



HORIZON 2020

Key Enabling Technologies for European Growth

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European Commission
DG Research & Innovation
Key Enabling Technologies - Strategy

Launch H2020
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Horizon 2020 is different

- 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
- Less prescriptive topics, strong emphasis on expected impact
- A strategic approach, with two-year work programmes
- Focus areas bring together different technologies, along entire innovation chain
- Cross-cutting issues mainstreamed (e.g. social sciences, gender, international cooperation)



Horizon 2020

Total indicative budget: 77.0 billion €*

Excellent science

- *European Research Council*
- *Future and Emerging Technologies*
- *Marie Curie actions*
- *Research infrastructures*

Indicative Budget:
24.4 billion €*

Industrial leadership

- ***Leadership in enabling and industrial technologies***
- *Access to risk finance*
- *Innovation in SMEs*

Indicative Budget:
17.0 billion €*

Societal challenges

- *Health, demographic change and wellbeing*
- *Food security, sustainable agriculture, marine and maritime research and the bioeconomy*
- *Secure, clean and efficient energy*
- *Smart, green and integrated transport*
- *Climate action, resource efficiency and raw materials*
- *Inclusive, innovative and reflective societies*
- *Secure societies*

Indicative Budget:
29.7 billion €*

* 2014-20, actual budget (indicative)
Includes 5.9 billion € for "widening participation",
"science with and for society", JRC and EIT
– not shown in three priorities above

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

**This
Work Programme**

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 partnership with 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 (KETs)

What are KETs?

- Six strategic technologies
- Driving competitiveness and growth opportunities
- Contributions to solving societal challenges
- Knowledge- and Capital-intensive
- Cut across many sectors

- **Nanotechnologies**
- **Advanced Materials**
- **Micro- and nano-electronics**
- **Photonics**
- **Biotechnology**
- **Advanced Manufacturing**

European KET Strategy:

- **EC Communications**
(2009)512 & (2012)341
- **KET High-level Group**

The issues regarding KETs

- Europe has strong position in science and in patenting activity
- EU actors are at 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 priorities for KETs

- Technology development and validation, aiming at industrial deployment of Key Enabling Technologies (KETs)
- Strategic research agendas, roadmaps and value chains (applications in several sectors)
- Industrial engagement / leverage
- Pilots and demonstrators
- Cross-cutting KETs (combinations of KETs and manufacturing), 30% of KET budget
- Enabling applications in societal challenges

Example - combining several KETs for advanced products

**Societal
Challenge**

Health



- New nanotechnology-based diagnostics
- New target drug delivery and release
- Regenerative medicine

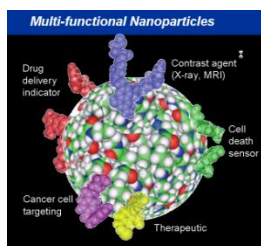
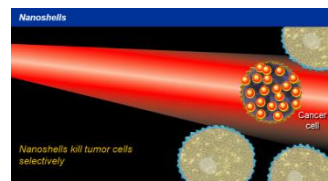
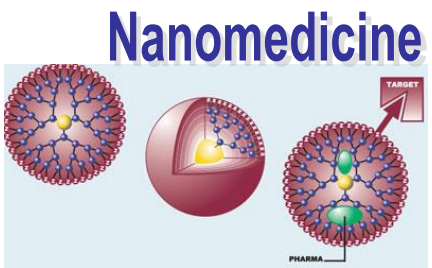
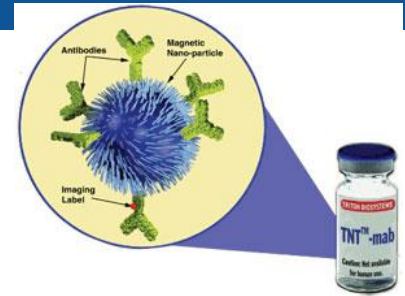
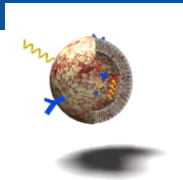


Advanced materials
Microelectronics

Nanotechnologies

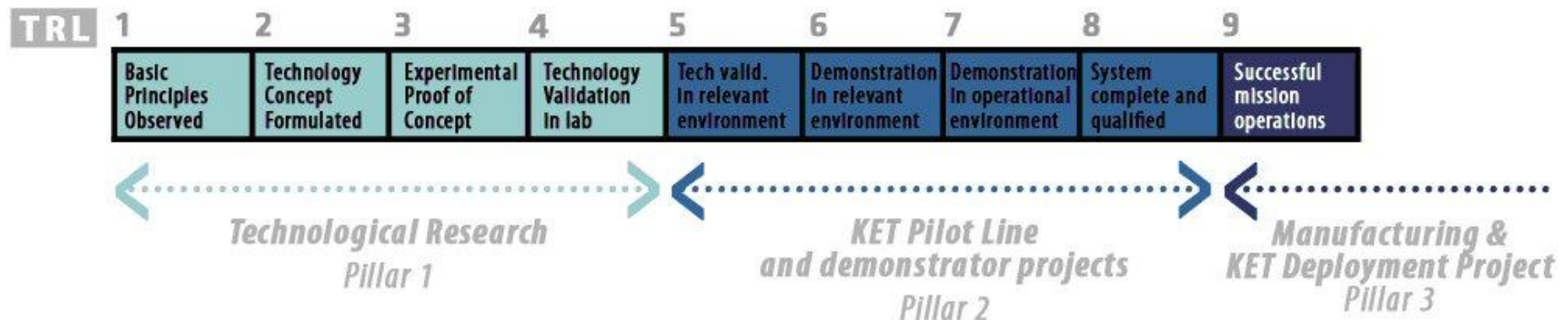
Photonics

Biotechnologies



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 – 7; centre at TRLs 5-6

H2020 – LEIT/KETs: From R&D to close-to-market activities

- Use of Technology Readiness Levels (TRLs from 3-4 to 8)
- Two funding rates

Research and innovation actions: 100% funding:
~TRLs 3-6

Innovation actions: 70% funding: ~ TRLs 5-7

Non-profit participants can claim 100% funding

- Cross-cutting KETs (combinations of KETs and manufacturing)
- Seamless coverage provided by FETs/ERC – LEIT – Societal Challenges
- Ground prepared in FP7 (first pilots and demonstrators, innovation activities)

Public Private Partnerships (PPPs)

- **Industry plays leading role** in defining research priorities
- **Pre-defined budget** ensures continuity and commitment
- Focused on **enabling industrial technologies**
- Increased use of **SME-friendly** instruments and **demonstration**
- Roadmaps prepared with large stakeholder involvement and public consultation
- Concrete technological and sector related objectives – commitment from industry to reach them and to provide the necessary R&D+I investments
- Fully open H2020 calls

PPPs in H2020

- Industrial Investment Package of 10 July 2013 :
 - Joint Technology Initiatives (JTIs) implemented by Joint Undertakings
 - Contractual PPPs (cPPPs)
 - Public-Public Partnerships (P2Ps)
 - PPPs in H2020 :
 - Continuation of existing JTI's : Clean Sky, Innovative Medicines Initiative (IMI), Hydrogen and Fuel Cells (HFC)
 - New JTI's : Joint Technology Initiative on Electronic Components and Systems for European Leadership (ECSEL), Bio-based industries (BBI)
- cPPPs (implemented within H2020 WP)
- Robotics
 - Photonics
 - Advanced 5G Network Infrastructures
 - **Factories of the Future (FoF)**
 - **Energy-efficient Buildings (EeB)**
 - **Sustainable Process Industry (SPIRE)**
 - European Green Vehicles Initiative
 - High-performance Computing

PPPs identified in the Specific Programme

- Industrial Investment Package of 10 July 2013 :
 - **JTIs/JUs**
 - **contractual PPPs**
 - **P2Ps**

- **For H2020 in LEIT:**
 - JTI: Joint Technology Initiative on Electronic Components and Systems for European Leadership (ECSEL)
 - JTI on bio-based industries (BBI)
 - Robotics
 - Photonics
 - Advanced 5G Network Infrastructures
 - Factories of the Future (FoF)
 - Energy-efficient Buildings (EeB)
 - Sustainable Process Industry (SPIRE)

cPPPs

Policy Issues in LEIT of relevance for proposals and projects

- Exploitation and business plans
- Industrial-size projects to look at additional funding/financing sources
- Contributions to solving societal challenges and to focus areas
- Open to International Cooperation
- Engagement with Social sciences and humanities
- Responsible approach to research and innovation
- Gender and diversity issues

H2020: Strong participation of 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

- RSFF: a successful instrument in FP7 to provide loans and guarantees supporting investments in RDI
- 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

Risk-Finance in H2020

- Implemented by EIB and through partner banks
 - **Loan Finance**
 - **Equity Finance**
 - At least 1/3 for R&I-intensive SMEs and mid-caps through guarantees on loans
 - Complementary to the COSME Equity Facility for Growth investing in expansion and growth phases.
 - MoU between EC and EIB for improved access to finance for investments in KETs (signed on 27 February 2013)

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 to be undertaken timely (by the end of 2013)
- 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)

European Institute of Innovation and Technology (EIT)

How does the EIT work?

Integrating three sides of 'knowledge triangle': higher education, research and business: Knowledge and Innovation Communities (KICs) to promote innovation in Europe.

Three KICs were launched in 2010:

Climate-KIC: climate change mitigation and adaptation

EIT ICT Labs: information and Communication Technologies

KIC InnoEnergy: sustainable energy.

EIT budget ~ EUR 2.7bn for 2014-2020.

Five new KICs:

Two in 2014:

Innovation for healthy living and active ageing,

Raw materials - sustainable exploration, extraction, processing, recycling and substitution

Two in 2016:

Food4Future - sustainable supply chain from resources to consumers;

Added-value manufacturing

One in 2018:

Urban mobility

<http://eit.europa.eu/kics/>


TOPICS

**Nanotechnologies, Advanced Materials,
Biotechnology
and Advanced Manufacturing and Processing**



European
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COSME

Other Funding Opportunities

Horizon 2020

Excellent Science

- ☐ European Research Council
- ☐ Future and Emerging Technologies
- ☐ Marie Skłodowska-Curie actions
- ☐ Research infrastructures

Industrial Leadership

- ☒ Leadership in enabling and industrial technologies(LEIT)
- ☐ Access to risk finance
- ☐ Innovation in SMEs

Filter a call

Type

- ☒ Proposal
- ☐ Tender

Status

- ☒ Open
- ☐ Closed
- ☐ Forthcoming

Sort by ☐ Title ☐ Call Id ☐ Publication Date ☒ Deadline Date

Industrial Leadership BIOTECHNOLOGY H2020-LEIT-BIO-2014-1 Pub.Date: 11/12/2013 Deadline: 12/03/2014	Industrial Leadership Call for SPIRE - Sustainable Process Industries H2020-SPIRE-2014 Pub.Date: 11/12/2013 Deadline: 20/03/2014	Industrial Leadership Call for Energy-efficient Buildings H2020-EeB-2014 Pub.Date: 11/12/2013 Deadline: 20/03/2014
Industrial Leadership Call for Factories of the Future H2020-FoF-2014 Pub.Date: 11/12/2013 Deadline: 20/03/2014	Industrial Leadership H2020-LEIT-Space-Competitiveness of the European Space Sector-2014 H2020-COMPET-2014 Pub.Date: 11/12/2013 Deadline: 26/03/2014	Industrial Leadership Earth Observation-2014 H2020-EO-2014 Pub.Date: 11/12/2013 Deadline: 26/03/2014

Work Programme topics

Structure reflects the challenge based approach

3 key features :

- **Specific Challenge**

- sets context, problem to be addressed, why intervention is necessary

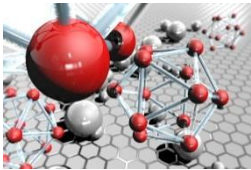
- **Scope**

- delineates the problem, specifies the focus and the boundaries of the potential action BUT without overly describing specific approaches

- **Expected Impact**

- describe the key elements of what is expected to be achieved in relation to the specific challenge

Call for Nanotechnology, Advanced Materials and Production



Bridging the gap between nanotechnology research and markets

- Addresses 3 of key European nano-enabled industrial value chains :
 - Lightweight multifunctional materials and sustainable composites
 - Structures surfaces
 - Functional fluids
- SMEs invited to participate
- Expected activities :
 - Deployment and market introduction by scaling up lab experience to industrial scale and by demonstrating viability of variety of manufacturing technologies
- Attention: special evaluation sub-criteria

***Deadline 2014 call:
6 May***

Call for Nanotechnology, Advanced Materials and Production

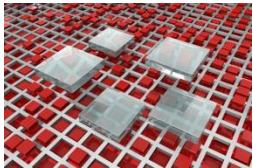


Nanotechnology and Advanced Materials for more effective Healthcare

- Support **more effective therapies** in health care for important diseases.
- Required development : reach point where they can be considered **fit for purpose** in preparation of, but not including, clinical trial stages.
- **Gender** issues important : technologies and innovations should suit both women and men.

***Deadline 2014 call: 6 May
for single stage and first
stage, 7 Oct. for second
stage (check topics)***

Call for Nanotechnology, Advanced Materials and Production



Nanotechnology and Advanced Materials for low-carbon energy technologies and Energy Efficiency

- Support EU objectives to increase use of **renewable energy sources** and improve **energy efficiency**
- Demonstrate **technology readiness** for further take-up by societal challenge
- Contributions to Materials Roadmap Enabling Low Carbon Energy Technologies
- Time to market should be assessed with view of contributing to **EU2020 targets**

***Deadline 2014 call: 6 May
for first stage, 7 Oct. for
second stage***

Call for Nanotechnology, Advanced Materials and Production



Exploiting the cross-sector potential of Nanotechnologies and Advanced materials to drive competitiveness and sustainability

- Boosting European **industry competitiveness** and contributing to a **sustainable economy**
- Enabling **multi-sectorial potential**, by developing and advancing technological readiness of solutions with break-through potential.
- **International cooperation** particularly appropriate.

***Deadline 2014 call: 6 May
for first stage, 7 Oct. for
second stage***

Call for Nanotechnology, Advanced Materials and Production



Safety of nanotechnology-based applications and support for the development of regulation

- **Risk management** to become integral part of supply chain
- All projects should align with the **EU Nanosafety Cluster** and other international activities
- **International cooperation** encouraged, in particular with leading nanotechnology developing Nations (US, Canada, Australia, Korea, Japan, China, Brazil)
- **Responsible governance** determining for future impact of nanotechnologies on society and economy (KET-support)

***Deadline 2014 call: 6 May
for single stage and first
stage, 7 Oct. for second
stage (check topics)***

Call for Nanotechnology, Advanced Materials and Production

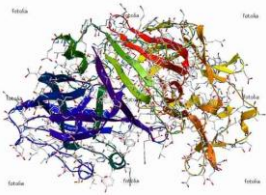


Addressing generic needs in support of governance, standards, models, and structuring in nanotechnology, advanced materials and advanced manufacturing and processing

- Addressing general, structural needs in areas incl.
 - Infrastructure,
 - metrology and standards,
 - skills and networking,
 - dissemination and communication,
 - business models
- Other funding sources such as structural funds, are vital
- Proactive approach towards international collaboration

Different deadlines – check topics

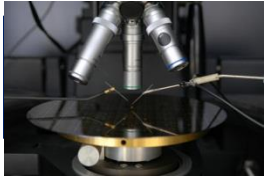
Call for Biotechnology



Cutting-edge biotechnologies as future innovation drivers

- **Synthetic biology** : potential to influence or event transform large areas of our economy and society.
- **Bioinformatics** critical to realise full value of biotechnology
- Appropriate measures to facilitate effective transfer and implementation into **new applications**.

***Deadline 2014 call: 12 March
for first stage, 26 June for
second stage***



Call for Factories of the Future (FoF PPP)

- **Aim** : help EU manufacturers (incl. SMEs) to adapt to global competitive pressures
- **How** : developing necessary key enabling technologies across broad range of sectors
- Meet increasing **global consumer demand** for greener, more customised and higher quality products
- Transition to **demand-driven industry** with lower waste and energy consumption
- Activities :
 - Industry-led R&D projects (incl. Demo activities)
 - Cross-sectoral, addressing needs of SMEs
- Attention: some topics have special evaluation sub-criteria

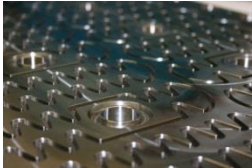
Deadline 2014 call: 20 March



Call for Energy-efficient Buildings (EeB PPP)

- Drive creation of **high-tech building industry** - Turning **energy efficiency** into **sustainable business** - Fostering EU **competitiveness in construction sector** on global level
- Reduce energy consumption & CO² emissions in existing and new buildings.
- Effective integration of key technologies into construction operations for sustainable, long-term competitiveness.
- Contributes to EU industrial leadership and grand societal challenges
- Participation of public authorities, asset for some projects as owners of large part of EU building stock.

Deadline 2014 call: 20 March



Call for Sustainable Process Industries (SPIRE PPP)

- Resource efficiency essential factor in industry
- General goal: **optimise industrial processing, reducing energy & resources consumption, minimising waste**
- Specific goals :
 - reduction in **fossil energy intensity** of up to 30% from current levels by 2030.
 - reduction of up to 20% in **non-renewable, primary raw material intensity** compared to current levels by 2030.
 - reduction of **greenhouse gas emissions** by 20% below 1999 levels by 2020, further reductions up to 40% by 2030 and at least 80% by 2050.
- Attention: some topics have special evaluation sub-criteria

Deadline 2014 call: 20 March



Find out more on Horizon 2020:

<http://www.ec.europa.eu/research/horizon2020>

Participant Portal:

<https://ec.europa.eu/research/participants/portal/page/home>

Please use the information given in the OJ and on the Participant Portal to prepare proposals.

Thank you for your attention