European Commission

HORIZON 2020

The EU Framework Programme for Research and Innovation

Key enabling technologies for European growth

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HORIZON 2020

What is Horizon 2020

- **Initial Commission proposal for a €80 billion research and innovation funding programme (2014-2020); now just over €70 billion (79 billion in current prices including inflation)**
- **A core part of Europe 2020, Innovation Union & European Research Area:**
  - Responding to the economic crisis to invest in future jobs and growth
  - Addressing people's concerns about their livelihoods, safety and environment
  - Strengthening the EU's global position in research, innovation and technology

What's new

- **A single programme** bringing together three separate programmes/initiatives*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access,** for all companies, universities, institutes in all EU countries and beyond

* The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)

Three priorities

Priority 1.
Excellent science

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

Proposed funding (€ million, 2014-2020)*

European Research Council (ERC) Frontier research by the best individual teams	**13 095**
Future and Emerging Technologies Collaborative research to open new fields of innovation	**2 696**
Marie Skłodowska-Curie actions (MSCA) Opportunities for training and career development	**6 162**
Research infrastructures *(including e-infrastructure)* Ensuring access to world-class facilities	**2 488**

* All funding figures in this presentation are subject to the pending Multiannual Financial Framework Regulation by the EP and the Council

Priority 2.
Industrial leadership

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**

Proposed funding (€ million, 2014-2020)

Leadership in enabling and industrial technologies (LEITs) (ICT, nanotechnologies, materials, biotechnology, manufacturing, space)	**13 557**
Access to risk finance Leveraging private finance and venture capital for research and innovation	**2 842**
Innovation in SMEs Fostering all forms of innovation in all types of SMEs	**616** + complemented by expected 20% of budget of societal challenges + LEITs and ***'Access to risk finance'*** with strong SME focus

Priority 3.
Societal challenges

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

Proposed funding (€ million, 2014-2020)

Health, demographic change and wellbeing	**7 472**
Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the Bioeconomy	**3 851**
Secure, clean and efficient energy *	**5 931**
Smart, green and integrated transport	**6 339**
Climate action, environment, resource efficiency and raw materials	**3 081**
Inclusive, innovative and reflective societies	**1 310**
Secure societies	**1 695**
Science with and for society	*462*
Spreading excellence and widening participation	*816*

* Additional funding for nuclear safety and security from the Euratom Treaty activities (2014-2018)

EURATOM

Budget: €939 million to support indirect research actions in nuclear fission, radiation protection and fusion activities
Duration of the Programme - 5 years, in line with the Euratom Treaty

What is new?

- Euratom Programme complements Horizon 2020 and addresses the same key challenges;
- The same rules for participation apply to Horizon 2020 and Euratom Programme;
- A streamlined fusion research programme focusing on the implementation of the fusion roadmap;
- A single regulation instead of four separate decisions during FP7

Role of the EIT and JRC in Horizon 2020

	Proposed funding (€ million, 2014-2020)
European Institute of Innovation & Technology (EIT) Combining research, innovation & training in knowledge and Innovation Communities	**2 711**
Joint Research Centre (JRC)* Providing a robust, evidence base for EU policies	**1 903**

* Additional funding for the JRC for Euratom Treaty activities

Horizon 2020 is different: conceptual

- **Single set of** simpler and more coherent participation **rules**
- New **balance between trust and control**
- Moving from several **funding rates** for different beneficiaries and activities to just two
- Replacing the four methods to calculate overhead or «indirect costs» with a **single flat rate**
- Major simplification under the **forthcoming financial regulation**
- **Successful applicants to get working more quickly:** time-to-grant of 8 months; exceptions for the ERC and in duly justified cases
- **No negotiation of the grant agreement in future, what is submitted will be evaluated. Potential participants must now be aware of this.**

Horizon 2020 is different: implementation

- A strong **challenge-based approach**, allowing applicants to have considerable freedom to come up with innovative solutions
- **Emphasis on innovation**, with continuing support for R&D (research and innovation actions with 100% funding; innovation actions with 70% funding)
- **Less prescriptive topics**, strong emphasis on expected impact
- A strategic approach, with **two-year work programmes**
- **Focus areas** bring together different technologies, along the entire innovation chain
- **Cross-cutting issues mainstreamed** (e.g. social sciences, gender, international cooperation)

Leadership in enabling and industrial technologies (LEIT)

Priority 1: Excellent Science

Priority 2: Industrial Leadership

Leadership in enabling and industrial technologies (LEIT) *(i) ICT including micro- and nano-electronics and photonics* **(ii) Nanotechnologies** **(iii) Advanced Materials** **(iv) Biotechnology** **(v) Advanced Manufacturing & Processing** *(vi) Space*
Access to risk finance *Leveraging private finance and venture capital for R&I*
Innovation in SMEs *Fostering all forms of innovation in all types of SMEs*

Priority 3: Societal Challenges

Industrial Leadership

- Key Enabling Technologies (KETs) and support to industry, to recover from economic crisis
- Emphasis on R&D and innovation with strong industrial dimension
- Activities primarily developed through relevant industrial roadmaps (ETPs, PPPs)
- Involvement of industrial participants and SMEs to maximise expected impact → key aspect of proposal evaluation
- Funded projects will be outcome oriented, developing key technology building blocks and bringing them closer to the market

Mastering and industrial deployment of Key Enabling Technologies

- Six strategic technologies:
  Nanotechnologies, Advanced Materials ,
  Micro and nano-electronics, Photonics,
  Biotechnology, and Advanced Manufacturing
- Driving competitiveness and growth opportunities
- Contributions to solving societal challenges
- Knowledge- and Capital- intensive
- Cut across many sectors

- European KET Strategy:
  EC Communications (2009)512 & (2012)341
  Final report of the High-level Group on KET

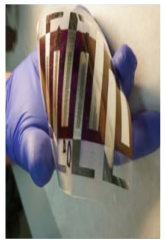
The issues regarding KETs

- Europe has a strong position in science and in patenting activity
- EU actors are at the top of patent ranking in each KET
- But there is a gap between the technology base and the manufacturing base
- We need to add demonstrators, competitive manufacturing and product development to the technologies

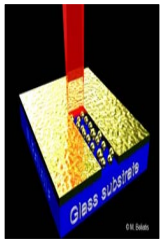
From Lab to Industry to Market

Main challenges and drivers

Enable European industry to innovate and lead



Strenghen industrial capacity and business perspectives

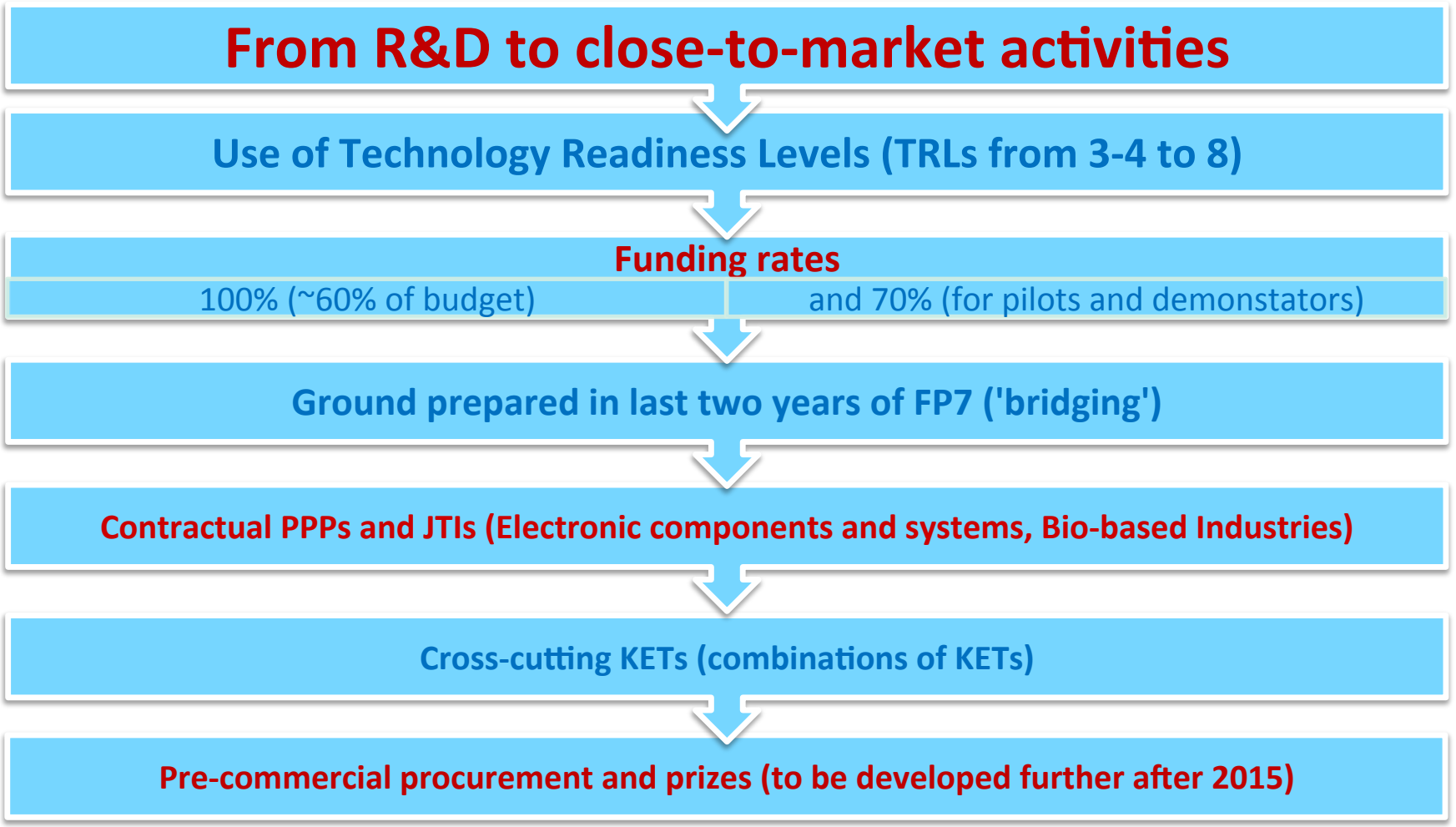


Competitiveness through tech. leadership, cost-efficiency through resource- and energy-efficiency

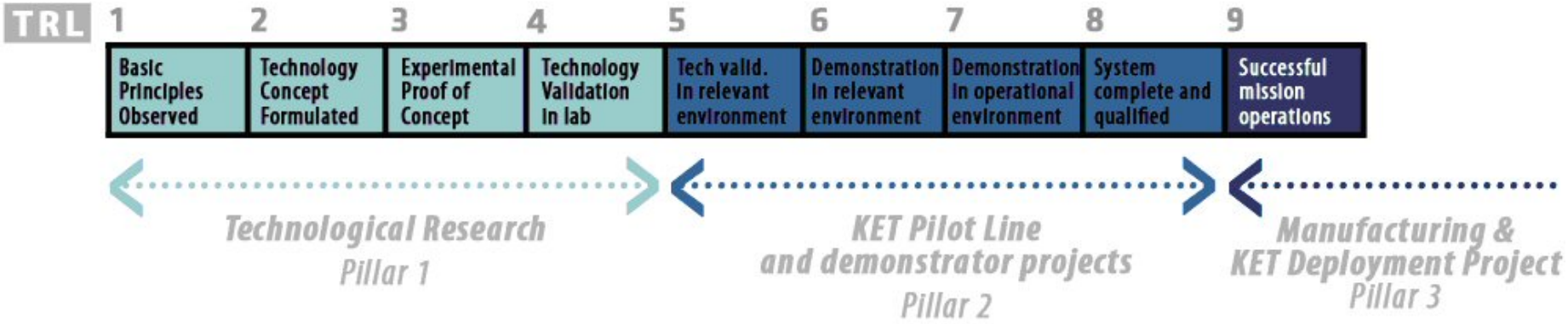
Industrial engagement, leveraging investment, pilots and demonstrators

Enabling factor addressing societal challenges – 'sustainable growth'

Covering the innovation cycle "research to market"



Technology Readiness Levels (TRLs)
– a useful tool in development and deployment of KETs

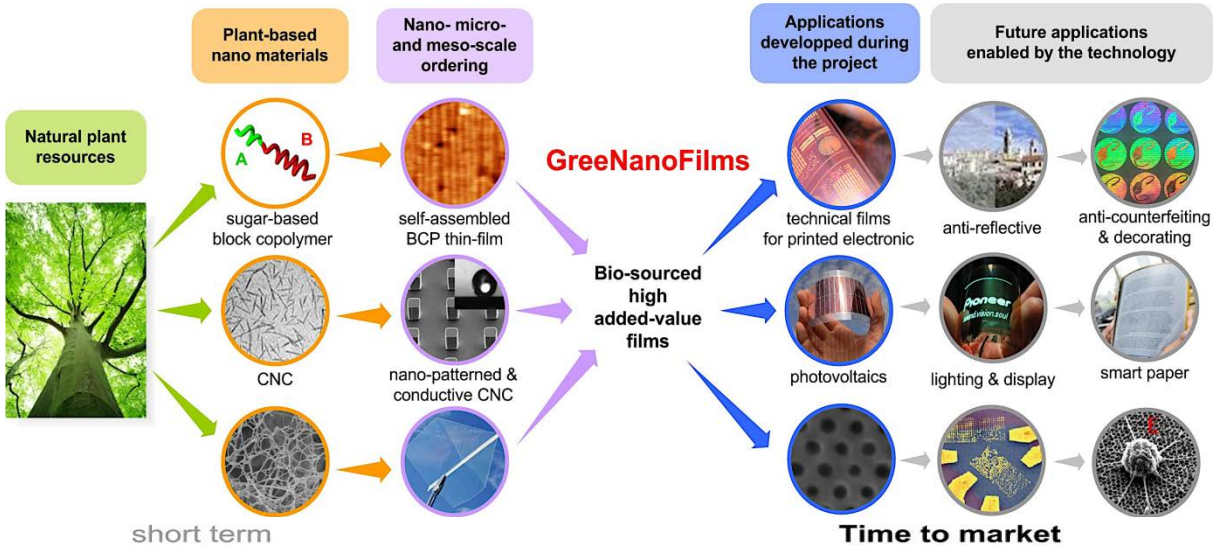


- **NMP in FP7: TRLs 1 – 4;**
  up to 5-6 in 2012-13 (pilots and demonstrators)

- **LEIT KETs: TRLs 3/4 – 8; centre at TRLs 5-7**

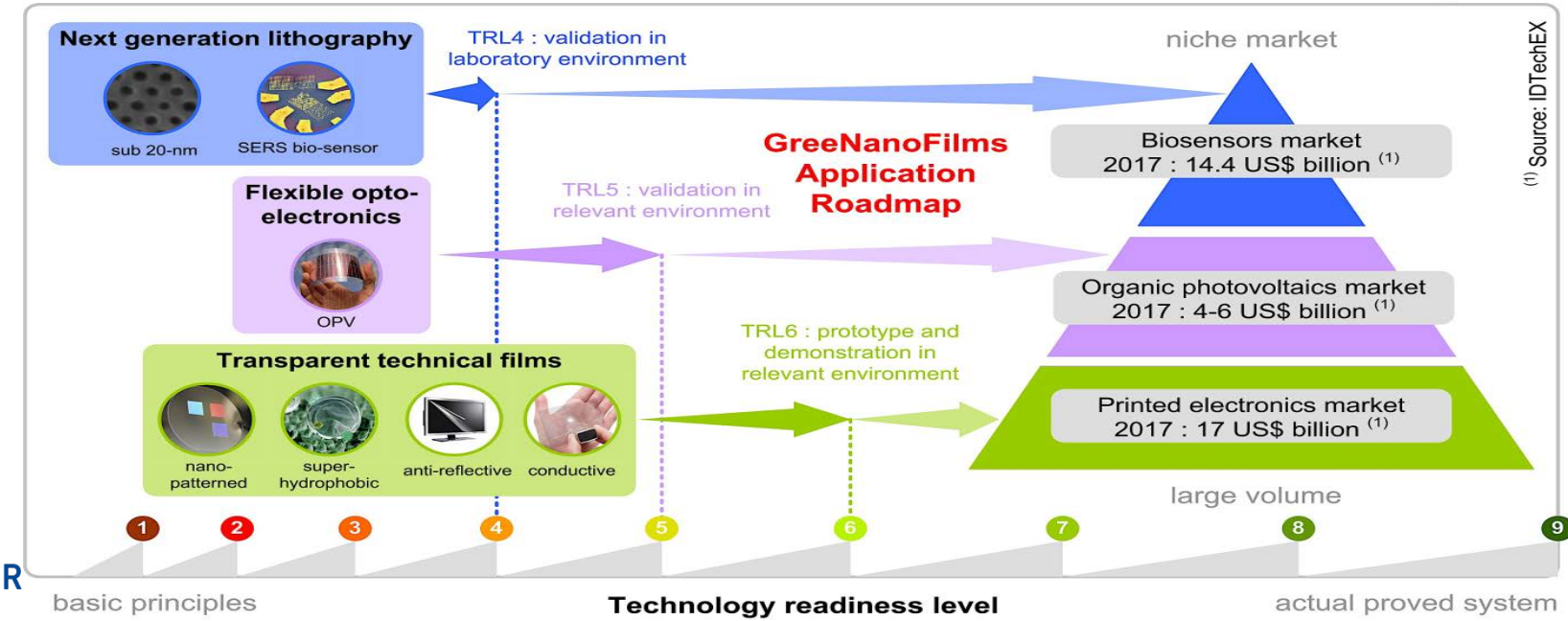
GreeNanoFilms

Example



Plant-based biomaterials:

- Glycopolymers
- Cellulose nanocrystals (CNC)
- Cellulose nanofibrils (CNF)



MAIN CALL PRIORITIES

- Focus on technology development with industrial deployment of Key Enabling Technologies (KETs)
- Based on strategic research agendas, roadmaps and value chains (with applications in several sectors and societal challenges)
- Support for further innovation, through e.g. project clusters and links to other funding (e.g. smart specialisation)
- Contributions to objectives of selected focus areas, *within LEIT calls - with enabling character*: personalising health care, decarbonising energy, waste as a resource

Horizon 2020 aims at strong participation by SMEs

- **Integrated approach** - around 20% of the total budget for societal challenges and LEITs to go to SMEs
- **Simplification** of particular benefit to SMEs (e.g. single entry point)
- A **new SME instrument** will be used across all societal challenges as well as for the LEITs
- A dedicated activity for research-intensive SMEs in **'Innovation in SMEs'**
- **'Access to risk finance'** will have a strong SME focus (debt and equity facility)

Risk finance in H2020

- Part of the Horizon 2020 budget (3.7%) will be in the form of risk-sharing (for loans and guarantees) and risk finance (equity)
- Goal: Stimulate more investment in research and innovation, notably by the private sector - leverage effect
- Building a bridge from R&D to Innovation: effective and cost-efficient way to complement grant funding under Horizon 2020, national/regional programmes (including structural funds) and bring R&D results to the market

H2020 and synergies with Structural & Investment Funds (ESIF)

- Increased funding for research and innovation available under regional funding
- *Smart Specialisation*: strategic framework to access funding for Research and Innovation in Structural Funds 2014-2020
- National / regional authorities in charge (not the Commission)
- Policy support measures undertaken timely
- Support from other EU, national or regional programmes encouraged (supported or not by ESIF)
- Some topics particularly suitable for additional funding (e.g. to deploy technologies)

Useful links

- **Horizon 2020 portal:**

  www.ec.europa/research/horizon2020

- **Participant portal:**

  http://ec.europa.eu/research/participants/portal/desktop/en/home.html

- **Smart specialisation**

  http://s3platform.jrc.ec.europa.eu/

- **National contact points**

  http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html

  Specific for NMBP proposers http://www.nmpteam.com/

European Commission

Thank you for your attention!

Find out more:
www.ec.europa/research/horizon2020

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