whole **new mind-set** in Europe, crucial for **entrepreneurship** and **innovation**

# Horizon 2020 - Excellent Science

## Research Infrastructures (RI):

3 main objectives:

- Developing the European research infrastructure for 2020 and beyond
- Fostering the innovation potential of research infrastructure and their human capital
- Reinforcing European research infrastructure policy and international co-operation



# Horizon 2020 - Industrial Leadership

## LEADERSHIP IN ENABLING AND INDUSTRIAL TECHNOLOGIES (LEIT):

### 1. ENABLING TECHNOLOGIES

- Information and Communication Technologies (ICT)
- Nanotechnologies
- Advanced materials
- Biotechnology
- Advanced Manufacturing & Processing
- Space

Combined in  
one Work-  
programme

### 2. ACCESS TO RISK FINANCE

### 3. INNOVATION IN SMES

# Horizon 2020 - Societal Challenges

## Societal Challenges:

1. Health, Demographic Change and Wellbeing
2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bio-economy
3. Secure, Clean and Efficient Energy
4. Smart, Green and Integrated Transport
5. Climate action, environment, resource efficiency and raw materials
6. Europe in a changing world - inclusive, innovative and reflective societies
7. Secure societies - protecting freedom and security of Europe and its citizens.

THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

# H2020: The biggest EU Funding Programme for Research and Innovation Projects



# What is Innovation ?

- Innovation is the process and outcome of creating something new, which is also of value.
- Innovation involves the whole process from opportunity identification, research or invention to development, prototyping, production marketing and sales.

**Innovation = Invention (research) +  
exploitation**

# The Innovation Chain

Research &  
development

Covered by H2020

Prototyping,  
'plans' for new  
products

Market  
development

Market  
replication

# Types of actions supported by grants

- **Research and Innovation Actions**
- **Innovation Actions**
- **Coordination and Support Actions**
- **SME instrument**
- ERANET Co-fund
- Pre-commercial procurement Co-fund
- Public procurement of innovative solutions Co-fund

# Coordination and support actions

Actions consisting primarily of **accompanying measures** such as standardisation, dissemination, awareness-raising and communication, networking, coordination or support services, policy dialogues and mutual learning exercises and studies, including design studies for new infrastructure and may also include complementary activities of networking and coordination between programmes in different countries.

# Research and innovation actions

- Actions primarily consisting of activities aiming to establish new knowledge and/or to explore the feasibility of a new or improved technology, product, process, service or solution.
- For this purpose they may include basic and applied research, technology development and integration, testing and validation on a small-scale prototype in a laboratory or simulated environment.



# Innovation actions

- Actions primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. Often specific TRL levels are required as a starting point.
- For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.



# Innovation actions

Basic research is not foreseen in Innovation Actions.

Innovation Actions are based on existing prototypes, tested concepts, etc. that have a certain level of maturity.

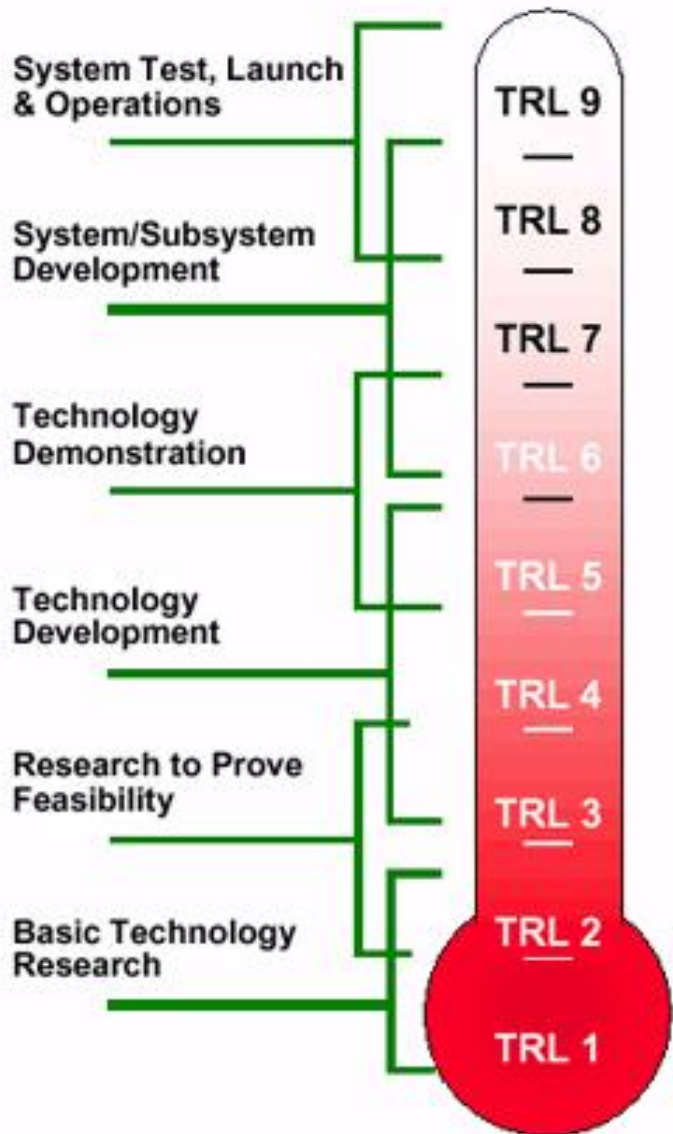
**How can such levels be defined ?**

# Measuring Technology Maturity

## Technology Readiness Levels (TRLs)

- The use of TRLs as a measurement of the maturity level of particular technologies is a new development in Horizon 2020.
- This measurement system provides a common understanding of technology status and addresses the entire innovation chain. By evaluating a technology project against the parameters for each Technology Readiness Level, one can assign a TRL rating to the project based on its stage of progress.
- Many of the call topics have a defined TRL at which the implementation of the project is intended to start. For example a project has to start at TRL 1-3 and end at TRL 4-5.

# A measurement of the maturity level of technologies: a new development in H2020



TRL9 – actual system proven in operational environment

TRL8 – system complete and qualified

TRL7 – system prototype demonstration in operational environment

TRL6 – technology demonstrated in relevant environment

TRL5 - technology validated in relevant environment

TRL4 – technology validated in LAB

TRL3 – experimental proof of concept

TRL2 – Technology concept formulated

TRL1 - Basic principles observed

# Innovation and the Private Sector

To ensure that innovation is happening in H2020

**SME participation become obligatory in most projects. Around 20% of the total budget for Societal Challenges and LEITs must go to SMEs.**

This is good news for SMEs, of course !

It is also an important message for universities: purely academic consortia are out !

# Opportunities for SMEs

A specific SME instrument comes under the H2020 objective of ‘smart, sustainable and inclusive growth, however with a small budget!



THE FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

HORIZON 2020

The practical side

# Eligible costs

## Main cost categories:

- Personnel costs
- Costs of subcontracting
- Other direct costs
  - Travel costs and subsistence allowances
  - Depreciation costs of equipment
  - Costs of other goods and services (including non-deductible VAT)



# Rules of Participation

## Minimum conditions

- For standard collaborative actions
  - At least, 3 legal entities, each established in different MS/AC
- For SME Instrument, programme co-fund, CSA
  - 1 legal entity established in a MS/AC

## Additional conditions

- To be set out in the Work Programme (i.e. number of participants, type of participants, etc.)

# Evaluation of proposals

## Award criteria

- Excellence
- Impact
  - *Higher weighting for innovation actions*
- Quality and efficiency in the implementation
- Details, weightings and thresholds be laid down in WP
- Evaluation carried out by independent experts
- Possibility of a 2 stage submission procedure

# Simplified Funding Model

## One reimbursement rate by action

The same rate for all beneficiaries and all activities:

- Up to 100% for Research and Innovation actions
- Up to 70% for innovation (non-profit entities up to 100%)
- Up to 70% for PCP co-fund, 33% for ERANET co-fund, 20% for PPI co-fund

# Simplified Funding Model

## A single method for calculation of indirect costs:

- Flat rate of 25% of total direct costs, excluding subcontracting, costs of third parties and financial support to third parties

# Work Programmes

What are these Work Programmes and what do they contain?

Where to find them:

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

**RESEARCH & INNOVATION**  
Participant Portal

European Commission > Research & Innovation > Participant Portal > Calls

HOME FUNDING OPPORTUNITIES HOW TO PARTICIPATE EXPERTS SUPPORT ▾ Search PP

**EU Programmes 2014-2020**

Search Topics

Call Updates

**Calls**

H2020

Research Fund for Coal & Steel

COSME

3rd Health Programme

Consumer Programme

**Calls for Proposals**

**Horizon 2020**

- ☐ Future and Emerging Technologies (FET)
- ☐ Marie-Sklodowska-Curie Actions
- ☐ Research Infrastructures
- ☐ Industrial Leadership
  - ☐ Leadership in enabling and industrial technologies (LEIT)
    - ☐ Information and Communication Technologies
    - ☐ Nanotechnologies
    - ☐ Advanced materials
    - ☐ Biotechnology



**EN**

**Horizon 2020**

**Work Programme 2016 - 2017**

*11. Smart, green and integrated transport*

## **Table of contents**

<b>Introduction .....</b>	<b>6</b>
---------------------------	----------

<b>Call - 2016-2017 Mobility for Growth .....</b>	<b>10</b>
---	-----------

<b>1. AVIATION .....</b>	<b>11</b>
--------------------------	-----------

MG-1.1-2016: Reducing energy consumption and environmental impact of aviation .....	12
---	----

MG-1.2-2017: Reducing aviation noise .....	13
--	----

MG-1.3-2017: Maintaining industrial leadership in aeronautics .....	15
---	----

MG-1.4-2016-2017: Breakthrough innovation .....	17
---	----

MG-1.5-2016-2017: Identification of gaps, barriers and needs in the aviation research.....	18
--	----

<b>2. WATERBORNE.....</b>	<b>20</b>
---------------------------	-----------

MG-2.1-2017: Innovations for energy efficiency and emission control in waterborne transport.....	21
--	----

MG-2.2-2016: Development, production and use of high performance and lightweight materials for vessels and equipment.....	22
---	----

MG-2.3-2016: New and improved transport concepts in waterborne transport .....	23
--	----

MG-2.4-2017: Complex and value-added specialised vessels.....	24
---	----

<b>3. SAFETY .....</b>	<b>25</b>
------------------------	-----------

MG-3.1-2016: Addressing aviation safety challenges .....	26
--	----

MG-3.2-2017: Protection of all road users in crashes.....	27
---	----

MG-3.3-2016: Safer waterborne transport and maritime operations .....	29
---	----